Coherence in Real- and Apparent-Time:

A sociolinguistic variationist investigation of language change in Swabia

by

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Statement of Originality

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For Rupert

Abstract

This research investigates linguistic variation and change in three understudied areas of the dialect-standard language continuum: the changing use of Swabian, an Alemannic dialect spoken in southwestern Germany; the compatibility between findings from a combined real-time panel and trend study; and, the role of sociolectal coherence in explaining how systematic and predictable linguistic patterns can shape variation and foster or constrain language change. This study investigates two communities, the large urban metropolis of Stuttgart and the mid-sized, semi-rural town of Schwäbisch Gmünd, at two points in time: 20 participants, initially interviewed in 1982 and then re-interviewed between 2017-2018, form the panel component, and 40 participants, “social twins” matched with the panel participants for community, age, sex, and education, constitute the trend component. Twenty linguistic variables, 10 phonological and 10 morphosyntactic, are investigated via a token-based Dialect Density Measure (DDM), and two exemplary variables are analysed in-depth: the social meaning of the merger of two variants of the Swabian (ai) diphthong and the use of *wo* ‘where’ as a relative clause marker versus the standard German relativisers *der*, *die*, *das*, etc.

The results show, not surprisingly, that dialect density has declined considerably over the 35-year time period. However, speakers with higher Swabian orientation and with a greater tendency to accommodate to their interlocutors retain more dialect variants, effects that eclipse all other factors (e.g., age, sex, education, mobility). This research builds on concepts from implicational scaling and the lattice theory of mathematics to investigate the hypothesis that more coherent lects are less vulnerable to change and convergence to the standard language while less coherent lects are more susceptible. The findings offer new theoretical insights into the concept of sociolectal coherence and the roles of dialect identity and linguistic accommodation, suggesting some new directions for the study of real- and apparent-time change.

Keywords: sociolinguistics, linguistic variation and change, sociolectal coherence, standard language convergence, dialect levelling, supralocalisation, identity, accommodation, mobility, panel studies, trend studies, apparent-time, real-time, dialects, German, Swabian.

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Abbreviations

AdA	Atlas zur deutschen Alltagssprache (Universities of Salzburg and Liège)
ALM	Alemannic Language Family
DiWA	Digitaler Wenker-Atlas (Schmidt/Herrgen, 2001ff.)
DWB	Deutsches Wörterbuch (Grimm/Grimm 1854ff.)
ENG	English translation
MHG	Middle High German
PFK	Pfeffer-Korpus (Institute für deutsche Sprache Mannheim)
REL	relative pronoun
SGL	Swabian-German Lexicon (Beaman 2020)
SSA	Südwestdeutscher Sprachatlas (Steger u.a. 1989ff.)
SNBW	Sprachatlas von Nord Baden-Württemberg (Universität Tübingen)
STD	Contemporary Standard German
SWB	Schwäbisches Wörterbuch (Fischer 1904ff.)
SWG	Swabian language
SWS	Südwest-Standard-Korpus (Universität Freiburg)
WLH	Weinreich, Labov and Herzog (1968)

Preface and Acknowledgements

It goes without saying: this thesis has been very long in the making. Back in 1976 when I took my first sociolinguistics course, Language in Society, taught by John P. Broderick, an alumnus of Georgetown University and at that time a professor in the English department at Old Dominion University (ODU), I could have never imagined that I would be submitting my doctoral thesis on the same topic over four decades later. Dr. Broderick had a profound and enduring impact on my professional life, unleashing in me a love for linguistics, and I thank him sincerely for the intellectual inspiration and infinite patience he extended to me as a young undergraduate struggling to find my way. I also wish to thank Frau Meier from the German department at ODU, who taught me a love for the German language. Teachers with her energy, enthusiasm, and humour are all too rare.

Dr. Broderick encouraged me to attend Georgetown to do a PhD in sociolinguistics, where I enrolled in 1978. To prepare for the intense study ahead, in the summer of 1978, I took a backpacking trip from England to Germany, where I spent five weeks working and traveling through Germany with the goal of improving my fluency in the language. On the ferry from Dover to Calais, I met Rupert from the *Bodensee* ‘Lake Constance’, who invited me to his home in the *Schwäbischen Alb* ‘Swabian mountains’, where I learned about *Schwabenland* ‘Swabia’ and developed a deep love and admiration for the Swabian people and their language. While his family name and the name of his town have long since left my memory, the warmth and kindness Rupert and his family showed me are truly cherished and will never be forgotten.

At Georgetown I began my thesis under the direction of Ralph Fasold, “Fuzz” as he was known to us, who introduced me to the quantitative methods of variationist sociolinguistics and the importance of both quantitative and qualitative approaches for meaningful empirical analysis. When we couldn’t get VARBRUL to run on the Georgetown computers, Fuzz sent me with my deck of punch cards to Greg Guy at the University of Pennsylvania, where I learned about factor weights, interaction effects, and much more. I am deeply indebted to Fuzz and Greg for sharing their knowledge, tolerating my infinite questions, and helping me first uncover the systematic patterns of sociolinguistic variation in Swabian, on which this thesis is based.

I would also like to acknowledge the *Deutscher Akademischer Austauschdienst* (DAAD) ‘German Academic Exchange Service’ for their financial support in 1982, the first year I spent doing fieldwork in Swabia. The recordings of Swabian speakers I made at that time are the foundation of this study. Most importantly, I would like to extend my deepest, heartfelt appreciation to Reinhard Winter from Schwäbisch Gmünd and the University of Tübingen and to Edgar Kindler from Warmbronn and the University of Stuttgart, who conducted 30 interviews for me in 1982 with their family and friends, which launched me on my Swabian journey. After

returning to Swabia in 2016, Reinhard has continued to be an avid supporter of my research, welcoming me back to Tübingen, making introductions for me in the community, and being a sounding board for my research approach and findings.

After completing my coursework at Georgetown and passing my oral examinations, I was deep in debt with student loans and in need of job. My aim was to work part-time and continue the analysis of my Swabian data and the writing of my thesis the rest of the time. However, life happens despite the best intentions: away from my support network at Georgetown, working at a computer start-up in San Francisco, and starting a family was all-encompassing; hence, my thesis was shelved for 35 years. All things happen for a reason they say, and, in the end, I am deeply grateful to Dave Duffield who had confidence in me to help him launch his new initiative, Workday, which provided me with the financial support needed to complete this project.

In 2014, after selling my company and thinking long and hard about my next journey, my long-time friend and colleague, Greg Guy, encouraged me to return to academia and complete my PhD. With his recommendation, in 2016, I met Jenny Cheshire, Erez Levon and Devyani Sharma at Queen Mary University of London who accepted me into QMUL's Research PhD Programme. My sincere and intense gratitude go to Jenny, Erez, and Devyani for welcoming me back into the field of sociolinguistics. I was extremely worried how I was ever going to catch up after a 35-year hiatus; however, these three made it easy. They seem never to tire or show lack of support for a silly question or mundane problem. Certainly, this thesis would not have been completed without the scholarly inspiration and enduring support of my primary adviser, Jenny Cheshire, a quiet genius, whose kind yet goal-oriented approach always kept me on the straight-and-narrow. I also wish to express my sincere appreciation to my secondary advisors, Peter Auer of Freiburg University, Greg Guy of New York University, and Devyani Sharma of Queen Mary University of London, who provided immeasurable guidance in myriad aspects along the way, from specifics on the German linguistic situation to refinements in scalar metrics to insights in multivariate analysis and models of coherence. My fellow PhD students at Queen Mary have also been a keen source of inspiration and stimulation, and I feel truly honoured to have been part of such a prodigious group of scholars, in particular, Elvis Coimbra Gomes, Matthew Hunt, Christian Ilbury, Rosie Oxbury, Elisa Passoni, Louis Strange, Nate Young, and Annette Zhao.

I would especially like to express my thanks to Harald Baayen at the University of Tübingen, who graciously offered me a guest doctoral position in his Quantitative Linguistics department and inspired me in a whole new area of linguistics: lexical richness and frequency distributions. I am incredibly beholden to Fabian Tomaschek for his immeasurable support with acoustic and statistical analysis, the intricacies of GAMMs and R, and especially for always being the voice of reason on what is doable and sensible. Konstantin Sering has also provided me with guidance in the statistical analysis of models of coherence. Finally, I would like to thank Tineke Baayen-Oudshoorn for administrative support in all areas of university life. It has been stimulating and challenging to work with these scholars at the University of Tübingen and attempt to marry the worlds of corpus linguistics, cognitive linguistics and sociolinguistics, a lifelong endeavour I look forward to continuing.

There are, of course, many other linguists who have provided me with support and encouragement along the way. First, my dear friend and colleague, Isabelle Buchstaller at the University of Duisburg/Essen, who taught me everything there is to know about panel studies and introduced me to the world of academic editorialship. The academic world is a better place because of Isa's high-quality standards, tireless attention to detail, and empathetic concern in balancing practicality and perfectionism. I have also benefited from several anonymous peer reviews of articles and conference abstracts I've submitted, and I am deeply appreciative of the time and effort these individuals took in providing thoughtful and detailed commentary with the goal of improving my work.

At the University of Tübingen, I would also like to recognise a whole group *Hiwis* (*Hilfswissenschaftler* 'student research assistants') for lending their native German speaking skills in transcribing the Swabian recordings, some of which were extremely difficult to understand. Many thanks to Rachel Dockweiler, Katharina Hirsh, Benni Hoffmann, Jana May, Oliver Müller, Anne Risse, Niels Stehwien, Vera Thomas, and Julia Voehringer. I would also like to acknowledge Jim Garrett, who suggested the idea of a Swabian database and built the first prototype. I am deeply indebted to Zhuge Gao and Nianheng Wu for their programming support in taking the prototype to the next step by converting the ELAN transcripts into expanded, annotated datafiles for loading into R for statistical analysis. Finally, very special thanks go to the native Swabian speakers who conducted the 2017 interviews for me: Steffie Hartmann, Kai Nosek-Winter, Jakob Rusche, and Julia Voehringer.

Last but not least, I would like to extend my heartfelt gratitude to my family: my parents for instilling in me the belief that I can accomplish anything I set my mind to; my children for being the lights of my life and my dreams for the future; and, my husband for his endless patience with my constant questions about the "awful German language" (Mark Twain 1880).

Finally, I am most grateful to Mother Time. When I think of myself in 1983 as I first began writing this thesis, I am struck not only by the phenomenal technological and empirical advances that have occurred in the field, but also by my own absolute naïveté and the personal growth I have experienced over the last 40 years. Suffice it to say that this work has greatly benefited by modern technological advances in data automation and statistical analysis, as well from a lifetime of experiences by a life-long researcher who has hopefully grown a little bit wiser across her lifespan.

Karen V. Beaman
January 29, 2021

Symbols and Conventions

SMALL CAPS – used to highlight a specific technical term in the literature; typically, a term appears in small caps only the first time it is introduced within a chapter.

italics – indicate words spoken by the speaker, e.g., *des beschde Daitsch*, in line with the orthographic conventions established for this project (see Appendix F).

<u>underscore</u> – specify standard German translations, e.g., <u>das beste Deutsch</u>, as prescribed by Duden (Duden 2015).

‘single quotes’ – signal English translations, e.g., ‘the best German’, my translation to convey the general meaning of the utterance, rather than a literal, word-for-word translation.

[square brackets] – represent phonetic transcriptions, e.g., [dɛs bɛsdə daɪtʃ], following the International Phonetic Alphabet (IPA) (InternationalPhoneticAlphabet.org 2020).

/slashes/ – specify phonemic symbols, e.g., /aɪ/, which denote the minimum unit of distinctive sound in the phonological system (Bloomfield 1933).

(parenthesis) – indicate a linguistic variable, e.g., (ai), a sociolinguistic linguistic variable as defined by established variationist criteria (Labov 1963).

{curly brackets} – signal confidential information that has been replaced to protect the privacy of the speaker, such as personal names, birthplaces, e.g., {Rupert}, {Weiler in den Bergen}

. period / , comma / ? question mark / ! exclamation mark – mark the end of a “communication unit” or “utterance”, a construct subjectively assessed through pace and prosodic cues and objectively determined by the presence of finite verb or appositive construction; these units are used only to break longer utterances into smaller chunks for analytical purposes and are not meant to convey any type of cognitive, syntactic, or generative concept.

-singledash- – indicate filler words and hesitations, e.g., *-eh-*, *-äh-*, *-uh-*.

---three dashes – joined to the word indicate a false start, e.g., *bes*---, *nat*---, *b*---, *wo mã*---.

--- repetition – with spaces indicate repeated words, e.g., *wie* --- *wie* --- *wie, er* --- *er*.

… three dots – indicate a short pause in the utterance, e.g., *ds Mädle … nee ds Gäbele genau.* Longer pauses are marked by multiple series of three dots, e.g., … … …

The International Phonetic Alphabet (IPA)

CONSONANTS (PULMONIC) © 2018 IPA

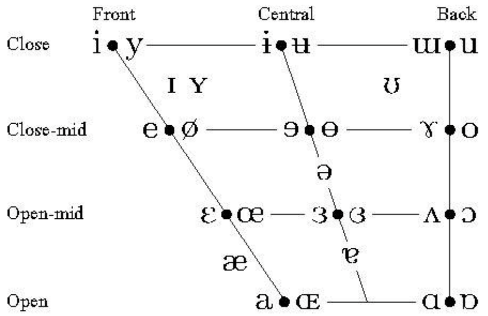
	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
ʘ Bilabial	ɓ Bilabial	ʼ Examples:
ǀ Dental	ɗ Dental/alveolar	pʼ Bilabial
ǃ (Post)alveolar	ʄ Palatal	tʼ Dental/alveolar
ǂ Palatoalveolar	ɠ Velar	kʼ Velar
ǁ Alveolar lateral	ʛ Uvular	sʼ Alveolar fricative

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

OTHER SYMBOLS

ʍ Voiceless labial-velar fricative

w Voiced labial-velar approximant

ɥ Voiced labial-palatal approximant

ʜ Voiceless epiglottal fricative

ʢ Voiced epiglottal fricative

ʡ Epiglottal plosive

ɕ ʑ Alveolo-palatal fricatives

ɺ Voiced alveolar lateral flap

ɧ Simultaneous ʃ and x

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. t͡s k͡p

DIACRITICS Some diacritics may be placed above a symbol with a descender, e.g. ŋ̊

Voiceless	n̥ d̥	Breathy voiced	b̤ a̤	Dental	t̪ d̪
Voiced	s̬ t̬	Creaky voiced	b̰ a̰	Apical	t̺ d̺
ʰ Aspirated	tʰ dʰ	Linguolabial	t̼ d̼	Laminal	t̻ d̻
More rounded	ɔ̹	ʷ Labialized	tʷ dʷ	Nasalized	ẽ
Less rounded	ɔ̜	ʲ Palatalized	tʲ dʲ	ⁿ Nasal release	dⁿ
Advanced	u̟	ˠ Velarized	tˠ dˠ	ˡ Lateral release	dˡ
Retracted	e̠	ˤ Pharyngealized	tˤ dˤ	̚ No audible release	d̚
Centralized	ë	Velarized or pharyngealized ɫ			
Mid-centralized	e̽	Raised	e̝ (ɹ̝ = voiced alveolar fricative)		
Syllabic	n̩	Lowered	e̞ (β̞ = voiced bilabial approximant)		
Non-syllabic	e̯	Advanced Tongue Root	e̘		
˞ Rhoticity	ɚ a˞	Retracted Tongue Root	e̙		

SUPRASEGMENTALS

ˈ Primary stress ˌfoʊnəˈtɪʃən

ˌ Secondary stress

ː Long eː

ˑ Half-long eˑ

̆ Extra-short ĕ

| Minor (foot) group

‖ Major (intonation) group

. Syllable break ɹi.ækt

‿ Linking (absence of a break)

TONES AND WORD ACCENTS

LEVEL		CONTOUR	
e̋ or ˥	Extra high	ě or ˩˥	Rising
é ˦	High	ê ˥˩	Falling
ē ˧	Mid	e᷄ ˦˥	High rising
è ˨	Low	e᷅ ˩˨	Low rising
ȅ ˩	Extra low	e᷈ ˧˦˧	Rising-falling
ꜜ Downstep		↗ Global rise	
ꜛ Upstep		↘ Global fall	

Source: https://en.wikipedia.org/wiki/File:IPA_chart_2018.pdf (licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license).

Chapter 1. The changing dialect situation in Swabia

Consuetudo loquendi est in motu
'The usage of speech is always in motion'
— Marcus Terentius Varro (116-27 BC)

1.1. Introduction

Since antiquity, scholars have recognised that language is constantly changing. The earliest known scholar to philosophise about language change was Marcus Terentius Varro (116-27 BC) who commented, *consuetudo loquendi est in motu* 'the usage of speech is always in motion' (translated by Taylor 1975:51). Reflecting on both synchronic and diachronic processes of language change, Varro first pointed out processes of standard and nonstandard language convergence and divergence: "not only are there words spoken correctly today which once were uttered incorrectly by some of the ancients, but also there were words spoken systematically in former times which are now uttered incorrectly" (*Ibid.)*. According to Taylor, Varro acknowledged both the systematicity of language, which he called ANALOGY, and the idiosyncrasy of language, which he called ANOMALY, referring to the "regularity of inflectional morphology" and the "arbitrariness of derivational morphology" (Taylor 1975:51). He understood that the phenomena of systematicity and idiosyncrasy co-occur and must be integrated into a holistic theory of language change. Varro could be considered the world's first sociolinguist through his identification of one of the earliest documented diglossic situations – the "poets," the educated and learned, and the "ordinary" speakers, the uneducated – remarking on the fact that language is used differently by different social strata within the community (Taylor 1975:51-52).

Over the last 50 years, sociolinguists have repeatedly confirmed Varro's precocious observations, demonstrating that language exhibits systematic and predictable patterns of variation which reflect both internal linguistic processes and external social influences: "empirical studies have confirmed the model of an orderly heterogeneous system in which the choice between linguistic alternants carries out social and stylistic functions, a system which changes with accompanying changes in social structure" (Weinreich, Labov, and Herzog 1968:162, henceforth WLH). It is this concept of orderly linguistic heterogeneity and the role of social structures in shaping language variation and change that this research effort seeks to address.

This chapter introduces the overall research aims of this investigation (Section 1.2), provides an overview of the research design and expected contribution of this work (Section 1.3), describes the German dialect landscape and the linguistic attitudes toward Swabian (Section 1.4), and offers a roadmap for understanding the organisation of this thesis (Section 1.5).

1.2. Research aims

To explore the concept of ORDERLY HETEROGENEITY in language variation and change, this research examines the changing use of Swabian or *Schwäbisch*, an Alemannic dialect[1] spoken in southwestern Germany, through a combined real-time panel study and trend study. Specifically, this research has three aims:

(1) to investigate and document, from a sociolinguistic perspective, the changing use of Swabian, an understudied variety of German;

(2) to evaluate the compatibility and complementarity of real-time panel and trend studies in determining the nature and direction of language change; and,

(3) to explore a model of sociolectal coherence and how systematic and predictable linguistic patterns can shape variation and foster or constrain language change.

This section discusses each of these research aims in turn and provides a brief introduction to the literature. Chapter 2 provides a broader synthesis of the theoretical background concerning these three domains and the challenges the current study seeks to address.

1.2.1. Changing Swabian dialect situation

A growing body of research suggests that many dialects, i.e., nonstandard language varieties, are receding across the globe (e.g., Auer 2005; Britain 2009; Dorian 1977; Kristiansen 1998; Schilling-Estes and Wolfram 1999; Smith and Durham 2011, 2012; Vandekerckhove and Britain 2009), and nowhere is this more evident than in Europe, notably Germany (e.g., Auer 1998, 2018; Bellmann 1998; Schmidt 2011; Schwarz 2019; Wagener 1999, 2002). Increasing mobility, expanding education, and rising immigration are bringing more diverse people into more frequent and more prolonged contact. Extended periods of DIALECT CONTACT (e.g., Auer 2007; Britain 2013, 2016; Britain and Trudgill 1999; Dodsworth 2017; Trudgill 1992) promote LINGUISTIC ACCOMMODATION (e.g., Auer and Hinskens 2005; Giles et al. 1991; Kerswill 2008; Trudgill 1991) as individuals strive to "imitate" their peers or groups they aspire to, or as they accommodate to speakers from disparate linguistic backgrounds. As a consequence, DIALECT LEVELLING, "a process whereby differences between regional varieties are reduced, features which make varieties distinctive disappear, and new features emerge and are adopted by speakers over a wide geographical area" (Williams and Kerswill 1999:149), has become ubiquitous. Such situations generally evolve as the result of broad societal changes brought about through globalisation, industrialisation, urbanisation, agricultural development, migration/immigration,

[1] Throughout this work, I consider Swabian to be a "dialect" rather than a "language", following the conventions of most German dialectologists and based on the fact "it has no army or navy" (a retort attributed to a participant in a lecture given by Max Weinreich in 1945). I also follow Auer (2005) who follows Coseriu's (1980) use of the term "dialect" as a purely relational concept with respect to the standard language: "without a standard there can be no dialect" (Auer 2005:8).

expanding/diversifying workforce, changing political structures, geographical/social mobility, and ubiquitous social media (Kerswill 2002).

Britain (2009:121) maintains that dialect contact and dialect death are “inextricably linked”, and, for many reasons, the attrition process does not necessarily lead to a complete shift to a new variety. Instead, “the dominant trend is towards a number of new socially and regionally based, koineised, ‘compromise’ dialects, shaped by contact between local, regional, interregional and other, including standard, varieties” (Britain 2009:121), a process variously called KOINEISATION, SUPRALOCALISATION or SUPRAREGIONALISATION (e.g., Auer 2005, 2018; Britain 2010, 2011; Britain and Trudgill 1999; Kerswill 2001, 2008; Schwarz 2019). The emerging “New Regionalism”, claims Auer (2013), encompasses a positive re-evaluation of regional identity, especially in economically prosperous regions such as Stuttgart, which “lead speakers to deploy regionally indexed linguistic features in ways not systematically accounted for in traditional dialectology and variationism” (Auer 2013:17).

At the same time, there are counterforces at play. Studies have shown that concepts of DIALECT IDENTITY (Mendoza-Denton 2002; Meyerhoff et al. 2021; Le Page and Tabouret-Keller 1985; Schilling-Estes 2004; Sharma 2012; Silverstein 1998), INDEXICALITY (Bucholtz and Hall 2005; Eckert 2008, 2019), STANCE/STYLE (Bucholtz 2014; Coupland 2001; Jaffe 2016; Johnstone 2009), and SOCIAL MEANING (Cheshire 2003; Moore 2017; Moore and Podesva 2009) exert considerable influence on the attrition or retention of local and nonstandard linguistic features. However, the extent to which such socio-cognitive constructs stimulate or inhibit processes of dialect levelling has not been fully examined.

While numerous scholars have studied dialect contact and levelling, “few linguists have investigated language varieties whose unique status is threatened by encroaching varieties of the same language” (Schilling-Estes and Wolfram 1999:486), and none have examined dialect levelling in a changing dialect-standard language situation via a real-time longitudinal sociolinguistic study. ***Hence, the first aim of this investigation is to assess the nature and degree of change occurring in Swabian, an understudied variety of German, which is undergoing extensive levelling as a result of wide-ranging societal changes. My goal with this research is to supplement our theoretical understanding of the processes of dialect levelling and to expand our empirical knowledge of the sociolinguistic situation in Swabia.***

1.2.2. Real-time studies of language change

Starting with his seminal work in the 1960s, Labov introduced Sir Charles Lyell's (1833) UNIFORMITARIAN PRINCIPLE into sociolinguistics, claiming that "the forces operating to produce linguistic change today are the same kind and order of magnitude as those which operated in the past" (Labov 1972:275). Labov’s approach, known as the APPARENT-TIME method, is based on the assumption that post-adolescent individuals, i.e., after the CRITICAL PERIOD (Lenneberg 1967), do not substantially change their speech patterns across their lifespan (Labov 1994). Thus, a linguistic change observed at a single point in time across different generations of speakers, i.e., APPARENT-TIME, is a SYNCHRONIC reflection of DIACHRONIC change in progress. However, this premise has proven to be problematic in many situations, leading researchers to ask questions such as: Are all post-adolescent individuals stable across the lifespan? Do all individuals change in the same ways, at the same rates, and at the same points across their lives? Moreover, do the grammars of individuals change along with the grammars of the communities of which they are a part? (Buchstaller and Wagner 2018; Rickford and Price 2013; G. Sankoff and Wagner 2006).

Increasingly, researchers have begun conducting studies of language change in REAL-TIME, i.e., returning to the same community after a period of time and repeating the same study (Labov 1994:74). Such studies may be intra-individual, i.e., tracking the same individuals at different points across their lifespans, a REAL-TIME PANEL STUDY (Buchstaller 2006, 2015; Buchstaller et al. 2017; G. Sankoff and Blondeau 2007, 2013; G. Sankoff, Wagner, and Jensen 2012; Wagner 2012b; Wagner and Sankoff 2011), or inter-individual, i.e., examining the same communities although different individuals at different points in time, a REAL-TIME TREND STUDY (Blake and Josey 2003; Cukor-Avila and Bailey 2013; Jensen and Maegaard 2012; Schilling-Estes 2005; Sundgren 2009; Wagener 2002; Wolfram and Schilling-Estes 1996).

While many patterns from real-time panel studies have produced significant and highly informative results (Baxter and Croft 2016; Blondeau 2018; Buchstaller 2006, 2015; Gregersen, Maegaard, and Pharao 2009; Wagner 2012b, 2014), most empirical evidence better supports the predictions from the apparent-time method (Sankoff 2006). In her analysis of 13 trend and panel studies, Sankoff (2006:113) found that "apparent-time is a truly powerful concept in locating the presence of change." For changes in progress, most panel/trend study combinations have found that aggregate data from the panel study mirrors changes in the trend study, albeit to a modest extent. The studies that Sankoff reviewed showed that the majority of speakers remained stable over their lifespan, while only a minority changed substantially (Sankoff 2006:114).

Sankoff's (2006, 2018, 2019) work has been instrumental in reconciling the findings between panel studies and trend studies; however, to date, no systematic evaluation has been done on exactly "how" compatible or complementary panel and trend studies really are. "How much" better are apparent-time approaches than real-time approaches? What is the best way to compare and contrast the findings? And, critically, what are the essential factors that cause some speakers to remain stable and others to adapt, either in the direction of the community change or against the change, what Sankoff calls RETROGRADE CHANGE? ***Hence, the second aim of this investigation is to explore a methodological approach for measuring the compatibility and complementarity panel and trend studies, looking at the findings through both a real-time and apparent-time lens. My objective is to show how a combined panel and trend study can contribute to a broader understanding of the origin, diffusion and actuation of linguistic change.***

1.2.3. Patterns of systematicity and coherence

It is generally accepted that linguistic features tend to cluster – that is, are bound together by patterns of correlation – for structural reasons (e.g., vocalic chain shifts (Labov 1966a), parametric relationships (Guy 2013), among others); however, what is not well established is whether variables cluster and covary for social reasons and whether these clusters form distinct sociolects. Since Guy's (2013) thought-provoking study investigating the cognitive coherence of sociolects, considerable debate has ensued as to whether the statistical construct of COVARIATION, i.e., the correlation of multiple linguistic features across different levels of the grammar and within specific social groups, constitutes SOCIOLECTAL COHERENCE. While some studies have uncovered some level of covariation, others have found little or none. In fact, Guy's (2013) own research found that "some sociolectal cohesion does exist, but it may be weaker and more multidimensional than is commonly assumed" (Guy 2013:63).

While the concept of sociolectal coherence has recently received some attention in the literature (Guy and Hinskens 2016; Meyerhoff and Klaere 2017; Newlin-Lukowicz 2016; Oushiro 2016; Oushiro and Guy 2015; Tamminga 2019), little research conclusively supports its existence or role in a theory of language variation and change. Studies have employed various methods in analysing whether linguistic features covary within specific language varieties. One of the earliest such studies was by Horvath and Sankoff (1987), who investigated variation in four vowels in Sydney, Australia using principal components analysis (PCA). More recently, Meyerhoff and Klaere (2017) used constrained correspondence analysis (CCA), incorporating researcher designated constraints (e.g., "village membership") to guide the data reduction and aggregation algorithms. Guy (2013), Oushiro and Guy (2015), Newlin-Lukowicz (2016), and Tamminga (2019) used multivariate analyses to obtain factor weights (i.e., speakers' tendency to use an innovative or nonstandard variant derived through random effects or residuals) and performed cross-correlations to determine whether speakers with different social characteristics cohere in their patterns of variable usage.

While covariation is one method for determining coherence, another approach utilises Guttman (1944) scalogram analysis to identify the underlying, orderly structure of the variation revealing implicational-like patterns (Bickerton 1973; DeCamp 1968; Fasold 1970; Greenberg 1963; Rickford 2001). In a recent study of the Belgian dialect of *tussentaal*, Ghyselen and Van Keymeulen (2016) found that, as a result of destandardisation, demotisation, and loss, *tussentaal* "is not just a random idiolectal mix of dialect features, but that it is structured by implicational principles shared across the speech community.… In fact, clear patterns were found whereby the presence of one dialect feature automatically implies the presence of other features" (Ghyselen and Van Keymeulen 2016:14-15).

Despite these studies, questions abound on what exactly constitutes sociolectal coherence and how it should be measured. Does covariation imply coherence? Are there different levels of coherence? How does coherence affect language change? ***Thus, the third aim of this***

investigation is to explore more broadly the concept of sociolectal coherence and to introduce a new method for analysing and measuring levels of coherence. Following the quantitative variationist approach pioneered by Labov (1963), coupled with Guttman-like (1944) implicational scaling, and building on constructs from the order and lattice theory of mathematics (Partee, Ter Meulen, and Wall 1993), I propose a model that brings together three views of coherence – covariation, implicational scaling, and lattice theory – to evaluate the impact that differing levels of coherence have on language variation and change. My aspiration is to demonstrate a holistic approach to the theory of coherence, using a large set of phonological and morphosyntactic variables, across two speech communities, in both real- and apparent-time, *under the premise: "the more variables we model at once, the more sociolinguistically informative our models will be"* **(Meyerhoff and Klaere 2017:42).**

1.3. Research design

This section introduces the research design and theoretical framework for this thesis, briefly describes the corpus, methods, and analytical techniques employed, and concludes with a review of the expected contribution of this research to the fields of variationist sociolinguistics and German social dialectology.

1.3.1. Theoretical framework

The theoretical framework for this study is grounded in contemporary quantitative sociolinguistic theory, based on the Labovian variationist paradigm in analysing socially significant linguistic variables, drawn from empirical observations, with the objective of explaining their distribution and usage. The ultimate goal of any theoretical sociolinguistic investigation is to be able to generalise the findings from the sample to the broader population. To this end, I take both a DESCRIPTIVIST APPROACH by reporting the frequency and usage of linguistic variables across speakers, time periods, and social environments, and an EXPLANATORY APPROACH in seeking correlations (not necessarily causations) and triangulations to suggest the nature and direction of the observed linguistic phenomena.

Sociolinguistics is replete with subtheories (e.g., gravity/wave/cascade models, accommodation theory, social network theory, acts of identity), yet, as Coupland (1998:112-113) has argued, lacks a holistic, overarching theory distinct from general linguistic theory and social theory. Hence, an essential objective of this research is to tie together various conventions, techniques, and principles in exploring the compatibility and complementarity of real- and apparent-time analyses. This study takes up Coupland's objective "to compare and contrast existing sets of programmatic principles, and to explore points of overlap or incompatibility" (Coupland 1998:114): according to Coupland, "sociolinguistic research which follows programmatic principles … is inherently theoretical" (Coupland 1998:116).

1.3.2. Corpus

The corpus for this study consists of recordings of 80 sociolinguistic interviews conducted with native Swabian speakers from two speech communities (urban and semi-rural), across two points in time (1982 and 2017-2019), covering informants from various socio-demographic groups (age, sex, educational level) with differing socio-structural and socio-cognitive constraints (dialect identity, interlocutor accommodation, and geographic mobility). Twenty-one linguistic variables, 10 phonological and 11 morphosyntactic, have been selected to explore the linguistic situation in Swabia. The Swabian corpus is fully described in Section 3.4.

1.3.3. Methods

The methods for this investigation combine both empirical, hypothesis-based as well as interpretive, exploratory-based approaches, using both quantitative and qualitative research techniques. In analysing the variation between dialect features and the standard language, this study draws from two widely accepted sociolinguistic paradigms: SOCIAL DIALECTOLOGY (Auer 2013; Cheshire and Britain 2003; Trudgill 1986; Wieling et al. 2014; Wieling, Nerbonne, and Baayen 2011) and quantitative VARIATIONIST SOCIOLINGUISTICS pioneered by Labov (Labov 1966b, 1994, 2001, 2011). In addition, this investigation makes use of a number of methodological constructs drawn from social psychology, such as IDENTITY (Bucholtz 2014; Bucholtz and Hall 2005; Hoffman and Walker 2010; Nagy, Chociej, and Hoffman 2013; Le Page 1986; Tabouret-Keller 1997; Tajfel 1982), SOCIAL NETWORKS (Katz et al. 2004; L. Milroy 1987; Sharma 2011, 2017), and ACCOMMODATION THEORY (Auer and Hinskens 2005; Giles 1980; Giles, Coupland, and Coupland 1991; Giles and Powesland 1997). This study also couples Guttman- and Bickerton-like methods of IMPLICATIONAL SCALING (Bickerton 1973; Ghyselen and Van Keymeulen 2016; Guttman 1944; Rickford 1991) with abstract constructs from the order and LATTICE THEORY of mathematics (Partee, Ter Meulen, and Wall 1993) to model patterns of variation and sociolectal coherence (Guy 2013; Guy and Hinskens 2016). The methodological framework is described further in Section 3.3.

1.3.4. Analysis

In order to provide balanced insight into the language situation in Swabia, the analysis comprises both quantitative and qualitative components. In general, the quantitative analysis consists of extracting tokens for the 21 linguistic variables, correlating them with relevant socio-demographic, socio-structural, and socio-interactional factors, using clustering and classification techniques such as principal components analysis (PCA) to uncover significant groupings, and building best-fit models, such as generalised linear mixed regression models (GLMER) and generalised additive mixed models (GAMMs). Additional methods drawn from the order and lattice theory of mathematics are used to shed light on patterns of linguistic coherence. The qualitative analysis draws from my own quasi-ethnographic interpretations derived from over five years living in the region and working with the Swabian people and their language (Eckert 1997; Hymes 1966; Tetreault 2018). The specific analytical techniques used are described in detail in each relevant chapter.

1.3.5. Expected contribution

Through the three research aims described above, this research advances many empirical, methodological and theoretical contributions to the field of language variation and change. On the empirical side, this investigation brings a deeper understanding of the changing dialect situation in Swabia and broadens our knowledge of dialect contact and levelling phenomena, particularly in Germany. From a methodological point of view, this research exemplifies an approach for analysing the compatibility and comparability of the findings between panel and trend studies. From the theoretical perspective, this study demonstrates the merit of integrating and triangulating findings from apparent- and real-time analyses to advance a more holistic understanding of language variation and change. Finally, I hope that the proposed model for depicting and measuring sociolectal coherence offers improved descriptive and explanatory value into the patterns of complexity inherent in an evolving dialect-standard language situation.

1.4. Swabian Background

This section provides a brief background on the Swabian dialect situation. It first provides a high-level review of the German dialect landscape, with particular focus on the Alemannic variety to which Swabian belongs, followed by a review of the Swabian political and geographic borders and a short discussion of a few distinguishing features of Swabian (Section 1.4.1) (a full discussion of the linguistic features in this study can be found in Appendix A). Considerable attention is paid to the attitudes toward Swabian as expressed by speakers in the current study, which play a profound role in dialect usage and ongoing change (Section 1.4.2). This section concludes with a few thoughts on the future of Swabian in modern Germany (Section 1.4.3).

1.4.1. German dialect landscape

This section starts with an overview of the German dialect landscape and continues with a description of the Alemannic and Swabian varieties.

1.4.1.1. German dialects

German dialects are generally divided into low, middle, and upper based on the extent to which they were affected by the second Germanic or High German consonant shift (Clyne 1995:27) (see Figure 1-1), a phonological change which occurred between the third and fifth centuries in which a group of nine consonants shifted in two, three, or four phases, depending on the opinions of different historical linguists (Cercignani 1979). The southern German dialects, called *Oberdeutsch* 'Upper German' or *Hochdeutsch* ‘High German’, comprising Alemannic, East Franconian and Bavarian, were almost wholly affected by this sound shift (shown in darker shades of orange in Figure 1-1); the *Mitteldeutsch* 'Central German' dialects in the middle part of the country were only partially affected (lighter shades of orange); and, the northern dialects, *Niederdeutsch* 'Low German' were completely unaffected by the shift (shades of yellow).

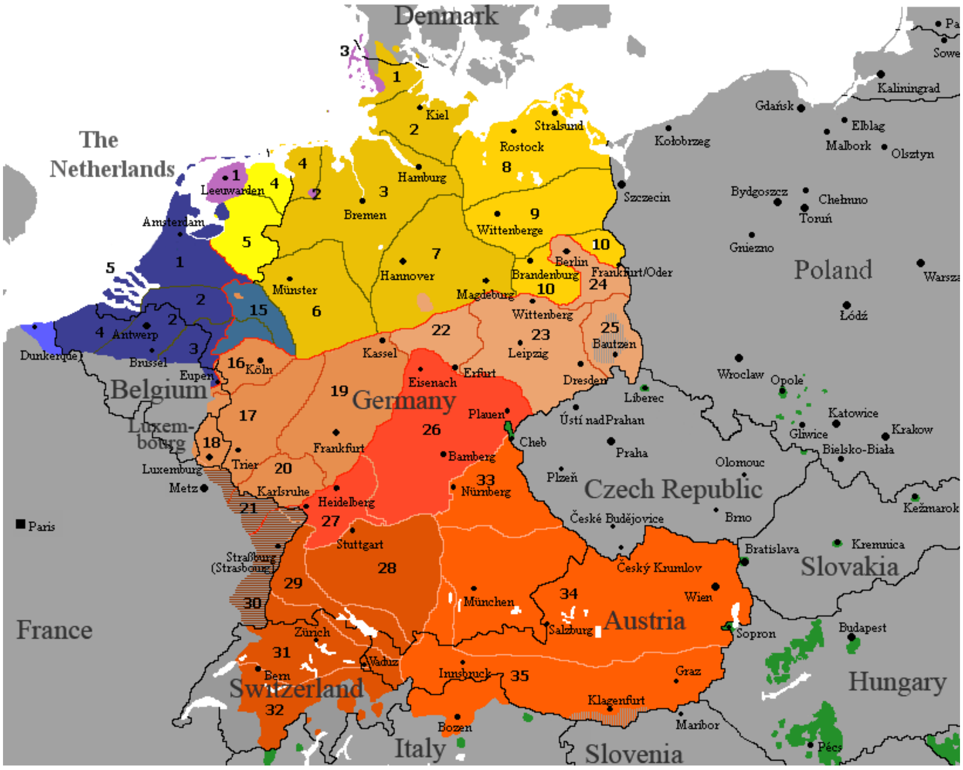


Figure 1-1. Continental West Germanic Dialects (Dutch/Frisian/German) after 1945
(From Rex Germanus, Public Domain, https://commons.wikimedia.org/w/index.php?curid=1485476)

1.4.1.2. Alemannic dialects

Alemannic, from the word *Alamanni* 'all men', spoken by over seven million people today, emerged through a confederation of German tribes that settled in the upper Rhine area in the third to sixth centuries. It is bordered on the west by French, the south by Italian, the east by Bavarian, and the north by Franconian (see Figure 1-1 and Figure 1-2). In addition to Swabian, the Alemannic family consists of three other varieties: Low Alemannic, spoken in southern Württemberg, Allgäu, Baden, Alsace, and Basel, Switzerland; High Alemannic, spoken mostly in Switzerland and in the southern parts of the Black Forest; and, Highest Alemannic (*Hegschtalemannisch*), spoken in the alpine regions of Switzerland. The High Alemannic dialects spoken in Switzerland are a national variety referred to as Swiss German (*Schwyzerdiitsch*). While in standard German palatalisation of /st/ and /sp/ in initial positions is categorical (e.g., [ʃturm] *Sturm* 'storm', [ʃpiːl] *Spiel* 'game'), one highly distinguishing feature of the Alemannic dialects is the palatalisation of /st/ in all positions (e.g., [feʃt] *Fest* 'party').

1.4.1.3. Swabian dialect

Swabia or *Schwabenland* is the traditional name for a part of the state of Baden-Württemberg located in the southwestern corner of Germany. Its name is derived from the *Suebi* tribe who lived between the Upper Rhine and the Upper Danube in the first century AD (Russ 2013:337). Geographically, the borders of Swabia are the Lech river in the east and the Black Forest in the west; however, there are no natural geographic borders to the north and south. Linguistically, the Swabian dialect shares no borders with non-Germanic varieties: it is bordered by Low Alemannic to the west, High Alemannic to the south, Bavarian to the east, and Franconian to the north (see Figure 1-2). Swabian is also spoken by several minority groups across the globe, including Bavaria, Romania, Brazil, Canada, and the United States; however, these groups are beyond the scope of the current study.

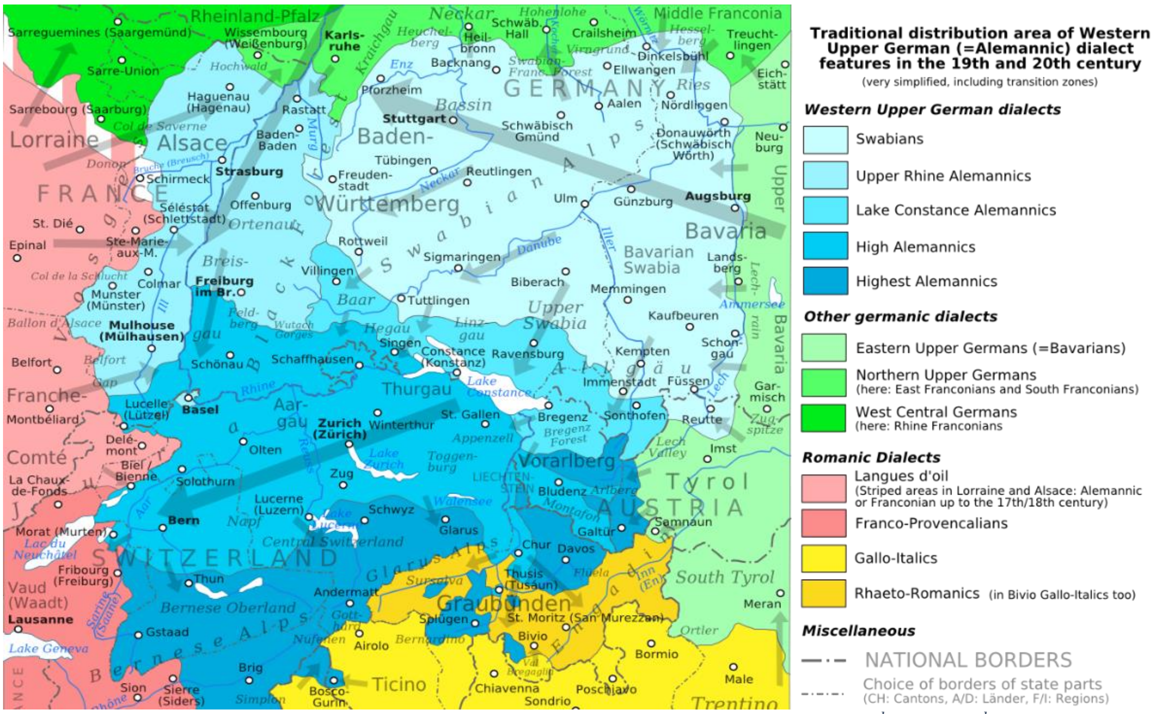


Figure 1-2. *Western Upper German (Alemannic) Dialect Areas in 19th and 20th Century*
(Permission granted under the terms of the GNU Free Documentation License)

Swabian is distinguished from the other Alemannic varieties by a number of linguistic features; two of the most productive and salient markers of Swabian are nasality and vowel shifting (a full description of the Alemannic and Swabian linguistic features analysed in this investigation can be found in Appendix A). Nasalisation commonly occurs with /a/, /e/, and /o/ before /n/ and /m/, such as in *Mann* 'man' [man] and *hund* 'dog' [hunt] which are realised as [mã] and [hõ] in Swabian (Griffen 1992). The shifting of the (ai) diphthong is another common and salient feature (Jutz 1931:81). In Swabian, the Middle High German (MHG) diphthong /eɪ/ underwent a split to a back nucleus, sometimes followed by a mid-front glide target – a shift that subdivides Swabia into east and west: [eɪ] shifted to [aɪ] in standard German (e.g., [braɪt] *breit* 'wide' and [aɪgən] *eigen* 'own') and to [ɔə] in West Swabian (e.g., [brɔət] and [ɔəgə]) and to [ɔɪ] in central and East Swabian (e.g., [brɔɪt] and [ɔɪgə]) (Jutz 1931:21). The shifting of the (ai) diphthong in Swabian is analysed in detail in Chapter 5.

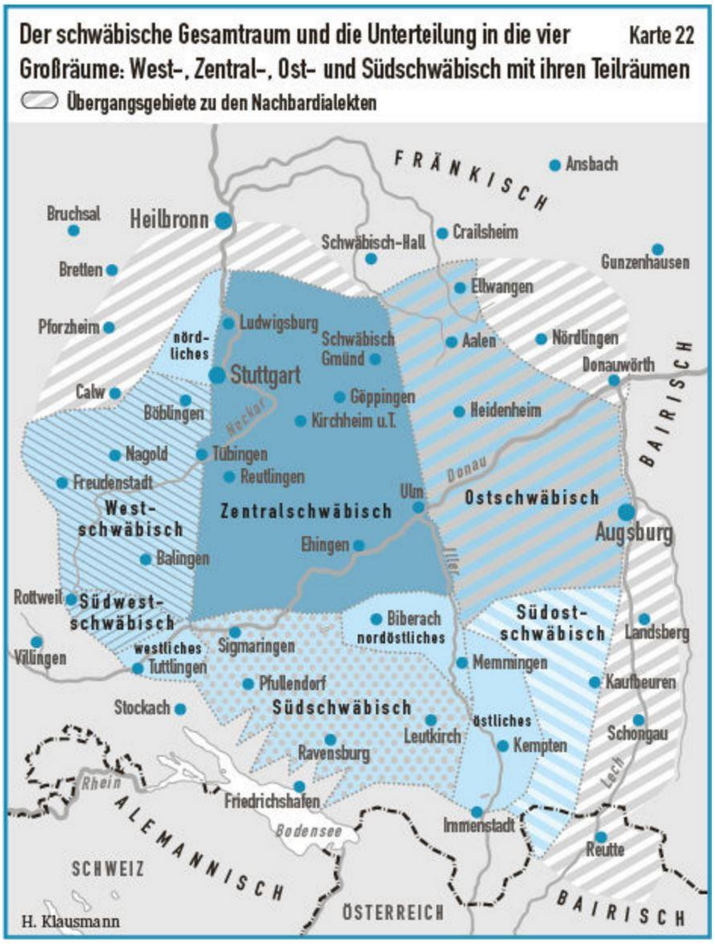


Figure 1-3. Swabian Dialect Map (Klausmann 2014)

There are three main regional varieties of Swabian – west, central, and east – each of which shows a north-south distinction (see Figure 1-3). The current study focuses on the Central Swabian variety as spoken in the towns and villages surrounding Stuttgart and Schwäbisch Gmünd. Swabian has been extensively documented over the years by many dialectologists (Bohnenberger 1928; Fischer 1895; Frey 1975; Klausmann 2018c, 2018d, 2018a; Mihm 2000; Ruoff 1985, 1997; Ruoff et al. 1973; Schwarz 2015; Spiekermann 2008; Streck 2012; Zinser 1933), and these works form the foundation of this research.

Figure 1-4 shows a sign posted outside the traditional *Mauganeschtle Restaurant* in Tübingen, which serves Swabian specialities, particularly *Maultaschen* 'Swabian ravioli'. In Swabian, the sign reads, *do hogged dia, dia emmer do hogged*, which translated to standard German would be, <u>da sitzen sie, die immer da sitzen</u>, and in English 'here sit those, who always sit here'.[2] This sign provides a simple example to demonstrate how different Swabian phonology, morphology, and lexical items are from standard German.

[2] All translations from German to English are my own. Following the conventions established for this project, Swabian is written in italics, standard German is underscored, and English translations are enclosed in single quotation marks.

Figure 1-4. Sign posted outside the Mauganeschtle Restaurant in Tübingen

Scholars and laypersons alike have commented on the comprehension difficulties between speakers of Swabian and other German varieties (Ammon 2017; Ammon and Loewer 1977), and, as a result, Swabian speakers often encounter problems in school. Ulrich Ammon, a linguist and Swabian speaker himself, writing about the evolution of standard German, describes the ridicule dialect speakers would receive from teachers and about the "accent training" he was forced to participate in so that he could learn to speak "correct" German and hence properly recite poetry before the class (Ammon 2017). Still today, some speakers in the current study expressed their embarrassment when they first went to school speaking Swabian and how they had to "train" themselves away from speaking Swabian (see example (18) from Michaela[3] in Section 1.4.2.5).

1.4.2. Swabian attitudes

While a full ethnolinguistic analysis (Giles and Ryan 1982:208) of Swabian is beyond the scope of this thesis, an understanding of the linguistic attitudes toward the dialect and standard German is vital for understanding the Swabian linguistic situation. A strong Swabian identity, manifested in deeply ingrained linguistic attitudes in the minds of Swabian speakers, wields a formidable influence on the dialect-standard language situation (Gal 1978; Hundt 1996; Kennetz 2008; Kristiansen 2009; Preston 1999, 2013a; Soukup 2009; Svenstrup 2019; Webster and Dailey-O'Cain 2016). As Preston (2013:103) claims, "the cognitive foundations and processes of language regard … play an important part in the explanatory areas of language variation and change." Language attitude studies from the longitudinal LANCHART project (Gregersen 2009) have suggested that there are "two value systems at two levels of consciousness" and that

[3] All names in this study are pseudonyms which have been changed to protect the privacy of the speakers.

"language change is governed by the subconscious level" (Kristiansen 2009:167). Hence, ideologies that Swabian speakers have about what is "correct" or "good" German reveal symbolic and hidden power structures (Bourdieu 1991) which are exposed in the conscious and unconscious linguistic choices they make.

Following the design of the LANCHART study, Svenstrup (2019) carried out a traditional matched-guise language attitude study with 235 adolescents across five locations in northern Swabia. The quantitative attitudinal data were augmented by qualitative data drawn from group interviews with 49 adolescents. Svenstrup chose to study adolescents due to their "readiness to discuss and challenge existing norms" and because of "their position as future users and gatekeepers of the language" (Svenstrup 2019:160). His findings show that more academically-oriented individuals prefer standard German and this effect is stronger for adolescent girls and for Stuttgart over the other localities, suggesting that language attitudes are deeply "rooted in conceptions and values to do with rurality/urbanity and education" (*Ibid*:161) (cf. Gal (1978)). Svenstrup's study also signals a difference between the conscious and unconscious attitudes of the speakers, in which the conscious attitudes demonstrate a preference for Swabian, while the unconscious attitudes reveal a preference for standard German (*Ibid*:162-163). Standard German is seen as a marker of success, reinforced in the schools where teachers act as "gatekeepers" of the norm (*Ibid*:164). Svenstrup concludes that "*Hochdeutsch* 'standard German' is the future and *Schwäbisch* is not for everyone," suggesting that Swabian and standard German have developed "indexical relationships to separate social domains" (*Ibid*:164) and that speakers "switch" or "shift" between the two varieties:

> *"the adolescents conceive of themselves as being in a transition phase on the move away from the local dialect towards the spoken German standard…. the total picture based on the self-reporting task indicates that conceptions and values to do with education and rurality/urbanity are a main ingredient of the adolescents' reorientation from Schwäbisch to Hochdeutsch" (Svenstrup 2019:161).*

Svenstrup's findings are also reflected in the attitudes of speakers in the current study. During the interview, speakers were asked what they thought of Swabian, whether it was "good" or "bad" German. In order to provide some background and context for interpreting the findings from this study, the following subsections document some of the comments that speakers made during the interviews. These comments represent a wide range of attitudes which show how Swabian serves as a cultural marker, plays a vital role in identity formation, and functions as a sign of status and education – providing insights into both established and changing beliefs, preferences, and identities – a predominant theme underlying this investigation.

1.4.2.1. Culture and identity

The choice to speak Swabian or standard German plays a key role in identity formation, as speakers use language to convey themselves as *ein echter Schwab* 'a real Swabian', *ein*

Reingeschmeckter ‘an outsider who has adopted Swabian’ or *ein Hochdeutscher* ‘a standard German speaker’ (see Section 3.7.2.1 dialect identity). Many speakers commented on the considerable cultural differences that exist, asserting that the two varieties represent completely “different worlds”, as the following examples illustrate.

(1) *Willard (2017)*

i hätt niemâls e Frau -eh- geheiratet	*‘I could never have married a woman*[4]
die ned Schwäbisch schwätzt	*who didn’t speak Swabian*
ich hatte viele Freundinne	*I had many girlfriends*
die unschwäbisch waren	*who were not Swabian*
die kulturellen Unterschiede sind	*the cultural differences are*
zu elementar muss mã sage	*too elementary I have to say*
ds Ausdrucksvermöge isch sehr beschränkt	*the ability-to-express-yourself is very limited*
du kannsch mit Dialekt ôifach	*with the dialect you can easily*
ganz andere Welten erschließen	*unlock completely new worlds*
isch ein ganz breites Fundament	*it’s an entirely broad-based foundation*
auf dem mã da gemeinsam steht	*on which you come together’*
	[S066-17-I-1-Willard-00:07:14][5]

(2) *Helmut (2017)*

meine Kinder schämen sich sogar	*‘my children are actually ashamed*
heutzutage Schwäbisch	*of Swabian these days*
also die verbinden Schwäbisch	*thus they associate Swabian*
mit irgendwas was sie nicht möchten	*with something they don’t like*
dieser dörfliche Zusammenhalt	*this village-solidarity-stuff*
stoßen die eher ab	*they are more likely to reject it’*
	[S036-17-I-1-Helmut-01:15:20]

1.4.2.2. Status and stigma

Many speakers mention the stigma associated with speaking Swabian, claiming that the dialect reflects backward, “simple-minded” people, often farmers, with a low-level education (cf. Gal (1978) in which speaking Hungarian indexes a rural, backward, uneducated speech). Some disclose that speaking dialect induces feelings of inferiority, as the following quotations show (see Sections 3.7.1.4. and 3.7.1.5 for discussion on the measures of education and social status).

(3) *Helmut (2017)*

des is halt au ene Generation gwesen	*‘it’s been also like a generation*
wo mã mit dem Schwäbisch viellêicht	*where with Swabian perhaps you*
eher ja einfache Leute identifiziert hat	*identified it yeah more with simple people’*
	[S036-17-I-1-Helmut-00:11:09]

(4) *Rupert (2017)*

wo ich sehr distanziert säähe	*‘where I look from a distance*
und wo ich mi au richtig bemühe muss	*and where I also have to really struggle*

[4] For the English translations in this study, I have tried to strike a balance between staying close to the spoken German while making the English easily readable; hence, literal translations are only provided when the purpose of the analysis is to evaluate morphosyntactic structure, such as in Chapter 6.

[5] This citation [S066-17-I-1-Willard-00:07:14] references speaker ID S066, recording from 2017, I for sociolinguistic interview, 1 for first recording, pseudonym Willard, 07:14 minutes into the recording.

des net abzuwerte also	*not to devalue it then*
wenn jeman derb schwäbisch daherkommt	*if someone comes in here with deep Swabian*
des sind scho auch halt ôifach	*they are like already basically*
Bildungsmarker oder Statusmarkierunge	*education markers or status markers*
ja hat sich eher so rum entwickelt	*yeah it has developed as such'*
	[S008-17-I-1-Rupert-00:57:04]

(5) Rachael (2017)

Schwäbisch des heert ja jeder also	*'Everyone hears [when you speak] Swabian so*
und nâ han i immer	*and then I always have*
e bissle Minderwertigkeitskomplex	*a bit of an inferiority complex*
aber des isch e Blödsinn	*but that's nonsense*
und des kommt bloß bei dr Sprââch	*and it comes just from the language'*
	[S022-17-I-1-Rachael-00:44:01]

1.4.2.3. Value judgements

Speakers in the study express a range of value judgements about Swabian, from outright disdain to real pride because the dialect sounds "cool" and "friendly". One enlightened speaker commented on the conflict between knowing that you should not speak Swabian because you will not be taken seriously and the absolute longing to speak it because it lies so close to your heart.

(6) Ricarda (2017)

[Schwäbisch] isch halt e Dialekt	*'Swabian is like a dialect*
also ich find ihn nicht sehr schön	*so I don't think it's very pleasant*
mir gefällt der nicht	*I don't like it*
es gibt andere	*there are others*
die mehr so e sing-sang haben	*which have more of a sing-song*
sowas find ich gefälliger	*something I find more pleasing*
des Schwäbische find ich vom Klang her	*I think from the sound of Swabian*
mit dem "isch" und "brmblwm"	*with the "isch" und "brmblwm"*
find ich nicht so schön ja …	*I don't think it's nice yeah*
Pfälzisch finde ich zu Beispiel ganz nett	*West Franconian I think is a very nice example'*
	[S015-17-1-Ricarda-00:52:34]

(7) Markus (2017)

kein gutes Deutsch natürlich	*'[Swabian is] not good German naturally*
wenn ich über sowas nachdenk	*if I think about it*
s ist offenbar e Dialekt	*it's clearly a dialect*
der sich fe andre nicht so schön anhört	*that for others doesn't sound so nice*
aber immer noch besser als des Sächsische	*but [it's] still always better than Sachsen'*
	[S014-17-I-1-Markus-00:31:53]

(8) Fabian (2017)

also gewisserweise isch mã da scho	*'so in a certain way you're really*
e bissle Stolz darauf ã	*kinda proud [to speak Swabian]*
desch aber eich zu	*it's actually intended to be up to*
neunundneunzig Komma fünf Prozent	*ninety-nine point five percent*
alles witzig und positiv gmeint	*all funny and positive*
und niemand meint des in Konotation	*and no one thinks of it in association*
wie Baure oder sowas	*with farmers or anything*
also des isch scho ganz cool	*so it's already pretty cool*
und von dem her i glaub die Schwabe sind	*and for that reason I think Swabians are*
au relativ gut angesehen in Deutschland	*also seen relatively good in Germany*
und so des isch ja e fleißiges Volk ja	*and they are hard-working people yeah'*
	[S119-17-I-1-Fabian-00:37:16]

(9) Patrizia (2017)

ich find Schwabe immer sympathisch	*‘I always find Swabian congenial*
weil ich die Sprache au mag	*because I also like the language*
ich hab au viele Komplimente scho	*Also I have gotten many compliments*
für ds Schwäbische kriegt	*on my Swabian*
vor allem als ich im Norde war	*especially when I was in the North*
des würd sich total niedlich anhöre	*it sounds totally cute*
und total sympathisch genau	*and totally friendly*
schöne Sprachvariante	*[a] lovely language variety*
so Sachse oder so	*but Sachsen or so*
find ich jetzt also ned so schee ja	*I don’t find to be so nice yeah’*
	[S120-17-I-1-Patrizia-00:43:21]

(10) Willard (2017)

des Schwäbische …	‘*Swabian …*
steht in keinem guten Ruf	*doesn’t have a good reputation*
jeden Dialekt schätz ich mehr als	*I value every dialect more than*
so wie mã in Hannover redet	*the way they speak in Hannover*
also Hochdeutsch des Tagesschaudeutsch	*so standard German is TV-news-hour-German*
des isch kein Bauch dabêi	*there is no belly [feeling] in it*
des isch nur Kopf kôine Seele drin	*it’s only a head with no soul inside’*
	[S066-17-I-1-Willard-00:47:13]

(11) Helmut (2017)

ist dieses Wechselspiel	*‘this interplay has*
ganz deutlich geworden	*become really clear*
auf der einen Seite	*on one side*
dieses Gefühl in der Öffentlichkeit	*this feeling in public*
du darfst nicht Mundart sprechen	*you shouldn’t speak dialect*
weil du gleich dann	*because then you’ll immediately*
nicht ernst genommen wirst	*not be taken seriously*
auf der anderen Seite halt man merkt	*on the other side like you notice*
dass da einfach eine Sehnsucht danach ist	*that there is simply a longing for it’*
	[S036-17-I-1-Helmut-01:25:16]

(12) Siegfried (2017)

also i bin wenn du so willsch	*‘so I am if you will*
e stolzer Schwââbe	*a proud Swabian*
on i find s schade	*and I think it’s a shame*
dass die Sprââch verlore gâht	*that the language is being lost’*
	[S021-17-I-1-Siegfried-00:25:36]

1.4.2.4. Expression and comprehension

Some speakers insisted that that they can say certain things in Swabian that they cannot express in standard German. Many of these speakers are older or less educated and hence may simply lack experience with and opportunity in using the standard language. These comments suggest how different traditional Swabian is from the standard language to the extent that the dialect is not readily intelligible to non-Swabian speakers.

(13) Louise (1982)

im Daitsche isch die Mundart sehr guet	‘*in German the dialect is very good*
sie kã so viel ausdriicke	*it can express so much*
was die Hochsprache ebe nicht kã	*what standard German even can’t do*
wo s ôifach kei Ibersetzung gib	*where there is simply no translation*

mã keennt des net	*you can't*
in Hochdeutsch iibersetze	*translate it in standard German*
was mã manchmâl	*what you sometimes*
mit em Schwäbische ausdriicke kã	*can say in Swabian'*
	[S013-82-I-2-Louise-00:11:49]

(14) *<u>Bertha (1982)</u>*

wenn i Urschwâbe heer	*'when I hear old-Swabian*
also die mã gar ned versteht	*so that you can't even undersand*
des denkt mã immer	*then you always think*
des isch e Fremdsprache ja	*that's a foreign language yeah*
muss mã halt manchmal de Kopf schüttle	*sometimes you have to shake your head*
aber so find i des kôi schlimme Sprach	*but I don't think it's a bad language*
i find e Dialekt isch nie schlecht	*I don't think dialect is ever bad'*
	[S034-82-I-1-Bertha-00:26:17]

(15) *<u>Klaus (2017)</u>*

egal wo du hin kommsch	*'it doesn't matter where you come from*
wenn du da voll im Dialekt drinne bisch	*if you are then full in dialect*
hasch du keine Chance die zu verstehen	*you have no chance to understand it*
wenn du des wirklich	*when you really*
zum erschte Mâl so heersch	*hear it for the first time*
dann stehsch de dann	*then you stand there*
wie der Ochs vor der Apothek	*like the ox in front of the pharmacy'*
	[S041-17-I-1-Klaus-00:45:32]

1.4.2.5. Linguistic accommodation

There is a strong expectation for Swabians to accommodate linguistically when speaking to non-Swabians; many speakers do this automatically and unconsciously, while others are chastised or ridiculed into changing their speech. Some comments from speakers regarding linguistic accommodation follow (see Sections 4.4.1.3. and 3.7.2.2 for further discussion).

(16) *<u>Markus (1982)</u>*

in Berlin zum Beispiel wêiß i	*'in Berlin for example I know*
dass dâ manche ziemlich	*that many people there seemingly*
aggressiv sogar reagieret	*react even aggressively*
weil die ôifach saget	*because they simply say*
wenn du in e Gebiet kommsch	*if you come to an area*
wo kôi Mundart oder Dialekt gsproche wird	*where no dialect is spoken*
dann musch du di da meeglichscht ãpasse	*then you have to adapt as much as possible*
kommt sogar vor	*it even happened one time*
dass wenn in der Wirtschaft	*that when in a bar*
mit ein paar Schwabe bist	*with a few Swabians*
und du schwäbisch unterhältsch	*and you're talking in Swabian*
dass dann irgendwie	*that then for some reason*
de Nâchbar herkommt	*the neighbour comes over*
mit dem du gar nix zum due hasch	*someone you have nothing to do with*
und der secht dann sag mal	*and says then tell me*
kennet ihr net normal schwätze	*can you guys not talk normally'*
	[S014-82-I-2-Markus-00:14:52]

(17) *<u>Markus (2017)</u>*

ich hab dann wirklich so ene Art	*'I have really had so a sort of*
"Schwäbischvermeidungsschwäbisch"	*Swabian-avoidance type of Swabian*
gehabt also so ene Sprache	*so a language*

die dann sowohl im Schwäbischen	*that then as much in Swabian*
als sie sich im Schwäbischen net doof ãheert	*as Swabian itself doesn't sound stupid*
und sich im Hochdeutschen au net	*and that also in standard German*
als ultra-schwäbisch outet	*doesn't come out as ultra-Swabian*
so etwas in der Mitte was fe beide geht	*so something in the middle that works for both*
	[S014-17-I-1-Markus-00:46:14]

(18) <u>Michaela (2017)</u>

also in der Grundschule et	so [I didn't attend] the elementary school
nâ bin i auf d Waldorfschule komme	I went to the Waldorf school
und niemand hat Schwäbisch gschwätzt	and no one spoke Swabian there
und des war mir so peinlich und	and it was so embarrassing for me
i dacht i bin so der letschte Bauer	I thought I was the "last farmer"
obwohl i ja kôin Bauer bin	although I'm not a farmer
des war so schlimm für mi	it was so terrible
und deswege hab i mir des	and that's why I
so krass abtrainiert	so blatantly untrained myself
so krass Schwäbisch zum schwätze	so blatantly to speak Swabian
wenn i neue Leute kenn	when I meet new people
i versuch des immer zum verstecke	I always try to hide it
und jetzt erschte find i s eigentlich voll cool	and just now I think it's actually totally cool
und freu mi zum Beispiel immer	and I always look forward for example
wenn i dahôim bin	when I come home
und mit --- mit meiner Oma	with my grandmother
weil die dann so richtiges Schwäbisch hat	because she has real Swabian
also no mehr als i	so much more than me
	[S126-17-I-1-Michaela-01:03:34]

(19) <u>Marius (2017)</u>

i bin ja au Läährer	*'I'm a teacher*
da merk i dass viele	*I notice that a lot of people there*
wo sonscht au Schwäbsich gschwätzt hen	*where normally Swabian is spoken*
vielleicht friiher in der Schul	*maybe earlier in the school*
oder in der Famil	*or in the family*
die versuchet da plötzlich	*they suddenly try*
Hochdeutsch zum rede	*to speak standard German*
weil se sich dann besser vorkommet	*because then they look better*
oder wenn se sich ned besser vorkommet	*or when they don't look better*
denket s wenn se Schwäbisch schwätzet	*they think that when they speak Swabian*
sind se Bauersäck -ähm-	*they are "simple-minded lazy bums"*
aber ich steh net dazu	*but I don't agree with that*
aber in Schule merk i des im Unterricht	*but in school I notice*
dass en Läährer dann Hochdeutsch reden	*that then a teacher speaks standard German*
denk ja fuck hört sich des Scheiße an	*I think yeah fuck it sounds like shit*
wenn die Hochdeutsch redet	*when they speak standard German*
und die Kinder krieget des ja au mit	*and the kids get it yeah*
dass die sich grad verstellt	*that the teachers are pretending*
und i verstell mi da au ned	*and I don't pretend*
wenn i da mit	*then when I talk with*
irgendwelche Dozente schwätz	*some lecturer*
und dâ schwätz i halt au Schwäbisch	*and then I speak Swabian*
i schwätz halt so Schwäbsich	*I speak Swabian so like*
das i wêiß dass die mi verstehet	*I know that they understand me*
also i han da ned	*so I don't use any*
irgendwelche Breschdlingsgsältz	*such words like "strawberry marmalade"*
mã kã ja au Schwäbisch schwätze	*you can speak Swabian yeah*
sodass die dann einen au verstehet	*so that they also understand you'*
	[S076-17-I-1-Marius-00:34:34]

(20) *__Laura (2017)__*

mit meinem klôine Bruder schwätz I	‘*with my little brother I speak*
gröschtenteils Hochdeutsch	*mostly standard German*
und mit meinem große	*and with my older [brother]*
des brôiteschte Schwäbisch	*the broadest Swabian*
weil gut mei klôiner Bruder der isch ja	*because well my little brother he is yeah*
zehn Jahre jünger als ich	*ten years younger than me*
also der kã des gar et verstande	*so he can’t really understand it’*
	[S124-17-I-1-Laura-01:08:39]

1.4.2.6. Lifespan change

One of the questions asked in the interview is whether the speaker thought their language had changed over the course of their lifetime, and most speakers responded without a doubt. One speaker remarked that she needed to change how she spoke so that other people could understand her, in particular with immigrants and people from other regions.

(21) *__Pepin (2017)__*

von dem her war i mal typisch	*‘at that time I was typical*
und zum Glück nimme so arg	*and luckily not so much anymore*
wer schwäbisch versteht	*those who understand Swabian*
mã legt sich hin ... brudal.	*have to laugh ... brutal‘*
	[S018-17-I-1-Pepin-00:35:37]

(22) *__Markus (2017)__*

die zwei Älteren die habm beide mit	*‘my two older [children] they both*
ganz normal Schwäbisch angefangen	*started with completely normal Swabian*
und ich hab ja au Videos von früher	*and I also have videos yeah from earlier*
und -äh- bin dann jedes Mal verwundert	*and -ah- I am amazed every time*
wie die Schwäbisch reden	*how they speak Swabian*
und mittlerweile sind se eigentlich	*and meanwhile they actually [speak]*
beim glatten Hochdeutsch oder so....	*plain standard German or so…*
die habm den Switch ziemlich klar gmacht	*they made the switch pretty clear’*
	[S014-17-I-1-Markus-00:48:09]

(23) *__Belinda (2017)__*

aber wie jetz die in der Grundschul	*‘but what it’s like in elementary school now*
ob dâ e bissle hochdeutscher	*whether they speak more standard German*
dääd I viellêicht scho meine	*I would perhaps already think so*
sind ja au so viele andere Kinder ge	*there are so many other kids yeah*
aus andere Gegende da oder	*from other regions there or*
die ganze Flüchtlinge jetzt	*all the immigrants now*
viellêicht muss ma scho	*perhaps you already have to*
e bissle hochdeutscher spreche	*speak a little more standard German*
des dääd i scho denke,	*I would surely think that’*
	[S053-17-I-1-Belinda-00:39:48]

(24) *__Johanna (2017)__*

meine Mutter hat schon immer so	my mother had always
halb eigentlich Hochdeutsch geredet	spoken so half-standard German
bei der ist jetzt witzigerweise im Alter	now oddly with her as she ages
wieder schwäbischer geworden	she’s become more Swabian again
	[S105-17-I-2-Johanna-00:32:18]

(25) <u>*Michaela (2017)*</u>

s gibt ôi ôinziges Video von mir als Baby	there is one single video of me as a baby
meine Eltern schwätzet da so andersch	my parents speak so differently
s isch richtig krass	it's really blatant
wenn du die heut hörsch	when you hear them
und wenn du die damals hörsch	and when you hear them before
mei Mama schwätzt da so richtich	my mother speaks really
arg Schwäbisch so richtig komisch einfach	"really terrible" Swabian so really odd
des hört sich gar et an wie unsere Eltern	it doesn't sound at all like our parents
	[S126-17-I-1-Michaela-01:10:09]

1.4.2.7. Identity, diversity, and change

In a 2018 article in the *Frankfurter Allgemeine Zeitung*, the Frankfurt daily newspaper, Winfried Kretschmann, the Minister-President of Baden-Württemberg, who grew up in the rural *Schwäbischen Alb* 'Swabian mountains', is cited in the headlines as saying, *Ich spreche Schwäbischer als früher* 'I speak more Swabian than before' (Frankfurter Allgemeine Zeitung 2018). To provide an additional perspective on attitudes towards Swabian, following is an excerpt from an interview with Kretschmann, conducted by Dominik Kuhn, the German producer, director, comedian, and musician known as "Dodokay," in which Kuhn asked Kretschmann how important Swabian is to him (Kuhn 2020):

(26) <u>*Kretschmann (2018) on Diversity*</u>

solche Dialekte sind etwas bedroht ja	*such dialects are being threatened yeah*
wie kleine Sprache überhaupt …	*like small languages everywhere*
und ich find des ganz wichtig	*and I think it is very important*
des geheert einfach zu Vielfalt dazue	*it's a part of diversity'*
	[Winfried Kretschmann-2018-1:00]

(27) <u>*Kretschmann (2018) on Identity*</u>

das Dialekt auf jedenfalls unser	*'the dialect at least ours*
hat eine bestimmte Ebene und irgendwie	*has a certain niveau and in some way*
eine bestimmte Charakterisierung	*a particular characterisation*
das zeigt auch	*it also reveals*
was über die Menschen aus	*something about the people*
die das sprechen	*who speak it*
sozusagen wie eine Rückkoppelung	*sort of like a feedback-loop*
sie prägt auch selber die Leut zuriick	*it also shapes back the people themselves'*
	[Winfried Kretschmann-2018-2:22]

(28) <u>*Kretschmann (2018) on Lifespan Change*</u>

i habe letztes Mal	*'I recently*
en Aufnahme von mir gesehen	*saw a recording of myself*
als junger Abgeordneter	*as a young congressman*
da habe ich noch	*at that time I really still*
richtig Hochdeutsch gesprochen	*spoke standard German*
des kann i heut gar nimmer	*I can't do it anymore*
ich bin ja Flüchtlingskind	*I'm an immigrant-kid*
das heißt wir haben zu Hause	*that means we spoke*
Hochdeutsch gesprochen	*standard German at home*
und ich habe des verlernt	*and I've forgotten it*
und der Spruch	*and the saying*
"wir können alles	*"we can do anything*

außer Hochdeutsch" stimmt	*except standard German"[6] is true*
i kann des heut nimme wirklich richtig gut	*I can't really do it right anymore today*
ich habe es irgendwie verlernt	*I've forgotten it somehow*

[Winfried Kretschmann-2018-8:40]

Kretschmann's comments overtly encapsulate the fundamental role that dialect still plays in the lives of many Swabian speakers. However, born in 1948, at 71 years old, Kretschmann represents an older population, and his linguistic attitudes, as this study unveils, are not necessarily representative of today's modern, younger generation.

1.4.3. Future of Swabian

In deliberating over the future of dialects, scholars have various views. On one side are those who claim that a widespread standardisation process is taking place and that dialects across the world, particularly in Europe, are rapidly receding under the encroachment of the standard language. The other view considers dialects to be a vital and dynamic facet of the culture and community, with speakers indexing dialect and standard language features in constructing differing identities, styles, and stances. A third, more balanced viewpoint maintains that supralocalised or supraregionalised languages are emerging, centred in major urban areas such as Stuttgart. Each of these perspectives is discussed in turn with respect to the future of Swabian.

Since the end of the second world war, many scholars agree that a process of linguistic standardisation has been taking place in Germany, primarily the result of increasing industrialisation, urbanisation, globalisation, immigration, education, and mobility (both geographical and social). In 1955, Engel claimed that an *Ausgleichsbewegung* 'equalising movement' has been taking place between the southwestern dialects and standard German, which is the strongest in middle and eastern Swabia (Engel 1955:21), most notably in the large urban area surrounding Stuttgart. In 1959, Leopold claimed that "dialects were receding at a surprisingly fast rate before the standard language" (Leopold 1959:150). More recently, Ammon (1973), Bausch (1982), and Clyne (1995) have also documented an *Abbau* 'reduction' of dialect features in Swabian with respect to standard German. It seems evident that the future of Swabian involves a weakening of traditional dialect features and a strengthening of more standardised features.

However, other scholars maintain that Swabian continues to occupy a central role in everyday life (Ruoff 1997), although the domains of appropriate usage may be shrinking (Baayen, Beaman, and Ramscar 2020, Ruoff 1997:142-143). Swabians live in a pluralistic world. Speaking Swabian allows speakers to express pride in their local identity and demonstrate strong ties with family, friends, and *Heimat* 'homeland'. Switching to standard German enables speakers to

[6] This quote refers to a campaign that the Baden-Württemberg government ran in 1999, *Wir können alles. Außer Hochdeutsch* 'We can do everything. Except standard German' (https://www.bw-jetzt.de/), with the goal of elevating the opinion of Swabian throughout Germany.

portray themselves as highly educated and geographically and socially mobile. I observed this phenomenon in action on multiple occasions with my informants. One speaker, in his "Swabian-accented" standard German proudly proclaimed to me that he has "raised his social status over that of his parents." He says that he can rachet his Swabian up or down depending on the listener and the image he wants to portray. Comments like these, along with many others, indicate that Swabian is "alive and well" and has taken on an indexical status that speakers exploit, consciously and unconsciously, to convey social meaning and construct differing personas depending on the image they want to portray.

Finally, a third, widely held view is that, as a result of pervasive mobility and persistent contact, dialects are undergoing massive regional levelling, processes of SUPRALOCALISATION and SUPRAREGIONALISATION, in which "linguistic variants with a wider socio-spatial currency become more widely adopted at the expense of more locally specific forms" (Britain 2010:193). Schmidt (2011) claims that "the actual establishment of the modern regional languages began around 1930 with the radio-based spread of the supraregional standard pronunciation norms of 1898, which set in train a devaluation of the old prestige varieties" (Schmidt 2011:144). Auer (2013:5) argues for a regionalised speaker-centric model, which allows individuals to convey their Swabian identity and, at the same time, express their regional belonging. He maintains that this "new regionalism is a reaction to state centrism, but also to globalisation, which is seen as [a] threat to territorial unity and sovereignty" (Auer 2013:17). It is this sense of dialect identity and its indexicalities within a supraregionalised model and the impact it has on language variation and change in Swabian that this thesis seeks to untangle.

1.5. Roadmap for this thesis

This thesis is organised as follows. Chapter 2 provides the theoretical foundations for this research by describing current sociolinguistic theoretical paradigms and empirical approaches relevant to the three research questions at the foundation of this investigation. Chapter 3 outlines the research framework and describes the Swabian corpus in detail, including the linguistic variables under investigation and the internal and external predictors considered in evaluating the Swabian sociolinguistic situation. Chapters 4 through 7 report the results of four in-depth analyses: the impact of local orientation and geographical mobility on dialect density (Chapter 4); the social meaning of a diphthong merger (Chapter 5); the effects of education and prescriptivism on the choice of relative clause markers (Chapter 6); and, patterns of systematicity and coherence which define Swabian sociolects (Chapter 7). Finally, Chapter 8 summarises the principal findings and reflects on the empirical and theoretical implications to be drawn from this research, addressing the limitations of the study and offering opportunities for future research.

Chapter 2. Theoretical foundations

kennet ihr net normal schwätze?
'can you guys not talk normally'
-Markus 1982

2.1. Introduction

At the heart of this investigation is the exploration of an enduring question in variationist sociolinguistics dating back forty years: what is the "nature of the relationship between the individual and the group" (Guy 1980:1). How does variation in the speech of individual speakers evolve and interconnect to create collective group norms? Speaking dialect is an intensely personal phenomenon – one that unites speakers into speech communities that project shared values and a collective identity. Some speakers adapt and move with the community as it changes; others hold tight to their traditional values, retaining their individualities while the community changes around them. Amid this seeming chaos, a sense of coherence in the speech patterns of individuals and their communities is maintained, without which "the cognitive and social reality of the 'sociolect' [would be] problematic" (Guy 2013:63).

This chapter discusses the theoretical backbone for this investigation of Swabian by exploring prior work around the three research aims of this project, as presented in Chapter 1: the evolving dialect landscape in Swabia (Section 2.3), longitudinal lifespan and community studies of language change (Section 2.4), and patterns of systematicity and sociolectal coherence that shape, constrain or restrict linguistic variation and change (Section 2.5). First, I begin with a brief overview of the history of dialectology in Germany.

2.2. Brief history of dialectology in Germany

Understanding the current state of linguistic research concerning Swabian starts with traditional dialectology, the study of the geographical distribution of language varieties. In the first half of the 19th century, dialectologists began drawing the first language maps in Europe. Johann Andreas Schmeller, considered the founder of German dialectology, published the first comparative dialect survey in 1821, *Die Mundarten Bayerns* 'Bavarian dialects' (Schmeller 1821), supplemented by a four-volume Bavarian dictionary, *Bayerisches Wörterbuch* (Schmeller 1827). In 1849, Bernhardi developed the first map of the German language. Yet, it was Wenker and Wrede's (1895) *Sprachatlas des Deutschen Reichs* 'Linguistic Atlas of the German Empire' which has had the most substantial impact on German dialectology. Wenker sent 50,000 questionnaires to schoolmasters across Germany, asking them to transcribe a set of 40 sentences (the *Wenkersätze* 'Wenker's sentences') into the local dialect. This exceptional effort took forty years to complete and resulted in 16,000 hand-drawn dialect maps. More recently, and focussed specifically on Swabian, Ruoff et al. (1973) founded the *Tübinger Arbeitsstelle, Sprache in Südwestdeutschland* 'Tübingen Workplace, Language in Southwest Germany', recording over 2,000 speakers between 1955 and 1973 in more than 500 locations across Baden-Württemberg. Most recently, and currently still underway, is the work of Klausmann and his team at the Ludwigs-Uhland Institute at the University of Tübingen, who have recently published the *Sprachatlas von Nord Baden-Württemberg (SNBW)* 'Linguistic Atlas of North Baden-Württemberg', covering 140 localities and 15 cities across Baden-Württemberg (Klausmann 2018c, 2018a, 2018b). These substantial databases are significant for their breadth of geographical coverage, yet are limited in that they follow the traditional dialectologist approach of recording mostly older, rural, generally less educated speakers (cf. NORM – non-mobile, older, rural, men (Chambers and Trudgill 1998)), with no consideration given to stratified sampling across socio-demographic groups which has regularly shown to influence dialect usage.

The birth of DIALECTOMETRY, pioneered by Séguy (1973), brought a quantitative approach to dialectology by establishing statistical methods to aggregate and calculate the linguistic distances and similarities between dialects, particularly those spoken in transition zones which are typically characterised by small differences between neighbouring locations. Séguy's (1973:22-23) approach consisted of comparing minute linguistic differences between two bordering localities and calculating an index of linguistic distance, which was then used to establish dialect boundaries. Nerbonne and Heeringa (2007) applied a dialectometric approach to Trudgill's GRAVITY MODEL of dialect change, which uses parameters of population size and geographical distance to calculate the strength of the influence of a large urban centre relative to other localities (Trudgill 1974:233). While not dismissing the role of gravity, Nerbonne and Heeringa (2007:275) claim that the "influence of geography has been [massively] exaggerated", as their research shows that the effects of social contacts and interlocutor accommodation enact significantly greater influence on the spread of linguistic innovations than geographical distribution. While dialectometry has been expanding its scope in recent years, the dearth of extralinguistic factors considered, as well as the reliance on linguistic atlases and written language corpora rather than spontaneous spoken language, are substantial limitations.

In fact, most early approaches in dialectology took no account of the extralinguistic factors influencing language use; rather they focussed on an idealised variety spoken by NORMs. While the geographic scope of dialectology is quite broad, its focus on language use has been mainly restricted to "horizontal language contact" (Auer, Baumann, and Schwarz 2011:14), i.e., differences between local and regional varieties, with no regard for "vertical contact," e.g., differences based on age, sex, education, social class. The overall challenge with traditional dialectology is that it is based on many, now outdated assumptions about language, including: (1) people speak only one variety of a language or dialect; (2) speakers do not vary in their language or dialect usage (e.g., situation, topic, style, repertoire, interlocutor); (3) speakers' language does not change throughout their lifespan; (4) people are tied to specific locations and so speak the variety where they are from or currently live; and (5) older, rural farmers are the only "authentic speakers" – "the 'ideal' informant with all of the 'right' social characteristics that suit the analysis to be conducted" (Britain 2016:217). Moreover, a fundamental limitation of traditional dialectology is that no consideration is given to the inherent variability between or within individual speakers: in fact, dialectologists made every effort to eliminate variability from their analyses. Furthermore, dialectology has focussed predominantly on phonological and lexical differences, with little to no attention paid to the morphological or syntactic differences between varieties. The current investigation of Swabian addresses these limitations through a longitudinal study of variation and change, across a broad range of extralinguistic factors, covering both phonological and morphosyntactic features.

Ultimately, Chambers and Trudgill (1998:188) declared that "dialectology without sociolinguistics at its core is a relic." While in the past sociolinguists and dialectologists have tended to stay in their own camps, in recent years, there has been increasing interest by some researchers to focus on the commonalities between these two disciplines and to integrate their work. In reality, dialectology and sociolinguistics can be viewed as two sides of the same methodological coin. Although there are structural differences in approaches, Chambers and Trudgill (1998:187) point out that these two fields essentially share common goals. Both disciplines are interested in the language of individuals within speech communities: dialectology focuses on static snapshots of conservative, rural varieties, whereas sociolinguistics targets dynamic, innovative features in modern, urban varieties; while dialectology seeks to identify different linguistic varieties, sociolinguistics examines the inherent variability within a variety; dialectology primarily emphasises lexical items, whereas sociolinguistics investigates variables across all levels of the grammar. Of course, both disciplines depend on fieldwork, although the nature and type of data collected differ. Hence, the confluence of these two research streams forms a more comprehensive methodology for investigating everyday spoken language – an approach that the current investigation of Swabian follows.

2.3. Evolving dialect landscape in Swabia

As introduced in Chapter 1, the first aim of this research is to investigate and document the changing use of Swabian, a variety of German that has not been studied from a sociolinguistic perspective. In this section, I review crucial issues in the dialect-standard landscape particularly relevant to the Swabian situation, from dialect-standard convergence (Section 2.3.1) to dialect contact (Section 2.3.2), accommodation (Section 2.3.3), identity (Section 2.3.4), levelling (Section 2.3.5), geographic mobility (Section 2.3.6), and supraregionalism (Section 2.3.7). I conclude with a summary of the pivotal lessons learned with respect to linguistic variation and change in a situation of dialect contact and levelling (Section 2.3.8).

2.3.1. Dialect-standard language convergence

Over the last 50 years, linguists across Europe have been recording evidence of dialects converging to the standard language (e.g., Auer 1998, 2005, 2018; Auer and Hinskens 1996; Hinskens, Auer, and Kerswill 2005; Kerswill 2010; Mattheier 1986, 1996; Smith and Durham 2012; Trudgill 1983). Auer and Schwarz (2014) maintain that "most dialect-to-standard advergence[7] ... is lexically driven and restricted to etymological classes... [and] the individual words within the lexical class do not behave in the same way" (Auer and Schwarz 2014:263-264). In Germany, as a result of the country's strong focus on education, along with other factors of modern life (e.g., ease of travel, greater mobility, mass communication), dialects are levelling, and traditional varieties are rapidly receding (e.g., Auer 1998, 2005; Auer, Baumann, and Schwarz 2011; Clyne 1995; Leopold 1959; Schwarz 2014). However, counterforces are at work: effects of overt/covert prestige, cultural pride, and local identity can impede the processes of convergence and even promote divergence (e.g., Dorian 1994; Grondelaers, van Hout, and van Gent 2016; Moore and Carter 2015; Schilling-Estes and Wolfram 1999; Trudgill 1972). Despite these myriad disparate influences, there are also stable dialect variants that persist and do not change. Curiously, dialect loss offers a silver lining: "people start cherishing what is perceived to have become rare" (Vandekerckhove and Britain 2009).

2.3.2. Dialect contact

While some dialects are declining, new varieties are emerging, accelerated by a multitude of social and economic developments, bringing speakers of more distinct varieties into contact on a regional, national and even global scale (Britain 2009). The principal outcomes from a dialect contact situation include LEVELLING and SIMPLIFICATION (Auer 2018; Britain 2002; Kerswill 2003; Trudgill 1974, 1986; Williams and Kerswill 1999), the emergence of INTERDIALECTAL FORMS (Auer 1999, 2018; Kerswill and Williams 2000), REALLOCATION, both socio-stylistic and phonological (Britain 2002; Britain and Trudgill 1999; Kerswill 2002), and BIDIALECTALISM (Cornips and Hulk 2006; Smith and Durham 2012). In their study of bilingual children from ethnic minority communities in the Netherlands, Cornips and Hulk (2006:355) discovered that bidialectalism has "increased so much that monolingual speakers of nonstandard dialects have become the exception." In Scotland, Smith and Durham (2012:57) suggest that the emergence of a "pivotal generation in dialect obsolescence" is underway, one "signalled by extreme linguistic heterogeneity across a group of historically homogeneous speakers."

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[7] Auer and Schwarz (2015:264) point out that the term "advergence" (Mattheier 1996) more accurately reflects the uni-directional nature of dialect variants moving to the standard language rather than "convergence" which implies two variables moving toward each other. However, this study adopts the term "convergence", which is more generally used in the sociolinguistic literature, to mean the changing of dialect variants to standard language variants.

Auer (2005) asserts that, contrary to the Americas, where language change is generally *endogenous*, i.e., initiated internally within the speech community, language change in Europe is typically *exogenous*, i.e., shaped through external influences, such as dialect contact and levelling. Labov (2001:20) defines DIALECT CONTACT quite simply as "the effect of one system on another;" however, Britain (2018:270) argues for a more multifaceted approach to the dialect contact model of language change, one that takes "a much more inclusive stance … with respect to who is a relevant speaker" and challenging "the a-mobile focus of much earlier research." Such provocation incites the current study to incorporate a broad view of speakers' geographic mobilities and to address how mobility should be defined, measured, and integrated into a holistic study of language variation and change.

Mufwene (2001:4-6) suggests that situations of dialect and language contact create a FEATURE POOL, a set of variables brought together from different varieties as a consequence of the contact situation. Speakers actively select various features from the pool, combining and modifying them in different ways. Hence, a critical goal of the current investigation is to understand which features available to the Swabian speaker are becoming standardised (i.e., regionalised, levelled, reallocated) and thus disappearing, and which are being manipulated through situation-specific processes of accommodation and tapped for identity formation.

2.3.3. Dialect accommodation

When speakers of mutually intelligible dialects come into contact, they generally adapt or accommodate their speech to that of their interlocutors, a process which is subtle and largely unconscious (Giles, Taylor, and Bourhis 1973:178). Building on the interpersonal speech communication work of Giles and his colleagues, Trudgill (1986) argues that repeated short-term speech accommodation in interaction leads to long-term accommodation and hence language change. He maintains there is a "general and seemingly universal (and therefore presumably innate) human tendency toward 'behavioural co-ordination'" (Trudgill 2004:27-28); hence, "dialect mixture is the inevitable result of dialect contact, and the mechanism which accounts for this is quasi-automatic accommodation in face-to-face interaction" (Trudgill 2008:241). Since Trudgill's ground-breaking work, a flood of studies on linguistic accommodation has engulfed sociolinguistic research (Auer 2007; Auer, Barden, and Grosskopf 1998; Coupland et al. 1988; D'Arcy and Tagliamonte 2010; Drager, Hay, and Walker 2010; Finegan and Biber 2001; Kerswill 2002, 2010; Tuten 2008). Fundamentally, the foundation for many of these perspectives on linguistic accommodation dates back to Bloomfield (1933:476):

> *"Every speaker is constantly adapting his speech-habits to those of his interlocutors…. The inhabitants of a settlement … talk much more to each other than to persons who live elsewhere. When any innovation … spreads over a district, the limit of this spread is sure to be along some lines of weakness in the network of oral communication."*

However, Auer and Hinskens (2005:343) contend that it is difficult to find evidence to indicate that interpersonal accommodation leads to community-wide change. They prefer to think of accommodation as targeting a stereotypical persona or mental model of a social group (cf. Bell's (1984) "audience design") rather than as face-to-face accommodation in social interaction. Britain (2018:255) maintains that speakers can disregard the tendency to accommodate (i.e., "reduce the linguistic distance") by actively diverging from their interlocutors in the construction of their unique personas. Baxter and Croft (2016:169) argue that speakers who accommodate less willingly will change more suddenly, while those who accommodate more eagerly will change more continuously. As a result, Giles, Coupland, and Coupland (1991) argue for a distinction to be made between subjective or intended accommodation and objective or real accommodation, suggesting that accommodation is a two-way phenomenon between the speakers' desire (or lack thereof) to accommodate to their interlocutors and their actual real-life behaviour in interaction. To reconcile these views, Auer and Hinskens (2005:337) propose a combined CHANGE-BY-ACCOMMODATION and IDENTITY-PROJECTION model in which speakers adopt specific features that convey their "wish" to identify with a particular group (or to some "abstract image of the group"). While a comprehensive two-way analysis of accommodation is beyond the scope of this thesis, this study incorporates a metric to assess speakers' subjective "desire" to accommodate to what they "assume" to be the variety used by different interlocutors, which I call "Interlocutor Choice" (see Section 3.7.2.2); this metric is then used to evaluate the impact that different "perceived" interlocutors have on dialect accommodation and change.

2.3.4. Dialect identity

Rather than accommodation and adaptation, another line of research argues that DIALECT IDENTITY, the "positioning as a user or non-user of the local dialect" (Johnstone 2016:51), is a pivotal factor in dialect usage. A wealth of scholars from various disciplines have shown how identity construction can influence linguistic performance and play a central role in the understanding of language variation and change (e.g., Auer 1998; Bakhtin 1986; Bucholtz and Hall 2005; Coupland 2001, 2008; Dodsworth 2017; Drager 2015; Eckert 2000; Eckert and Wenger 2005; Johnstone 2016; Kiesling 1998; Mendoza-Denton 2002; Moore and Carter 2015; Le Page 1986; Le Page and Tabouret-Keller 1985; Schilling-Estes 2004; Sharma 2012; Silverstein 2003; Tabouret-Keller 1997; Tajfel 1982). The social psychologist Tajfel defines identity as "that part of an individual's self-concept which derives from his [*sic*] knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (Tajfel 1978:63). In this same vein, Le Page and Tabouret-Keller (1985:181) invoke the term ACTS OF IDENTITY, suggesting that speakers create for themselves patterns of linguistic behaviour resembling those of the groups to which they wish to be identified, as well as distinguishing themselves from the groups with which they wish to be disassociated.

In contrast to Le Page and Tabouret-Keller's acts of identity approach, which is centred on the individual, Milroy's social network construct, which is grounded in the community, proposes that nonstandard language varieties are maintained through external pressures from informal kinship and friendship networks and that any attempts to minimise or stigmatise nonstandard variants can be viewed as a "direct attack on the values and social identity of the speaker" (Milroy and Milroy 1985a:90). Similarly, Wolfram and Schilling-Estes (2003:732) report on Smith Island's resistance to an ongoing change because the traditional variant is highly valued and serves as a "marker of in-group identity." Whether conscious or unconscious, speakers exhibit a sense of "linguistic self-defence" in opposition to the encroachment of the "outside world" as embodied in the standard language (Schilling-Estes and Wolfram 1999:510). Auer (2005:28) concurs, stating that nonstandard language varieties allow

> *"users to act out, in the appropriate contexts, an identity which could not be symbolised through the base dialects (which may have rural, backwardish or non-educated connotations) nor through the national standard (which may smack of formality and unnaturalness and/or be unable to express regional affiliation)."*

Nonetheless, Trudgill (2004) vehemently shuns the role of identity in new-dialect formation, and Labov (2001) also sheds doubt on the relevance of identity to language change. While the islanders on Martha's Vineyard are often viewed as demonstrating strong local identity, Labov and his colleagues found very few correlations between levels of local identification and language change (Labov 2001:191). The debate between accommodation and identity seems to be centred around whether new varieties are actively and consciously "created" by speakers (i.e., "free will") or whether they "emerge" spontaneously and accidentally (i.e., "determinism") as Mufwene (2001) claims. Trudgill (2008:243) clearly states that he sees "no role for identity factors", stressing that if speakers are conveying a shared identity through their use of language, then it "is parasitic upon accommodation and chronologically subsequent to it" (Trudgill 2008:251). Labov's (2001:20) agrees that social evaluation and linguistic attitudes play only a minor role in dialect change and that the motivating force is "mechanical and inevitable", drawn from Bloomfield's (1933) PRINCIPLE OF DENSITY, which claims that every communicative act is associated with a degree of convergence between the speaker and interlocutor (Bloomfield 1933:476). To propose that speakers "use dialect features to express identity is to presuppose that use of dialect is the *assertion* of an identity, rather than the *reflection* of an identity already formed" (Sayers 2009:356). To reconcile these two opposing positions, Tuten (2008:261) proposes that, most likely, the dual concepts of identity and accommodation are concomitant and mutually dependent.

Clyne (1995:218) asserts that "the German language is both a unifier and separator of people…. it reflects both cultural cohesion and socioeconomic political division." Similarly, Kennetz (2008:5) refers to the *Mauer in den Köpfen* 'wall in the minds'[8] to describe the importance of social identity in Germany, an influence that he claims is even more powerful than speaker age, sex, education, and occupation. While it is not the intention of this thesis to resolve the philosophical identity-accommodation debate and determine whether the choice of linguistic variants is an active (conscious or unconscious) function of identity (i.e., "free will") or an inactive (inherent and automatic) process of accommodation (i.e., "determinism"), a specific challenge for the current study is to tease apart the confounding factors of accommodation and identity in order to assess their influence on dialect change in Swabian. Given the broad range of theoretical perspectives regarding the concept of identity and its role in processes of language variation and change, this research uses speakers' *perception* of their own identities as expressed through shared values, understanding of differences, and participation in collective activities (Hoffman and Walker 2010), a factor I call "Swabian Orientation" (see Section 3.7.2.1).

2.3.5. Dialect levelling

Trudgill (1986:98) defines DIALECT LEVELLING as "the reduction or attrition of MARKED variants", i.e., forms that are "unusual or in a minority," adding that situations of pervasive and prolonged dialect contact lead to a process of KOINÉISATION, or new-dialect formation (*Ibid:*106), which consists of both LEVELLING (i.e., the disappearance of distinctive features) and SIMPLIFICATION (i.e., reduced irregularities) (cf. Auer's (1999) "fused lects"). Britain (2009:123) adds that dialect levelling generally affects "locally embedded features", which are eradicated and replaced by broad regional features from outside the community. Such situations are generally triggered as a consequence of broad social changes, such as industrialisation, urbanisation, agricultural development, and an expanding, increasingly diverse workforce (Britain 2009, 2017; Kerswill 2001). As to the origin of levelling, Cheshire et al. (1999) pinpoint adolescents as driving the process, as they adapt their speech to that of their peers rather than their parents. Indeed, dialect levelling is particularly prominent among young people who actively adopt features they believe to be "non-local" while avoiding variants they feel may portray their "local roots" (Foulkes and Docherty 2014:14).

The ground-breaking work of Milroy (1987) and her colleagues reveals that dialect levelling is more common in urban populations in which people tend to have "weaker social ties," as a result of their greater geographic mobility and hence increased contact with a wide variety of different speakers. In situations of dialect levelling, it is generally the socially or locally marked variants in the dialect system that are purged while the unstratified and regionally used variants survive (Milroy and Llamas 2013:438). Milroy and Milroy (1985b:375) also found that the speed

[8] A term used in the media in the 1990s to describe the ever-present divide and ongoing social conflicts between the east and west parts of Germany.

of change is slower in communities united by “strong ties” and more rapid in communities connected by “weak ties”. Trudgill (2004:442) adds that tightly-knit communities with dense, multiplex networks display greater linguistic conformity because the “strong social ties” help to reinforce and ensure adherence to group norms.

Britain (2009:121) sums up levelling and dialect loss with three claims: (i) “[it] is inextricably linked to dialect contact; (ii) “the attrition process has not led to a widespread shift towards [the] standard”; and (iii) “while some dialects are undoubtedly undergoing attrition, new varieties are emerging.” Critical to the Swabian situation is why some dialect variants recede, others level out, and others newly emerge, and what this portends for the future of the dialect. Thus, one aim of the current investigation is to assess the degree of Swabian still spoken today and the extent and nature of levelling that has occurred over the last 35 years (see Chapter 4).

2.3.6. Speaker mobilities

“Mobility is central to what it is be human” (Cresswell 2006:1). With ever-increasing globalisation, expanding immigration, and swelling numbers of commuters travelling from rural locations to urban centres for work, MOBILITY and SUPERDIVERSITY (Vertovec 2007) have become part of everyday life. Blommaert (2010:xiv) argues against the Saussurean synchrony in which language is removed from the spatial and temporal aspects that define its existence. Language, he says, is “intrinsically and perpetually mobile, through space as well as time…. The finality of language is mobility, not immobility.” Despite these views, dialectologists and sociolinguists alike have systematically skirted the issue of geographic mobility and its impact on language variation and change (Britain 2002, 2016). Britain's (2016) thought-provoking article on “sedentarism” and “nomadism” calls out the “elephant in the room” by pointing out how dialectologists and sociolinguists alike have ignored mobility in their quest for the “authentic speaker” – the prototypical NORM informants, those born and raised exclusively in the region under study (Chambers and Trudgill 1998) (see Section 2.2). Speakers who have moved extensively in and out of the region, or even within the region under study, have traditionally been treated with suspicion (Chambers 2000). “A strong sedentarism prevails: mobility is either ignored, seen as peripheral to models of linguistic change, or positively shunned and treated as suspect” (Britain 2016:222).

Auer (2013:6) questions “whether the exclusive focus on stable settlements and immobile speakers has ever done justice to language and language change.” From prehistory to the Great Migration to European colonial expansion to the age of industrialisation and urbanisation, the human race has always been highly mobile. At the turn of the century, only about 3% of the world population lived in cities. Today, as a result of industrialisation and urbanisation, more than half of the world’s population lives in urban areas, and this trend is expected to continue to increase 62% by 2050 (United Nations 2019). Auer (2013:7) criticises research that leaves the speaker out of studies of space and language, arguing that “mobility has become such a central feature of human existence in the age of globalization that any kind of linguistics that is not able to address its effects will be in danger of falling out of step with reality."

All people are mobile, and it is this notion of "local mundane mobility" that grounds and orients people to the places and communities that are central in their lives (Britain 2016:237). Britain (2016) insists that, as researchers, we need to expand our theoretical lens to consider both ends of the mobility/immobility scale, incorporating a more nuanced view of paths in the middle. In understanding how mobility influences linguistic variation and change, not only "who" is mobile, but "where" and "how" mobile speakers are, must be taken into consideration, including differences in social and geographic stratification (Britain 2020:94). Thus, to answer Britain's call to incorporate mobility into variationist research, this study devises a multidimensional index of geographic mobility which considers not only the distances speakers move from their home but also the number of moves and the length of time spent in each location (see Section 3.7.2.3).

2.3.7. Rise of supralocal and regional standard varieties

Increasingly, situations of dialect levelling are giving way to developments of SUPRALOCALISATION and SUPRAREGIONALISATION, processes in which speakers of different varieties, who are in frequent and intensive contact with one another, gradually drop highly localised variants and adopt more widely used supralocal or supraregional variants (Auer 1998; Britain 2009, 2010, 2011; Hickey 2010, 2013). This contact does not necessarily require direct, face-to-face interaction but can result from indirect exposure to other varieties, such as horizontal contact with neighbouring varieties, as well as vertical contact with the standard language. In this sense, supraregionalisation differs from interlocutor accommodation and identity construction which do require face-to-face interaction. It also differs from dialect levelling which entails the loss of highly local, stigmatised or salient variants and the uptake of entirely new variants (Hickey 2003:236). Auer (1998) sees the process of regionalisation as the interaction of two related phenomena: one of horizontal dialect levelling (i.e., from "neighbouring dialects") and one of vertical dialect levelling (i.e., from the "standard variety"), which often leads to the rise of intermediate varieties (Auer 1998:1-2). Britain (2011) adds that although mobility is a "democratising force" bringing diverse people into greater contact, supralocalisation is still highly socially differentiated (e.g., class, gender, socioeconomic status) (Britain 2011:43).

A question for the current study is to what extent can linguistics models predict which features participate in processes of supralocalisation and supraregionalisation (and to what degree) and which features remain distinctly local or die out. Scholars have proposed several factors (Britain 2010; Hickey 2003; Kerswill and Williams 2002; Trudgill 1986; Trudgill et al. 2000; Trudgill, Gordon, and Lewis 1998):

1. mergers are preferred over distinct variants unless significant homophony results;
2. mergers advance when the functional load of the distinction is low;
3. unmarked forms survive over marked ones, even if they are the minority option;

4. forms that do not have strong social and regional stereotypes are persistent;
5. features that are less “perceptually salient” are more resistant to levelling; and,
6. the majority form across all dialect groups represented in the mix is favoured.

Hence, a paramount objective for the current study is to consider these aspects of supralocalisation and evaluate the impact they have on the dialect situation in Swabia. Factors (1) and (2) from above are addressed in Chapter 5, and the others are evaluated in Chapter 4.

2.3.8. Lessons from studies dialect change

Regrettably and surprisingly, there are few sociolinguistic studies on dialect contact and levelling in Germany and none on Swabian (cf. Auer 2005). Garnered from five decades of research on dialect contact and levelling, this section summarises the primary lessons pertinent to the Swabian situation and provides references to subsections in the methodology which describe how each is addressed in the current investigation. They are organised into three groups: lessons relative to the community, to the speakers, and to the linguistic variables.

2.3.8.1. Community Factors

(C.1) The nature of the speech community can result in differing outcomes of dialect change. The findings from the vast literature on dialect contact and levelling show that different communities, at various times, yet in similar situations, exhibit analogous, yet distinct outcomes (Britain 1997:38). The reasons for this are varied but generally lie in the unique sociohistorical and cultural context of the community. In particular, “diffuse” speech communities with elevated population movement (cf. Milroy’s “weak ties”) are likely to exhibit more rapid changes, including levelling, whereas “focussed” communities with more stable social environments (cf. Milroy’s “strong ties”) are more likely to demonstrate linguistic conformity (Kerswill and Williams 2002:182). Furthermore, in line with Trudgill’s (1974) GRAVITY MODEL, the size of the community and its distance from a large urban metropolis is inversely proportional to the degree of levelling that occurs. Hence, in the current study, varying aspects of the speech communities must be accounted for as they can produce very different outcomes based on differing socio-geographic-political contexts (see Section 3.7.1.1).

(C.2) The types of social networks in the community influence the nature and speed of dialect change. The strength and density of social networks within the community play a significant role in dialect levelling with strong, dense ties supporting the retention of dialect features and weak, loose ties promoting convergence and levelling (Dodsworth 2017; L. Milroy 1987). As Swabian communities evolve and social ties weaken (see Section 1.4.3), levelling is becoming pervasive, particularly in urban centres with growing immigrant and non-Swabian populations. Thus, as with C.1 above, the current study must consider the evolving nature of the social connections in each of the communities under investigation (see Section 3.7.1.1).

(C.3) Changes in the community are generally, but not always, mirrored in the individual. The effects of dialect levelling are not haphazard or arbitrary but rather exhibit an orderly set of possibilities exposing systematic and unifying patterns of change (Britain and Trudgill 1999:254). Studies have shown that individual change generally follows communal change (Sankoff 2005, 2018); however, there are also divergent individual patterns stemming from a variety of sources, including changing identities and ideologies, differing life events and career paths, and even random sampling errors resulting from small sample sizes (Wagner and Buchstaller 2018). Hence, it is critical for the current study to consider both the sociohistorical context of the communities (see Section 3.4.1), as well as the social and personal lifespan trajectory of the individuals (see Section 3.4.3) to differentiate both the unifying and the diverging patterns of change.

2.3.8.2. Speaker Factors

(S.1) The dual forces of accommodation and identity are interrelated in their effect on dialect change. As discussed in Sections 2.3.3. and 2.3.4, speakers' linguistic choices exhibit both accommodation and identity construction, both conscious and unconscious (Britain 1997; Kerswill 2010; Trudgill et al. 2000; Trudgill, Gordon, and Lewis 1998). The steadily escalating contact Swabians experience with the standard language through higher education, ubiquitous media, and encounters with non-Swabians, the more instinctive their accommodation to the standard language becomes. And, as discussed, long-term contact begets accommodation which precipitates levelling. However, the interaction (or interdependence) between accommodation and dialect identity construction is not well understood. While this study does not attempt to resolve the philosophical debate between "free will" (identity) and "determinism" (accommodation), it is hoped that separate measures for local orientation and interlocutor choice will provide some insights into speakers' preference of linguistic variants (see Sections 3.7.2.1 and 3.7.2.2).

(S.2) Dialect variants can carry social meaning which impacts the nature and direction of change. The concepts of speaker identity and accommodation are inextricably linked to the multidimensional social meaning of the linguistic variants, drawn from the social histories, local practices, and language ideologies of the community (Eckert 2008; Moore and Carter 2015). In some cases, young speakers, in particular, can project both a conservative "local identity" as well as a more modern "supralocal youth identity", reallocating dialect features to index these differing personas (Dyer 2002:113). As a result, this study considers how speakers, in particular younger age groups, use Swabian-specific variants differently from more widely used regional dialect variants to invoke levels of social meaning in their discourse (see Section 4.4.1.6).

(S.3) Changing geographic mobilities introduce new influences into the dialect situation. Studies show that even small increases in geographic mobility can exert a weighty impact on the linguistic situation. The distances people travel, how long they are away, and with whom they interact introduce a plethora of new factors into the dialect situation which must be accounted for. Thus, rather than attempt to control and marginalise mobility, this research takes up Britain's

(2009, 2013, 2016) call to “delocalise” the life paths of individuals and incorporate the impact of geographic mobility on the linguistic situation (see Sections 3.7.2.3 and 4.4.1.4).

(S.4) Extralinguistic factors can supersede intralinguistic ones in their influence on dialect change. The social-psychological factors enveloping the dialect situation have such a prodigious impact on speakers’ linguistic choices that extralinguistic factors (e.g., attitudes, loyalties, and animosities) can override internal structural ones (Kerswill 2003:230, Torgersen and Kerswill 2004:47). Britain (2010:195) claims that the victorious forms can be predicted based on their (i) markedness, (ii) social/regional stereotyping, and (iii) salience. Such constraints call for multivariate analyses on the factors influencing the dialect situation in order to assess the relative weight of each factor on speakers’ choices (see Sections 3.7.3 and 4.4.4).

2.3.8.3. Variable Factors

(V.1) Variables from different levels of the grammar respond to change in different ways. Due to their lower frequency of occurrence and to their more delimited level of social stratification (Cheshire 1999, 1987), morphosyntactic variables vary and change in ways different from phonological ones. For example, Kerswill and Williams (2002:99) found more levelling of grammatical features than phonological ones which they attribute to their greater “distinctiveness.” Consequently, variables from differing levels of linguistic structure (e.g., phonological, morphosyntactic, lexical) must be investigated to expose the potentially conflicting patterns of convergence, divergence, and retention (see Sections 3.6.1 and 3.6.2).

(V.2) Linguistic variables change differently based on their variety or linguistic heritage. As discussed throughout this section, local dialects are giving way to supralocal and supraregional varieties or “compromise dialects” (Britain 2009:122). Studies show that individual features react and evolve differently based on their unique sociohistorical and linguistic contexts. For example, Kerswill and Williams (2002:97) found that the degree of linguistic difference between varieties had a direct effect on the maintenance or divergence of highly localised features. Hence, an important distinction for the current study is to differentiate between the traditional, conservative features of Swabian and those that belong to the larger Alemannic family or to other broader regional varieties (see Section 3.7.3.1).

(V.3) The salience of a linguistic variable plays a crucial role in dialect change. Research demonstrates that the salience or “awareness” of a linguistic feature can influence linguistic change (e.g., Auer 2014; Auer, Barden, and Grosskopf 1998; Breitbarth 2014; Buchstaller 2016; Erker 2017b, 2017a; Hickey 2000; Kerswill and Williams 2002; Naro 1981; Oushiro 2016; Oushiro and Guy 2015; Rácz 2013; Sharma 2005), yet the findings are far from consistent. Auer, Barden, and Grosskopf (1998:163), in their study of the dialect of upper Saxony, found that “dialect features … perceived by the speakers as ‘salient’ are taken up and given up more easily and faster than those … perceived as ‘less salient’.” Hickey (2003) also found that less salient features are more resistant to levelling. A critical obstacle, however, is that salience has been

defined in the literature in numerous ways, from a simple segmental property to cognitive, perceptual, and social aspects of "markedness" with the ability to "invoke social meaning" (Labov 2001:25-28). This study defines salience as the overt speaker awareness of a feature (see Section 3.7.3.2). Crucially, however, the concept of salience is intricately entwined with notions of stigma, identity and frequency; hence, each of these factors must be analysed separately and together to uncover both the singular and combined impact of these related forces.

(V.4) The stigma or prestige of a linguistic variable is a strong predictor of its attrition or retention. Studies have shown that socially marked regional or stigmatised forms (cf. Labov's STEREOTYPES) are generally disfavoured and levelled out of the pool of variants in favour of less marked, less stereotypical, more prestigious supralocal variants; yet, some variants may take on new roles in the dialect, marking style, social status, or local belonging, and be exploited for identity purposes (Britain 2002:35; Britain and Trudgill 1999:247; Kerswill and Williams 2000:85; L. Milroy 2020:26). Paiva et al. (2020) claim, "the absence of social evaluation of a variant paradoxically both facilitates stability (since there is no social meaning to be expressed by diverging or following the community trend) and permits idiosyncrasy (since there is no social consequence associated with idiosyncratic behavior)." Thus, a principal aspect of this investigation is to distinguish between variables with more and less stigma in order to understand the impact on levelling and dialect change in Swabia (see Section 3.7.3.3)

(V.5) The evolutionary status of a linguistic variable can impact its change or maintenance. Britain (2009:139) laments the extreme dearth of research on linguistic forms undergoing attrition. Except for dialectologists and linguists working on endangered languages, most sociolinguists have been focussed on analysing the diffusion of innovative features rather than investigating the obsolescence of conservative ones (Britain 2009:124). Nevalainen, Raumolin-Brunberg, and Mannila (2011) found that progressive features exceed more conservative ones in all stages of a variable's evolution except in the nearly completed stage, a phenomenon they dubbed the "progressive pull." Nahkola and Saanilahti (2004:90) found that features exhibiting small amounts of variation (i.e., those at the beginning or end of their life-cycle) are more stable, while those with considerable variation are more likely to change, a finding also observed by Sankoff and Blondeau (2007:583). To address this phenomenon, this study examines both innovative and changing features, as well as conservative and stable ones, to explore why variables react in different ways in volatile situations of dialect contact and levelling (see Section 3.7.3.4).

(V.6) The lexical frequency of a variable exhibits effects of both stability and change. Confounding environmental, structural, and social influences on language variation and change are lexical frequency effects, a linguistic force that has received relatively little attention in sociolinguistic variationist research. Indeed, there is considerable controversy regarding the nature and impact of lexical frequency on linguistic processes and sound change (Baayen, Beaman, and

Ramscar 2021; Bybee 2002; Drager 2011; Erker and Guy 2012; Poplack 2001; Tomaschek et al. 2018; Wieling, Nerbonne, and Baayen 2011). Erker and Guy (2012) claim "items that are highly practiced and very familiar will be recognized more quickly, articulated more easily, changed more or less readily, perceived as more grammatical, and accorded distinctive mental status; in effect, practice makes perfect, or at least, practice makes different" (Erker and Guy 2012:526). However, there is no general agreement on the nature and impact of lexical frequency on linguistic processes: some studies show that higher frequency accelerates phonological reduction (Bybee 2002); in contrast, others claim that lower frequency favours regularisation and levelling (Wieling et al. 2011), creating a challenge for the current investigation of Swabian to unravel (see Section 3.7.3.5 and Chapter 5).

2.4. Longitudinal studies of language change

The second aim of this research is to examine and evaluate the compatibility and complementarity of real-time panel and trend studies, and their relationship and interaction with apparent-time analyses, in determining the nature and direction of language change in Swabian. In this section, I first review critical aspects of real- and apparent-time analyses (Section 2.4.1) and panel and trend studies (Section 2.4.2). I then summarise the principal findings from a number of influential combined real-time panel and trend studies (Section 2.4.4) and synthesise the lessons learned and critical challenges that the current investigation must address (see Section 2.4.5).

2.4.1. Real- and apparent-time

As discussed in Section 1.2.2, sociolinguistic research embraces two primary analytical practices to detect patterns of linguistic change: APPARENT-TIME and REAL-TIME. Given that the CRITICAL-PERIOD HYPOTHESIS (Lenneberg 1967) expects individual speech patterns to be fixed by early adulthood, the apparent-time hypothesis as formulated by Labov, predicts that younger generations promote innovative features with escalating frequencies (Labov 1963, 1966b, 1972a) and that differences across generations reflect speech at different points in time. Table 2-1, adapted from Blondeau (2017:346), depicts the main characteristics of these two methods.

Method	Time Slice	Data Collection	Study Nature	Study Type
Indirect	Synchronic	One wave	Cross-sectional	Apparent-time
Direct	Diachronic	Multiple waves	Longitudinal	Real-time

Table 2-1. Direct and Indirect Methods of Data Collection (adapted from Blondeau 2017)

The first apparent-time and real-time studies of linguistic change were conducted by Gauchat (1905) and Hermann (1929) (cited by (Labov 1963:292)). Gauchat (1905) evaluated six phonological features across three age groups (i.e., apparent-time) and demonstrated the regularity of sound change across the generations; most of the changes he observed were confirmed 24 years later in real-time by Hermann (1929). Since 1929, countless real-time trend and panel studies have established the validity of Gauchat and Hermann's approach, two of the most well-known and comprehensive are the Montréal project, conducted by Sankoff and Blondeau between 1971 until 1995 (G. Sankoff 2013, 2018, 2019; G. Sankoff and Blondeau 2007, 2013), and the LANCHART project in Denmark, conducted by Gregersen and his colleagues between 2005 until 2017 (Gregersen 2009; Gregersen, Jensen, and Pharao 2014; Gregersen, Maegaard, and Pharao 2009). The cornucopia of work produced from these two projects has laid the methodological and theoretical foundation for all subsequent panel research.

However, in recent years, the assumption of speaker lifespan stability has come under critical attack, as an increasing number of studies show significant differences in speech patterns across the lifespan (Bowie 2005, 2011, 2021; Buchstaller 2006, 2015, 2016; Gregersen et al. 2018; Gregersen, Maegaard, and Pharao 2009; G. Sankoff 2006, 2018; G. Sankoff and Blondeau 2007, 2013; G. Sankoff and Wagner 2006; Wagner 2012a, 2012b; Wagner and Sankoff 2011). It appears that "adults' linguistic tendencies are less fixed than previously assumed" (Buchstaller 2016:200). Indeed, adult vernaculars may change as a result of specific historical events, unique cultural contexts, social, psychological or cognitive adjustments, and personal life-changing events (e.g., marriage, divorce, relocation, social and geographic mobility) (Tetreault 2017:237). While stable speech patterns in adulthood appear to be the primary pattern, many studies report dramatic increases in both innovative and conservative variants, as well as change reversals, as people age (Sankoff and Blondeau 2013:263), presenting a crucial conundrum: if individuals, post-adolescence, do not retain their early-acquired grammars, then change may be proceeding more quickly or more slowly than apparent-time studies suggest (G. Sankoff 2018; Wagner and Buchstaller 2018). A resolution to this quandary is to investigate both individual change and community change simultaneously in an effort to tease out the nuances between them because "group norms are not just artifacts of the macrocosmic viewpoint, representing mere averages of a collection of widely scattered individual norms. Rather, they recapitulate the generally uniform norms of individuals" (Guy 1980:12).

2.4.2. Trend and panel studies

Recently, real-time studies of language change have become prevalent (see Baxter and Croft (2016), Sankoff (2006), and Section 2.4.4 for a review), and two approaches for collecting and analysing real-time data have become standard: TREND STUDIES and PANEL STUDIES. Trend studies examine change in the community by examining cross-sections of the population (stratified by age) either at a single point in time, i.e., the SYNCHRONIC METHOD, or at different points in the time, i.e., the DIACHRONIC METHOD. Panel studies investigate change in the individual by following a specific group of speakers and resampling the same people at successive points in time (Buchstaller and Wagner 2018; G. Sankoff 2006; Wagner 2008; Wagner and Sankoff 2011). Table 2-2 summarises the main characteristics of trend and panel studies.

Method/Time Slice	Study Type	Study Nature	Sample Type	Data Collection
Apparent-time/ Synchronic	Trend Study	Community	Same time; different people	One wave; differing age groups
Real-time/ Diachronic	Trend Study	Community	Different times; different people	Multiple waves; differing age groups
Real-time/ Diachronic	Panel Study	Individual	Different time; same people	Multiple waves; any age groups

Table 2-2. Trend and Panel Study Data Collection Methods

Trend studies offer the most reliable approach to investigating language change because they typically cover a broader cross-section of the community (Labov 1994; Trudgill 1988); however, panel studies provide rich insights into how individuals in the community behave, augmenting the trend study results. Sankoff (2006:115) claims that, as people age, they "register lesser differences from their earlier selves than does the community over the same time interval," confirming considerable other research which shows change spreads faster through the community and that young people are the leaders of change. Trend studies are essential for evaluating the TRANSITION, CONSTRAINTS, EMBEDDING and EVALUATION problems (WLH 1968); however, they are not able to pinpoint with certainty the ACTUATION of a change or the factors responsible for its emergence. While panel studies can address this shortcoming, they are often hampered by samples too small to establish statistical significance across the population; nonetheless, panel studies are "extremely valuable for interpretation" and refinement of the overall results (Labov 1994:76). Thus, combined trend and panel research is crucial for constructing more informative and supportable models of language change (Sankoff and Blondeau 2007:561). Still, little sociolinguistic research has targeted combined real-time panel and trend studies as a priority (see following Section 2.4.4 for a review of prior research), likely due to the considerable amount of time and effort required.

2.4.3. Patterns of linguistic change

Labov (1994) outlined four distinct patterns to describe how individuals and communities change (or do not change) over time, to which Sankoff (2005) added a fifth pattern, which she calls LIFESPAN CHANGE (see Table 2-3). The STABILITY pattern represents a situation in which both the individual speakers and the overall community remain flat showing no change in the use of a particular variable based on age, a situation which has not generally been studied by sociolinguists. AGE-GRADING denotes a situation in which individuals use more (or less) variants of a particular feature at a certain age, while the community remains stable, a situation which usually arises in response to linguistic market pressures (Chambers 1995; Cheshire 2006; Hockett 1950; D. Sankoff and Laberge 1978; Wagner 2012b). LIFESPAN CHANGE occurs when speakers adapt their language in the direction of the community-wide trend, which is generally more abrupt for the individual and gradual for the community. One type of LIFESPAN CHANGE is RETROGRADE CHANGE, which transpires when some speakers move against the community-wide trend, generally away from innovative forms to more conservative ones (Sankoff 2006). GENERATIONAL CHANGE is the pattern most commonly seen in apparent-time studies in which individuals remain stable across their lifetimes, while subsequent generations increase (or decrease) their use of a variant leading to gradual change across the community. Finally, COMMUNAL CHANGE defines a pattern in which both the individual and the community change abruptly. Labov (1994:84) claims this is a frequent pattern with lexical and syntactic change.

Type of Change	Diachronic Pattern		Synchronic Pattern
(linguistic interpretation)	Individual	Community	(age in apparent-time)
1. Stability	Stable	Stable	Flat, no slope with age
2a. Age-grading	Abrupt change	Stable	Regular slope with age
2b. Lifespan change	Abrupt change	Gradual change	Regular slope with age
3. Generational change	Stable	Gradual change	Regular slope with age
4. Communal change	Abrupt change	Abrupt change	Flat, no slope with age

Table 2-3. Patterns of language change or stability in the individual and the community (Adapted from Labov 1994:83; Sankoff 2006:111; Sankoff and Blondeau 2007:563)

2.4.4. Combined real-time panel and trend studies

Sankoff (2006) provided a summary of 13 trend studies which showed gradient age distributions, six of which contained both a trend and panel component. Building on these initial six studies, Table 2-4 summarises a collection of 22 combined trend and panel studies, 16 of which I have garnered from the literature since Sankoff's (2006) seminal publication, spanning ten countries, seven languages, and 15 varieties. The first section of the table presents 16 studies (many comprising multiple investigations of the same variables and communities) that demonstrate fairly consistent results between the community and the individual, indicating that, for the most part, lifespan change mirrors community change. Critically, however, as Paiva, Duarte, and Guy (2020) illustrate, all linguistic features do not necessarily move in the same direction at the same time; rather, some represent change from below, others change from above, some increase, others recede, and still others remain stable across the community and the lifespan. The second section of Table 2-4 presents six studies with mixed patterns of results depending on the linguistic situation and the variables examined. Despite these diverse results, overall, this table reveals considerable consistency between community and lifespan change.

Authors	Variety and Variables	Trend and Panel Samples	Community Change	Individual Change
CONSISTENT PATTERNS OF COMMUNITY AND LIFESPAN CHANGE				
Sundgren, Buchstaller, and Beaman (2021); Sundgren (2002, 2009)	Eskilstuna Swedish 9 morphosyntactic variables	<u>Trend Study:</u> 1967: 83 speakers 1996: 72 speakers <u>Panel Study:</u> 13 speakers over 30-year period	<u>GENERATIONAL CHANGE:</u> change from above for most of speakers with effects of age, class and sex; females leading the change	<u>LIFESPAN CHANGE:</u> change from below; panel skewed due to over-representation of non-socially mobile speakers

Authors	Variety and Variables	Trend and Panel Samples	Community Change	Individual Change
Sankoff and Wagner (2020)	Québécois French Inflected (IF) vs periphrastic (PF) future	Trend Study: 68 speakers (1971 and 1984) Panel Study: 59 speakers	COMMUNITY CHANGE: clear historical trend in the replacement of IF forms by PF forms	RETROGRADE CHANGE: emerging from social forces in late-stage creating a long tail of language change
Brook, Jankowski, Konnelly, and Tagliamonte (2018)	Toronto English 4 morphosyntactic and morpho-phonological	Trend Study: 2002 to 2004 224 speakers Panel Study: 1 speaker (Clara) 16-30 years old	GENERATIONAL CHANGE: two variables are changing, one rapidly, one gradually; STABILITY: two variables are stable	LIFESPAN CHANGE: showing consistent incrementation and stabilization after age 17 into emerging adulthood
Naro and Scherre (2013)	Rio de Janeiro Brazilian Portuguese Subject/verb concord and noun phrase concord	Trend Study: 1980: 64 spkrs 2000: 32 spkrs Panel Study: 16 speakers	GENERATIONAL CHANGE: increasing frequency, reversing earlier trends toward loss or stability	LIFESPAN CHANGE: shifting age patterns; subtle differences in the effects of social variables, education
Rickford and Price (2013)	African American English (AAVE) East Palo Alto Invariant habitual *be*, 3rd sg *-s* absence, *is + are* absence	Trend Study: Alim (2004) Panel Study: Tinky and Foxy 3-5 interviews 1985 to 2008	STABILITY: considerable stability across the community with variation by style and interlocutor	AGE-GRADING: individual change due to their shifting world orientation as speakers move into adulthood
Wagner (2012b)	Philadelphia English (ing) [ɪn] ~ [ɪŋ]	Trend Study: 2005-2006 68 speakers Panel Study: 13 speakers	STABILITY: curvilinear age-grading pattern with younger speakers exhibiting higher frequencies	AGE-GRADING: decrease with post-high school transition and increase in casual versus careful style
Sankoff, Wagner, and Jensen (2012)	Montréal French Inflected versus periphrastic future	Trend Study: 68 speakers Panel Study: 1971 and 1984 59 speakers	GENERATIONAL CHANGE: positive correlation in use of inflected future and speaker age	LIFESPAN CHANGE: significant increase over 13-year span; RETROGRADE CHANGE: for some speakers
Wagner and Sankoff (2011)	Montréal French Inflected versus periphrastic future	Trend Study: 59 speakers 15-62 years over 13 years Panel Study: 59 speakers	GENERATIONAL CHANGE: gradual change over 120 years from inflected to periphrastic future	AGE-GRADING: marked inflected variant increased over speaker lifetimes based on social class and formality
Nevalainen, Raumolin-Brunberg, and Mannila (2011)	Early English Correspondence 6 morphological and syntactic variables	Trend Study: 1410 to 1681 778 speakers Panel Study: 1500 to 1619 52 speakers	GENERATIONAL CHANGE: faster changes lead to fewer in-between speakers (neither progressive nor conservative)	LIFESPAN CHANGE: progressive speakers exceed conservative ones in all phases except for the effect of "progressive pull"
Van Hofwegen and Wolfram (2010)	African American English (AAVE) Chapel Hill NC 3 morphosyntactic: copula absence, *-s* 3rd person absence, nasal fronting	Trend Study: 67 speakers 1990-2007 Panel Study: 32 speakers 6 interviews each	AGE-GRADING: core features that converge with developmental traits are optimised in early childhood	AGE-GRADING: reflecting the adolescent peak, showing two primary trajectories: "roller coaster" and curvilinear
Gregersen, Maegaard, and Pharao (2009)	LANCHART Danish Naestved and Copenhagen short (æ)	Trend Study: 1986-2007 43 speakers Panel Study: 1986-1990 2005-2007 43 speakers	Seeming STABILITY in Copenhagen, yet COMMUNAL CHANGE by social class; COMMUNAL CHANGE differentiated by sex in Naestved	LIFESPAN CHANGE: a quarter of speakers shift significantly, two speakers more than others, influencing overall group results

Authors	Variety and Variables	Trend and Panel Samples	Community Change	Individual Change
Nahkola and Saanilahti (2004)	Virrat Finnish 14 phonological and morphosyntactic variables	Trend Study: 1986 and 1996 46 speakers 100-years Panel Study: 24 speakers	GENERATIONAL CHANGE: 7 variables show steady advance; 7 show "unsteady", 4 variables reversed; 10 led by women	LIFESPAN CHANGE: patterns changed over time; transitions were as common with the middle-aged as with the young
Kurki (2004)	Hanhijoki Finnish trilled /r/ → plosive /d/	Trend Study: 1980: 16 spkrs Panel Study: 1990: 6 spkrs	GENERATIONAL CHANGE: consistent change from above activated by social change	LIFESPAN CHANGE: consistent with community change
Cukor-Avila (2002)	African American English (AAVE) Springfield TX 2 morphosyntactic: habitual invariant *be*, quotative *be like*	Trend Study: 1988 to present 103 speakers Panel Study: 12 speakers over 30 years	GENERATIONAL CHANGE: gradual change from below due to peer influence as a result of vast and rapid demographic changes	LIFESPAN CHANGE: individual change consistent with community change
Ashby (1981, 2001)	Tourangeau French *ne* deletion	Trend Study: 1976: 35 speakers 1995: 29 speakers 14-21 / 51-64 yrs Panel Study: 10 speakers	GENERATIONAL CHANGE: change from below, with greatest loss by women and younger speakers	STABILITY for most (6 out of 10) speakers; RETROGRADE CHANGE for 3 out of 4 speakers over age 65, likely due to retirement
Auer, Barden, and Grosskopf (1998)	Upper Saxonian Vernacular German Leipzig and Dresden 12 phonological features	Trend Study: 1990-1992 56 speakers Panel Study: 56 speakers 8 interviews each over two years	GENERATIONAL CHANGE: all variables show a positive correlation with age and dialect use, except one (coronalised /ç/	LIFESPAN CHANGE: change from above; features perceived as more salient change more rapidly; while lexicalisation shelters variables from loss
MIXED PATTERNS OF COMMUNITY AND LIFESPAN CHANGE				
Paiva et al. (2021); Paiva and Duarte (2003)	Rio de Janeiro Brazilian Portuguese 3 morphosyntactic: null subjects; clitic loss; subject-verb agreement	Trend Study: 1980: 64 spkrs 2000: 32 spkrs Panel Study: 16 speakers	GENERATIONAL CHANGE and STABILITY: change from below with null subjects and clitic loss; change from above with subj-verb agreement	LIFESPAN CHANGE and STABILITY: alignment of individuals to the community trends dependent on the type of variable
Sankoff (2019); Sankoff and Blondeau (2007,2013); Blondeau et al. (2003)	Montréal French Auxiliary use: *avoir* → *être*; Apical → dorsal /r/; Inflected → periphrastic future	Trend Study: 1971 – 120 spkrs 1984 – 72 spkrs 1995 – 12 spkrs Panel Study: 1984 – 60 spkrs 1995 – 12 spkrs	COMMUNAL CHANGE: Rapid community change from above for all three variables across apparent-time	STABILITY for auxiliary use and apical /r/ for most speakers; LIFESPAN CHANGE for apical /r/ for younger speakers; AGE-GRADING with the inflected future
Bowie (2011, 2015, 2017, 2021)	Mormon Church Utah English 2 phono variables: low back merger of BOT/BOUGHT and (wh) full voicing	Trend Study: 1940 and 2010 13 speakers Panel Study: 10 speakers over 25 years	GENERATIONAL CHANGE: move to fully-voiced (wh); however, lack of any obvious pattern for vowel merger	Lack of evidence as to whether individual behaviour falls into a normal distribution
Mackenzie (2017)	BBC Film Documentaries loss of tapped-r	Trend Study: various Panel Study: Sir David Attenborough 1956-1961: 30's 2006: 80 years old	COMMUNAL CHANGE: rapid change in the community away from tapped-r (Fabricius 2017; Hughes et al. 2012; Wells 1982)	STABILITY: no significant change over time; however, domain-specific RETROGRADE CHANGE detected for differing constraints

Authors	Variety and Variables	Trend and Panel Samples	Community Change	Individual Change
Fruehwald (2017)	Philadelphia Neighborhood Corpus (PNC) 4 vowels: /ay/, /ey/, /aw/, /ow/, and filled pauses	<u>Trend Study:</u> 1973 and 2012 325 speakers <u>Panel Study:</u> *zeitgeist* proxy for birth year	<u>GENERATIONAL CHANGE:</u> intergenerational incrementation with relatively stable intragenerational patterns	Only two of five changes showed intragenerational or lifespan instability and only for one gender
Zellou and Tamminga (2014)	Philadelphia Neighborhood Corpus (PNC) Nasal coarticulation	<u>Trend Study:</u> 46 speakers under 25 years <u>Apparent-time:</u> 18 speakers <u>Pseudo-Panel:</u> 41 speakers 30 to 67 years	<u>GENERATIONAL CHANGE:</u> gradual increase (1950-1965), followed by a brief period of decrease (1965-1980), ending with a reversal (those born after 1980)	<u>STABILITY:</u> no change found for speaker age; however, constraint effects differ across studies (e.g., no effect of frequency in the trend study)

Table 2-4. Summary of Research on Combined Panel and Trend Studies

The studies from Table 2-4 demonstrate that mixed patterns of community and lifespan change seem to fall into two groups: those that investigated multiple variables and those that found changing constraint effects across the study period. As ample research has shown, the type of change is dependent on the type of variable, its overall frequency of use, and its current stage of evolutionary development. Studies such as Sankoff (2019) and Paiva, Duarte, and Guy (2021) irrefutably demonstrate how systematic patterns of change are exposed when the evolutionary and sociohistorical contexts of the individual linguistic variables are considered.

2.4.5. Lessons from combined real-time studies

The main findings from the body of research on combined panel and trend studies presented in Table 2-4 can be summarised into several crucial lessons, which the current investigation seeks to address.

<u>*(R.1) Real-time analysis supports apparent-time analysis, yet ambiguities remain*</u>. Sankoff (2006) and the studies reported in the first section of Table 2-4 provide considerable evidence that real-time studies support the apparent-time construct. Since it is now broadly accepted that speakers can and do change their language post-critical-age, real-time analysis is essential to help disambiguate findings concerning the rate of change and range of variability in the community. In the current study, I analyse the trend and panel data separately and together to provide a full picture of linguistic variation and change over time, both across the individual lifespan and the community (see Chapters 4-7).

<u>*(R.2) Apparent-time studies tend to underestimate the speed and duration of change.*</u> Prior research shows that apparent-time studies tend to underestimate the rate of a change (Boberg 2004; G. Sankoff and Blondeau 2007). Even when a change in progress is observed in apparent-time, panel studies reveal that all speakers do not necessarily move blindly and relentlessly in the direction of the change. Some move more quickly, some more slowly, some not at all, and some even move in reverse of the change. Drawn from an analysis of 19 apparent- and real-time

studies, Baxter and Croft (2016:167) developed a mathematical model to simulate the rate of change and found that "an apparent-time change over 30 years corresponds to a real-time change of 50 to 60 years" (for the population mean grammar to change from .20 to .80) (*Ibid:*145). Hence, the current study analyses the real and apparent-time components separately and in parallel to expose the speed and duration of the changes occurring in Swabian (see Chapters 4-7).

(R.3) Features can be used by different speakers in different ways at different times across the lifespan. The studies in Table 2-4 demonstrate that the type and nature of the variable, as well as its relative (in)stability in the community, can lead to different patterns across speakers' lifetimes. Nahkola and Saanilahti (2004:88) found that some variables changed later in life for middle-age speakers, yet were fairly stable for older speakers. Paiva, Duarte, and Guy (2021) concluded that, while changes from below tend to be followed by most speakers, changes from above show more erratic patterns. For example, they discovered change from below with overt pronouns, a variable nearing completion, change from above for subject-verb agreement, being led by younger, educated speakers, and stable wide-spread use of null objects for all individuals. Such studies show that variables can be imbued with social meaning, used differently by individuals for diverse social and stylistic reasons, as well as for identity formation (Hazenberg 2017; Moore and Carter 2015). Thus, a critical aspect for the current investigation is to analyse the variables independently to determine unique patterns of usage (see Section 4.4.3).

(R.4) Trend studies provide broad socio-demographic representativeness. As mentioned, trend studies are the more reliable method for evaluating linguistic change as a result of their greater socio-demographic representativeness which is integral to the sampling process (Labov 1994:83-85; Trudgill 1988). Due to their restricted size, most panel studies suffer from a "paucity of n's" (Cukor-Avila and Bailey 2018; Wagner and Tagliamonte 2018), specifically, a lack of representation through skewed and highly heterogeneous samples, and therefore, have generally not been able to demonstrate whether intra-speaker trajectories across recording periods are significant or not. Most studies are so small that they can only provide basic percentage data, unable to conduct tests of significance to determine the broader reliability of the findings. Baxter and Croft (2016:136), following Sankoff and Blondeau (2007), found that less than half of the individual changes involved in community change changed by less than 10%. The current study of Swabian addresses this shortcoming with a larger number of speakers and more highly productive variables than many prior studies (see Sections 3.4.3 and 3.6).

(R.5) Panel studies provide insight into the range of individual variation within a community. Panel studies can illuminate the range of variation among the speakers in a community, from full acceptance of a change in progress (from LIFESPAN CHANGE through COMMUNAL CHANGE) to ambivalence to the change (STABILITY) to reversal of a change (RETROGRADE CHANGE) (Sankoff 2006), an aspect of language change which is lost when considering only community-wide averages and trends. For example, Buchstaller et al. (2017:15)

found wide-ranging differences in Tyneside speakers' participation in an ongoing change, which they attribute to differing levels of "dialect loyalty", the extent to which the speakers participate in the *linguistic market*, and how close they are to retirement. Bowie's (2005:57) research in Utah has shown that "individuals can behave in ways not easily predictable from social factors." Hence, a crucial goal for this study is to understand the range of individual variation among the speakers and compare it with the overall community variation to provide greater insight into the nature, speed, and duration of the change (see Section 4.4.3).

(R.6) Trend studies cover longer timeframes, while panel studies are limited to the lifespan. Trend studies can provide insights over an extended timeframe, while panel studies are naturally limited by the lifespans of the individuals. Of course, the length of time it takes to complete a real-time study and the resources and logistics involved can be daunting (Gregersen, Jensen, and Pharao 2014, 2018). Unless planned and pre-arranged in the design of a panel study, relocating informants after long elapsed periods is not a trivial task. Hence, panel studies must deal with high drop-out rates, making it difficult to compare results across time. The current study has the serendipitous and fortuitous advantage that the recordings from 35-years ago were well-preserved and that 20 of the original 40 participants could be located and were willing to be re-interviewed (see Sections 3.4.2.1 and 3.4.3.1).

(R.7) Real-time studies must consider population and culture shifts that occur over time. Trend and panel studies that take place over decades must consider major social, demographic, and economic shifts that occur in the populations under investigation. Rising levels of education, increasing mobilities, and changing cultures, along with broader societal changes brought about by globalisation, digitisation and immigration, make it challenging to compare samples across disparate points in time (Britain 2016; Kerswill 2001; Vertovec 2007). As a result, the current investigation must incorporate broad sociological and ethnographic observations in unravelling how the changing linguistic situation has been impacted by the dynamic and pervasive societal changes that have occurred over the last 35 years.

(R.8) Real-time studies must deal with inconsistent interview situations across recording periods. A concern with real-time data is the effect of different social situations within the sociolinguistic interview itself, as it is nearly impossible to match the interview environment across all speakers and all time periods in all ways. In particular, the social situation reflects stylistic variation based on the familiarity and power balance between the interviewer and interviewee (Gregersen, personal communication), as well as the influence of the biological aspects of ageing making the comparison of results across different interviews difficult (Gregersen and Barner-Rasmussen 2011; Gregersen, Jensen, and Pharao 2018; Thibault, Vincent, and Audet 1990). The essential problem is one of "comparability", that is "to control intra-individual variation within recordings in order to get at inter-individual differences between recordings, both those from different persons and those from the same person but from another

point in time" (Gregersen and Barner-Rasmussen, 2011:8). In the current study, care has been taken in matching the interviewers for similar social characteristics and in mirroring the interview settings across time periods as closely as possible (see Section 3.5.1).

(R.9) Combined panel and trend studies can provide insight into the actuation of change. While trend studies can signal a change in progress in apparent-time, the behaviour of panel participants can aid interpretation into the cause and motivation of change (i.e., the ACTUATION problem (WLH 1968)). A large, socio-demographically balanced panel study, considering the cognitive, sociocultural and stylistic aspects of intra-speaker (in)stability, can expose facets of transmission and diffusion which provide greater awareness into the origin of a linguistic change (Bowie 2005; Cukor-Avila and Bailey 2013). Hence, a major aim of the current study is to compare and contrast the findings from the panel and trend studies to provide greater understanding into the origin and actuation of changes in progress.

(R.10) Multistage corpora support the investigation of both community and individual change. Multistage corpora, with a mixture of time dimensions based on speaker date of birth, age, and time of recording, provide the ability to discriminate between generational change and intraspeaker lifespan change. Such corpora enable the systematic comparison of community and individual change linked directly to specific life stages, age ranges, and interview dates, a factor which Fruehwald (2017:5) calls the *zeitgeist* 'spirit of time'. The development of this type of multistage corpus for Swabian, enabling both apparent-time and real-time analysis, is a principal outcome of the current investigation.

2.5. Systematic patterns of sociolectal coherence

The third aim of this research effort is to explore a model of sociolectal coherence to illustrate how systematic and predictable linguistic patterns can shape variation and advance or constrain language change. In this section, I first provide an overview of common approaches that have been used by researchers to examine coherence: covariation (Section 2.5.1), implicational scaling (Section 2.5.2), and co-occurrence restrictions (Section 2.5.3). Next, I review the main findings from 36 studies in coherence (Section 2.5.4), followed by a summary of the main lessons from this body of research that the current investigation seeks to address (Section 2.5.5).

2.5.1. Covariation

Guy and Hinskens (2016) maintain that WLH's (1968) concept of ORDERLY HETEROGENEITY implies that "speech communities are sociolinguistically coherent .... [meaning that] the community should collectively behave in parallel: variants (or rates of use of variants) that index a given style, status, or a social characteristic should co-occur" (Guy and Hinskens 2016:2). The idea of SOCIOLINGUISTIC COHERENCE implies that speech communities can be distinguished by their SOCIOLECTS, which Guy (2013:64) characterises as a "cluster of variables" that identify a specific social group, e.g., dialect, ethnolect, class-based variety, style, register. "If sociolects are indeed socially and cognitively coherent varieties, we should expect some degree of correlation among the different variables present in a community" (Guy 2013:64). This supposition has given rise to a contentious debate in the field regarding the role of community coherence versus that of individual agency (Eckert 2005, 2008), which Guy (2014) refers to as "bricks and bricolage". Guy maintains that individual linguistic variables can be "mortared together" to construct a sound edifice ("bricks") or they can be "elaborative additions" to portray a particular style, stance, or identity ("bricolage") which will be "relatively fluid, and not necessarily have any more coherence and permanence than one's specific ensemble of clothing worn on a given day" (Guy 2014:2).

In his investigation of four Brazilian Portuguese variables, two phonological and two morphosyntactic, Guy (2013) discovered some evidence for sociolectal coherence, particularly in women's tendency to use higher status variables; however, men showed no such coherence, raising the question whether nonstandard phonology is more indexical of masculinity, a constraint that overpowers coherence. Oushiro and Guy (2015) also found little covariation in their investigation of six features of Brazilian Portuguese and concluded that coherence might be better explained through "structural similarities" and phonic salience (Naro 1981) than through social groupings. In their review of six studies from Guy and Hinskens' (2016) *Lingua* issue dedicated to the topic of coherence, Woo, Gadanidis, and Nagy (submitted) observed that little over half of the linguistic variables investigated demonstrated coherence, while their own findings on heritage Cantonese spoken in Toronto showed even less covariation: only six out of 21 variable pairs were significantly correlated ($p < .05$) (and only two under the Spearman test). Section 2.5.4 provides a review of 36 studies of sociolectal coherence which I have amassed, in which just over half (53%) demonstrate clear patterns of coherence. The dilemma over why some studies show greater coherence than others is a primary focus of the current investigation.

2.5.2. Implicational scaling

A different approach to assessing coherence is drawn from Guttman's (1944) SCALOGRAM ANALYSIS, a method of describing the underlying structure of the variation by mapping linguistic features in implicational-like patterns (C.-J. Bailey 1973; Bickerton 1973; DeCamp 1968; Fasold 1970; Greenberg 1963; Rickford 2001). While Greenberg (1963) was the first to remark on the role of implicational relationships in defining language universals and typologies, the creolist DeCamp (1968), with his analysis of the Jamaican Creole continuum, is credited with independently developing and bringing scalogram analysis into studies of sociolinguistic variation. Implicational scales depict hierarchical patterns of linguistic features such that the presence of one feature "implies" the presence of other features. Specifically, in an IMPLICATIONAL SCALE, the presence of feature A "implies" the presence of feature B which in turn "implies" the presence of C, which "implies" D, and then E, and so on, but not necessarily in reverse. Thus, if feature C is present in a variety, then features D and E will also be present, but not necessarily features A and B. The absence of feature of B, for example, implies the absence of feature A. DeCamp's model was quickly contested mainly because it entailed strict, uni-directional patterns and required a binary decision regarding the presence or absence of a feature, thereby ignoring the gradient aspect of language ("degrees of optionality"). Fasold (1970) proposed combining DeCamp's implicational scaling approach with Labovian variation frequency analyses, creating a model with considerably greater explanatory value than traditional binary or trinary scaling. As Fasold (1970:551), over 50 years ago, insightfully observed:

> *"Social dialects are not differentiated from each other by discrete sets of features, present in the speech of people at one social level but completely absent in the speech of people at another level. Rather, they are distinguished by differences in the combination of features, and by variations in the frequency of occurrence of features which are present in everyone's speech."*

Initially, implicational scaling appeared to be a promising method for discriminating between socially significant levels of dialect; however, over the last 40 years, it has fallen out of favour. In addition to its overly strict, uni-directional requirements, most scales required arbitrary thresholds be set, which some scholars argued were purposefully manipulated to provide an "optimal fit" of the data with the model.

Recently, however, implicational scaling has shown some resurgence. In a real-time study of recordings from the 1950s and the 1990s of city council meetings in the German city of Mainz, Lameli (2004) uncovered consistent patterns between the two time periods, concluding that implicational scaling is an effective tool for determining the level of dialect spoken and predicting the direction of change and hence the future state of the dialect. The Mainz study also revealed consistent patterns of reduction in high-salient dialect features across the two time periods, in particular the attrition of nonstandard vocalic features over consonantal ones. Sharma's (2005) study of Indian speakers of English as a second language in northern California demonstrated that, despite its variability, second-language learning is distinctly structured, exhibiting implicational patterns between stablising dialect features and second language learning stages (2006:195). She exposed a fundamental problem with implicational scaling: namely, nonstandard features are spread more broadly across speakers than are standard features, which produces multiple implicational patterns based on the "type of variability" (or "style"), what she refers to as strategic "usage patterns and choices of individuals in local discursive practices" (Sharma 2005:206). Similar to Sharma's findings, Newman's (2010) study of New York Latino English discovered different degrees of systematicity for different speakers, from the most substrate variant to the least, establishing three groups or "ethnolinguistic repertoires" (Benor 2010): systematic, partially systematic, and individualistic (Newman 2010:232). Newman found that overall variation mapped with "locally salient peer-cultural" influences revolving around different music genres, e.g., African-American Hip Hop, *reguetón*, a Spanish musical genre, as well as a techno-geek group. Ghyselen and Van Keymeulen's (2016) also showed the usefulness of frequency-based implicational scales as an analytical tool in their study of the Belgian dialect *tussentaal* spoken in Flanders. These researchers found different levels of implicational scaling based on the regional character of the variable and the formality of the speech setting: in particular, they found less pronounced scalarity in the more formal sociolinguistic interviews than in the informal, unstructured conversations. Clearly, these and other studies point to implicational scales as an effective heuristic in describing systematic patterns of linguistic variation and change.

2.5.3. Co-occurrence restrictions

Related to implicational scaling is another thread of research which maintains that multiple related variables co-occur within a unified variety, such that changes in one variant trigger changes in another variant. This view is based on early work by Gumperz (1969:245ff) who argued that linguistic variants "tend to appear in co-occurrent sequences" and that "the variation of each distinctive cluster of values … correlates with distinctive social content or function." This observation implies that the value or "social meaning" of a variant can only be derived by evaluating clusters of variants that co-occur within a unit of speech, e.g., the same phonological word, the same utterance, or even longer "stretches of speech" such as an entire text.

Auer (1997) draws on these concepts in investigating co-occurrence restrictions in three European dialect varieties, showing how some variables have greater influence than others (e.g., *n*-apocope "dominates" *s*-palatalisation in Alemannic). He maintains that linguistic variables do not co-occur randomly, rather there are clear restrictions on which variables co-occur freely and which are more tightly constrained. Ultimately, tight, bi-directional co-occurrence restrictions (i.e., strong coherence) dichotomise lects while loose, uni-directional ones (i.e., weak coherence) promote greater variation which can stimulate language change. Considering the role of social factors, Auer (1997:95) adds, "it seems that given the appropriate social backing, any co-occurrence may be turned upside down," suggesting that "the decay of linguistic knowledge about [co-occurrence] restrictions may therefore be viewed as an early indicator of language loss" (Auer 1997:73). Auer argues that co-occurrence restrictions are different from other methods discussed in this section in that: (i) they are categorical, meaning that violation produces an unacceptable utterance; (ii) they are not as strict since their domain is the phonological word or phrase and not the entire text; (iii) they are not bound by statistical covariance based on correlations between variables (which are also typically conducted across the entire text); and, (iv) they allow for any number of uni-directional, "intermediate forms".

In another study on the co-occurrence of linguistic variables, Newlin-Lukowicz (2016) found that the co-occurrence of specific ethnic and regional variables in the English spoken by Polish immigrants in New York City correlated with speakers' ethnic identities, suggesting that speakers select variants from a feature pool (Mufwene 2001) or a linguistic repertoire (Benor 2010) and combine them in unique ways as they construct different identities. Similar to Newman (2010), Newlin-Lukowicz' findings show that the patterning of linguistic variables exhibits linguistic coherence within social clusters (i.e., speakers oriented toward America, those oriented toward Polish New York City, and those oriented toward Poland), exposing a "large degree of linguistic heterogeneity driven by social meaning" (Newlin-Lukowicz 2016:112). Sharma and Rampton's (2015) influential study of a British-Asian community in West London devised an innovative metric, "lectal focusing in interaction" (LFI), to quantitatively measure style shifts and indexicalities of social meaning (ethnicity and class) at the "micro-level of interaction". Thus, a major challenge for the current study of Swabian is to examine the influence of dialect identity and social meaning on linguistic coherence with various groups of linguistic features.

2.5.4. Studies in linguistic coherence

As mentioned, the concept of sociolectal coherence has recently received some attention in the literature, however, as this section shows, not all studies have found clear patterns of coherence of multiple variables across the grammar. Table 2-5 provides a summary of 36 sociolinguistic studies investigating coherence, of which 53% (19/36) demonstrate fairly clear patterns (top section of the table) while 47% (17/36) do not (bottom section of the table). Rather than discuss each study individually, the following Section 2.5.5 synthesises the major threads from this set of research and discusses how the lessons from these prior studies are addressed in the current investigation.

Authors	Varieties	Variables	Methods	Key Findings
CLEAR PATTERNS OF COHERENCE				
Beaman (2021)	Swabian German	6 phono 6 morphosyn	Frequency analysis; implicational scaling; lattice theory	lects with lower levels of coherence were more vulnerable to change, while those with stronger coherence were more resistant to change
Montgomery and Moore (2018)	Isles of Scilly Cornwall UK	9 phono	Mean ratings; Paired t-tests; Logistic regression	"remarkably ordered reactions among listeners" (p646); "the importance of context in the social perception of language" (p655)
Meyerhoff and Klaere (2017)	Bequia (St Vincent and the Grenadines)	6 morphosyn (grouped into "profiles")	Constrained correspondence cluster analysis	"the more variables we model at once, the more sociolinguistically informative our models will be" (p42)
Erker (2017a)	New York Spanish	5 phono and morphosyn	Frequency analysis; chi-square tests	"less salient linguistic variables are more likely to co-vary, that is, to be uniformly influenced by the contact setting, than are variables of higher salience" (p2)
Hazenberg (2017)	New Zealand English	17 vowels (grouped into utterances)	Cluster analysis; pairwise comparisons; ANOVA; Tukey's HSD post-hoc test	"Index of Similarity" found for some vowels "an age effect …, a gender effect, and a sexuality effect, as well as whether … the vowel is a potential site for gendered identity work" (p205)
Villena-Ponsoda and Vida-Castro (2017)	Málaga Spanish	2 phono	Correlation coefficients; PCA; ANOVA; linear regression	"social and perceptively coherent … depending on age, orientation towards the standard, and gender" (p1)

Authors	Varieties	Variables	Methods	Key Findings
Ghyselen and Van Keymeulen (2016)	Tussentaal in Flanders	4 phono 2 morphosyn 2 syntax 1 lexical	Implicational scaling; frequency analysis; FisherExactTest	"clear patterns ... whereby the presence of one dialect feature automatically implies the presence of other features" (p14)
Newlin-Lukowicz (2016)	Polish New Yorkers	3 phono	Cluster analysis and frequency analysis	"support the repertoire model … large degree of linguistic heterogeneity driven by social meaning" (p112)
Wiese and Rehbein (2016)	Kiezdeutsch (KiDKo)	4 syntax	Frequency analyses	"syntactic, information- and discourse, and semantics … point to a network that [links] domains in a systematic way" (p57)
Becker (2016)	New York City English	3 phono	Correlation analysis	"high level of community coherence … both in sociolinguistic patterning and in patterns of change" (p92)
Sharma and Rampton (2015)	British Indian English	13 phono (utterances)	Lectal focusing in interaction (LFI)	"long-term lectal focusing [shows] a shift from marker-like use among older men toward indicator-like use among younger men" (p26)
Sharma (2005)	NNVE (Indigenised Non-Native Variety of English)	6 syntactic variables	VARBRUL; multiple regression analysis	"implicational analysis reveals a potential distinction between stabilizing dialect features and second language learning stages, suggesting a quantitative manifestation of the 'cline of bilingualism" (p195)
Lameli (2004)	German Mainz (city council meetings)	16 phono (7 vowels, 9 consonants)	Frequency analyses; implicational scaling	"implicational scaling is a suitable tool for determining the degree of variation" … "consonantal features are less sensitive to change than vocalic ones" (p265)
Lenz (2003)	West Middle German		Frequency; analyses; Implicational scaling	Five types of features – primary, secondary, tertiary, quaternary, and quinary – which are implicationally structured revealing structure in variability
Chambers (1997)	Canadian English	1 lexical 1 phono 1 morphosyn	Frequency analysis	"the more you aggregate data for a sociolinguistically significant change, the more coherent it becomes" (p180)
Auer (1997)	Lucanian Italian, Bavarian and Alemannic German	lexical/phono: 9 Italian 5 Bavarian 11 Alemannic 11 Czech	Co-occurrence restrictions	"Co-occurrence restrictions are one of the ways in which complex repertories become organized along continua of standard-dialect realizations" (p95)
Horvath and Sankoff (1987)	Sydney English	4 vowels /iy/, /ey/, /ow/, /ay/	Principal components analysis	It "is not what kinds of social characteristics combine to differentiate groups in society, but what social characteristics are linguistically relevant" (p202)
Thelander (1982)	Burträsk Swedish	12 morpho and morpho-phonemic	Correlation analysis; implicational patterning	"model of two separate macro-variables provides the best categorical approximation to [the] data … producing three speech varieties" (p73-74)
Ma and Herasimchuk (1972)	English and Spanish	14 phono	Q analysis and factor analysis	"five clusters of variables constituting bilingual speech styles … [and] four speaker groups with distinctive style profiles" (p5)

Authors	Varieties	Variables	Methods	Key Findings
UNCLEAR PATTERNS OF COHERENCE				
Woo, Gadanidis, and Nagy (submitted)	Heritage Cantonese in Toronto	2 phono 4 morphosyn (4 social factors)	Logistic regression; BLUP values; Pairwise correlations	"co-variation is unpredictable … there is no more co-variation among the variables undergoing change … than in the set of variables as a whole" (p3)
Daleszynska-Slater, Meyerhoff, and Walker (2019)	Bequia (St Vincent and the Grenadines)	1 morphosyn (past-tense marking)	Frequency analyses; logistic regression (Rbrul)	"placing groups on a continuum is not straightforward…. linear models of variation may reify relationships … not sustained across levels of analysis" (p58)
Tamminga (2019)	Philadelphia English	6 phono	Pairwise correlations	evidence for covariation in only a subset of correlations suggesting change reversals are "motivated by avoidance of saliently local-sounding accent-features" (p131)
Waters and Tagliamonte (2017)	Toronto English	1 lexical 1 morphosyn 3 discourse	Pearson product-moment correlation coefficients	"extremely limited correlation in the use of more than one incoming variant by individual … leaders of one change are unlikely to be the leaders of others" (p24)
Erker and Otheguy (2016)	English and Spanish	1 phono 1 morphosyn	Correlation analysis and MANOVA	"coherent series of changes mediated by principles of cognitive economy and social salience" (p144)
Oushiro (2016)	Brazilian Portuguese	3 phono 3 morphosyn (grouped into "profiles")	Logistic regression (RBRUL)	"higher cohesion with in-group than out group speakers … function of density of communication" (p129)
Grondelaers and van Hout (2016)	Tussentaal and Belgian Standard Dutch	various phono, morphosyn, and lexical	Qualitative Perception Analysis; factor analysis	"coherence ... is more a matter of language perception and evaluation … and to a large extent consensus-based" (p69)
van Meel, Hinskens and van Hout (2016)	Moroccan and Turkish Dutch Ethnolects	13 phono 4 morphosyn	ANOVA and cluster analysis	"one cluster shows no social differentiation … and two others by the speakers' ethnic background in interaction with age and belonging" (p72)
Gregersen and Pharao (2016)	Danish	3 phono	Mixed-effects regression analysis	"coherent in perception not in use ... coherence is ... in the eye of the beholder ... or the ideologically informed ear of the listener" (p42)
Tsiplakou et al. (2016)	Cypriot Greek	4 phono and morphosyn	Correlation analysis and ANCOVA	"coherence across variables... the behaviour of variants depends on ... extralinguistic factors" (p10)
Oushiro and Guy (2015)	Brazilian Portuguese (São Paulo)	3 phono 3 morphosyn	Mixed-effects modelling; factor weights; cross-correlations	"co-variability is conditioned not only by structural similarities … but also by general linguistic constraints.... markedness may be a more general linguistic principle underlying co-variation" (p156)
Leblanc (2014)	Chiac Acadian French	2 phono 5 lexical (utterances)	Clustering; frequencies; correlations; multiple regression	partial support for clustering of lexical items in one school, not in the other; "different use of style-shifting in the time analysis" (p104-105)
Guy (2013)	Brazilian Portuguese (Rio)	2 phono 2 morphosyn	Logistic regression (VARBRUL)	''coherence is weaker and more multidimensional than commonly assumed'' (p63)

Authors	Varieties	Variables	Methods	Key Findings
Nevalainen, Raumolin-Brunberg, and Mannila (2011)	Early English (15-17c)	6 morphosyn	Repeated sampling; frequency analyses	varied based on "type of change, stage of development, the rate of diffusion" and social network (royals vs administrators) (p22-23)
Newman (2010)	New York Latino English	4 phono 1 prosodic	Implicational scaling	"NYLE can be seen as only marginally systematic or highly so" (p207)
Labov (2001)	Philadelphia English	2 phono	Pearson's correlation coefficients	"not all phonological changes are correlated … some are highly correlated, while others are not significant" (p373)
Maclagan, Gordon, Lewis (1999)	New Zealand English	5 phono	Frequency analysis; Multiple regression analysis	"the behavior of individual speakers across variables produce[s] different results from those obtained [from] group data for single variables" (p38)

Table 2-5. Summary of Relevant Research on Sociolinguistic Coherence

2.5.5. Lessons from studies in coherence

The lessons from previous studies in sociolectal coherence are few, but the opportunities are vast. The following paragraphs summarise the major findings from the literature on coherence which the current investigation seeks to address.

(C.1) The role of coherence in theories of language change has not been well-established. The most striking finding in looking at the studies in Table 2-5 as a group is that the role of coherence in language variation and change has not been well-established. The cumulative results show moderate to strong coherence in just over half of these studies (53%), with just under half showing weak to no coherence. Hardly a compelling finding. So why is it that studies have been unable to find consistent patterns of coherence? Sociolects, dialects, regiolects, and so on must be in some way internally coherent, otherwise individuals would not be able to so readily identify speakers of different varieties (e.g., British English, African American English, Swabian German) and would likely even have trouble communicating with one another. Chambers (2003:114) points out that "for the most part, people sound the way you would expect them to sound given the facts about their class, sex, age, and region," and that even the "Oddballs" (i.e., the non-conformists linguistically and socially, such as "outsiders," "aspirers," and "interlopers") end up along the bell curve following the norms of their communities. Thus, one objective of this study is to explore what role coherence could play in a theory of language variation and change.

(C.2) There is no standard and generally agreed-upon definition of linguistic coherence. A fundamental issue in evaluating coherence or incoherence is the lack of a standard, widely agreed-upon, and operationally sound definition of the term. Sociolinguists look at coherence in different ways (e.g., covariation/correlation, co-occurrence restrictions/constraints, implicational scaling, clustering, micro/macro interaction), and some researchers are more rigorous in their definitions and interpretations while others are more lenient; additionally, researchers have had differing expectations, tolerances for ambiguity, and minimum thresholds. "How much" coherence has to exist before a given lect can be considered coherent? Gregersen and Pharao

(2016:42) suggest that "coherence is in the eye of the beholder -- or rather in the ideologically informed ear of the listener." Hence, an important goal for the current study is to establish a verifiable definition for the term coherence.

(C.3) Some variables cohere, while others are used for identity formation ("bricolage"). Hazenberg's (2017:205-206) work on "gendered vowels" in Auckland English found that some vowels systematically cohere while others are available to speakers for "identity work". Guy (2014) suggests that some variables are likely used as "bricks" (to build strong foundational coherence) and others as "bricolage" (to convey style and stance or construct identities). But how can these phenomena be teased apart? Have linguists been looking at the "right" variables or perhaps "enough" variables in order to find variables that cohere? Most prior studies of coherence have looked on average at four to six variables. Perhaps the studies that show high levels of coherence just "got lucky" in picking the "right" variables to examine, while the others were "unlucky"? Researchers can do greater justice to the concept of coherence by investigating a broader set of variables and by systematically evaluating which ones are primarily driven by structural or sociolectal coherence, which may be used to signal group membership, which may be manipulated for identity formation, and which may simply reflect linguistic "whateverism" ("bricolage"). Hence, a challenge for the current study is how to distinguish among the different uses that speakers make of the variables at their disposal.

(C.4) The predictors governing coherence may be more nuanced than previously expected. Closely related to finding the "right" variables is the question as to whether researchers have been evaluating the "right" predictors. Schilling-Estes and Wolfram (1999) have argued that "the social meaning of linguistic variation is far more localized.… For example, usage levels for raised /ay/ in Ocracoke do not correlate neatly with age or sex but do correlate well with membership in the locally salient Poker Game Network" (Schilling-Estes and Wolfram 1999:516) … "unusual patterns of variation and change can be explained by appealing to the social significance of language features" (*Ibid*:486). Other studies have shown that the role of identity and the social meaning of indexicalities, particularly when features are grouped into "profiles" or evaluated within "utterances" (Hazenberg 2017; Meyerhoff and Klaere 2017; Oushiro 2016; Sharma and Rampton 2015), can often better explain the unexpected patterns of language variation. In a recent talk with *ABRALIN ao Vivo,* Guy (2020) presented a compelling argument that coherence is a function of shared indexicalities which may be different for each variable: he continues, "variables that share common indexicalities are more likely to covary."

(C.5) Limited statistical methods have been employed to evaluate coherence. Another challenge is whether the most explanatory statistical methods for uncovering patterns of coherence have been employed. The majority of studies cited here use cross-correlations and linear regression analyses, which may not be the most informative for exploring coherence. Studies that use principal components analysis (PCA), constrained correspondence analysis

(CCA), and implicational scaling, seem to show better results (Ghyselen and Van Keymeulen 2016; Horvath and Sankoff 1987; Meyerhoff and Klaere 2017). Meyerhoff and Klaere (2017) maintain that the existence of coherence

> *"seems more clearly presaged when we cluster speakers based on several variables than it is by models of variation that work with pairwise correlations between variables, because clustering provides a mode of analysis and a manner of data visualisation that enables us to follow the movement of individuals and groups within the larger speech community" (Meyerhoff and Klaere 2017:42).*

Gregersen and Pharao (2016) report only weak correlational coherence in the variables they studied; however, in examining their figures, there appears to be an implicational order to the variables across the localities they investigated: ae < ru < eng (Gregersen and Pharao 2016:32). These and other findings suggest that perhaps the best methods or the most effective tools for detecting differing levels and types of sociolinguistic coherence have yet to be developed.

(*C.6) The type, status, and sociohistorical origin of the variable influence the nature and degree of observed coherence.* With a few exceptions (Hazenberg 2017; Montgomery and Moore 2018; Sharma and Rampton 2015), most studies have looked for coherence in the internal structure or extralinguistic context, rather than at the sociocultural-historical nature of the variables themselves. Guy and Hinskens (2016:4) question whether new variants of existing features may, at least in the early stages, be more likely to be used in idiosyncratic ways. Is there more heterogeneity in a new urban vernacular than in a long-established variety? In dynamic situations of dialect change and levelling, the constant influx of new variants and features to the pool adds to the instability of the variety. Hence, a critical aspect to be considered in analysing sociolectal coherence is the origin and evolution of each variable.

Drawing on lessons from this prior body of work, the current study continues the quest to understand sociolectal coherence by exploring an abstract mathematical model based on lattice theory (see Chapter 7), using a larger set of variables, in two speech communities, and across two points in time under the premise: "the more variables we model at once, the more sociolinguistically informative our models will be" (Meyerhoff and Klaere 2017:42).

2.6. Summary

The section provided a review of the theoretical background in which the current study is grounded. The three interrelated themes of this research – (1) the changing dialect situation and incipient levelling occurring in Swabian, (2) the methodological challenges in the comparability between real- and apparent-time studies, and (3) the orderly patterns of heterogeneity and sociolectal coherence that govern language change – are systematically examined in chapters 4 through 7. The following chapter lays out the specific hypotheses related to these research questions and describes the data collection methods and quantitative analyses employed in answering them.

Chapter 3. Data and methods for real- and apparent-time analysis

derb schwäbisch des sind ôifach Bildungsmarker oder Statusmarkierunge
'deep Swabian they are basically education markers or status markers'
-Rupert 2017

3.1. Introduction

This chapter outlines the data and the methods used in this investigation and explains how the selected approach addresses the research aims presented in Chapter 1. I begin by laying out the research questions and hypotheses (Section 3.2) and defining the methodological framework followed to address them (Section 3.3). Next, I describe the Swabian corpus, covering the speech communities, recording periods, and investigation methods, along with the data collection and preparation process (Section 3.4 and 3.5). This is followed with a review of the dependent linguistic variables investigated (Section 3.6) and the independent internal and external predictors chosen for evaluation (Section 3.7). This chapter contains the overall methods for the entire study; specific data and methods particular to individual analyses are covered in the relevant chapters, for example, details of the acoustic analysis for the (ai) diphthong are described in Chapter 5, grammatical constraints on Swabian relative clause markers are reviewed in Chapter 6, and lattice theory and methods for modelling coherence are discussed in Chapter 7.

3.2. Research questions and hypotheses

As a reminder, this research seeks to answer three questions:

Question 1: How is the dialect situation in Swabia changing, and what are the drivers or inhibitors of change?

Question 2: What can a combined real-time panel and trend study tell us about the interaction between individual and community language?

Question 3: How does the concept of sociolectal coherence shape linguistic variation and promote or restrict language change?

To answer these questions, three hypotheses have been formulated.

3.2.1. Hypothesis 1: Dialect levelling and speaker identity, accommodation and mobility

As discussed in Section 2.3, across the globe, traditional dialects are in attrition, levelling with the standard language, and supraregional varieties centred around large urban metropolises are emerging (Auer 2005; Britain 2009, 2010; Kerswill 2003; Trudgill 1986). Dialect attrition and retention have been shown to be stimulated or stifled by individuals' dialect identity and orientation to the local culture and language (Dodsworth 2017; Moore and Carter 2015; Schilling-Estes 2005; Tabouret-Keller 1997). Similarly, the degree to which speakers accommodate to the speech of their interlocutors impacts their choice of linguistic variants (Ghyselen 2016; Kerswill

2010; Trudgill 1986, 1992). Moreover, speakers' geographic mobilities bring them into ever greater contact with ever more diverse groups of speakers, introducing another confounding factor in their choice of dialect or standard language features (Auer 2007, 2013; Blommaert 2014; Britain 2016; Britain and Trudgill 1999). Hence, ***HYPOTHESIS* 1 predicts, that over the 35-year timeframe of this study, dialect levelling will be observed in Swabian; however, the extent of attrition (or retention) will be modulated by speakers' personal orientation to Swabia and their purported choice to speak Swabian or standard German to the people with whom they commonly interact.**

3.2.2. Hypothesis 2: Compatibility between panel and trend studies

As discussed in Section 2.4, a combined real-time panel and trend study affords the opportunity to triangulate the findings using both REAL-TIME and APPARENT-TIME analyses. The APPARENT-TIME hypothesis, based on the CRITICAL-PERIOD HYPOTHESIS (Lenneberg 1967), assumes that individual speech patterns are fixed after adolescence – a premise at the core of Labov's (1974) heuristic: "the use of the present to explain the past." However, recent studies have begun to question the assumption of post-adolescence stability. Since the apparent-time method assumes post-adolescence stability, it is likely to UNDERESTIMATE the rate of change (Buchstaller 2015; G. Sankoff 2006; G. Sankoff and Blondeau 2007). Inversely, as some individuals may become more conservative over time and thus move counter to an ongoing change, the apparent-time method may also OVERESTIMATE the rate of change (Buchstaller 2015; G. Sankoff and Wagner 2006). Therefore, ***HYPOTHESIS* 2 predicts that the direction of language change will be observable in the apparent-time analysis of the trend study, and, although there may be individual differences, the rate of change will be detected in the real-time analysis of the panel study.**

3.2.3. Hypothesis 3: Coherence and orderly patterns of variation and change

Over fifty years ago, WLH (1968:188) observed that "idiolects do not provide the basis for self-contained or internally consistent grammars;" rather, it is the grammar of the speech community, governed by social factors, which reflects regularity and coherence and where linguistic change occurs. As described in Section 2.5, one approach toward operationalising WLH's concept of ORDERLY HETEROGENEITY is the idea of coherence, which Guy and Hinskens (2016:1) define as "the extent that linguistic features systematically covary." A primary assumption underlying this research is that greater lectal coherence (whether a dialect, sociolect, regiolect, or idiolect) implies that changes in one variable trigger changes in another such that multiple related variables co-occur within a unified variety (*Ibid*.). The role of lectal coherence parallels Milroy and Milroy's (1985) claim that "closed", more homogeneous social networks are more impervious to change (i.e., tight coherence) while "open", more heterogeneous networks are more vulnerable to change (i.e., loose coherence)**.** Thus, ***HYPOTHESIS* 3 predicts that lects with**

greater levels of sociolectal coherence, in both real- and apparent-time, will be more resistant to change, while lects with lower levels of coherence will be more susceptible to change.

3.3. Methodological framework

The methodological framework or "blueprint" for this research effort comprises both empirical and interpretive methods: the empirical method starts with a theory and develops hypotheses to be tested against the observed data (i.e., deductive approach); the interpretive method begins with an exploration of the data and builds a theory that supports the observations (i.e., inductive approach). This study takes a mixed approach in the search for holistic insight into the Swabian sociolinguistic situation, a perspective that cannot be obtained from the use of either method on its own (Bhattacherjee 2012:35; Patton 2002:264).

This investigation takes an exploratory, interpretive approach in describing the undocumented Swabian sociolinguistic situation (RESEARCH QUESTION 1) and an empirical, hypothesis-based approach in evaluating the compatibility and complementarity of panel and trend studies (RESEARCH QUESTION 2) and in examining the role of sociolectal coherence in promoting or constraining language change (RESEARCH QUESTION 3). To support these two approaches, both quantitative and qualitative research techniques are employed. The quantitative analyses are based on token counts, frequency distributions, and statistical modelling, while the qualitative analyses are drawn from quasi-ethnographic interpretations based on my personal experiences from over five years living in the region. The use of quantitative and qualitative methods requires thoughtful trade-offs between the breadth and depth of the research: while quantitative methods can generate large quantities of data, qualitative methods typically make broader generalisations about a smaller number of observations. Critical to an effective methodology is the appropriate use of triangulation, specifically, validating the reliability and consistency of the findings using different data sources, analytical methods, and theoretical approaches (Meyerhoff 2016; Patton 1999). Throughout this study, I have tried to make the appropriate trade-offs and triangulate findings where possible, avoiding the "analysis-paralysis" conundrum[9] by not getting bogged down into over-analysing results with diminishing returns.

The quality of a research effort can be assessed in terms of its internal and external validity: internal validity indicates whether changes in the dependent variable are indeed "caused" by changes in the independent variable(s), and external validity determines whether the research findings are generalisable from the sample to the broader population (Bhattacherjee 2012:35-36). Figure 3-1, adapted from Bhattacherjee (2012), depicts the differences in internal and external validity for a number of different research types. I have added panel study and trend study to this

[9] An expression derived from an aphorism often attributed to Voltaire (1770) who said, *le mieux est l'ennemi du bien* 'the perfect is the enemy of the good.'

diagram to demonstrate how both approaches fall within the *Cone of Validity* (Bhattacherjee (2012:36): the panel study looks for causes and effects across the lifespan of a subset of individuals, while the trend study takes a broader more generalisable approach to the larger population. Hence, a combined real-time panel and trend study brings greater overall validity and provides an important first step toward triangulation of the results.

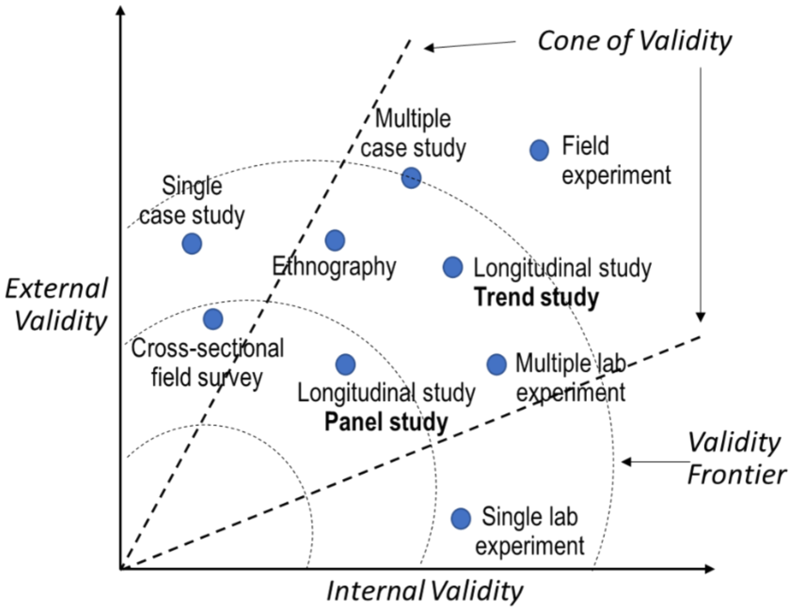

Figure 3-1. Internal and External Validity (adapted from Bhattacherjee 2012)

3.4. The Swabian corpus

The corpus for this study consists of 80 sociolinguistic interviews of native Swabian speakers, recorded at two points in time in two different communities.

3.4.1. Speech communities

Labov states, “one cannot understand the development of a language change apart from the social life of the community in which it occurs” (Labov 1963:275) and, over the last 50 years, this phenomenon has been substantiated by countless sociolinguistic studies. This project investigates two typical Swabian communities, the large urban metropolis of Stuttgart and its neighbouring suburbs and the mid-sized town of Schwäbisch Gmünd with its many surrounding small, rural and semi-rural villages, providing the opportunity to examine variation and change from both an urban and a semi-rural perspective. Roughly 100 kilometres apart, both communities lie within the Central Swabian dialect area (see Figure 1-3).

3.4.1.1. Stuttgart

Stuttgart is the heart of Swabia and considered to be the ideological norm centre for Swabian (Ruoff 1997:145). It is a large urban hub (see Figure 3-2) with over one million inhabitants and is home to many well-known global firms, such as Daimler-Mercedes-Benz, Porsche, Bosch, and Siemens. Stuttgart has one of the most diverse populations in Germany, with almost twice as many "foreigners" (individuals with at least one foreign-born parent) as in Germany overall (Auer 2020).[10] The city also benefits from substantial internal migration, with many inhabitants from the north and east who have moved to the region for employment.

Figure 3-2. City of Stuttgart

For the panel study, many of the informants originate from Warmbronn-Leonberg, a Stuttgart suburb located about 17 kilometres west of the city (see Figure 3-3). The village, first mentioned in 1100, began as a *Rodungssiedlung* 'clearing settlement' from Renningen. With just over 4,000 inhabitants, it lies on the main commuter artery which runs from Renningen to Stuttgart. Hence, inhabitants are more closely oriented toward the city of Stuttgart for work and leisure. Until 1974, Warmbronn was an independent municipality; it was joined with Leonberg in 1975 which has just over 47,000 inhabitants.[11]

Figure 3-3. Town of Warmbronn-Leonberg

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[10] *Statistisches Amt, Landeshauptstadt Stuttgart,* https://statistik.stuttgart.de/statistiken/tabellen/7392/jb7392.php
[11] Drawn from various official government websites: https://www.leonberg.de, Viewed on 22-jan-2020.

All speakers in the panel study live within 25 kilometres of Stuttgart, except one who had moved 51 kilometres north by the second recording. Informants in the trend study originate from various localities around Stuttgart, all within a 30-kilometre radius, with the exception of one speaker who lives 49 kilometres northeast. Appendix B lists the speakers' residences at the time each recording was made.

3.4.1.2. Schwäbisch Gmünd

The second community investigated is Schwäbisch Gmünd, a mid-sized, semi-rural town located 100 kilometres east of Stuttgart. With 60,000 inhabitants, it is a typical mid-sized German town, surrounded by small rural villages with 77% of the land dedicated to woodland and agriculture (see Figure 3-4). Schwäbisch Gmünd is located in the middle of Swabia, between the city of Stuttgart and the border with Bavaria, situated in a valley of the Rems between the edge of the Welzheimer Wald (part of the Swabian-Franconian Forest) in the north and the foothills of the eastern Swabian Alb in the south (see Figure 1-2). The first settlements date back to the second century AD when the Roman military pushed across the Danube. Schwäbisch Gmünd derives its name from the confluence of many streams (*Gemünde*). From 1805 to 1934 the town was officially called *Gmünd*, a term still used locally today.[12]

Many of the speakers in the current study live in and around the small, neighbouring village of Iggingen which has just over 2,000 inhabitants (see Figure 3-5). Iggingen was first mentioned in the year 855 under the Latin name *Ucchinga*. One of the popular clubs that people in the study from Iggingen take part in is called *Mittelalterverein* 'Middle Ages Club', in which participants isolate themselves for long weekends or even several weeks at a time and live and eat as if they were in the Middle Ages. The comraderie gained from this activity plays a major role in the relationships that individuals in the community foster.

Figure 3-4. Town of Schwäbisch Gmünd

[12] Drawn from various official government websites: http://www.schwaebisch-gmuend.de/, http://www.iggingen.de/. Viewed on 22-jan-2020.

Most speakers in the panel study live within 10 kilometres of Schwäbisch Gmünd, except for four speakers who had moved by the time of the second recording: one speaker had moved 100 kilometres south to Tübingen, one 280 kilometres south to Switzerland, and two had moved 300-600 kilometres to northern Germany. Informants in the trend study come from various localities around Schwäbisch Gmünd, all within a 50-kilometre radius, with the exception of two speakers who live 100 kilometres further south. Appendix B lists the speakers' residences at the time each recording was made.

Figure 3-5. Village of Iggingen

3.4.2. Recording periods

This study covers a 35-year time span: the first set of interviews was conducted in 1982 and the second set between 2017-2019. The details and circumstances surrounding these two recording periods are described in the following sections.

3.4.2.1. 1982 study

In 1982, supported through a grant from the *Deutscher Akademischer Austauschdienst* (DAAD) 'German Academic Exchange Service', I moved to Stuttgart to collect data for my dissertation at Georgetown University. During that year, I conducted interviews with 40 Swabian speakers; however, after the first six interviews, it became obvious that Swabians do not speak Swabian to non-Swabians. So, I recruited two fellow students and friends, 24-year-old men, Rupert[13] from the University of Tübingen and Egbert from the University of Stuttgart, to conduct

[13] As previously mentioned, all names in this study are pseudonyms which have been changed to protect the privacy of the speakers.

the interviews for me in their own speech communities: Rupert for Schwäbisch Gmünd and Egbert for Stuttgart (see Section 3.5.1.4 for a discussion of the Swabian interviewers). In 1982, these two individuals were the focal point for their communities, and the interviews they conducted were with their family, friends, and acquaintances.

3.4.2.2. 2017 study

In 2016, I returned to Swabia and set up residence in Tübingen, a university town 45 kilometres south of Stuttgart. With the support of Harald Baayen's Quantitative Linguistics department at the University of Tübingen and with the aid of several local Swabian interviewers (see Section 3.5.1.5), I conducted the second data collection phase between 2017 and 2019. In total, I collected 121 interviews, 20 re-interviews with speakers from 1982 and 101 new interviews. Of the new interviews, 35 were from the suburbs around Stuttgart, 33 from towns around Schwäbisch Gmünd, and 33 from towns surrounding Tübingen. This thesis concerns the 20 speakers from 1982 re-interviewed in 2017 who comprise the panel study (see Section 3.4.3.1) and 40 new speakers from 2017, matched for social characteristics with the panel study speakers, who comprise the trend study, henceforth the "twin study" (see Section 3.4.3.2).

3.4.3. Investigation methods

This study entails two primary modes of investigation, a real-time panel study and a real- and apparent-time trend study, described in the following sections.

3.4.3.1. Panel study

Table 3-1 shows the breakdown of the 20 panel speakers across the two recording periods by age group (Section 3.7.1.3), education level (Section 3.7.1.4) and sex (Section 3.7.1.2). Appendix B.1 provides a list of the panel speakers and their socio-demographic characteristics. (Note that Group 1 comprises three speakers from 1982 who were unfortunately deceased by 2017 and hence not available for the panel study; their 1982 interviews are included in the broader trend study (see Section 8.6 regarding opportunities for future research).)

Study Year	Age Groups	Sex	Stuttgart Hi Edu	Stuttgart Lo Edu	Schwäbisch Gmünd Hi Edu	Schwäbisch Gmünd Lo Edu	Total
1982	Group 2: ages 30-60	M	0	0	0	1	**1**
	Born 1922-1952	W	0	1	0	2	**3**
1982	Group 3: ages 18-29	M	4	0	6	0	**10**
	Born 1953-1964	W	1	1	3	1	**6**
2017	Group 4: ages 61-88	M	0	0	0	1	**1**
	Born 1929-1956	W	0	1	0	2	**3**
2017	Group 5: ages 30-60	M	4	0	6	0	**10**
	Born 1957-1987	W	1	1	3	1	**6**
Subtotal			10	4	18	8	
TOTAL			14		26		40

Table 3-1. Speaker Demographic Stratification – Panel Study

3.4.3.2. Social twin study

The trend study component of this research comprises 40 Swabian speakers who are "social twins" of the panel study participants, matched for age, sex, education and locality. When there was a choice in the Swabian corpus of two or more trend speakers to match one panel speaker, the speaker with the most data was selected. These participants are considered "social twins" because they exhibit the same mean age (44.8 for the panel study and 45.7 for the trend study) (Blondeau 2001:469) and reflect a similar distribution across speaker sex (100% match), locality (93% match), age group (73%), and education (73%), producing an 84% overall match. Table 3-2 shows the breakdown for the 40 twin speakers by major socio-demographic category. Appendix B.2 provides a list of the twin speakers and their socio-demographic characteristics.

Study Year	Age Groups	Sex	Stuttgart Hi Edu	Stuttgart Lo Edu	Schwäbisch Gmünd Hi Edu	Schwäbisch Gmünd Lo Edu	Total
2017	Group 4: ages 61-88	M	0	1	1	1	**3**
	Born 1929-1956	W	0	1	1	3	**5**
2017	Group 5: ages 30-60	M	1	2	3	4	**10**
	Born 1957-1987	W	1	2	2	2	**7**
2017	Group 6: ages 18-29	M	4	0	4	1	**9**
	Born 1988-2000	W	1	1	3	1	**6**
Subtotal			7	7	14	12	
TOTAL			14		26		40

Table 3-2. Speaker Demographic Stratification – Twin Study

3.5. Data collection and preparation

To build the Swabian corpus, data collection and preparation were accomplished through a multi-step process, depicted in Figure 3-6. A description of each step follows.

Figure 3-6. Sociolinguistic Data Preparation Process

3.5.1. Sociolinguistic interview

This project follows the Labovian approach to the sociolinguistic interview (Labov 1984), in which the primary goal is to elicit and record "the language used by ordinary people in their everyday affairs" (Labov 1972:69), with sufficient quantity and of high enough quality to support detailed phonetic, acoustic, and grammatical analysis.

3.5.1.1. Interview setup

The interviews were set up in three ways based on the study type (panel or trend) and the recording period (1982 or 2017).

1982 panel study: As mentioned, in 1982, the interviews were conducted by two students, one from Stuttgart and one from Schwäbisch Gmünd, who were integral members of their communities. Hence, they recruited their family and friends, and my role was that of participant-observer or "friend-of-a-friend" (Milroy and Milroy 1985a). In 1982, the speakers in each community were a tight-knit group of family and friends, all living in close proximity to one another, exhibiting many dense, multiplex social relationships with "strong ties" (*Ibid.)*.

2017 panel study: Not unexpectedly, locating the 1982 speakers 35 years later, turned out to be quite a challenge. By 2017, community ties among the members had weakened, and social connections had become considerably more dispersed, particularly in Stuttgart, as people had moved, married, changed jobs, and grown apart to such an extent that many had lost complete contact with one another. Even family members who were formerly very close had dispersed to such a degree that regular contact had become quite limited. Finding individuals after such a long period requires dogged detective work, which is greatly facilitated today by Google search. Most individuals had no recollection of having conducted the prior interview, and several politely declined to participate. I was successful in locating and convincing 20 of the original 40 speakers from 1982 to do a second interview. As a result, while in 1982 the interviewees were close family and friends of the interviewer, by 2017 most of the interviewers and interviewees were complete strangers, re-introduced as a "friend-of-a-friend-of-a-friend."

2017 twin study: Two approaches were used to solicit participants for the 2017 twin study. The primary tactic involved a process of "daisy-chaining" off the panel study participants and interviewing family and friends through their recommendations. However, once this network was exhausted, a supplemental approach entailed hanging flyers in local universities around Stuttgart and Schwäbisch Gmünd to solicit native Swabian speakers to participate in the study. Hence, for the twin study, as with the 2017 panel study, the majority of interviewers and interviewees have no previous relationship with one another. Section 3.5.1.5 elaborates on the INTERVIEWER EFFECT and how it has been handled in the current study.

3.5.1.2. Principal investigator presence

As Principal Investigator (PI) and participant-observer, my participation in the interviews provided me with the opportunity to become immersed in the community to learn more about the norms, practices, and power dynamics influencing the linguistic situation, while at the same time retaining the ability to "retreat to the fringes" as interactions between the speakers developed, thereby lessening the effect of the observer in the data collection process (Milroy 2002). Still, there is no way to eliminate the OBSERVER'S PARADOX (Labov 1973). As mentioned, Swabians speak Swabian with other Swabians, hence my presence could be a deterrent in eliciting "real Swabian" as spoken in everyday conversation. In reality, the logistics around my participation in every interview were a challenge due to complex schedules and long commutes. As a result, I participated in 60% (24/40) of the panel study interviews and 58% (23/40) of the trend study interviews. In 1982, I was present in 65% (13/20) of the panel study interviews – only one in Stuttgart and all but one in Schwäbisch Gmünd. In 2017, I was present in 95% (19/20) of the panel study interviews and 45% (18/40) of the trend study interviews. To control for the influence of my presence, this factor was recorded for every interview (see Appendix C) and factored into the multivariate modelling. Ultimately, the findings show that my presence or absence in the interview did not have a significant effect on the level of Swabian spoken.

3.5.1.3. Interview setting

Labov et al.'s (1968) study of the speech of Harlem teenagers was the first to uncover significant differences between single and group interviews. Rickford (2014:601) showed that "basic aspects of the [interview] setting, scene, participants," among other elements, fundamentally affect speakers' choice of linguistic variants and hence should be factored into all sociolinguistic analyses. Recently, Gregersen et al. (2018:160) provided several examples from the LANCHART corpus that demonstrated significant differences when the interview type, which they call the "speech event" (e.g., single interview or group discussion), the number of interviewees, and the "interactional structure" (i.e., the symmetric or asymmetric power relationship between the interviewer and interviewee) vary across informants. In the ideal situation, the researcher would control for all of these factors; however, in large, longitudinal sociolinguistic studies, obtaining perfectly controlled data is simply unrealistic.

Thus, I aimed to elicit natural, spontaneously spoken Swabian by creating as casual an interview setting as possible and opted to control for other factors in the interview setting through the multivariate modelling. The majority of the interviews were conducted in the speakers' homes over coffee and cake (which I bought from the local bakery for each interview). A few interviews were conducted in a local *Kneipe* 'bar', two were done in empty seminar rooms at the university, and one was carried out in a church after a family wedding, complete with church bells chiming in the background. A few interviews were conducted in groups, such as a husband and wife, elderly parents with their son or daughter, or a small group of friends. Appendix C lists the setting where each interview took place, the number of people in attendance (counting the interviewer), and my presence or absence (as principal investigator).

3.5.1.4. Interviewers

With the exception of five interviews, which I personally conducted with the interviewers themselves, the interviews were carried out by local native Swabian speakers from the community. The interviewers were instructed to create a casual, conversational environment and to speak normal, everyday Swabian. In total, there were nine different interviewers (see Table 3-3). To reduce the GAP EFFECT in the panel study (see the following section), an attempt was made to match the interviewers in 1982 and 2017 for similar social characteristics (i.e., age group, sex, and educational level). Still, as there is no efficacious method to control for multiple interviewers in a large, longitudinal study, interviewer name was incorporated as a random effect in the multivariate modelling to help neutralise the bias.

Community	Interviewers	Panel 1982	Panel 2017	Twin 2017
Stuttgart	Bernard (M, 25)			1
	Egbert (M, 24)	6		
	Joachim (M, 25)			1
	Jutta (W, 32)		6	5
	Karen (W, 27)	1		
	Karen (W, 62)		1	2
	Selina (W, 22)			8
Schwäbisch Gmünd	Karl (M, 19)		13	21
	Karen (W, 27)	1		
	Rupert (M, 24)	12		
	none[14]			2
TOTAL Speakers		**20**	**20**	**40**

Table 3-3. Swabian Interviewers (including Interviewer Sex and Age)

3.5.1.5. Interviewer effect

Multiple, different interviewers introduce an INTERVIEWER EFFECT which creates several challenges for longitudinal studies (Bailey and Tillery 1999; Gregersen et al. 2018). First is the effect of INTERVIEWER STYLE. Some interviewers are naturally better than others at creating a casual environment, asking the questions in Swabian, and eliciting vernacular speech (cf. the "Rutledge Effect" (Bailey and Tillery 1999)). This phenomenon is particularly evident in 2017 with two of the interviewers: Jutta's interviews were on average 15 minutes longer than Karl's. Second is the inescapable GAP EFFECT, an artefact of the long time span between interviews in a panel study (Cukor-Avila and Bailey 2018; Wagner and Tagliamonte 2018). In 1982, the interviewers and informants were close family and friends; in 2017, the lack of familiarity between the speaker and the interviewer created a more reserved interview environment. Third is the effect of the POWER STRUCTURE which can play an influential role with interviewers and interviewees of different age groups, sexes, and educational levels (Gregersen, personal communication).

To understand the effects of the interviewer-interviewee relationship and the power structure in the interview, I ran a series of multivariate analyses with three factors which prior studies have shown to impact speakers' choice of dialect. First, every interview was coded for INTERVIEWER CLOSENESS, that is, whether the interviewer and the speaker were previously acquainted with one another or not within the same recording period. Second, the sexes of the

[14] For one interview, I gave a group of three informants the interview questions and encouraged them to talk about the topics among themselves, and I excused myself from the room.

interviewer and speaker were coded as being of the SAME SEX or different sexes. The third factor considered whether there were significant differences between interviewers and interviewees from the SAME GENERATION or different generations (i.e., more than a 15-year age difference).

Table 3-4 shows the results of the multivariate analysis (*lm* function in R *stats* package, version 3.6.0). All three factors showed significant differences in interaction with recording year and generation. The 2017 recording period shows a mitigating effect on the level of dialect spoken; however, the results show that speakers of the same generation with close relationships with the interviewer are more likely to use Swabian, while those of the same generation and the same sex (both male-male and female-female) are more likely to use standard German. These findings confirm Gregersen et al. (2018) and others that the power relationship in the interview plays a significant role in speakers' choice of linguistic variants. To address this confound in the Swabian corpus, speaker name was added as a random effect in all multivariate modelling.

```
Coefficients                                Estimate  Std.Error  z-value   Pr(>|z|)
(Intercept)                                   41.767      6.245    6.689   2.98e-11 ***
MAIN EFFECTS:
Recording Year: 2017                          10.023      6.043    1.659   0.097363 .
Same Sex                                      15.248      6.575    2.319   0.020498 *
Same Generation                              -14.350      8.826   -1.626   0.104148
Interview Closeness: close                   -20.177      3.224   -6.259   4.81e-10 ***
INTERACTION EFFECTS:
Year 2017 : Same Sex                         -12.729      6.253   -2.036   0.041920 *
Year 2017 : Same Generation                   14.618      7.231    2.022   0.043350 *
Same Generation : Interviewer Closeness 17.441      6.403    2.724   0.006511 **
Same Generation : Same Sex                   -18.501      5.460   -3.388   0.000718 ***

MODEL STATISTICS:
Residual standard error: 49.12 on 1831 degrees of freedom
Multiple R-squared:  0.05975,Adjusted R-squared:  0.05564
F-statistic: 14.54 on 8 and 1831 DF,  p-value: < 2.2e-16
```

Table 3-4. Multivariate Analysis of Interviewer Effects on Speaking Swabian

3.5.1.6. Interview structure

The interviews followed the traditional variationist sociolinguistic interview format in eliciting three conversational styles: (1) casual conversation, organised into various topics, such as childhood games, e.g., how to play hide-and-seek, leisure activities, favourite books and movies, and local practices, e.g., making *Spätzle* 'Swabian egg noodles' and *Maultaschen* 'Swabian ravioli', attending a *Hocketse* 'local festival'; (2) reading style, from a passage of a familiar Grimm's fairy tale; and, (3) word lists, consisting of a simple word list and a list of minimal pairs.[15] All interviews used the same questionnaire template, a full copy of which can be found in Appendix D. If speakers wandered off the topic, the interviewer was instructed not to interrupt

[15] In addition to the sociolinguistic interviews, one speaker was asked to self-record himself in a variety of different situations (at home with family, talking with friends, talking with a client, etc.) and six speakers were spontaneously recorded over a family lunch. These recordings form part of the Swabian corpus and offer the opportunity for future analysis of stylistic differences and interlocutor accommodation.

with the aim of obtaining more natural, unmonitored speech. Most interviews were an hour-long, although a few were as short at 35 minutes and a couple over two hours.

3.5.1.7. Socio-demographic questionnaire

At the end of the sociolinguistic interview, a questionnaire was provided to each speaker to collect necessary socio-demographic information, such as self-reported sex, birth year, birthplace, education, occupation, all residences where they had lived throughout their lifetime and for how long, all jobs they had held, and their parents' background (e.g., birthplace, occupation, education). The questionnaire also asked speakers to make a subjective assessment as to whether they speak Swabian or standard German with 13 different interlocutors (see Section 3.7.2.2 for how this information was operationalised). A copy of the Socio-demographic Questionnaire can be found in Appendix D.5. All speakers were assigned a unique speaker ID and pseudonym. The anonymised socio-demographics for all speakers were entered into an Excel/CSV file and loaded into R for analysis. The original copies of the speakers' completed Socio-demographic Questionnaires are stored under lock and key in the office of the secretary of the Quantitative Linguistics department at the University of Tübingen.

3.5.2. Recording

The 1982 recordings were made with a portable Sony cassette recorder and an internal microphone. The tapes were digitised using Audacity, at 44,100 Hz and 16-bit resolution, with noise reduction applied. The 2017 recordings were made with a Zoom H2 or H6 digital recorder with Sennheiser lavaliere microphones to provide simultaneous recording for up to six separate speech channels. The panel study interviews total just over 41hours and the trend study interviews just over 39 hours, yielding a corpus of 80 hours of recordings.

3.5.3. Transcription

All recordings were transcribed orthographically based on the transcribers' perception of a binary choice between the dialect variant and the standard variant (see Section 3.5.4 regarding validation). Transcriptions follow the Swabian orthographic conventions I established for the project (see Appendices E and F), using the ELAN tool from Max Planck Institute. With a large number of speakers and variables, manually annotating tokens in ELAN is a painstakingly time-consuming and highly error-prone process; hence, ELAN was used only for transcription, and the annotation process was automated in Python (see Section 3.5.5).

The standard ELAN template consists of three transcription tiers: SWG for the orthographic transcription of the Swabian informant; ITW for the orthographic transcription of the interviewer; and, NOI for extraneous noise or transcriber comments about activities going on at that point in the interview, such as phone ringing, baby crying, someone entering or leaving the room. For group interviews, each informant was transcribed in a separate SWG tier. The interviews were transcribed by native German speakers, undergraduate linguistics students at the University of Tübingen, following the conventions defined explicitly for this project (see Appendices E and F).

3.5.4. Validation

All transcripts were cross-validated at least four times: first, by a different student transcriber to the one who did the original transcription and then by the principal investigator (me), who made at least three passes through every transcript. In the first pass, my objective was to verify that the orthographic transcriptions were accurate and to neutralise any transcriber bias. My aim with the second pass was to ensure that false starts, repetitions, and internal text tags (e.g., relative clauses [REL], null past participle affixes [ge]) were coded correctly, and commas correctly placed to identify utterance boundaries, necessary for morphosyntactic analysis. I conducted the third review after the annotation process (see Section 3.5.5) to verify that all variables were correctly tagged, described in the following section.

3.5.5. Annotation

To support the manipulation of large quantities of data (80 hours of speech and 21 linguistic variables), I decided to build an automated ELAN-to-R (E2R) annotation process, drawing on the systems design and programming expertise gained during my 35-year hiatus from linguistics. E2R takes a set of ELAN transcripts as input and creates a set of extract files as output for input into R for statistical analysis. E2R involves multiple steps, as depicted in Figure 3-7 and described in detail in Appendix G.[16]

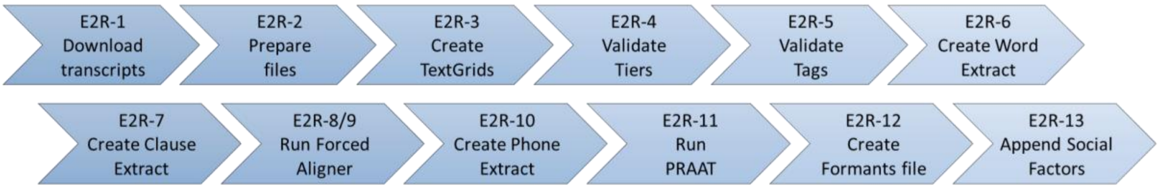

Figure 3-7. ELAN-to-R (E2R) Extraction Process

The E2R process uses a bespoke Swabian-German Lexicon (SGL) that I manually built from the words used by the speakers in the sociolinguistic interviews. Following the PRINCIPLE OF ACCOUNTABILITY, all words from the transcripts with variables under investigation (see Appendix A) were incorporated into the lexicon. SGL has over 14,000 Swabian and standard German variants, including English translations, part of speech (initially built with the standard German POS-tagger (Toutanova et al. 2003)), MHG origin, and lexical frequency counts from the

[16] I wish to thank Zhuge Gao, a research assistant and student in computational linguistics at the University of Tübingen, who designed and developed the required programs in Python and patiently and repeatedly ran the extracts, tying up her computer for hours on end.

Swabian corpus for word stem, lemma, standard variant, and Swabian variant. Appendix H provides a short sample of the lexicon. The E2R process strictly adheres to the PRINCIPLE OF ACCOUNTABILITY, ensuring that all tokens of a given linguistic variable are correctly identified and properly annotated. All analyses in this study use extracts created by the E2R process.

3.5.6. Consolidation

"The great art of the historical linguist is to make the best of this bad data – 'bad' in the sense that it may be fragmentary, corrupted, or many times removed from the actual productions of native speakers" (Labov 1972b:100). Naturally, I wish I had more speakers, varied speech styles, more variables, different predictors, additional communities, better interviewers, more experienced transcribers, and so on. However, I have tried to overcome the limitations and intrinsic biases in the Swabian corpus and assure its validity through rigorous statistical testing and mixed research methods involving data, theoretical, and methodological triangulation as reasonably as possible (Denzin 1970).

3.6. The linguistic variables

Labov (1963) set down four criteria for explicitly defining the linguistic variable for sociolinguistic research: (1) "frequently occurring" in the course of day-to-day speech, (2) "structurally integrated" into the grammar, (3) "highly stratified" across various social factors, and (4) "salient, yet immune from conscious distortion" (Labov 1963:279). Based on these criteria, I chose 21 variables – ten phonological and eleven morphosyntactic – from a palette of over 40 that I have identified (see Appendices A.1 and A.2 for a detailed description of each). These variables (1) are particularly representative of modern Swabian, (2) occur with sufficient frequency in spoken language, (3) are relatively easily categorised as dialect or standard, and (4) are well-supported by many linguistic descriptions of the dialect, most notably:

1. *Sprachatlas von Nord Baden-Württemberg (SNBW)* 'Linguistic Atlas of North Baden-Württemberg', Volumes 1-5 (Klausmann 2018c, 2018a, 2018b) published by the Ludwigs-Uhland Institute at the University of Tübingen. This ongoing project currently contains 250 maps built from data collected through questionnaires and recordings covering 140 localities and 15 cities across Baden-Württemberg, averaging 8-10 hours of recordings per location.
2. *Atlas zur deutschen Alltagssprache (AdA)* 'Atlas of Everyday German' is published online as a joint collaboration between the Universities of Salzburg and Liège. The data were collected indirectly through internet questionnaires, asking respondents for *normalen ortsüblichen Sprachgebrauch* 'normal, locally common language usage'. While this atlas is not built from directly observed spoken language, it provides a useful approximation to various linguistic features across the whole of Germany.
3. *Phonologischer Dialektwandel in den alemannischen Basisdialekten*

Südwestdeutschlands im 20. Jahrhundert: Eine empirische Untersuchung zum Vokalismus ‘Phonological Dialect Change in the Alemannic Base Dialects of Southwestern Germany in the 20th Century: an Empirical Investigation of Vowels’ (Schwarz 2015) provides a detailed comparison of the dialect maps from Georg Wenker’s *Sprachatlas des Deutschen Reichs* from 1880 with maps from the *Südwestdeutschen Sprachatlas (SSA)* 100 years later, comprising over 40,000 tokens analysed with mixed logistic regression analysis to isolate the significant factors influencing dialect change.

4. *Sprache in Baden-Württemberg: Merkmale des regionalen Standards* ‘Language in Baden-Württemberg: Features of the regional standard language’ (Spiekermann 2008) provides a quantitative analysis of 12 *Regionale Merkmale* ‘regional features’, 8 *Allegrosprachliche Merkmale* ‘allegro-linguistic features’, and 5 *Hypermerkmale* ‘hyper-features’, deviant forms, hypercorrected in the direction of the prestige variety, standard German (see Lenz 2005:76).
5. *Stuttgarter Schwäbisch: Laut- und Formenlehre eines Stuttgarter Idiolekts* ‘Stuttgart Swabian: Phonology and Morphology of a Stuttgart idiolect’ describes an urban Stuttgart idiolect in modern linguistic terms, that of the author himself (Frey 1975);
6. *Schwäbisch: Dialekt/Hochsprache Kontrastiv: Sprachhefte für den Deutschunterricht* ‘Swabian: Dialect/Standard German Contrasted: A language volume for teaching German’ (Ammon and Loewer 1977).

All but two of the 21 variables (SAF1 Swabian Affix *-le* and REL *wo*-Relatives) are coded for a binary distinction between the dialect variant and the standard German equivalent[17], i.e., the variant “normally written and spoken by educated speakers” (Trudgill and Hannah 2013:Loc221) and prescribed by *Duden*, the gatekeeper of the German language (Duden 2015, 2016; Duden Online 2018). For the Swabian Affix *-le* (SAF1) a normed frequency is used, i.e., the number of occurrences per 100 words (see Appendix A.2), and for Swabian Relativisers (REL) several different categories and frequencies are analysed (see Chapter 6).

3.6.1. Phonological variables

The phonological system of Swabian is quite complex with greater variety in the vowels and diphthongs than standard German. Whereas standard German has only three diphthongised vowels (see Figure 3-8), Swabian has ten (see Figure 3-9). Appendix A.1 provides a detailed

[17] I follow traditional sociolinguistic practice in choosing a binary categorisation. “While collapsing detailed transcriptions into categories ... may be undesirable in the sense that one loses the phonetic resolution of the original transcriptions, it should be remembered that the term ‘variant’ is only meaningful if we choose to impose categories onto what is, after all, a phonetic continuum. As long as this is carried out in a careful, principled, and reproducible way, the approach serves the sociolinguist’s purposes well” (Watt 2000:97).

description of the ten phonological variables selected for this study, including examples from the Swabian corpus with dialect maps where available. Table 3-5 provides a summary of the number of tokens for the ten phonological variables, broken down by study type and recording year.

	Monophthongs		Diphthongs		unstressed
	short	long	forward	backward	
Close	i ʏ u	iː ʏː uː			
Close-mid		eː øː oː			ə
Open-mid	ɛ œ ɔ	ɛː	ɔɪ		
Open	a	aː	ai	au	

Figure 3-8. Standard German Vocalic System (adapted from Duden 2015)

	Monophthongs		Diphthongs		
	short	long	forward	central	Backward
Close	i u	iː uː	ui	iə uə	
Close-mid	e o	eː oː	əɪ	eə ou	əu
Open-mid	ɛ ə ɔ	ɛː əː ɔː	ɔɪ		
Open	a	aː	ae		Au

Figure 3-9. Swabian Vocalic System (adapted from Frey 1975)

Phonological Variables	Panel 1982	Panel 2017	Twin 2017	TOTAL
AIS1 - MHG /ī/ Diphthong [əɪ ~ ai]	2,758	3,849	6,816	13,423
AIS2 – MHG /ei/ Diphthong [ɔɪ ~ ai]	2,371	3,300	5,657	11,328
ANN – Nasal ‘a’ before ‘n’ [ã ~ an]	2,402	2,721	4,880	10,003
FRV1 – Unrounded Front Vowel [e: ~ ø:]	695	750	1,286	2,731
FRV2 – Unrounded Diphthong [aɪ ~ ɔʏ]	712	892	1,540	3,144
FRV3 – Unrounded Front Vowel [iə ~ ʏ:]	1,307	1,988	3,288	6,583
FRV4 – MHG /uo/ Diphthong [uə ~ u:]	1,752	2,266	3,651	7,669
LEO – Lower Long Vowel [ɛ: ~ e:]	1,245	2,304	4,124	7,673
SFV – Stop-Fricative Variation [ɪç ~ ɪk]	602	963	1,581	3,146
STPV – Palatal Coda -st [ʃ ~ s] with verbs	376	522	1,004	1,902
STP6 – Palatal Coda -st [ʃ ~ s] with six verbs	568	640	1,324	2,532
STPI – Palatal Coda -st [ʃ ~ s] with ‘ist’	1,715	2,486	4,614	8,815
STPO – Palatal Coda -st [ʃ ~ s] with non-verbs	1,409	2,012	3,740	7,161
TOTAL Phonological Tokens	**17,912**	**24,693**	**43,505**	**86,110**

Table 3-5. Total Tokens in the Swabian Corpus – Phonological Variables

3.6.2. Morphosyntactic variables

The morphological system of Swabian has many marked differences with the standard German system, such as irregular verb stems, verbal inflexions, affixes (prefixes and suffixes), periphrastic constructions, as well as a variety of different lexical items. Appendix A.2 provides a detailed description of the eleven morphosyntactic variables selected for this study, including examples from the Swabian corpus with dialect maps where available. Table 3-6 provides a summary of the number of tokens for 10 morphosyntactic variables, broken down by study type and recording year. The eleventh variable, Relative Clause Markers (REL), is handled through a separate analysis (see Chapter 6).

Morphosyntactic Variables	Panel 1982	Panel 2017	Twin 2017	TOTAL
DAS – Definite Neuter Article: *des ~ das*	2,106	3,414	6,191	11,711
EDP – Plural Verb Inflection: *-ed ~ -en*	942	2,319	3,647	6,908
IRV1 – Irregular Verb: *gange ~ gehen*	263	371	718	1,352
IRV2 – Irregular Verb: *stande ~ stehen*	195	200	456	851
IRV3 – Irregular Verb: *hen ~ haben*	1,081	1,865	3,462	6,408
NEG – Negative Marker: *ned ~ nich(t)*	1,388	1,942	3,332	6,662
PVB – Periphrastic Subjunctive: *dääd ~ würde*	166	206	414	786
SAF1B – Swabian Affix: *bissle ~ bisschen*	252	307	600	1,159
SAF3 – Swabian Affix: *nââ- ~ hin-*	133	140	302	575
SAF5 – Swabian Affix: *Ø ~ ge-*	592	1,238	1,898	3,728
TOTAL Morphosyntactic Tokens	**7,118**	**12,002**	**21,020**	**40,140**

Table 3-6. Total Tokens in the Swabian Corpus – Morphosyntactic Variables

3.6.3. Dialect Density Index (DDI)

It is important to note that none of the participants (even the oldest born in 1922) is a categorical speaker of Swabian. All variables selected for this study show variability: some show high rates of the dialect variant, and others show high rates of the standard variant. In order to assess speakers' level of dialect, I developed a Dialect Density Index (DDI), modelled on the measure of dialect density by Wolfram and others (Van Hofwegen and Wolfram 2010; Oetting and McDonald 2002). DDI is a token-based composite metric which represents the concentration of dialect variants in each speaker's repertoire, calculated as the total dialect variants divided by the total variants. In order to evaluate different types of dialect density, I created five sub-indices: (1) grammatical level: 10 phonological and 10 morphosyntactic variables; (2) type of variety: 12 Swabian-only and 8 regional variables (see Section 3.7.3.1); (3) salience: 9 high-salience and 11

Dialect Density Sub-indices (DDI)	Panel 1982	Panel 2017	Twin 2017	TOTAL
BY COMMUNITY:				
Schwäbisch Gmund	16,639	20,768	42,138	79,545
Stuttgart	8,391	15,927	22,387	46,705
BY GRAMMATICAL LEVEL:				
Phonological Variables (10)	17,912	24,693	43,505	86,110
Morphosyntactic Variables (10)	7,118	12,002	21,020	40,140
BY LINGUISTIC VARIETY:				
Swabian-only Variables (12)	14,611	20,661	35,703	70,975
Regional Variables (8)	10,419	16,034	28,822	55,275
BY VARIABLE STATUS:				
Changing Variables (15)	19,738	28,907	50,493	99,138
Stable Variables (5)	5,292	7,788	14,032	27,112
BY VARIABLE SALIENCE:				
High-Salience Variables (9)	13,987	20,234	36,163	70,384
Low-Salience Variables (11)	11,043	16,461	28,362	55,866
BY VARIABLE STIGMA:				
High-Stigma Variables (5)	5,364	6,732	12,013	24,109
Low-Stigma Variables (15)	19,666	29,963	52,512	102,141
ALL VARIABLES (20)	**25,030**	**36,695**	**64,525**	**126,250**

Table 3-7. Total Tokens for the Dialect Density Indices (DDI) by Study Type and Year

low-salience variables (see Section 3.7.3.3); and, (5) all 20 linguistic variables combined. Table 3-7 provides a summary of the number of tokens for these different measures of dialect density.

3.7. The predictor variables

Five traditional socio-demographic factors, three composite sociolinguistic indices, and five other common sociolinguistic factors have been evaluated as predictors in all analyses. Predictor variables specific to a given linguistic variable, such as articulatory environment for the (ai) diphthong merger (Chapter 5) and animacy of the antecedent for relative clauses (Chapter 6), are discussed in the relevant chapter.

3.7.1. Socio-demographic factors

As Labov so eloquently stated over 50 years ago, "no change takes place in a social vacuum" (Labov 1963:274). The first wave of research into language variation and change focussed on traditional social-demographic factors, such as age, sex and socioeconomic class, which have been the mainstay of sociolinguistic analyses for over 50 years. While this approach has proven to be highly insightful for a large number of studies, it has been heavily criticised as being limiting and ethnocentric, missing critical aspects of the power structure, speakers' personal identities, and individual mobilities (Britain 2016; Cheshire 2002, 2006; Eckert 2003; L. Milroy 1987; Rickford 1986). In an attempt to overcome these limitations and uncover the social factors impacting the Swabian sociolinguistic situation, this study considers both traditional socio-demographic predictors as well as several more fluid socio-structural indices.

3.7.1.1. Speaker community

As previously discussed in Section 3.4.1, two speech communities, Stuttgart and Schwäbisch Gmünd, are evaluated in this investigation. All tests and models show significant differences in dialect usage between these two communities; hence, this predictor is factored into all analyses. In line with considerable other research (Britain 2016; Britain and Trudgill 1999; Trudgill 1986), this study also shows greater dialect levelling in the urban environment of Stuttgart, which serves as the norm for the region (Svenstrup 2019), and less dialect attrition in the semi-rural countryside of Schwäbisch Gmünd (see Chapter 4). Table 3-8 shows the distribution of speakers in the Swabian corpus by speech community.

Community	Panel 1982	Panel 2017	Twin 2017
Stuttgart	7	7	13
Schwäbisch Gmünd	13	13	27
TOTAL Speakers	**20**	**20**	**40**

Table 3-8. Speaker Distribution by Community, Study Type, and Year

3.7.1.2. Speaker sex

Speaker sex is one of the most commonly studied socio-demographic predictor variables in sociolinguistic research (Bucholtz 2002; Cheshire 2002; Eckert 1989; Labov 1990), and most studies, at least in western societies, confirm Labov's principles regarding sex and language change. However, Germany is not considered to be a highly gender-influenced society, and in fact, most linguistic studies of German have shown no effect of speaker sex on an individual's choice of dialect variants (Auer, personal communication). Indeed, Labov (1990:212) himself maintains that "not all sociolinguistic variables show a sex effect," although he adds that the majority do. Because speaker sex is such a powerful influence in many sociolinguistic situations across the world, it has been incorporated in this investigation and has only been dropped after testing and modelling have confirmed there to be no significant effect.

In this study, sex is treated as a discrete variable with two values, male and female, based on individuals' self-identification (i.e., "social identity" (Cheshire 2002; Eckert 1989) in the Socio-demographic Questionnaire completed at the end of the interview (see Section 3.5.1.7 and Appendix D.5). The response for sex is a free-form box, and no individuals wrote in responses other than *weiblich* 'female' or *mannlich* 'male'. Table 3-9 shows the distribution of speakers in the Swabian corpus by sex.

Speaker Sex	Panel 1982	Panel 2017	Twin 2017
Men	11	11	22
Women	9	9	18
TOTAL Speakers	**20**	**20**	**40**

Table 3-9. Speaker Distribution by Sex, Study Type, and Year

3.7.1.3. Speaker age

Speaker age is another of the most frequently investigated social variables in sociolinguistic research and has consistently proven to be a significant predictor of language change (Blondeau 2018; Buchstaller 2015; Eckert 1997). The role of age in language change has generally been approached from two perspectives: (1) GENERATIONAL CHANGE, change in the language spoken by speakers of different age groups; and (2) LIFESPAN CHANGE, change in the language spoken by individuals across their lifetimes, both of which are evaluated in this investigation.

Another important aspect of age considered in this study is that of the LINGUISTIC MARKET (Bourdieu 1991; Eckert 1997; D. Sankoff and Laberge 1978; Wagner 2012a), which claims that speakers exhibit greater use of dialect variants in younger ages, move to greater use of standard variants during middle ages, the years when they are heavily involved in the world of work, and then return to more dialect variants at older ages and after retirement, reflecting aspects of AGE-GRADING (Hockett 1950; Wagner 2012a). Some of my other research on lexical distribution and vocabulary growth across the lifespan has shown the linguistic market to be a significant factor in the use of Swabian versus standard German vocabulary (Baayen, Beaman, and Ramscar 2021).

Age is treated both as both a binned and a continuous variable in this study: bins are used to group speakers into age groups; and, birth year is used as a continuous variable for multivariate modelling purposes, which proved, in most cases, to be more explanatory than age groups. Informants in the Swabian corpus range in age from 18 (for the youngest speakers in 1982) to 88 (for the oldest speaker in 2017), covering a generational age-span of 105 years. Speakers were asked to provide their birth year in the Socio-demographic Questionnaire (see Appendix D.5) completed at the end of the interview. Table 3-10 shows the distribution of the speakers in the Swabian corpus by age group.

Study Year	Age Group	Birth Years	Age Range	Panel 1982	Panel 2017	Twin 2017
1982	Group 1	1901 thru 1921	61-81 years	*[18]		
1982	Group 2	1922 thru 1952	30-60 years	4		
1982	Group 3	1953 thru 1964	18-29 years	16		
2017	Group 4	1929 thru 1956	61-88 years		4	8
2017	Group 5	1957 thru 1987	30-60 years		16	17
2017	Group 6	1988 thru 2000	18-29 years			15
TOTAL Speakers				20	20	40

Table 3-10. Speaker Distribution by Age Group, Study Type, and Year

3.7.1.4. Speaker education

Speaker education is another predictor that is frequently considered in sociolinguistic studies (Ammon 2001; Cheshire et al. 1989; Moore and Carter 2015; Prichard and Tamminga 2012; Romaine 1992). While there are many ways to evaluate speakers' level of educational attainment, with the dual-educational system in Germany (Pritchard 1992), a straight-forward approach is whether the individual has completed their *Abitur* 'German college preparatory examination', *Abi* for short. Historically, few people in Germany completed this examination because it was not required for the majority of jobs. However, in recent years, requirements have been changing, with an increasing number of students now obtaining an *Abitur* and subsequently attending the university. The overall percent of individuals with an *Abitur* or higher educational degree rose from 7.8% in 1970 to 14.1% in 1982 to 18.9% in 1991 to 25.0% in 2000 (Frietsch 2003:38). Table 3-11 shows the distribution of the speakers in the Swabian corpus by education (with *Abitur* and without *Abitur*). In the current Swabian corpus, the panel study participants have a slightly higher level of education than the twin study participants: 70% of the panel versus 53% of the twin study participants completed their *Abitur*.

[18] Three speakers recorded in 1982 were over 60 years old and had passed away prior to 2017.

Education	Panel 1982	Panel 2017	Twin 2017
with Abitur	14	14	21
without Abitur	6	6	19
TOTAL Speakers	**20**	**20**	**40**

Table 3-11. Speaker Distribution by Education, Study Type, and Year

3.7.1.5. Social class

Extensive research has shown that language use varies across social strata with respect to speakers' power, status, wealth, etc.; however, determining the factors that effectively constitute social status categorisation is a complex task that has been deliberated by many sociolinguists through the years (Dodsworth 2009; Labov 1966b, 1990; L. Milroy and Milroy 1992; Moore 2011; Rickford and McNair-Knox 1994; Trudgill 1979). In order to investigate the effects of social status in Swabia, I developed a *Composite Class Index (CCI)*, consisting of two status dimensions – education and occupation – for both the speaker and the speaker's parents, equally weighted. The educational and occupational factors were drawn from Lampert et al. (2013) who outline a detailed approach for measuring socioeconomic status in Germany. Table 3-12 shows the structure of the German educational system and the levels assigned to speakers based on the school they attended (Lampert et al. 2013). Speakers receive .5 for attending the school and another .5 if they received a diploma from that school. Table 3-13 shows the general occupational categories assigned to each informant (*Ibid.*). Students were assigned the same occupational level as their parents and housewives the same level as their husbands.

The educational and occupational levels for each speaker and the speaker's parents are summed to create a Composite Class Index (CCI), a scale from 6 to 42, with higher values representing higher social classes. Following Labov's recommendation that "a useful view of the social distribution of a variable requires at least four divisions of the socioeconomic hierarchy" (Labov 1990:220), I divided the resulting scores into five even categories as shown in Table 3-14.

LEVEL	SCHULISCHE UND BERUFLICHE QUALIFIKATIONEN	SCHOOL AND PROFESSIONAL QUALIFICATIONS
1	Hauptschule Hauptschulabschluss	Primary School Certificate of Primary Education
2	Realschule Realschulabschluss	Secondary School Certificate of Secondary Education
3	Berufsschule Lehre/Lehrabschluss	Professional School Certificate of Apprenticeship
4	Fachschule Fachschulabschluss	Trade School Certificate of Trade School
5	Fachhochschule/Fachhochschulreife Gymnasium/Abitur	Vocational College Qualification University Entrance Qualification
6	Universität Bachelor Diplom	University Bachelor's Degree
7	Universität Master/Magister/Diplom/PhD/Doktor	University Master's Degree/PhD/ Doctorate

Table 3-12. Educational Levels adapted from (adapted from Lampert et al. 2013)

LEVEL	BERUF	PROFESSION
1	Landwirt Arbeiter (ungelernt/angelernt)	Farmers Workers (unskilled/semi-skilled)
2	Vorarbeiter/Facharbeiter Beamte (einfachen Dienst)	Foremen/Tradesmen Civil servants (lower service)
3	Selbstständige in Handel, Gewerbe Angestellte mit qualifizierter Tätigkeit	Self-employed in trade/business Employees doing qualified work
4	Angestellte mit verantwortlicher Tätigkeit Beamte (mittleren Dienst)	Employees in a position of responsibility Civil servants (intermediate service)
5	Freiberufler (keine Mitarbeiter) Beamte (gehobenen Dienst)	Freelancers (no employees) Civil servants (higher service)
6	Freiberufler (mit Mitarbeiter)	Freelancers (with employees)
7	Akademiker im freien Beruf Beamte (höheren Dienst)	Freelance academics Civil servants (highest service)

Table 3-13. Occupational Levels adapted from (adapted from Lampert et al. 2013)

CCI	Social Class Category
6-13	A
14-20	B
21-27	C
28-34	D
35-42	E

Table 3-14. Composite Class Index (CCI) and Derived Social Class Categories

Speaker Social Class	Panel 1982	Panel 2017	Twin 2017
A – Lower	16	8	19
B – Lower-middle	2	7	8
C – Middle	0	4	10
D – Upper-middle	2	1	3
E – Upper	0	0	0
TOTAL Speakers	**20**	**20**	**40**

Table 3-15. Speaker Distribution by Social Class, Study Type, and Year

Table 3-15 shows the distribution of speakers in the Swabian corpus by Composite Class Index. In this model, there are only four social classes in the Swabian corpus, since no speakers fall in the highest group. This binning of speakers by social class provides a useful picture of the distribution of speakers in the database; however, to support multivariate modelling, CCI is used as a continuous variable. The raw CCI score for each speaker is listed in Appendix B.

Figure 3-10 exposes the changing social situation in Swabia over the 35-years of this study. Increasing levels of education are creating a more highly stratified society; and, this change is not only across the lifespan (the blue and green boxes) but also across generations (large red box), demonstrating that social class differentiation has become more diversified, in stark contrast to the highly homogeneous social class structure of 1982 (small blue box).

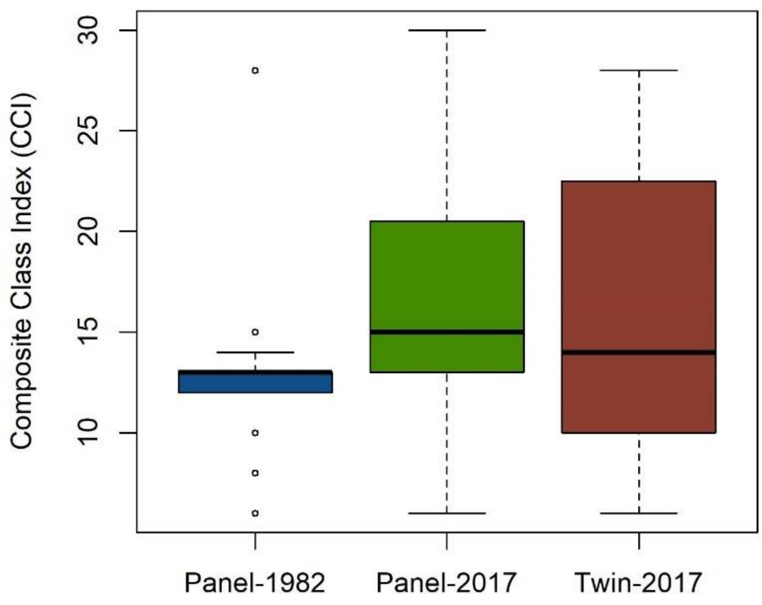

Figure 3-10. Summary of CCI Scores by Study Type and Year

3.7.2. Composite sociolinguistic indices

I developed three composite indices to assess the three social-structural predictors: identity, interlocutor choice, and mobility. The details on the operationalisation of each follow.

3.7.2.1. Swabian Orientation Index (SOI)

To measure speakers' level of dialect identity, I developed a SWABIAN ORIENTATION INDEX (SOI), modelled after Hoffman and Walker's (2010) *Ethnic Orientation Index*, Cheshire's (1982) *Vernacular Culture Index*, Sundgren's (2009) *Integration Index*, and Sharma's (2011, 2017) *Diversity Index*. Drawn from concepts in social psychology, SOI combines both objective or *etic* measurements with subjective or *emic* approaches to frame the concept of identity within the social context (Mendoza-Denton 2002; Le Page and Tabouret-Keller 1985; Tajfel 1974). This perspective toward identity measures speakers' *perception of difference* by both insiders and outsiders, the extent to which speakers *share qualities or values*, and the degree to which they *participate in shared activities* (Hoffman and Walker 2010:40‒41).

The questions in the Swabian Orientation Index (SOI) were selected to represent the wealth of cultural practices, local loyalty and pride, and social contacts that reflect a speaker's dialect identity. SOI is derived from speakers' responses to 12 questions asked during the interview covering their (1) allegiance to and feelings about being Swabian, (2) attitudes towards the Swabian language, and (3) knowledge of Swabian culture, specialties and activities. The speakers' responses were subjectively evaluated on a five-point scale and averaged, creating an index from one for the lowest to five for the highest Swabian orientation (see Table 3-16 for the parameters and questions and Figure 3-11 for the formula). The index was validated through principal components analysis (PCA) for each subscale: all subscales proved to be highly significant predictors of dialect versus standard language usage.

Swabian Allegiance:	
1-1.	Self-Declared Swabian: (Questions G1 and G2) *Are you a 'real' Swabian?* 5=definitely, 4=maybe, 3=don't know, 2=not really, 1=no
1-2.	Non-Swabian Contacts: (Question G4) *Do you know a lot people who are not Swabian?* 5=no, 4=a few, 3=don't know, 2=many, 1=a lot
1-3.	Swabian Ridicule: (Question G4) *If yes, what do they think of Swabian? Do they laugh at how you speak?* 5=always, 4=sometimes, 3=don't know, 2=not really, 1=not at all
1-4.	Accommodation: (Question H9) *When you travel to the north, do you try and change how you speak?* 5=not at all, 4=a little, 3=don't know, 2=a lot, 1=always
Swabian Language Attitudes:	
2-1.	Opinion of Swabian: (Question H2) *What do you think of Swabian? Is it "good" or "bad" German?* 5=super, 4=good, 3=don't know, 2=bad, 1=awful
2-2.	Job Prospects for Swabian Speakers: (Question H7) *Is it hard to find a job if you speak Swabian?* 5=no impact, 4=good, 3=don't know, 2=maybe some, 1=very difficult
2-3.	Opinion of Swabians Speaking Standard German: (Question H8) *Do you think it is odd when a Swabian speaks standard German?* 5=very odd/awful, 4=funny, 3=don't know, 2=good, 1=great
2-4.	Opinion of Non-Swabians Speaking Swabian: (Question H8) *Do you think it is odd when a non-Swabian speaks Swabian?* 5=very odd/awful, 4=funny, 3=don't know, 2=good, 1=great
Swabian Cultural Competence:	
3-1.	Swabian Knowledge: (Questions H3 and H4) *Are there different Swabian dialects? Are there any specific Swabian features?* 5=considerable, 4=some, 3=don't know, 2=not much, 1=none
3-2.	Swabian Specialties: (Question F1) *Do you know how to make Spätzle? Maultaschen? Moscht?* 5=of course, 4=somewhat, 3=don't know, 2=not well, 1=not at all
3-3.	Swabian People and Jokes: (Questions F3 and F4) *Do you know Häberle and Pfleiderer? Dodokay? Gogen-Witze?* 5=of course, 4=somewhat, 3=don't know, 2=not well, 1=not at all
3-4.	Swabian Activities: (Questions F2 and F5 and F6) *What is a Hocketse? What do you do there? What other local festivals?* 5=always, 4=some, 3=don't know, 2=not much, 1=never

Table 3-16. Swabian Orientation Index (SOI) Questions and Evaluation

$$SOI = \frac{\sum_1^n \lambda_i}{n}$$

Figure 3-11. Swabian Orientation Index (SOI) Formula

To illustrate how SOI is calculated, Table 3-17 shows the SOI values for Rupert and Angela, brother and sister from Schwäbisch Gmünd, in 1982 and 2017. I chose these two speakers to demonstrate the phenomenal change in Swabian identity that Rupert has undergone and the remarkable consistency in identity that Angela has maintained over the 35-year timeframe. As Chapter 4 shows, this change in SOI correlates with the frequency of dialect variants these two speakers use in the two time periods.

Swabian Orientation Questions	Rupert		Angela	
	1982	2017	1982	2017
Swabian Allegiance:				
1-1. Self-Declared Swabian	5	1	5	5
1-2. Non-Swabian Friends	4	1	3	3
1-3. Swabian Ridicule	5	4	3	3
1-4. Standard Language Accommodation	3	1	4	4
Swabian Language Attitudes:				
2-1. Opinion of Swabian Language	5	1	5	5
2-2. Job Prospects for Swabian Speakers	5	2	3	3
2-3. Swabians Speaking Standard German	3	2	5	5
2-4. Non-Swabians Speaking Swabian	1	1	5	5
Swabian Cultural Competence:				
3-1. Swabian Knowledge	5	5	5	5
3-2. Swabian Specialities	5	5	5	5
3-3. Swabian People and Jokes	5	5	5	5
3-4. Swabian Activities	3	1	5	5
Average SOI	4.08	2.42	4.42	4.42

Table 3-17. Example SOI Calculations for Two Speakers

Table 3-18 presents the summary statistics for SOI in the Swabian corpus, and Figure 3-12 graphically depicts SOI for the three study types. While there has been significant change across the lifespan for the individual panel speakers, interestingly, the 2017 twin study mirrors the 1982 panel study, reflecting no change in median Swabian orientation across the 35 years of this study (a point returned to in Chapter 4).

	Panel 1982	Panel 2017	Twin 2017
Lowest SOI	3.00	2.00	3.00
Highest SOI	4.50	4.75	4.42
Median SOI	4.00	3.71	4.00

Table 3-18. Median SOI Scores by Study Type and Year

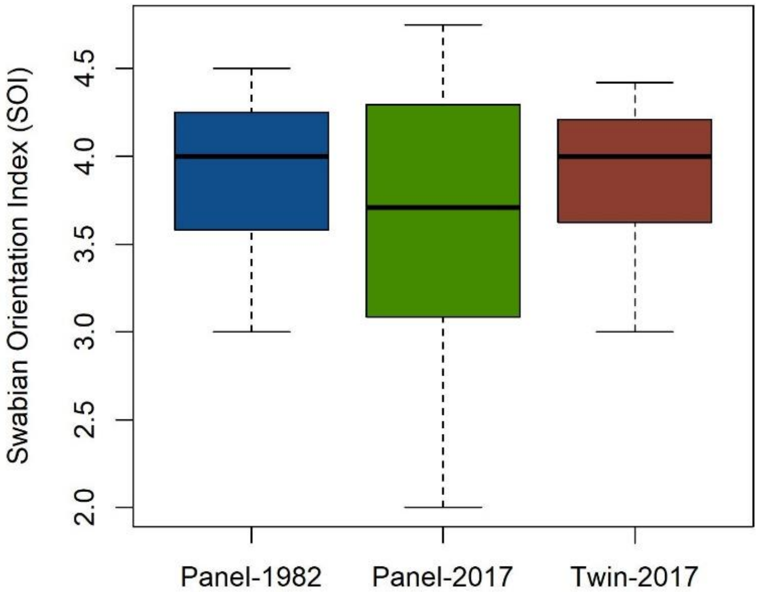

Figure 3-12. Summary of SOI Scores by Study Type and Year

3.7.2.2. Interlocutor Choice Index (ICI)

To operationalise the concept of how speakers accommodate to different interlocutors, I created an INTERLOCUTOR CHOICE INDEX (ICI), modelled on Sharma's (2017:395-396) “ego star network”, a network measure that “represents a set of relations between a given actor (ego) and others (alters).” ICI is a subjective index, based on a one-way interpretation of speakers’ self-reported answers to 13 questions in the Socio-demographic Questionnaire (see Appendix D.5) as to whether they “believe” they speak only Swabian, only standard German, or a combination of both with 13 different interlocutors (see Table 3-19). One point is assigned for each interlocutor if speakers say they speak only Swabian, zero for only standard German, and a half-point if they say both. This creates a scale from zero, for those reporting they speak no Swabian to anyone[19], to one, for those reporting they speak only Swabian with everyone. Figure 3-13 shows the formula.

1. Parents
2. Brothers and sisters
3. Relatives
4. Husband/wife/partner
5. Friends
6. Neighbours who are older
7. Neighbours who are younger
8. People you don’t know very well
9. People in a train or bus
10. Teachers/professors
11. Colleagues
12. Bosses
13. Clients

Table 3-19. Interlocutor Choice Index (ICI) Parameters

$$ICI = \frac{\sum_1^n \Upsilon_i}{n}$$

$$\Upsilon_i = \begin{cases} 0 & \text{if standard} \\ \frac{1}{2} & \text{if standard \& swabian} \\ 1 & \text{if swabian} \end{cases}$$

Figure 3-13. Interlocutor Choice Index (ICI) Formula

Table 3-20 provides the summary statistics for ICI drawn from the Swabian corpus, and Figure 3-14 presents a graphical representation. While the minimum ICI is .25 for the 1982 panel study and .23 for the 2017 panel study, Figure 3-14 reveals that .25 in 1982 is an outlier and that ICI has fallen across the lifespan from .89 for the 1982 panel speakers to .61 for the 2017 panel speakers. The minimum ICI for the 2017 twin study has dropped to .04 for someone who says she speaks Swabian only with her parents. Figure 3-14 also shows that ICI covers the entire range from 0 to 1 in the 2017 twin study, establishing considerable variation among the speakers and

[19] There are no cases in which a speaker reported not speaking Swabian to anyone. If that were to be the case, the speaker would have been excluded from the study.

signalling that the domains in which Swabian and standard German are spoken have become multiplex and more diverse over the 35 years of this study.

	Panel 1982	Panel 2017	Twin 2017
Lowest ICI	0.25	0.23	0.04
Highest ICI	1.00	1.00	1.00
Median ICI	0.89	0.61	0.73

Table 3-20. Median ICI scores by Study Type and Year

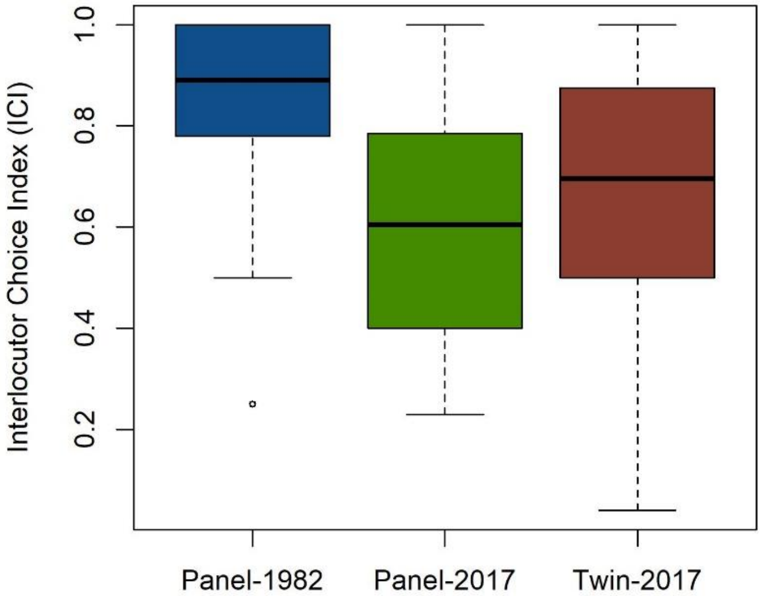

Figure 3-14 Summary of ICI Scores by Study Type and Year

3.7.2.3. Speaker Mobility Index (SMI)

Kerswill (2003:224) equates mobility with "commuting and other forms of short distance travel, as well as relocation" just as Britain (2016:233) maintains that "most people, most of the time, are engaged in relatively short-distance mundane mobilities." Thus, to operationalise this view of mobility, I developed a composite SPEAKER MOBILITY INDEX (SMI) which calculates the number of times individuals have moved throughout their lifetime, the distance from their current residence, and the length of time they spent in each location (these data are drawn from the Socio-demographic Questionnaire, Appendix D.5). SMI is made up of two subscales: RESIDENTIAL DISPERSION (represented by the Greek letter lambda λ) computes the number of moves a speaker has made over their lifetime, weighted by the number of years spent in each location; RESIDENTIAL DISTANCE (represented by the Greek letter delta δ) calculates the geographic distance (in kilometres) from the speaker's birthplace to each city lived in, weighted by the number of years in each location and converted to logarithms to reduce skewness for those who have moved long distances. SMI is the average of these two scores (re-scaled to an index from 0.0 to 1.0 for multivariate analysis). Figure 3-15 shows the SMI formulae.

To illustrate how the SMI is calculated, Table 3-21 provides an example for Angela, who was 18 in 1982 and 52 years old in 2017. In 1982, the family had never moved, and she had never lived away from home, giving her an SMI of 0. However, by 2017, she had lived in nine different locations, both within and outside of Swabia. Using the formulae in Figure 3-15, Angela's RESIDENTIAL DISPERSION INDEX is 79, and her RESIDENTIAL DISTANCE INDEX is 89, giving her a total SMI of 84 in 2017. In contrast, Angela's brother Rupert had a SMI of 39 in 1982 (he was 24 at the time and had moved 150 kilometres away for school) and a SMI of 52 in 2017 (he was 58 years old and, for the last 25 years of his life, has lived in the same location). The SMI provides a useful heuristic for measuring speakers' levels of "nomadism" and "sedentarism" (Britain 2016) in order to compare the relative mobility of different speakers.

Residential Dispersion

$$\lambda = 100 \times 1 - \sum_{i=1}^{n} \sqrt{y_i}$$

Residential Distance

$$\delta = \frac{100 \times \sum_{i=1}^{n} log(1 + d \times y)_i}{n}$$

Swabian Mobility Index (SMI)

$$SMI = \frac{(\lambda + \delta)}{2}$$

n = total number of years lived (speaker age)
d = residence (city) distance from birthplace (city)
y = years living in a residence (city)
i = number of moves (residences lived in)

Figure 3-15. Swabian Mobility Index (SMI) Formulae

Angela	Residence (City)	Years in Location	km from Birthplace
Birthplace	Schwäbisch Gmünd	--	--
Residence 1	Schwäbisch Gmünd	19	0
Residence 2	Heidelberg	2	157
Residence 3	Mannheim	2	172
Residence 4	Mannheim/Hohensachsen	2	172
Residence 5	Mannheim	4	172
Residence 6	Deggendorf	3	315
Residence 7	Iggingen	11	8
Residence 8	Groß Nemerow	2	710
Current Residence	Iggingen	8	8

Table 3-21. Example SMI Calculation for one Speaker

	Panel 1982	Panel 2017	Twin 2017
Lowest SMI	0.0	0.0	0.0
Highest SMI	64.0	84.0	81.0
Median SMI	14.5	41.0	40.0

Table 3-22. Median SMI scores by Study Type and Year

Table 3-22 provides the summary statistics for SMI from the Swabian corpus, and Figure 3-16 shows a graphical representation. While the lowest SMI, 0, is the same for all groups of speakers, the actual number of speakers who have never moved from their childhood home has dropped from 40% (8/20) in the 1982 panel study to 20% (4/20) in the 2017 panel study and 10% (4/40) in the 2017 trend study, patently demonstrating how geographic mobility has increased over the years. There is only one highly mobile speaker in 1982 (indicated by the open circle in Figure 3-16), who is evidently an outlier: Anneliese spent six years in school moving between Stuttgart and Ulm while studying to be a medical doctor. Figure 3-16 shows that there has been considerable change and variability in mobility across the lifespan of the panel speakers; however, the two 2017 samples show similar medians and range of diversity. It seems that mobility has become a way of life for some speakers, while others remain close to their roots.

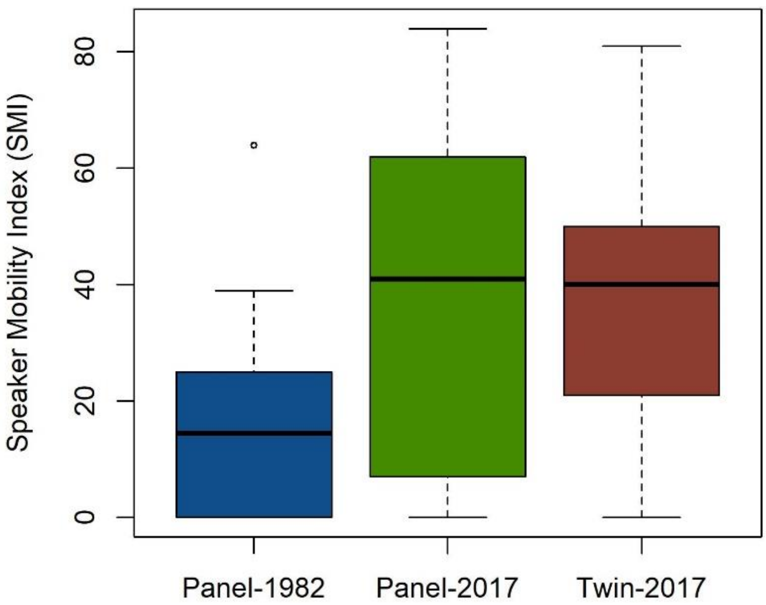

Figure 3-16. Summary of SMI Scores by Study Type and Year

3.7.3. Other sociolinguistic factors

Five sociolinguistic predictors have been incorporated in all analyses, each of which is described below.

3.7.3.1. Variable type

As discussed in Section 1.4.1, Swabian is part of the Alemannic family, a High German dialect, which means that it has many of its own dialect features but also shares features with other Alemannic and High German varieties. Hence, each of the 20 linguistic variables has been coded for Swabian-only, Alemannic (including Baden and Switzerland) or regional, covering variables originating from other regions, as documented in Table A- 1 in Appendix A. Table 3-7 provides a summary of the number of tokens for the 12 Swabian-only variables and the 8 regional variables. Because this thesis targets Swabian features, ALM and REG variables have been combined in order to contrast them with the SWG features. The decision on whether a variable is

Swabian, Alemannic or regional was made based on the dialectological literature, most notably *Sprachatlas von Nord Baden-Württemberg* (Klausmann 2018c, 2018a, 2018b), *Mundarten in Baden-Württemberg* (Ruoff 1983), *Sprache in Baden-Württemberg* (Spiekermann 2008), and Wenker's *Sprachatlas des Deutschen Reichs* (DiWA 2001).

3.7.3.2. Variable salience

The concept of variable salience is particularly tricky to operationalise without invoking circularity, and studies in salience have produced varying results in trying to assess its role in language change. For this study, I focus on a perceptual definition of salience, i.e., "speaker's awareness" (Trudgill 1986), the extent of naïve linguistic cognisance of the variable, which I determine based on whether a speaker has overtly commented on a variable during the sociolinguistic interview, particularly when asked the question, "Are there any specific features of Swabian? Which are the common ones?" Variables explicitly mentioned by the speakers are coded as high-salience; otherwise, they are considered as low-salience. The following examples from the transcripts illustrate overt comments on three linguistic variables: nasalisation of *an* (ANN), use of long *o* [oː] for the prefix *un* (ULO1), and Swabian suffix *-le* (SAF1) to mark the diminutive:

(29) *Markus (1982)*

SWG: *die saget net "kannsch" sondern "kãsch" … so dorch d Nâs und so was*
STD: die sagen nicht "kannst" sondern "kãnnst" … so durch die Nase und so was
ENG: 'they don't say "kannsch" but "kãsch" … so through the nose and so'

SWG: *"oomeeglich" … "oobache" ... wirklich "oomeeglich"*
STD: "unmöglich" … "unmöglich" … wirklich "unmöglich"
ENG: '"impossible" … "impossible" … really "impossible"'

[Markus-82-I-1-00:13:20]

(30) *Bertina (2017)*

SWG: *die Verniedlichungen, also ds Mädle … ds Gäbele genau … so e bissle*
STD: die Verniedlichungen, also das Mädchen … das Gäbelchen genau … so ein bisschen
ENG: 'the minimisation, so the little girl … the little fork right … also a little bit'

[Bertina-17-I-1-01:19:13]

In 2017, Siegfried tried to explain how Swabians can use nasal sounds to convey very different meanings:

(31) *Siegfried (2017)*

mã kã au viele Sache im Schwäbisch	'you can also say many things in Swabian
genial ausdrücke	brilliantly
was im Hochdeutsche	what in standard German
net so ôifach gâht	doesn't work so easily
wo mã s ôifach auf da Punkt bringt	where you get straight to the point
dâ sin mr mâl draufkomme,	we've come upon [it] sometimes
"sägen"	"to saw"
wo s um Säge gange	where it's about sawing
isch um Holz ja,	it's about wood yeah
dâ kã mã im Schwäbische -eh-	then you can in Swabian -eh-

kã mã mit drei Sache	you can with three things
des -äh- nasale verändre	the -ah- alternating nasals
"ãgsägt" "angsägt" "umgsägt"	"ãgsät" "angsägt" "umgsägt"
des sind drei verschiedene Sache ja	these are three different things yeah
wo se "ãgsät" isch ja "angesät"	where the "ãgsät" is yeah "seeded"
"abgsägt" isch "abgsägt"	"abgsägt" is "sawed" [or "ousted"]
"umgsägt" isch au "abgsägt"	"umgsägt" is also "ousted"
wenn du so willsch	if you so want'

[Siegfried-17-I-1-00:37:42]

While not a linguist, Siegfried tries to express how he can use specific Swabian variables to convey different meanings. Table A- 1 in Appendix A lists the variables being investigated in this study and their level of salience. Table 3-7 provides a summary of the number of tokens for the 9 high-salient and the 11 low-salient variables. However, another challenge for this study in evaluating speakers' awareness of certain variables is to distinguish salience from prestige and stigma, as I attempt to do in the following section.

3.7.3.3. Variable stigma

The stigmatisation or prestigiousness of linguistic variables has been a central topic in sociolinguistics since the field's inception (Kroch 1978; Labov 1963, 1966b; Trudgill 1986). Whether consciously or unconsciously, speakers promote or eschew prestigious or stigmatised features in large part based on the groups with whom they identify or to which they aspire (Milroy and Milroy 1985a; Milroy and Margrain 1980). In this respect, prestige is related to some extent to both salience (see Section 3.7.3.2) and identity (see Section 3.7.2.1). In chapter 4, I examine the interaction and collinearity of these three factors and their impact on dialect usage in Swabian.

To operationalise the concept of stigma for a linguistic variable, I again relied on comments made by Swabian speakers to determine whether a variable should be classified as having high or low stigma. Following is an example of a Swabian speaker talking about relative clause markers, providing evidence for its classification as stigmatised:

(32) *Ulrich (2017)*

die viele Schwaben irgendwie …	'many Swabians somehow …
"die wo" und "die was" und	"who where" and "who what" and
des kann i -ah- grammatikalisch nich	I can't -ah- grammatically
so falsch sprechen ja	say that so incorrectly yeah
"die --- die Leude die wo da warn"	"the --- the people who where there were"
"die wo" oder "die was" gibt s doch nich	*"who where" and "who was" just don't exist*
welche Bedeutung hat s	*what meaning it has*
wêiß keiner nee never	*no one knows not ever'*

[Ulrich-17-I-1-00:52:00]

Table A- 1 in Appendix A lists the variables being investigated in this study and their level of stigma. Table 3-7 provides a summary of the number of tokens for the 5 high-stigma and the 15 low-stigma variables.

3.7.3.4. Variable status

The evolutionary status of the variable, i.e., how far it has progressed in the change process, can influence the ongoing rate of the change. Bailey's (1973) WAVE MODEL of linguistic change maintains that change proceeds in an S-shaped curve: it starts slowly, gains momentum, and slackens off as the change nears completion: "what is quantitatively less is slower and later; what is more is earlier and faster" (Bailey 1973:82). Consequently, the WAVE MODEL predicts that changes occur faster in environments with favouring effects than in environments with disfavouring effects. Nahkola and Saanilahti (2004:89) found that the more dominant a variant is, the more stable its pattern of variation and that categorical variants are likely to remain categorical. Of course, external forces can always intervene to decelerate, deviate, and even halt a change in process. To operationalise the concept of variable status, I used a 10% cut-off point:[20] variables that have changed by more than 10% since the 1982 recordings (averaged over the community as a whole) are classified as "changing", while those showing less than 10% change are considered as "stable". In the current Swabian corpus, only three phonological variables (SFV, STPV, and STP6) and three morphosyntactic variables (DAS, SAF1, SAF1B) are classified as stable. All others in this study are in a dramatic state of change.

3.7.3.5. Lexical frequency

Bybee (2002:220) maintains that lexical frequency influences every aspect of language, and therefore should be incorporated in any serious linguistic study. She argues that frequently used words or phrases undergo "special reduction", yielding differing results based on lexical word class and showing that synchronic change occurs first in more frequently used words and then progresses to less frequent ones (Bybee 2017:273-275). However, other research has shown that once a sound change is in progress, it spreads faster through low-frequency words due to analogical processes; hence, high-frequency words show more resilience to change (Hay et al. 2015). Wieling, Nerbonne, and Baayen (2011) and Auer, Baumann and Schwarz (2011) found that high-frequency words show greater distance from the standard language. Wieling et al. (2011) established that frequency effects vary by location, and Auer et al. (2011) uncovered differing frequency effects based on the nature of the vowel, /iu/, /û/ and /uo/ versus /î/ and /ü/.

Erker and Guy (2012) discuss five methodological and analytical challenges in incorporating lexical frequency into the quantitative, variationist paradigm. The first concerns Zipf's (1949) law, which postulates that there are a few words with high frequencies and many words with low frequencies of occurrence. Thus, the dataset will naturally be skewed with a large number of tokens for the high-frequency words and a small number of tokens for the low-

[20] It is, of course, problematic to decide what quantitative criteria should be used to determine an appropriate cut-off point. Naturally, the higher the cut-off, the greater the number of variables that are grouped into one category or the other (Nahkola and Saanilahti 2004:88).

frequency words (see also Baayen 2001). This issue has been addressed in several ways in the current study. First, all multivariate modelling uses log-transformed frequencies to reduce skewing. Second, all analyses split the data into high- and low-frequency bins (based on a median split of the log-transformed frequencies). Third, individual outliers were evaluated to determine the impact of skewing on the data. Finally, outliers have been removed by identifying and excluding data points with residuals larger than 2.5 standard deviations from the mean.

The second methodological problem that Erker and Guy (2012) mention is whether to count underlying lemmata or surface forms and whether frequency should be measured locally or globally – naturally, there are pros and cons with each approach. Since the topics discussed in the sociolinguistic interviews are the same across interviews (e.g., hobbies, making *Spätzle* 'Swabian egg noodles'), I use local frequency counts derived from the words in the Swabian corpus rather than taking frequency from an external source which would be based on different topics.

The third problem that Erker and Guy (2013) bring up is whether frequency should be treated as a continuous or discrete variable; specifically, should the analysis examine counts, ranks, bins or what. As mentioned above, to keep it simple and provide adequate explanatory value, I split frequency counts into two bins, high-frequency and low-frequency words.

The fourth issue that Erker and Guy (2013) consider is whether frequency should be treated as another linguistic variable, demonstrating orthogonal constraints as with other linguistic predictors, or whether it has some other, special role in grammar. This conundrum dives into a deep theoretical debate between variationist and exemplar theorists on the role of the lexeme, which is beyond the scope of this thesis. For the current study, frequency is used as a predictor.

Finally, the fifth methodological challenge Erker and Guy (2013) ponder is how to handle the "autonomy principle" and deal with frequent collocations that are processed as "chunks" (Erker and Guy, 2012:529-531). In the Swabian corpus, for example, there are many lexicalised and grammaticalised constructions, such as *was-wôiß-i* <u>was-weiß-ich</u> 'what-do-I-know', *kôi-Ahnung* <u>keine-Ahnung</u> 'no-idea', *glaub-i* <u>glaube-ich</u> 'I think', and *wie-gsagt* <u>wie-gesagt</u> 'like-said'. These collocations are bound together in the transcriptions with a hyphen and hence are treated as single units for lexical frequency purposes.

3.8. Summary

This chapter has reviewed the Swabian corpus and the processes of collecting and preparing the data for analysis. The dependent and independent variables have been described, including the composite measures for Swabian orientation, interlocutor choice, and geographic mobility. The ensuing chapters provide detailed analyses in four critical areas of variationist sociolinguistic study: dialect levelling in real- and apparent-time (Chapter 4), the social meaning of a diphthong merger (Chapter 5), the influence of prescriptivism on the choice of relative markers (Chapter 6), and patterns of sociolectal coherence in real- and apparent-time (Chapter 7).

Chapter 4. Dialect levelling in real- and apparent-time

i bin, wenn du so willsch, e stolze Schwââbe
'I am, if you will, a proud Swabian'
-Siegfried 2017

4.1. Introduction

As elaborated in Chapter 2 (Section 2.3), educational, cultural, and demographic changes throughout the world, particularly in Germany, are leading to unprecedented dialect levelling. However, if, as Britain (2009:121) claims, dialect attrition "does not necessarily lead to an overall shift to the standard language," then which features shift, which do not, and how rapidly is the shift occurring in those features that do shift? Smith and Durham (2012:2) maintain that dialect shifts "may not indicate rapid dialect obsolescence per se, but merely reflect differing code choice" influenced by issues of time, identity, and place. Hence, a key question this study seeks to address is to what extent the assiduous dialect levelling occurring throughout Germany signals "dialect obsolescence", with a rampant shift to the standard language, or reflects "code choice" motivated by factors such as personal orientation to the homeland, inherent tendencies to accommodate to interlocutors of increasingly diverse backgrounds, high levels of geographic mobility, and rising levels of education.

This chapter focuses on two fundamental aspects of dialect change in Swabia: (1) the nature and extent of levelling in the community and across the lifespan, analysed in both real- and apparent-time, and (2) the role of social factors in dialect change, in particular speaker age, speech community, dialect identity, interlocutor choice, geographical mobility, and education. Specifically, this chapter probes two of the three hypotheses of this thesis: HYPOTHESIS 1: dialect levelling occurring in Swabian will be modulated by speakers' orientation to Swabia, their purported predilection to speak Swabian with the people they commonly interact with, and their geographic mobility across their lifetime; and, HYPOTHESIS 2: real-time studies complement apparent-time studies by providing insights into the nature of change: hence, the direction of language change can be observed in the apparent-time analysis of the twin study and the rate of diffusion in the real-time analysis of the panel study.

4.2. Theoretical background

The theoretical background on dialect levelling and longitudinal studies of dialect change has been thoroughly reviewed in Sections 2.3 and 2.4.

4.3. Data and methods

The analyses reported on in this chapter are based on the data and methods presented in Chapter 3. This section describes the dependent and independent variables investigated and the statistical methods employed in the exploring dialect density in Swabian.

4.3.1. Linguistic variable

The primary dependent variable considered in this chapter is the Dialect Density Index (DDI) (see Section 3.6.3 for details), which can be used to measure the degree of dialect levelling in Swabian, both in the community and the individual.

4.3.2. Sociolinguistic predictors

The following predictor variables (described in detail in Section 3.7) are considered in this analysis of the factors influencing dialect density in Swabia:

Socio-demographic factors:
- Speech community (Schwäbisch Gmünd or Stuttgart)
- Speaker sex (men or women)
- Speaker age group (five age groups, 2 for the oldest to 6 for the youngest)
- Speaker birth year (range from 1929 to 2000)
- Speaker education (0 for no Abitur or 1 with Abitur)

Composite sociolinguistic indices (with respect to the speaker):
- Speaker Composite Class Index (CCI) (range from 6 to 30)
- Swabian Orientation Index (SOI) (range from 2.00 to 4.75)
- Interlocutor Choice Index (ICI) (range from 0.04 to 1.00
- Speaker Mobility Index (SMI) – Dispersion (range from 0 to 79)
- Speaker Mobility Index (SMI) – Distance (range from 0 to 95)

Other sociolinguistic factors (with respect to the variables):
- Variable level (phonological or morphosyntactic)
- Variable variety (regional or Swabian)
- Variable status (changing or stable)
- Variable salience (low or high)
- Variable stigma (low or high)

Other factors (with respect to the interview situation):
- Sample type (panel or twin)
- Recording year (1982 or 2017)
- Interviewer closeness (previously acquainted or not)
- Interviewer-interviewee same-sex (yes or no)
- Principal investigator presence (yes or no)
- Number of persons in the interview (range from 2 through 6)

4.3.3. Stages of standardisation

In order to assess the extent of dialect levelling and standardisation occurring in Swabian, it is practical to have an empirical scale against which the dependent variable can be measured. Labov (1994:79-83) proposes five phases of linguistic change to assess the gradual diffusion of an incoming variant: stage 1 – completed change; stage 2 – change nearing completion; stage 3 – midrange change; stage 4 – new and vigorous change; and, stage 5 – incipient change. Trudgill et al. (2000:3-4) recognise three (or five) stages of levelling leading to new dialect formation: stage 1 – rudimentary levelling; stage 2a – extreme variability; stage 2b – further levelling; stage 3a – focussing via koinéisation and simplification; and, stage 3b – focussing via reallocation. Auer (2005) defines a typology of speech repertoires distinguishing five "sociolinguistic types", representing a chronological order in the process of dialect standardisation: type 0 – no endoglossic standard (exoglossic diglossia – no levelling); type A – medial diglossia with an endoglossic standard; type B – spoken diglossia, strictly allocated and seldom overlapping domains of usage; type C – diaglossia, intermediate variants between standard and dialect, and type D – dialect loss.

Inspired by these models, I devised a standardisation scale to be used as a heuristic in classifying the degree of standardisation (i.e., levelling to the standard language) occurring for each of the twenty Swabian variables. Table 4-1 defines five stages of dialect standardisation, along with the frequency ranges of the dialect variant for each stage (following the ranges established by Labov (1994)). Stage 1, NASCENT STANDARDISATION, signifies that the standard variant is not well established and the dialect variant is the favoured form (frequency of the dialect variant over 85%); stage 2, INCIPIENT STANDARDISATION, indicates that the standard variant is beginning to encroach on the dialect, yet the dialect variant remains the majority form (between 65% and 85%); stage 3, EMERGING STANDARDISATION, signals a high degree of variability between the dialect and standard form (between 35% and 64%); stage 4, ADVANCING STANDARDISATION, portends that the standard form is expanding at the expense of the dialect form (dialect frequency between 15% and 34%); and, stage 5, EXTENSIVE STANDARDISATION, marks broad use of the standard form such that the dialect form is in significant attrition or has become obsolescent (frequency below 15%).

Stage	Standardisation Stage	Frequency of Dialect Variant
1	Nascent standardisation	above 85%
2	Incipient standardisation	between 65% and 85%
3	Emerging standardisation	between 35% and 64%
4	Advancing standardisation	between 15% and 34%
5	Extensive standardisation	below 15%

Table 4-1. Five Stages of Dialect Standardisation

4.3.4. Statistical methods

Two primary methods of statistical analysis standard in variationist sociolinguistics are employed in this chapter. Principal component analysis (PCA) (*prcomp* function in the R package *stats*, version 3.6.0) is a simple data reduction method which allows for the visualisation of the most important relationships in a multivariate dataset by reducing the dimensionality of the data orthogonally to a small set of derived factors (i.e., principal components) and thereby grouping speakers based solely on their linguistic behaviour (Horvath and Sankoff 1987:185-186). The second method is multivariate linear and logistic regression (Cedergren and Sankoff 1974) using generalised mixed-effects logistic regression modelling with random intercepts (*glmer* function in the R package *lme4*, version 1.1-21) (Bates et al. 2015) to evaluate the relative effect of each predictor on the dependent variable when multiple factors are concurrently in play (Baayen, Davidson, and Bates 2008:271). Mixed-effects modelling with random intercepts enables the investigation of both group norms and individual variances from the group (Drager and Hay 2012:60). Since speaker and variable comprise a subset of a larger population that has not been exhaustively sampled, both have been incorporated as random effects to normalise inter-speaker and inter-variable variability (Baayen, Davidson, and Bates 2008; Drager and Hay 2012).

Because the "interpretation of regression coefficients is sensitive to the scale of the input" (Gelman 2008), speaker birth year and the composite sociolinguistic indices have been normalised to adjust for the fact that the scales for these predictors are of different orders of magnitude which, if left alone, would skew the results. Moreover, each predictor represents different physical quantities and qualities, and there is no independent *a priori* knowledge to expect that some variables should be considered more important than others. Thus, each predictor was centred and rescaled using the *scale* function in the *base* R package, version 3.6.0, which z-normalises the predictors by subtracting the mean and dividing by the standard deviation (defined as *sqrt(sum(x^2) / (n-1))*). This approach standardises all coefficients on the same scale, making their magnitudes more comparable and hence interpretable.

Best-fit models were determined with Akaike's Information Criterium (AIC), a standard metric for assessing the quality of a statistical model taking into consideration the trade-off between complexity and goodness of fit (Burnham and Anderson 2004). Only significant effects were included in the final models. An analysis of outliers was made to check for skewness and modality and to ensure normal distributions. In addition, each model was subjected to model criticism and optimised by excluding outliers (i.e., data points with residuals larger than 2.5 standard deviations from the mean) and then refit.

4.4. Analysis and results

The analyses and results for this investigation are organised into four subsections. First, changes in dialect density (Section 4.4.1) and the individual variables (Section 4.4.2) are analysed in both real-time and apparent-time, followed by an evaluation of changes in the individual speakers across their lifespans (Section 4.4.3). Next, the results of the multivariate analyses examining the interaction effects between the sociolinguistic factors are explored (Section 4.4.4). The discussion section combines the quantitative findings with qualitative considerations, incorporating comments from the Swabian participants, as well as my own ethnographic observations gathered from more than five years living in the region (Section 4.5).

4.4.1. Change in dialect density

To investigate dialect change in Swabian, this section starts with a distributional analysis of frequency changes in both real- and apparent-time by comparing dialect density across the two study types (Section 4.4.1.1). Next, differences across the two speech communities are considered (Section 4.4.1.2), followed by a deep dive into dialect change with respect to Swabian orientation and interlocutor choice (Section 4.4.1.3), geographic mobility (Section 4.4.1.4), educational achievement (Section 4.4.1.5), and linguistic variety (Section 4.4.1.6).

4.4.1.1. Change in real- and apparent-time

Recall that HYPOTHESIS 2 of this investigation of Swabian maintains that apparent-time change mirrors real-time change and that the direction of change can be observed in the apparent-time analysis and the speed of change in the real-time analysis (see discussion in Section 2.4). In order to investigate this premise, Figures 4-1 through 4-3 depict dialect density for each study type – 1982 panel study, 2017 panel study, and 2017 twin study – and age group (see Table 3-10). Dialect density is shown on the vertical axis and speaker age group on the horizontal axis. Stuttgart speakers are shown by purple dots and Schwäbisch Gmünd speakers by turquoise triangles. The dotted horizontal lines mark the median dialect density for each study type.

For the 20 panel speakers in 1982, the average DDI for all 20 variables is 56.8%, which drops to 38.4% in 2017, a decrease of 18.4% over these speakers' lifespans (see Table 4-2). For the 40 twin speakers in 2017, the average DDI is 39.9%, comparable to the 2017 panel study, providing support for the general premise that, across their lifetime, individual speakers typically follow the community trend. The figures also show a consistent pattern of decline in dialect density in apparent-time in both the panel and twin study, with the younger age groups showing lower levels of dialect density than the older generations, revealing further parallels in apparent-time and real-time analyses. Moreover, the apparent-time change in the twin study provides additional evidence that the changes in dialect density for the 20 panel speakers are the result of individual communal change, in which both the individual and the community are changing together, and are not due to age-grading, in which individuals change according to "patterns appropriate to their age" (see Sankoff 2019:199). Rather, it is the younger age groups who show a more rapid decline in dialect density over the middle and older age groups, particularly for Stuttgart speakers, signalling that the younger, urban generation is leading the change.

Overall, the 1982 recordings (leftmost panes in these figures) demonstrate a highly stable community with little difference across the two age groups. Change in apparent-time is detected by the consistent median drop in dialect density between the oldest and youngest speakers in the 2017 recordings (middle and rightmost panes). Change in real-time is perceived by the drop in dialect density between 1982 and 2017 for the panel participants (left and middle panes) exposing lifespan change, and by the drop between the 1982 panel and the 2017 twin participants (leftmost and rightmost panes), revealing real-time community change.

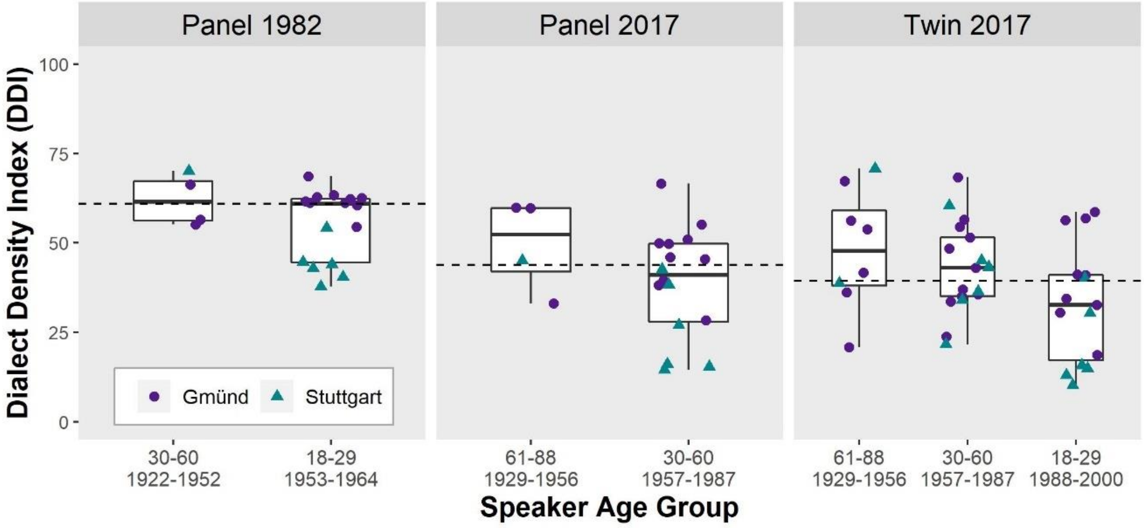

Figure 4-1. Dialect Density by Study Type and Age Group – All Variables

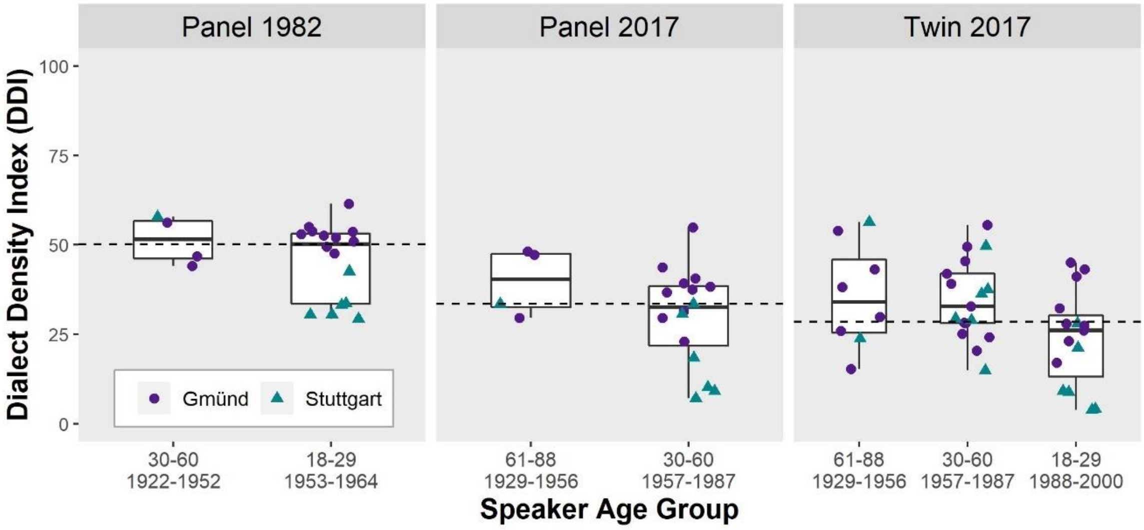

Figure 4-2. Dialect Density by Study Type and Age Group – Phonological Variables

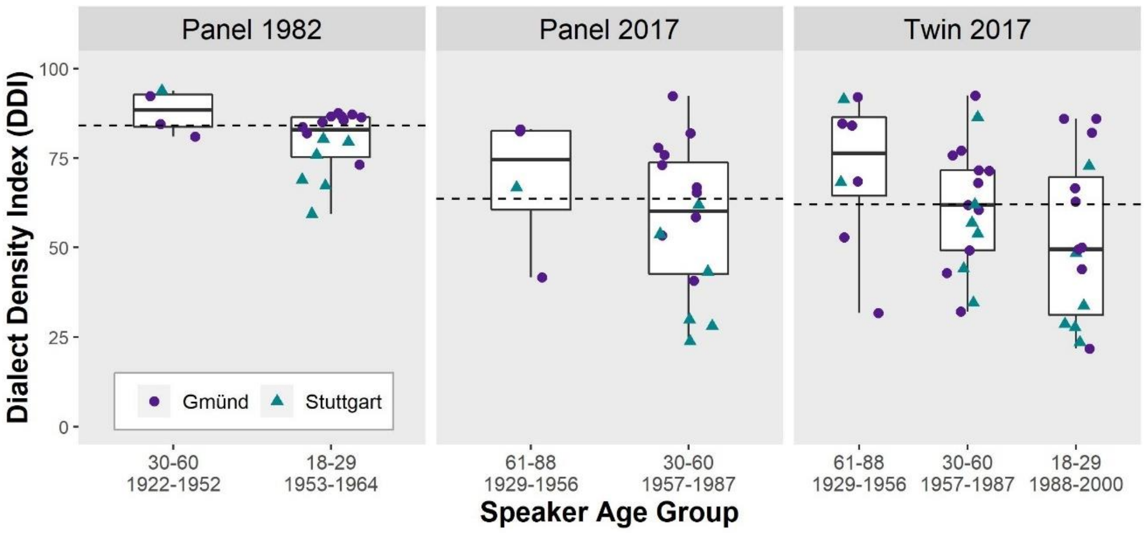

Figure 4-3. Dialect Density by Study Type and Age Group – Morphosyntactic Variables

Dialect Density Indices (DDI)	Panel 1982		Panel 2017		Twin 2017	
	DDI	n	DDI	n	DDI	n
BY COMMUNITY:						
Schwäbisch Gmünd	61.2	16,639	47.4	20,768	44.6	42,138
Stuttgart	47.9	8,391	26.6	15,927	30.8	22,387
BY GRAMMATICAL LEVEL:						
Phonological Variables (10)	46.9	17,912	29.9	24,693	30.0	43,505
Morphosyntactic Variables (10)	81.7	7,118	55.8	12,002	60.2	21,020
BY LINGUISTIC VARIETY:						
Swabian-only Variables (12)	43.5	14,611	23.0	20,661	23.3	35,703
Regional Variables (8)	75.4	10,419	58.3	16,034	60.3	28,822
BY VARIABLE STATUS:						
Changing Variables (15)	49.3	19,738	28.7	28,907	29.6	50,493
Stable Variables (5)	84.5	5,292	74.4	7,788	76.8	14,032
VARIABLE SALIENCE:						
High-Salience Variables (9)	71.1	13,987	51.9	20,234	54.4	36,163
Low-Salience Variables (11)	38.6	11,043	21.8	16,461	21.3	28,362
BY VARIABLE STIGMA:						
High-Stigma Variables (5)	51.2	5,364	28.8	6,732	31.5	12,013
Low-Stigma Variables (15)	58.3	19,666	40.5	29,963	41.8	52,512
ALL VARIABLES (20)	56.8	25,030	38.4	36,695	39.9	64,525

Table 4-2. Swabian Dialect Density Change Across Time

Figure 4-2 and Figure 4-3 break out dialect density for the 10 phonological and 10 morphosyntactic variables, respectively. The same trends are apparent at both levels of the grammar, with strong dialect levelling throughout the lifespan and across the community. Notably, dialect density is considerably higher for the morphosyntactic variables than for the phonological ones (see Table 4-2) and has decreased even more rapidly across the 35-years of this study: dialect density shows a real-time decline of 17.0% for the phonological variables and 25.9% for the morphosyntactic ones. In addition, the morphosyntactic variables show greater variability (i.e., interspeaker dispersion) which may be because they are more subject to cognitive manipulation than are phonological variables which entail more physical motor control (Guy, personal communication). The differing levels and nature of dialect density for the phonological and morphosyntactic variables lead to the assumption that morphosyntactic variables show sharper social stratification than phonological ones, and hence are more likely to retreat in the face of pressure “from above” (Cheshire 1987; D. Sankoff and Laberge 1978).

4.4.1.2. Urbanity and (semi-)rurality in Swabia

I now turn to the changes in dialect density between the large urban city of Stuttgart and the mid-sized, semi-rural town of Schwäbisch Gmünd. As discussed in Sections 1.4.2 and 1.4.3, differences in urbanity and rurality are ever-present in Swabia, and the urban-rural divide permeates all aspects of language usage. Following Trudgill’s (1974) GRAVITY MODEL, higher levels of standardisation are expected in Stuttgart, and elevated levels of dialect density are anticipated in Schwäbisch Gmünd (see Section 3.4.1 for a description of the two communities). Table 4-3 recaps the overall dialect density percentages for both communities across real- and apparent-time. In real-time, dialect density has dropped less in Schwäbisch Gmünd than in Stuttgart, but strikingly, dialect usage has not dropped at all in Schwäbisch Gmünd across apparent-time (the difference between the older and younger speakers is a mere 2.6%), while it has dropped the most for younger speakers in Stuttgart (24.6%). These results send a clear signal that younger speakers in Stuttgart are leading the change toward the standard language.

	Schwäbisch Gmünd			Stuttgart			
	1982	2017	△	1982	2017	△	
Real-time	61.2	47.4	13.8	47.9	26.6	21.3	
		Older	Younger	△	Older	Younger	△
Apparent-time		44.4	41.8	2.6	45.1	20.5	24.6

Table 4-3. Dialect Density Change in Real- and Apparent-time across Communities

In order to visualise the differences and change in the communities, Figures 4-4 through 4-6 present the results of a principal component analysis (PCA). The horizontal axes show principal component 1 (PC1), and the vertical axes principal component 2 (PC2) for all 20 variables. The Stuttgart speakers are enclosed with a purple ellipse and the Schwäbisch Gmünd speakers with a turquoise ellipse, drawn to two standard deviations from the mean of the group.

In 1982 (Figure 4-4), the plots reveal that the two speech communities were quite distinct: Stuttgart shows broader variation, while Schwäbisch Gmünd shows a tighter-knit community. By 2017 for the panel speakers (Figure 4-5), the two ellipses are beginning to merge, with Schwäbisch Gmünd converging toward Stuttgart. Finally, the 2017 twin study (Figure 4-6) shows almost complete overlap of the two communities in their use of these 20 dialect variants. Stuttgart still projects a broad range of variability, but now Schwäbisch Gmünd is almost wholly consumed within what appears to be a merged regional variety (cf. Auer's (1999) "fused lects"; Trudgill's (1986) "new dialect formation"; Kerswill and Williams' (2000) "koinéisation"), heralding a new situation of massive linguistic heterogeneity within a group of previously homogeneous speakers (cf. Smith and Durham 2012).

Validation for the sweeping changes occurring in Schwäbisch Gmünd can be found in the words of one of the panel speakers:

(33) *Siegfried (2017):*

Gmiind isch nimmer Gmiind,	*'Gmünd is no longer Gmünd*
in Gmiind in dr Innestadt im Spital	*in Gmünd in the city centre in the hospital*
isch alles Türkisch	*everything is Turkish*
s hat sich unglaublich verändert	*it has changed unbelievably*
und ganz viele eigsessene Gmünder	*and quite a lot of native Gmünders*
sin mit dr Entwicklung gar net eiverstande	*are not ok with the trend*
[die] sind enttäuscht	*they are frustrated*
wie s jetzt grad ablauft ja	*with how it's now currently going yeah*
ond i will net dass des jetzt irgendwie	*and I don't want in any way for this*

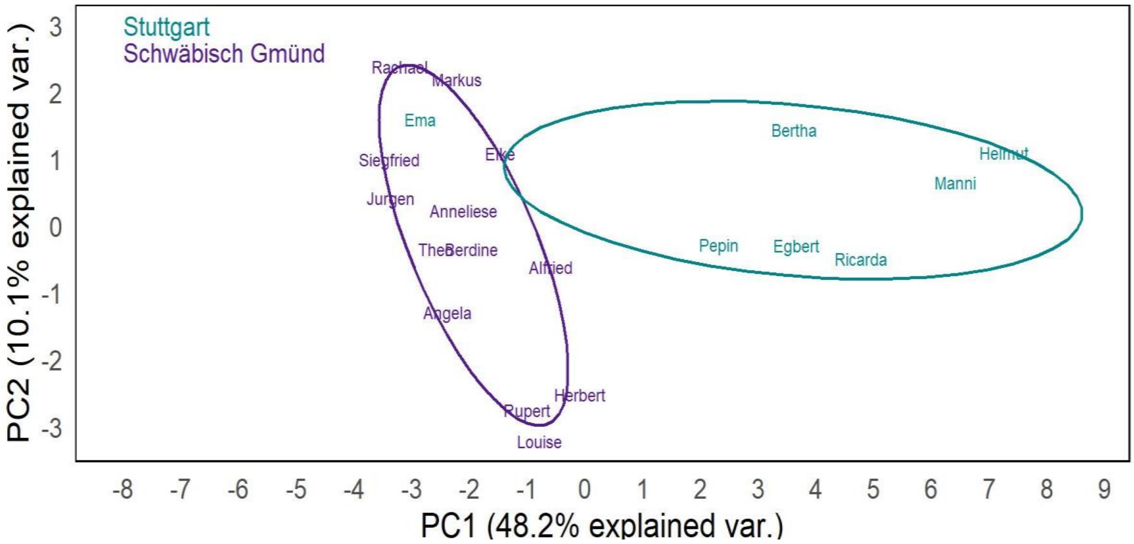

Figure 4-4. PCA for 20 Swabian Variables – 1982 Panel Study

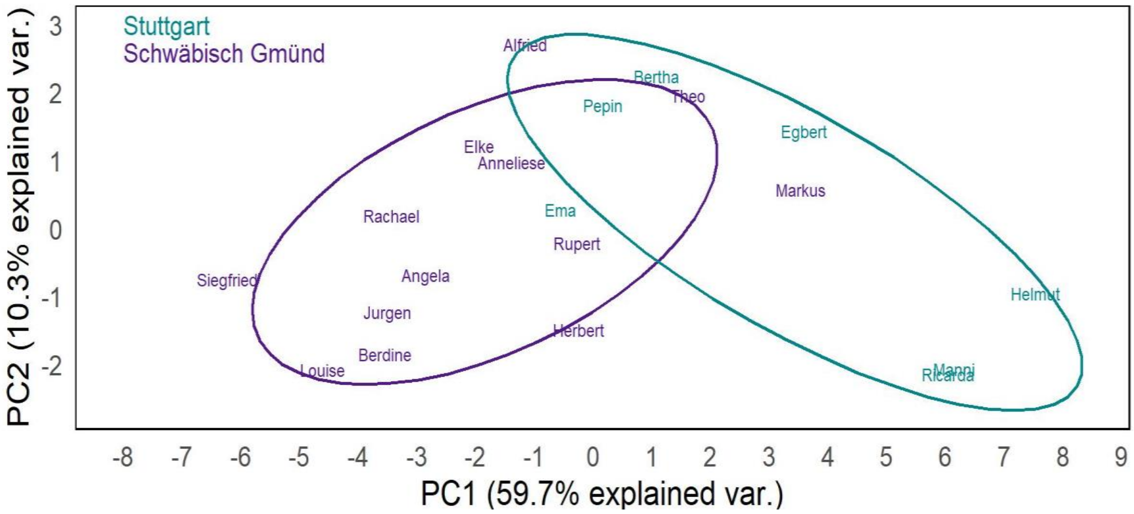

Figure 4-5. PCA for 20 Swabian Variables – 2017 Panel Study

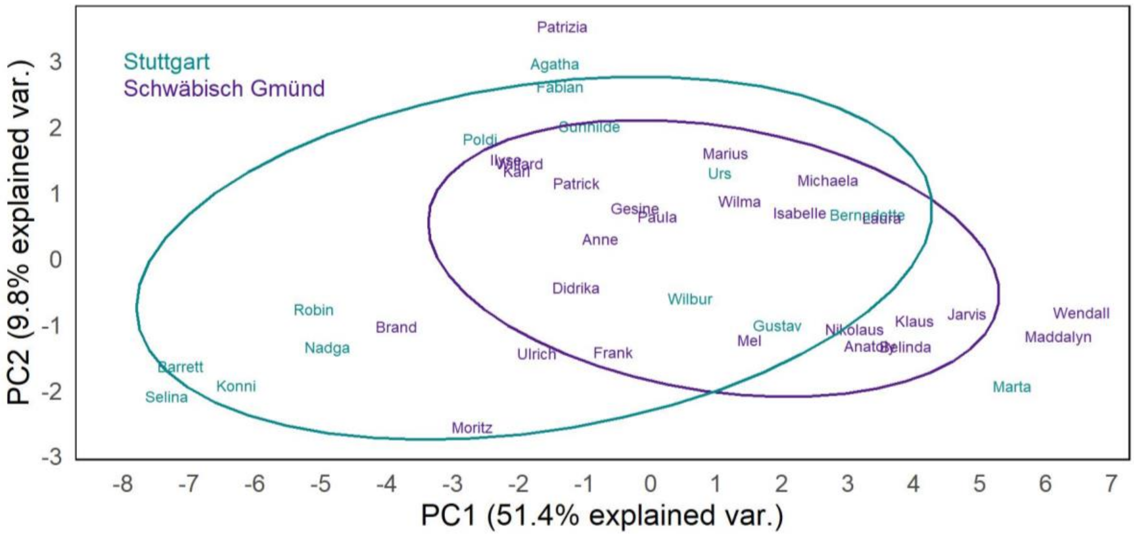

Figure 4-6. PCA for 20 Swabian Variables – 2017 Twin Study

rassischtisch raus kommt weil	*to come out as racist because*
i hab gege die Lait überhaupt gar nix	*I have absolutely nothing against the people*
i bin kôin Globalisierungsfanatiker	*I am not a globalisation-fanatic*
dass sich alles vermischt, des bin i net	*that everything mixes together, that I'm not*
jedes Land soll no seine Ôigeheite hen	*each land should have its own individualities*
Schwââbe soll Schwââbe sei,	*Swabians should be Swabians*
da Bôire soll no Bôirsch schwätze	*the Bavarians should speak Bavarian*
bin i konservativ in der Richtung	*I am conservative in this way*
aber da stand i dazu,	*but I stand by it*
und dâ hât sich in Gmiind viel verändert	*and a lot has changed in Gmünd'*
	[S021-17-I-1-Siegfried-00:34:05]

Although Siegfried does indeed come across as racist, his comments nevertheless reflect the changes that are taking place in Schwäbisch Gmünd. Of course, he is not only talking about the influx of the Turkish or the Italians before them or any other group of *Gastarbeiter* 'guest workers' who fulfil a highly productive role in the German economy and boost the upward mobility of the core workforce. Siegfried is lamenting change itself and how Germany has transitioned from a land of emigration to one of immigration (DOMiD 2020), bringing evermore diverse people into ever greater contact and on a global scale. What is the fate of the Swabian dialect within this context of vast societal transformation?

As pointed out in Section 1.4.3, considerable debate has ensued on the role of dialects in modern-day Germany: are they declining, are they being deployed for specialised domains of use, or are they converging into supraregional varieties? The results from Figure 4-6 indicate that these two varieties of Swabian (Stuttgart and Schwäbisch Gmünd) are merging (or have merged) into a SUPRAREGIONAL variety or REGIOLECT (see Section 2.3.7 for further discussion). Looking back at Figures 4-1 through 4-3 for all three study types, the majority of the turquoise triangles for the Stuttgart speakers appear below the purple dots for the Schwäbisch Gmünd speakers, signalling a lower level of dialect usage in the urban centre of Swabia. Hence, rather than the two varieties converging on one another, a more accurate description is the view that the Schwäbisch Gmünd variety is "adverging" (Auer and Schwarz 2015; Mattheier 1996) toward the higher status Stuttgart variety through a process of SUPRALOCALISATION or SUPRAREGIONALISATION (Auer 2013; Britain 2010; Hickey 2010). To dissect this phenomenon further and to understand what social factors may be affecting dialect change in Swabian, the next sections consider how dialect density is affected by three composite social indices – local orientation, interlocutor choice, and geographic mobility – along with educational level and the nature of the linguistic variable.

4.4.1.3. Dual roles of identity and accommodation

As discussed in Sections 2.3.3 and 2.3.4, the expression of personal identity and the process of accommodating to different interlocutors are intricately intertwined in influencing the forms occurring in an individual's speech. While it is beyond the scope of this research to weigh in on the debate over the theoretical and cognitive underpinnings of these two philosophies, this study can investigate which of these two approaches may have a stronger effect on dialect change in Swabia. This investigation employs two different composite indices: Swabian Orientation Index (SOI) (described in Section 3.7.2.1) and Interlocutor Choice Index (ICI) (described in Section 3.7.2.2).[21] Figure 3-12 and Figure 3-13 provide a summary of the median SOI and ICI scores in each of the three study types.

Figures 4-7 through 4-9 depict the distributional effects of SOI and ICI on dialect density for each study type, SOI on the left and ICI on the right. In each plot, SOI and ICI are shown on the horizontal axes and dialect density on the vertical axes. As before, Stuttgart speakers are represented by turquoise triangles and Schwäbisch Gmünd speakers by purple dots. The upper left corner of each plot displays the statistics from a linear regression model (*lm* function in the R package *stats*, version 3.6.0), showing the estimated correlation coefficient, adjusted R-squared, and p-value, along with the number of tokens and speakers in the sample.

Figure 4-7 illustrates dialect density for the 1982 panel speakers: while Swabian orientation is not a significant predictor of dialect density in 1982 ($p > .05$), interlocutor choice is significant ($p < .05$). In 1982, Stuttgart speakers claim to be more likely to accommodate to their interlocutors than Schwäbisch Gmünd speakers, as seen by the many turquoise triangles to the left of the purple dots. In fact, there is only one Stuttgart speaker in the upper right corner of the plot (Ema, the oldest speaker in Stuttgart) who shows high dialect density, high Swabian orientation, and low interlocutor choice, which can most likely be attributed to her age (49 in 1982, 84 in 2017) and occupation (housewife). While orientation was not a significant driver of speakers' propensity to speak dialect in 1982, speakers still recognised the need to adapt their speech for non-Swabian speakers, particularly those from the large, diverse metropolis of Stuttgart, who presumably interact more often with non-Swabian speakers.

Figure 4-8 shows that, by 2017, both Swabian orientation and interlocutor accommodation have become critical predictors of dialect usage for the 20 panel speakers ($p < .001$), even Ema), as well as for the 40 twin speakers shown in Figure 4-9 ($p < .01$). While dialect usage has declined over the years, dialect identity has remained a major influence for some speakers with certain interlocutors, supporting the supposition from Section 1.4.3 that the Swabian dialect is not receding for everyone everywhere. These findings underscore speakers' sensitivities to the changing environment and demonstrate their ability to use dialect forms to project their identities while adapting to the changing expectations in dialect usage as they accommodate to non-Swabian-speaking interlocutors.

These figures indicate that SOI and ICI are collinear. While the underlying motivation spurring speakers to change how they speak may be different, the effect of these two measures on

[21] I am grateful to Devyani Sharma and Jonathan Harrington, who reviewed some of my earlier work, for encouraging me to separate interlocuter accommodation and choice from Swabian orientation and evaluate these two effects separately.

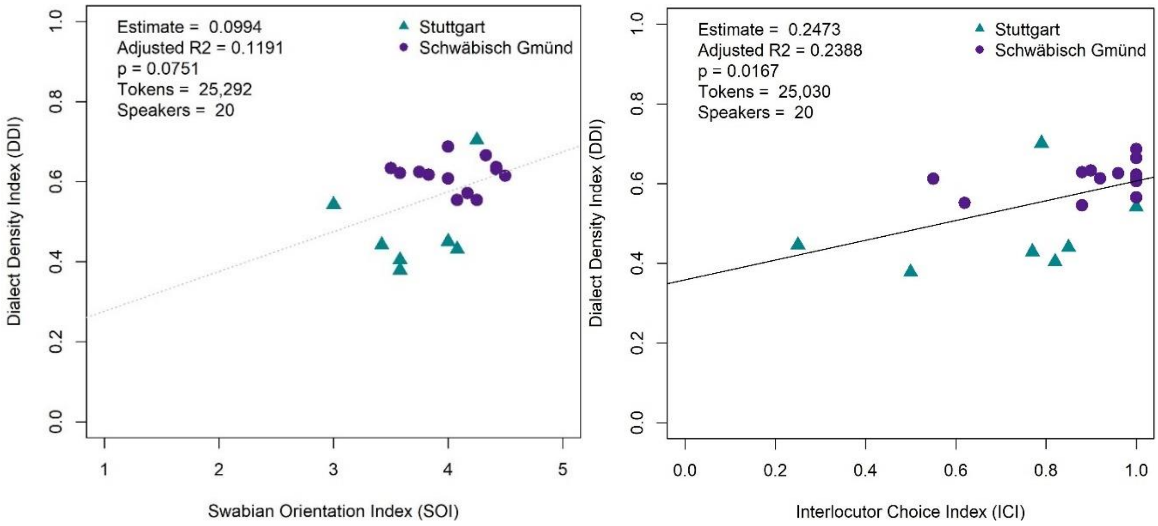

Figure 4-7. Dialect Density and Orientation versus Interlocutor Choice – 1982 Panel Study

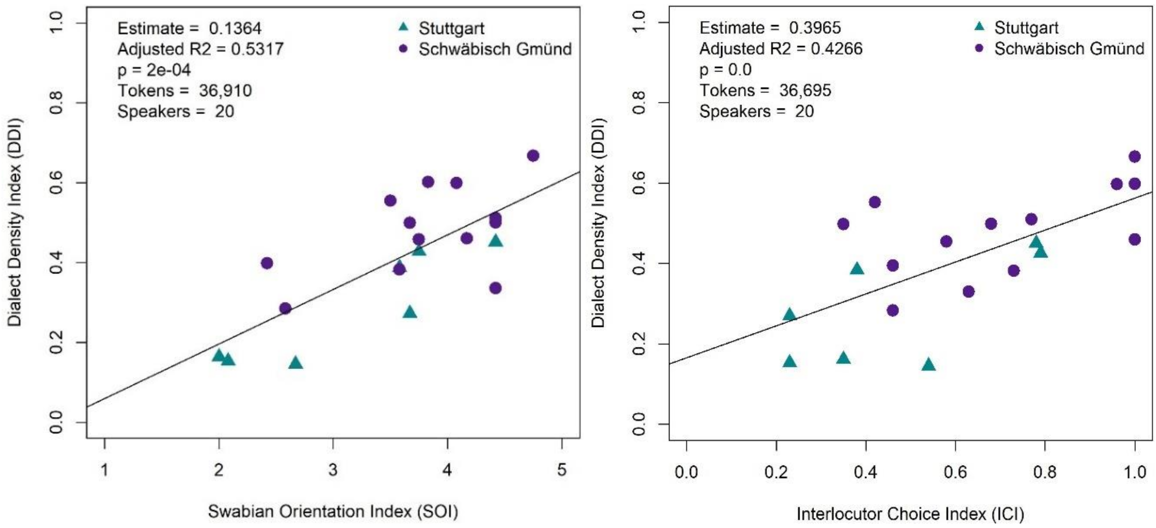

Figure 4-8. Dialect Density and Orientation versus Interlocutor Choice – 2017 Panel Study

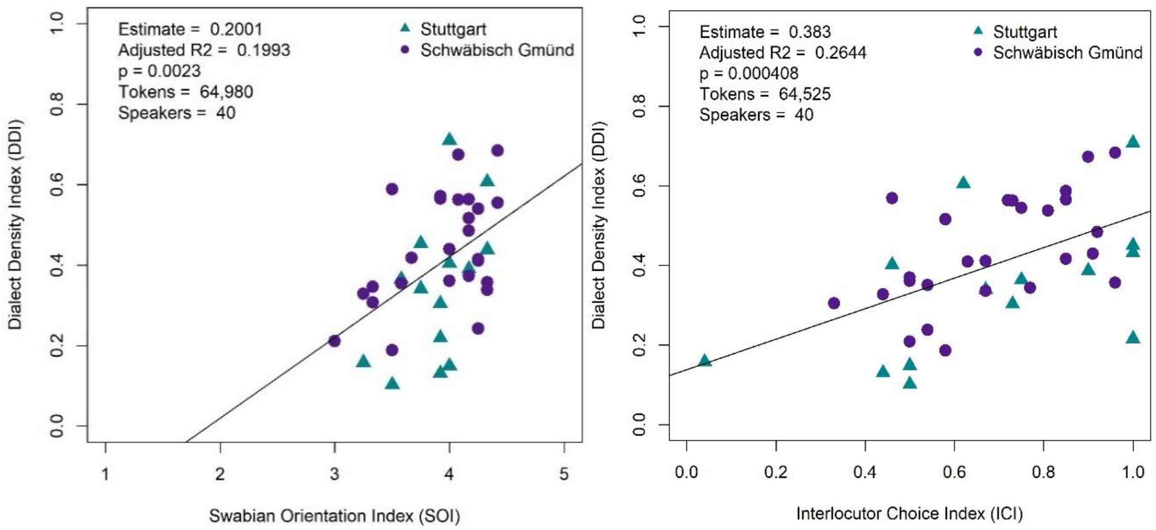

Figure 4-9. Dialect Density and Orientation versus Interlocutor Choice – 2017 Twin Study

dialect usage is essentially the same. Because SOI provides a slightly better statistical fit with the data and because ICI is based on self-reported data (see Section 3.7.2.2), all subsequent analyses in this thesis use Swabian orientation. The interaction of SOI with recording year, community, speaker age, and the nature of the linguistic variable is explored in Section 4.4.4.1.

4.4.1.4. Impact of changing mobilities

As discussed in Section 2.3.6, a crucial facet of modern German society is increasing geographic mobility – both Germans moving into Swabia from the northern and eastern parts of the country, as well as non-German immigrants moving into the region for employment. As a result, increased mobility should correlate with a decline in dialect density as people come into more frequent contact with non-Swabian speakers. Indeed, Figure 3-16 and Table 3-22 show that mobility has considerably increased for speakers between 1982 (median 14.5 for the 1982 panel study) and 2017 (41.0 for 2017 panel study and 40.0 for the 2017 twin study).

Figures 4-10 through 4-12 depict the relationship between dialect density and mobility: distance (moved from current home location) on the left and dispersion (number of and length of moves) on the right (see Section 3.7.2.3 for how mobility is calculated). An initial glance at all six plots demonstrate that only distance moved for the 1982 panel study participants (top-left pane) has a significant effect on dialect density ($p < .05$) (denoted by the solid black regression line versus the dotted grey lines in the other plots). However, as the multivariate analysis shows later in this chapter (see Section 4.4.4.1), mobility interacts with recording year and speaker birth year. Whereas highly mobile individuals in 1982 were the exception, by 2017, mobility has become a "way of life" (Blommaert 2010, 2014; Britain 2016).

4.4.1.5. Clout of educational achievement

Labov (2001) claims that education is probably the single best measure of a variable's social evaluation: specifically, higher levels of education generally correlate with linguistic forms that have higher levels of prestige, such as the standard language; whereas lower levels of education correlate with greater use of nonstandard (i.e., dialect) variants. In this investigation, I considered three different ways of assessing educational attainment. First, a conventional seven-point educational scale (described in Section 3.7.1.4) did not show any significant correlations with dialect density for any of the three study types, although for the 2017 twin study education approaches significance ($\hat{\beta} = -0.028$; $p = 0.0724$; Adjusted $R^2 = 0.0583$). I also analysed the impact of the Composite Class Index (CCI) (see Section 3.7.1.5), combining education and occupation for both the speaker and their parents, which also turns out to be significant only for the 2017 twin study ($\hat{\beta} = -0.0095$; $p = 0.0038$; Adjusted $R^2 = 0.1791$).

The third approach I considered in measuring educational achievement in Germany is the attainment of an *Abitur* 'college preparatory exam,' which is considered a notable achievement,

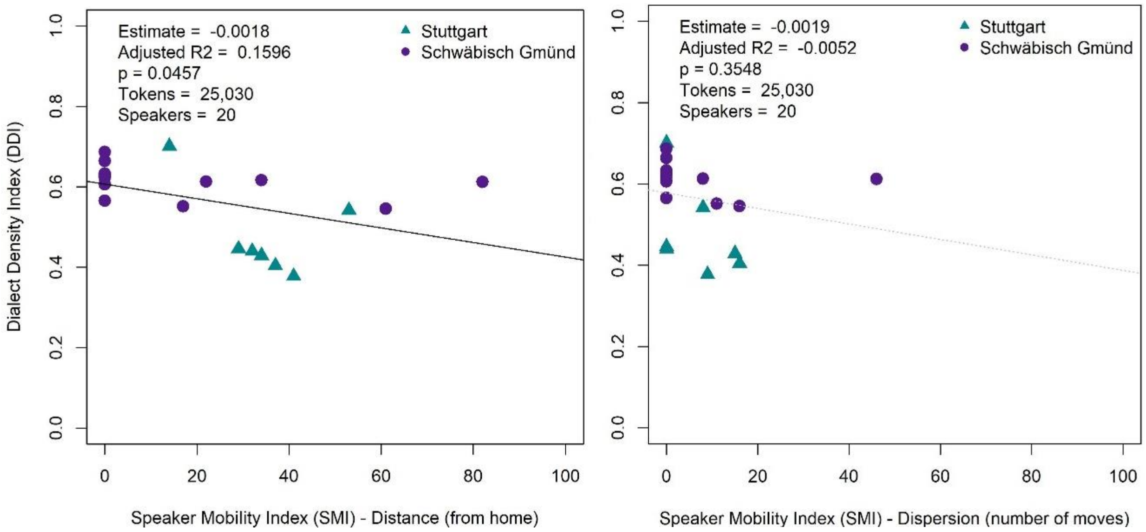

Figure 4-10. Dialect Density and Geographic Mobility – 1982 Panel Study

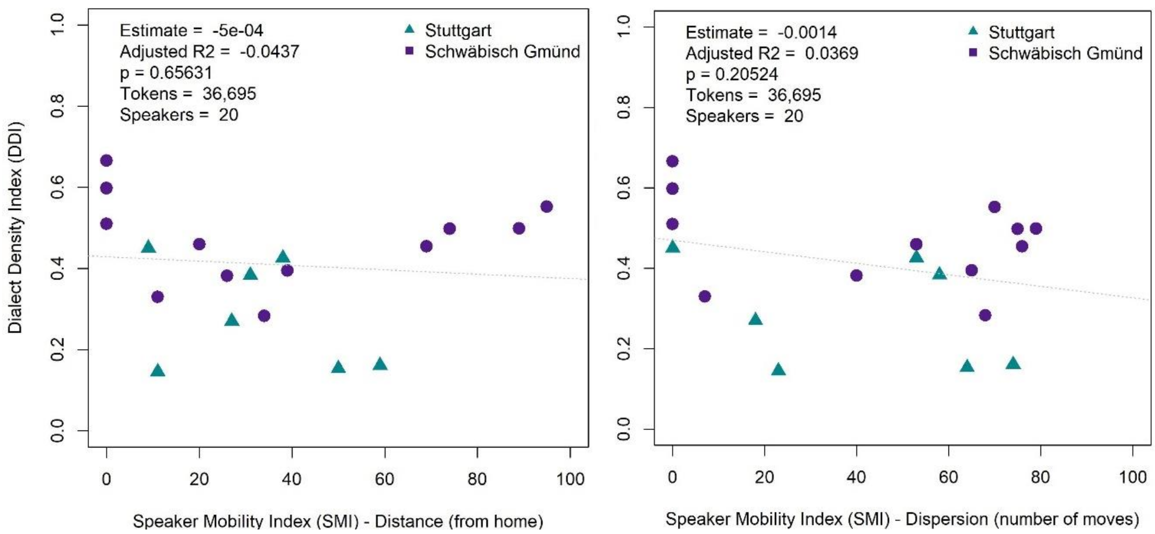

Figure 4-11. Dialect Density and Geographic Mobility – 2017 Panel Study

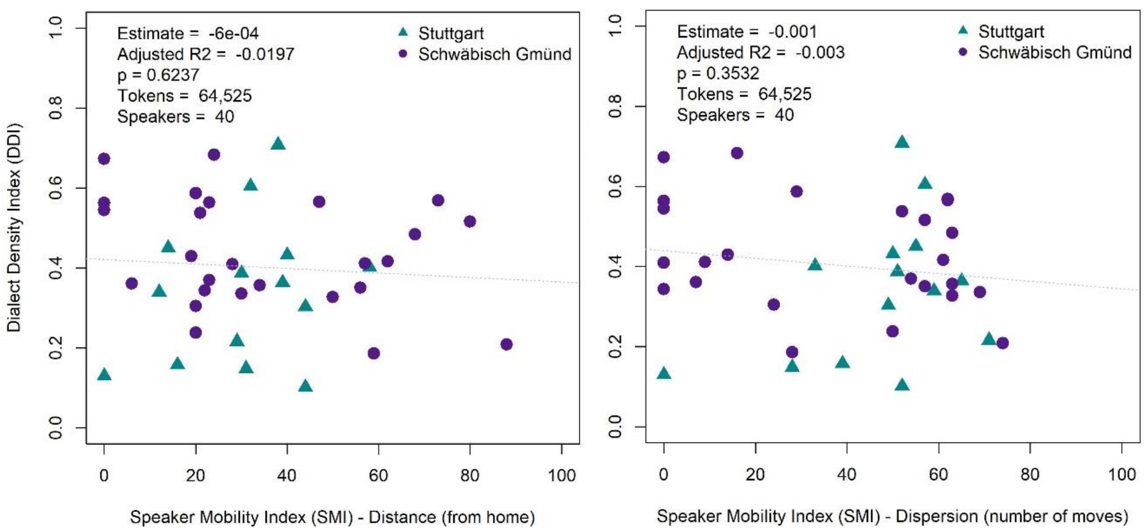

Figure 4-12. 2017 Dialect Density and Geographic Mobility – 2017 Twin Study

almost a ‘rite of passage’, for a young adult and generally marks the entry to a more professional career. However, as pointed out in Section 3.7.1.4, the clout associated with an *Abitur* has been changing in modern Germany with *Abitur* attainment becoming ever more frequent and, hence, a less prominent marker of social differentiation. As with the other predictors of education, *Abitur* achievement is significant only for the 2017 twin study participants ($\hat{\beta} = -0.1005$; $p = .0425$; Adjusted $R^2 = 0.0803$). Because all three approaches show similar results and because *Abitur* achievement provides a slightly better fit with the data, this predictor is used in all subsequent models. What is clear from this analysis is that educational achievement has become a significant predictor of dialect density in 2017, a major shift from the role that education held in Swabian society 35 years ago.

4.4.1.6. Social meaning and linguistic variety

As Sharma (personal communication) points out, research shows that local and regional variables often take on different roles in the speech community and can portray deeply rooted levels of social meaning (e.g., Eckert 2000; Haddican et al. 2013; Johnstone 2011; Milroy 2007; Moore and Carter 2015). Among the 20 linguistic variables in this study, 12 are unique to the Swabian variety, and 8 are used more broadly throughout southwestern Germany, specifically in Baden and Bavaria, as well as throughout Switzerland (see Section 3.7.3.1 for a description of variable variety). Considering the intense language attitudes documented in Section 1.4.2, as well as the robust effect of identity on dialect density seen in Section 4.4.1.3, it is reasonable to expect the Swabian-specific variables to more acutely reflect a sense of place and local belonging than the more widely used regional variables, which may be less likely to carry entrenched social meaning, at least for speakers of Swabian.

To investigate this premise, Figure 4-13 depicts a distributional analysis of dialect density for the 12 Swabian-specific variables across the three study types and age groups. In line with the preceding analyses in this chapter, the frequency of the Swabian-specific variables has declined sharply in the 2017 panel and twin studies over the 1982 panel study. The apparent-time view in the 2017 twin study visibly demonstrates that the Swabian-only variables are rapidly levelling with the standard language, especially for the youngest age groups (median DDI of 21.4% for the 30-60 years old in the 2017 panel study and median DDI of 12.6% for the under thirty group in the 2017 twin study).

Figure 4-14 shows the distribution and median dialect density for the eight regional variables across the three study types. Immediately evident is that dialect density for the regional variables is markedly higher than for the Swabian-specific variables in Figure 4-13. There is also considerably less levelling with the regional variables in both real-time (panel study 1982 and 2017) and apparent-time (across the age groups) as denoted by the dotted line marking the median, which varies little across the samples. It is important to note that linguistic variety is heavily entangled with salience and stigma, factors analysed further in Section 4.4.4.

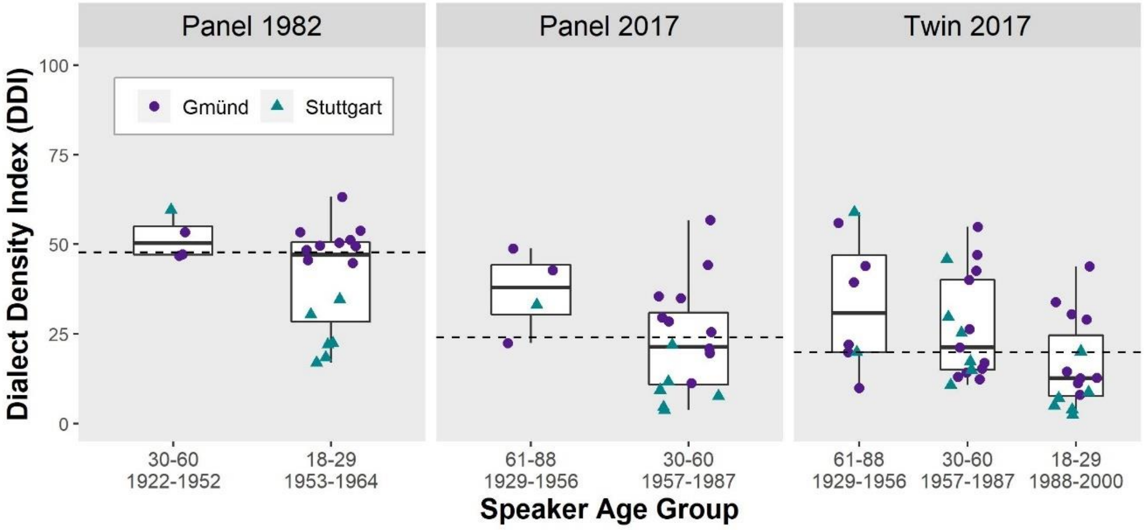

Figure 4-13. Dialect Density by Study Type and Age Group – 12 Swabian-specific Variables

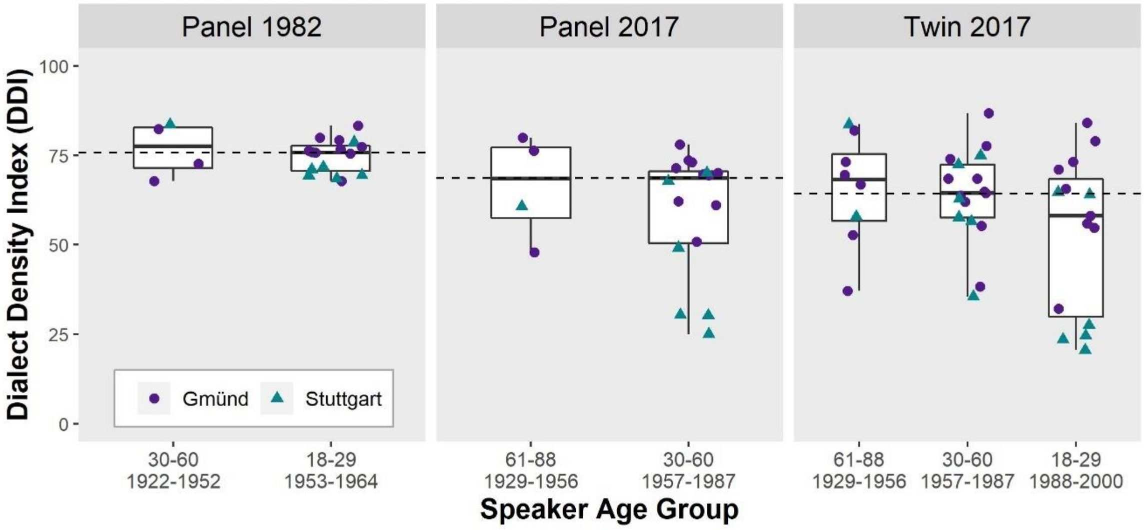

Figure 4-14. Dialect Density by Study Type and Age Group – 8 Regional Variables

The real- and apparent-time changes occurring with these two types of variables conform to what Milroy (2007:149) refers to as UNDER THE COUNTER and OFF THE SHELF change, two socially motivated types of change, broadly corresponding to a distinction between local and supralocal change. The Swabian-specific variables in this study are prime candidates for UNDER THE COUNTER change, typically found in smaller speech communities with more closely knit social networks, in which the variables are deeply embedded in speakers' mindsets and carry socially indexical characteristics. As discussed in Section 4.4.1.1, the close-knit Swabian community of 1982 has loosened as speakers have become more mobile, and the highly localised Swabian-specific variables are weakening and levelling processes are setting in. Figure 4-13 reveals a clear case of dialect levelling with almost complete elimination of the socially marked Swabian-specific features in the youngest age group (from a high of 50.3% in 1982, median DDI has fallen to only 12.6% for the under 30-year olds in the twin study). Still, speakers with strong bonds to their "homeland," particularly those from Schwäbisch Gmünd, use these variables to project their Swabian identity. Speakers such as Siegfried, as well as others (e.g., Berdine, Jurgen, Angela, and Klaus) convey their Swabian identity by alleging they speak Swabian to everyone and by switching to standard German only when they cannot be understood (although Klaus claims not to care whether others understand him or not, he never switches to standard German).

The regional variables in this study are leading candidates for OFF THE SHELF or supralocal change, which, according to Milroy (2007), is more visible and diffused from other varieties over a broader geographical (or social) area. This type of change also manifests social indexicalities, but rather than being reinforced through local, close-knit networks, it relies on pervasive contact between speakers of different varieties and is generally available to all speakers as a social and stylistic resource regardless of local identity. Figure 4-14 exhibits minimal real-time change and no significant apparent-time change for the eight regional variables (median DDI across the three age groups drops just 10%, from 68.2% for the over 60-year olds to 58.2% for the 30-year olds). However, as the next section shows, two of the eight regional variables, palatal coda -*st* (STP) particularly in verbs (STPV and STPI) and the diminutive affix -*le* (SAF1) and *bissle* 'a little' (SAF1B), exhibit OFF THE SHELF change.

4.4.2. Change in individual variables

While the aggregate assessment of dialect density discussed in the previous sections provides insight into overall dialect change in Swabia, examining the variables individually exposes which ones may be changing more rapidly, moving more gradually, or remaining stable. This section discusses the trends in the individual variables grouped by level of the grammar (phonological or morphosyntactic) and variable variety (Swabian-specific or regional). Appendix A provides detailed statistics by variable, including token counts and plots for each variable by study type and age group. I first discuss the phonological variables and then the morphosyntactic ones.

4.4.2.1. Phonological change in real- and apparent-time

Figure 4-15 depicts the frequency of dialect usage for the ten phonological variables by study type: the 1982 panel study is represented by blue squares, the 2017 panel study by green diamonds, and the 2017 twin study by red circles. Note that the STP variable (palatal coda -*st*) has been split into four sub-variables by word category: STPV for verbs, STP6 for six high-frequency verbs, STPI for the verb *ist/bist* 'is/are', and STPO for other word categories. With the exception of palatal -*st* in verbs (STPV), which has remained relatively stable, dialect frequency was greater in 1982 (blue squares) than in 2017 (green triangles and red circles) for all phonological variables. Moreover, the level of dialect usage between the 2017 panel study (green triangles) and 2017 twin study (red circles) participants is exceptionally close, providing additional support for the premise that apparent-time mirrors real-time and demonstrating that the twin study participants are indeed a suitable match with the panel study participants. Supporting the results from Figure 4-13, Figure

4-15 demonstrates that most of the Swabian-specific variables are less dense and in sharper decline than the regional ones, a difference further analysed in Section 4.4.4.1.

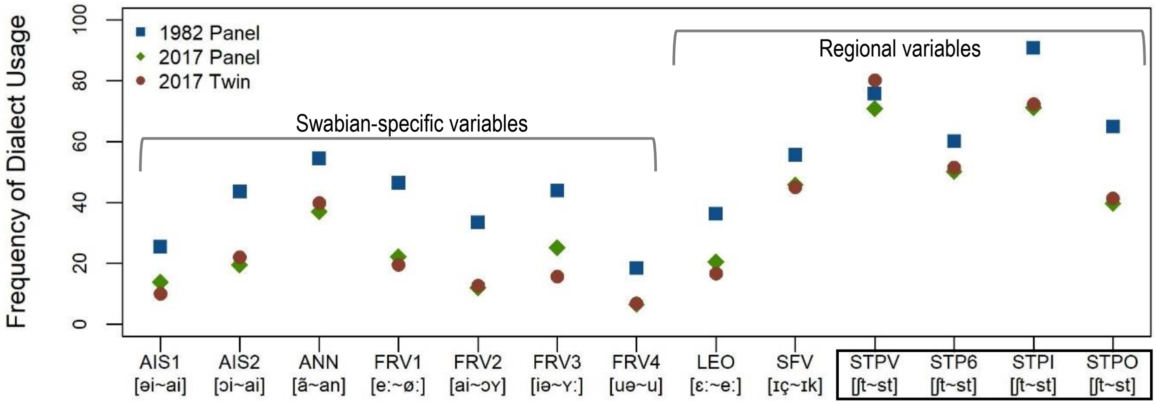

Figure 4-15. Real- and Apparent-Time Change – Phonological Variables

Table 4-4 reports the dialect density in the ten phonological variables across the three study types by linguistic variety. Highly stigmatised variables are denoted by an asterisk. The level of standardisation is noted for each variable based on the stages laid out in Table 4-1. The column “Lifespan Change” shows the degree of change between the 1982 panel study and the 2017 panel study, and the column “Community Change” shows the degree of change between the 1982 panel study and the 2017 twin study. Variables are identified as “changing” or “stable” based on a 10% cut-off point (see Section 3.7.3.4). As is quickly evident, the majority of the phonological variables are changing, advancing in the standardisation process, both within the community and across the lifespan. Only three variables are stable in both real- and apparent-time, showing 10% or less change: stop-fricative variation (SFV), palatal coda -*st* in verbs (STPV), palatal coda -*st* in six high-frequency verbs (STP6). These variables are discussed further in Section 4.4.4.2.

Table 4-4 also provides an interpretation of the change in real- and apparent-time: for two variables (AIS1 and FRV3), community change is occurring more rapidly than individual change; for two variables (ANN and STPV), individual change is occurring more rapidly; and, for the remaining nine variables, real- and apparent-time change are proceeding in parallel. While such results confirm the premise that real-time change mirrors apparent-time change, it also accentuates that, for various sociohistorical, cultural, and structural reasons, some variables may change more quickly and others more slowly. Still, other variables may remain relatively stable, such as palatal -*st* in high-frequency verbs (STPV), without sufficient social, cognitive or systemic motivation to incite change.

Palatal coda -*st* in verbs (STPI and STPV) is one variable that has largely not surrendered to levelling pressures; it remains stable in the NASCENT and INCIPIENT stages of standardisation. However, palatal coda -*st* in high-frequency verbs (STP6) and other word categories (STPO) shows EMERGING standardisation. At this point, I can only conjecture why the frequency of

Variable	1982 Panel Study	2017 Panel Study	2017 Twin Study	Lifespan Change (since 1982)	Community Change (since 1982)	Real- versus Apparent-time Interpretation
SWABIAN-SPECIFIC VARIABLES:						
AIS1 [əɪ~ai]	25.42 Advancing	13.96 Extensive	10.02 Extensive	-11.46 CHANGING	-15.40 CHANGING	**Community faster than the individual**
AIS2* [ɔɪ~ai]	43.59 Emerging	19.64 Advancing	22.02 Advancing	-23.95 CHANGING	-21.57 CHANGING	Real-time mirrors apparent-time
ANN* [ã~an]	54.57 Emerging	37.08 Emerging	39.97 Emerging	-17.49 CHANGING	-14.60 CHANGING	**Individual faster than the community**
FRV1 [e:~ø:]	46.56 Emerging	22.25 Advancing	19.57 Advancing	-24.31 CHANGING	-26.99 CHANGING	Real-time mirrors apparent-time
FRV2 [ai~ɔʏ]	33.48 Advancing	12.08 Extensive	12.81 Extensive	-21.40 CHANGING	-20.67 CHANGING	Real-time mirrors apparent-time
FRV3 [iə~ʏ:]	44.01 Emerging	25.21 Advancing	15.82 Advancing	-18.80 CHANGING	-28.19 CHANGING	**Community faster than the individual**
FRV4 [uə~u:]	18.57 Advancing	6.56 Extensive	6.97 Extensive	-12.01 CHANGING	-11.60 CHANGING	Real-time mirrors apparent-time
REGIONAL VARIABLES:						
LEO [ɛ:~e:]	36.27 Advancing	20.58 Advancing	16.67 Advancing	-15.69 CHANGING	-19.60 CHANGING	Real-time mirrors apparent-time
SFV [ɪç~ɪk]	55.73 Emerging	45.90 Emerging	45.06 Emerging	-9.83 STABLE	-10.67 STABLE	Real-time mirrors apparent-time
STPV [ʃt~st]	**75.89** Incipient	70.95 Incipient	80.30 Incipient	-4.94 STABLE	4.41 STABLE	**Individual faster than the community**
STP6 [ʃt~st]	60.23 Emerging	50.17 Emerging	51.61 Emerging	-10.06 STABLE	-8.62 STABLE	Real-time mirrors apparent-time
STPI [ʃt~st]	90.75 Nascent	71.30 Incipient	72.41 Incipient	-19.45 CHANGING	-18.34 CHANGING	Real-time mirrors apparent-time
STPO [ʃt~st]	**65.01** Incipient	39.79 Emerging	41.41 Emerging	-25.22 CHANGING	-23.60 CHANGING	Real-time mirrors apparent-time

Table 4-4. Community and Lifespan Change – Phonological Variables
(= high-stigma variables)*

Stage	1982 Panel	2017 Panel	2017 Twin
Nascent (above 85%)	*STPI [ʃt~st]*		
Incipient (between 65% and 85%)	*STPV [ʃt~st]* *STPO [ʃt~st]*	*STPV [ʃt~st]* *STPI [ʃt~st]*	*STPV [ʃt~st]* *STPI [ʃt~st]*
Emerging (between 35% and 64%)	***AIS2 [ɔɪ~ai]** ***ANN [ã~an]** **FRV1 [e:~ø:]** **FRV3 [ɪə~ʏ:]** *SFV [ɪç~ɪk]* *STP6 [ʃt~st]*	***ANN [ã~an]** *SFV [ɪç~ɪk]* *STP6 [ʃt~st]* *STPO [ʃt~st]*	***ANN [ã~an]** *SFV [ɪç~ɪk]* *STP6 [ʃt~st]* *STPO [ʃt~st]*
Advancing (between 15% and 34%)	**AIS1 [əɪ~aɪ]** **FRV2 [aɪ~ɔʏ]** **FRV4 [uə~u:]** *LEO [ɛ:~e:]*	***AIS2 [ɔɪ~aɪ]** **FRV1 [e:~ø:]** **FRV3 [ɪə~ʏ:]** *LEO [ɛ:~e:]*	***AIS2 [ɔɪ~aɪ]** **FRV1 [e:~ø:]** **FRV3 [ɪə~ʏ:]** *LEO [ɛ:~e:]*
Extensive (below 15%)		**AIS1 [əɪ~aɪ]** **FRV2 [aɪ~ɔʏ]** **FRV4 [uə~u:]**	**AIS1 [əɪ~aɪ]** **FRV2 [aɪ~ɔʏ]** **FRV4 [uə~u:]**

Table 4-5. Levels of Standardisation – Phonological Variables
*(bold = Swabian-specific variables; italics = regional variables; * = high-stigma)*

palatalisation would be different in these word groups. For the high-frequency verbs (STP6), mostly likely lexical frequency has an influence under the premise that change originates first in high-frequency words and then spreads to low-frequency ones (Bybee 2017:273-275); although, as pointed out in Section 3.7.3.5, frequency effects have produced conflicting results. Palatal *-st* in other word categories (STPO) encompasses a large set of variants, with palatalisation occurring in different environments, within and across morphological boundaries, a phenomenon to be explored in a future investigation.

Table 4-5 presents an alternative view of the change in the 10 phonological variables, organised by stage of standardisation. The Swabian-specific variables, indicated by bold font, are advancing more rapidly in the standardisation process (EMERGING, ADVANCING, or EXTENSIVE), whereas the regional variables, marked in italics, are mostly found at the NASCENT, INCIPIENT, or EMERGING stages. Three Swabian-specific variables (AIS1, FRV2, and FRV4) have reached Stage 5 in the levelling processing, showing extensive standardisation (less than 15% dialect use), soon (if not already) to be eradicated from the dialect.

4.4.2.2. Morphosyntactic change in real- and apparent-time

Figure 4-16 depicts the frequency distribution of the dialect variant[22] for the ten morphosyntactic variables for the three study types. As with the phonological variables, the morphosyntactic variables, with two exceptions (DAS and SAF1/SAF1B), show steep decline between 1982 and 2017, with the 2017 panel study and the 2017 twin study moving in parallel.

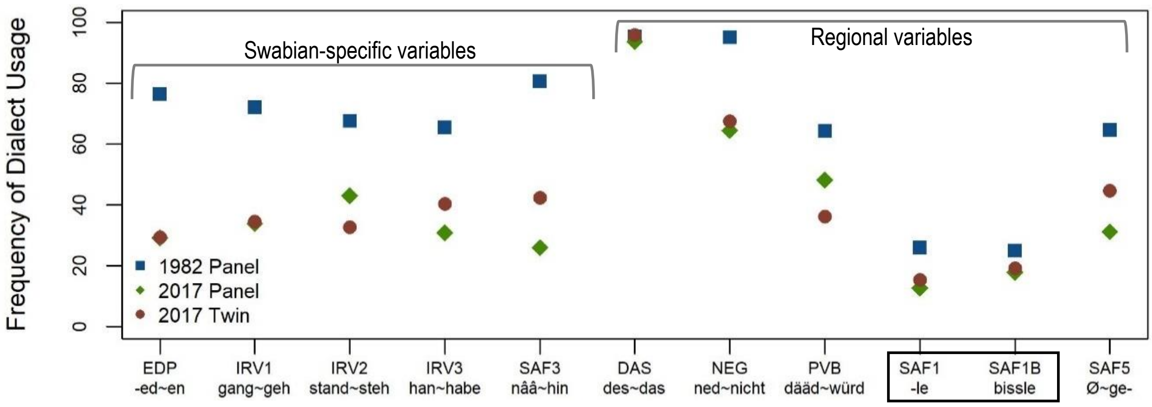

Figure 4-16. Real- and Apparent-Time Change – Morphosyntactic Variables

Table 4-6 summarises the change for each morphosyntactic variable across the community and the individual lifespan, providing an interpretation of the change in real- and apparent-time. For six variables, real-time change mirrors apparent-time change, for two variables

[22] Note that, due to the nature of the diminutive *-le* affix in Swabian, which does not fit a binary distribution, SAF1 and SAF1B are calculated as a "normed frequency", which is the count of all tokens of *-le* or *bissle* divided by the total number of words in the corpus, multiplied by 100 (Levey 2001).

Variable	1982 Panel Study	2017 Panel Study	2017 Twin Study	Lifespan Change (since 1982)	Community Change (since 1982)	Real- versus Apparent-time Interpretation
SWABIAN-SPECIFIC VARIABLES:						
EDP -ed~-en	76.50 Incipient	29.27 Advancing	29.35 Advancing	-47.23 CHANGING	-47.15 CHANGING	Real-time mirrors apparent-time
IRV1* gang~geh	72.20 Incipient	33.84 Advancing	34.64 Emerging	-38.36 CHANGING	-37.56 CHANGING	Real-time mirrors apparent-time
IRV2* stand~ste h	67.74 Incipient	43.12 Emerging	32.71 Advancing	-24.62 CHANGING	-35.03 CHANGING	Community faster than the individual
IRV3 han~habe	65.51 Incipient	30.96 Advancing	40.39 Emerging	-34.55 CHANGING	-25.12 CHANGING	Individual faster than the community
SAF3* nââ-~hin-	80.65 Incipient	26.00 Advancing	42.34 Emerging	-54.65 CHANGING	-38.31 CHANGING	Individual faster than the community
REGIONAL VARIABLES:						
DAS des~das	95.40 Nascent	93.72 Nascent	95.88 Nascent	-1.68 STABLE	0.48 STABLE	Real-time mirrors apparent-time
NEG ned~nicht	95.10 Nascent	64.51 Incipient	67.59 Incipient	-30.59 CHANGING	-27.51 CHANGING	Real-time mirrors apparent-time
PVB dääd~würd	64.29 Incipient	48.19 Emerging	36.23 Emerging	-16.10 CHANGING	-28.06 CHANGING	Community faster than the individual
SAF1 -le	26.08 Advancing	12.76 Extensive	15.35 Advancing	-13.32 CHANGING	-10.73 CHANGING	Real-time mirrors apparent-time
SAF1B bissle	25.01 Advancing	17.91 Advancing	19.30 Advancing	-7.10 STABLE	-5.71 STABLE	Real-time mirrors apparent-time
SAF5 Ø~ge-	64.74 Emerging	31.22 Advancing	44.83 Emerging	-33.52 CHANGING	-19.91 CHANGING	Individual faster than the community

Table 4-6. Community and Lifespan Change – Morphosyntactic Variables
(= high-stigma variables)*

Stage	1982 Panel	2017 Panel	2017 Twin
Nascent (above 85%)	*DAS des~das* *NEG ned~nicht*	*DAS des~das*	*DAS des~das*
Incipient (between 65% and 85%)	**EDP -ed~-en** ***IRV1 gang~geh** ***IRV2 stand~steh** **IRV3 han~habe** **PVB dääd~würd** ***SAF3 nââ-~hin**	*NEG ned~nicht*	*NEG ned~nicht*
Emerging (between 35% and 64%)	*SAF5 Ø~ge*	***IRV2 stand~steh** PVB dääd~würd	***IRV1 gang~geh** **IRV3 han~habe** *PVB dääd~würd* ***SAF3 nââ-~hin-** *SAF5 Ø~ge*
Advancing (between 15% and 34%)	*SAF1 -le* *SAF1B bissle*	**EDP -ed~-en** ***IRV1 gang~geh** **IRV3 han~habe** *SAF1B bissle* ***SAF3 nââ-~hin-** *SAF5 Ø~ge-*	**EDP -ed~-en** ***IRV2 stand~steh** *SAF1 -le* *SAF1B bissle*
Extensive (below 15%)		*SAF1 -le*	

Table 4-7. Levels of Standardisation – Morphosyntactic Variables
*(bold = Swabian-specific variables; italics = regional variables; * = high-stigma)*

(IRV2 and PVB), the community is moving faster than the individual, and for three variables (IRV3, SAF3, and SAF5), the individual is moving faster than the community. Three of the Swabian-specific variables (IRV1, IRV2 and SAF3), which are the most highly stigmatised, are receding at a rapid pace, showing 30-50% decline over the 35-year time span of this study.

Only two of the ten morphosyntactic variables are stable: the definite article *das* (DAS) and the diminutive suffix -*le* (SAF1/SAF1B). Use of *des* for *das* 'the' is widespread throughout Swabia for both communities and across all age groups (over 90%) and does not appear to be surrendering to the standard language (see Figure A- 22). While there is some minor reduction in the use of the diminutive suffix -*le* (SAF1) across the study types, its use is also largely stable. It is interesting to point out, however, that this variable is the sole example that I have found in Swabian in which speaker sex plays a role, albeit minor. While in 1982 women were slightly more likely to use the diminutive suffix -*le* than men (25 per 100 words for women versus 19 per 100 words for men), by the 2107 panel study, men are slightly more likely to use -*le* than women (24 per 100 words for men versus 15 per 100 words for women). The results from the 2017 twin study mirror the 1982 panel study. While the differences between the panel study men and women are not statistically significant ($\chi^2 = 2.077$, df = 1, $p > .05$) and could very well be the result of idiosyncratic changes in the panel study men, it is, however, a trend to watch in future research. None of the other variables shows any type of correlations with speaker sex, however minor.

Table 4-7 groups the morphosyntactic variables by their stage of standardisation, highlighting the Swabian-specific variables in bold and the marking highly stigmatised variables with an asterisk. All of the Swabian-specific variables are changing rapidly, moving from an INCIPIENT stage of change in 1982 to an EMERGING and ADVANCING stage in 2017, and only two are stable: definite Article *das~des* (DAS) and the diminutive *bissle~bisschen* (SAF1B). These variables are discussed further in Section 4.4.4.2.

4.4.3. Change across the lifespan

Next, I turn to dialect change across the lifespan by considering the differences in dialect usage for the 20 panel speakers between 1982 and 2017. Evaluating individual differences can shed light on the nature of variability and provide insight into the leaders of change.

4.4.3.1. Phonological change across the lifespan

Figure 4-17 depicts change in dialect density for the ten phonological features across the lifespan of the 20 individual panel speakers. Speakers are sorted from those showing the least change on the left to the most change on the right. Dialect density in 1982 is shown by blue squares and in 2017 by green triangles. Stuttgart speakers are indicated by a turquoise box around their name. Interpretation of change across the lifespan can be explained with respect to Sankoff's (2006) three stages: LIFESPAN CHANGE, LIFESPAN STABILITY, and RETROGRADE CHANGE (see Section 2.4.2 for an explanation).

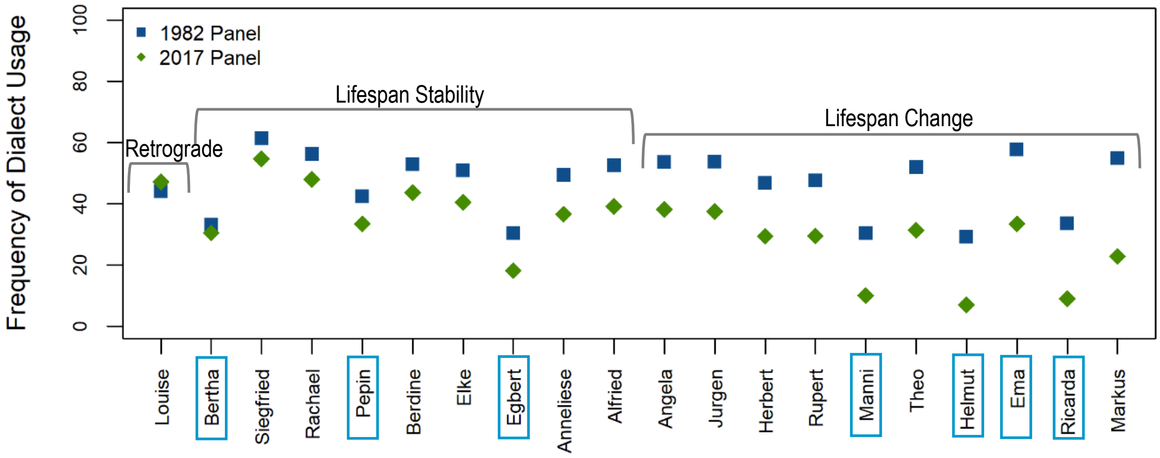

Figure 4-17. Change Across the Lifespan – Phonological Variables (Based on Sankoff (2006); Stuttgart speakers outlined in turquoise boxes)

For the phonological variables, half of the Swabian panel participants (10 speakers) exhibit LIFESPAN CHANGE, following community change with a decline in dialect density across their lifetime (established by a reduction of more than 15%), demonstrating that the processes of levelling can and do operate post-critical-age. The six speakers on the right of the plot (Manni to Markus) exhibit the greatest change, all showing greater than 20% reduction in dialect density. Four are from Stuttgart, three of whom show less than 15% dialect density in 2017, indicating that extensive standardisation has taken place for these individuals. Helmut exhibits the lowest dialect usage of all the panel speakers: from a relatively low dialect density in 1982 of 29.3%, by 2017 he shows only 7.1% dialect use. A moderator for a southwestern German radio station, Helmut verbalises how conflicted he feels between "knowing" that he should speak standard German so he will be taken seriously and "longing" to speak Swabian to identify with his homeland (see example (11)); for Helmut, "knowing" appears to be more potent than "longing."

Nine speakers exhibit LIFESPAN STABILITY, established by a reduction in dialect density between 0% and 15%. With the exception of two speakers (Berdine and Anneliese), all have continued to live and work in the towns in which they were born and raised. Berdine is married to a Frenchman, lived for ten years in Paraguay, Benin and Egypt, and has lived the last five years in the middle part of Germany (near Bonn); yet, even with high mobility and extensive non-Swabian influences throughout her adult life, Berdine has retained more of her dialect usage than her siblings, Angela, Jurgen and Rupert, all of whom exhibit greater change. Anneliese is a medical doctor who has been living in Zürich for the last ten years. In 2017, she commented that she likes Swabian and finds it *ene sehr charmante Sprache* 'a very charming language,' adding that she speaks more Swabian today than she ever did when she lived in Schwäbisch Gmünd[23].

[23] It is important to note that Anneliese lives in a privileged, "dialect friendly" environment, Switzerland (Hass 2006). *Schwyzerdütsch* 'Swiss German' belongs to the Alemannic variety, as does Swabian.

One speaker in Figure 4-17, Louise, shows a 3.1% increase in dialect density between 1982 and 2017, exhibiting what Sankoff (2006) calls RETROGRADE CHANGE. In 1982, Louise was in her early 50's and at the peak of her career. During the 1982 interview, she talked about the difficulties she encountered in being the only woman on the all-male board of directors for the local theatre. With the effects of the linguistic market (Sankoff and Laberge 1978) at work, it is reasonable to assume that in 1982 she was accommodating to the standard language. Now, after retirement from the workforce and in her sunset years, Louise is returning to more dialect usage, revealing the long-tail of language change and demonstrating how late-stage changes can run counter to community-wide trends (G. Sankoff, Wagner, and Jensen 2012).

4.4.3.2. Morphosyntactic change across the lifespan

Figure 4-18 portrays the change in dialect density for the ten morphosyntactic features across the lifespan for the 20 panel speakers. Speakers are sorted from those showing the least change on the left to the greatest change on the right. The majority of the Swabian panel participants (13 speakers) exhibit LIFESPAN CHANGE, indicating there is a significant amount of change in progress with dialect morphosyntax. Ricarda, Manni, and Marcus top the scale with over 40% reduction in their use of Swabian morphosyntactic features over their lifespans. Only six speakers show LIFESPAN STABILITY.

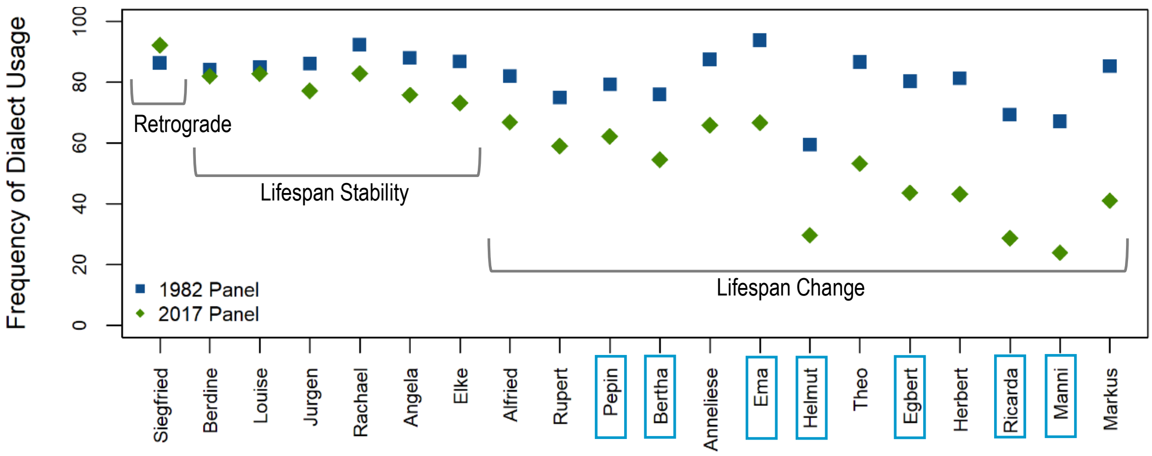

Figure 4-18. Change Across the Lifespan – Morphosyntactic Variables (Based on Sankoff (2006); Stuttgart speakers indicated in turquoise square)

Figure 4-18 reveals that the degree of change across the 35 years is considerably greater for the morphosyntactic variables than for the phonological ones seen in Figure 4-17, revealing that speakers are quicker to give up nonstandard morphosyntactic variants than phonological ones, supporting Cheshire's (1998:66) claim that the salience of morphosyntactic variables makes them a target for "prescriptivists and purists", and hence social stigmatisation. Sharma (2021:63) finds that morphosyntactic variables bring "greater social risk" than phonological ones because they tend to be viewed as "more direct signals of low competence" in the prestige variety. A strong cohort of Stuttgart speakers on the right of the figure seem to agree: the Stuttgart speakers are moving more rapidly to the standard language than the Schwäbisch Gmünd speakers, marking the prestigious urban centre of Stuttgart as the stimulus for the change.

Siegfried is the sole speaker exhibiting RETROGRADE CHANGE with respect to the morphosyntactic features, increasing his use of Swabian variants by 6% across his lifetime from 86.3% to 92.2%. He declares that he is a *stolzer Schwââbe* ‘proud Swabian’, as the citation at the opening of this chapter shows (see also example (12)), and is saddened that Swabian is succumbing to the standard language. He continues:

(34) Siegfried (2017)

die Sprache gheert zu meine Heimat	*‘the language belongs to my homeland*
ond i bin dahanne aufgwachse	*and I was raised down here*
mir gfällt s dâ, i war nie weg	*I like it here, I have never left*
un i will au nie weg	*and I never want to leave’*

[S021-17-I-1-Siegfried-00:25:36]

In sum, change across the lifespan, as revealed in this panel study of Swabian, shows that the majority of speakers change their language across their lifetime and follow the community-wide trend, at least with respect to “change from above” in a situation of rampant dialect-levelling. The rationale behind those speakers who swim against the tide and hang on to the traditional dialect forms (RETROGRADE CHANGE) can be found in the linguistic market, in which individuals revert to more nonstandard forms after retirement (Baayen, Beaman, and Ramscar 2021; Buchstaller 2006; D. Sankoff and Laberge 1978; Wagner 2012a) and to an extreme sense of dialect identity, in which individuals strive to hold on to something they feel they are losing (Beaman, 2021; Schilling-Estes and Wolfram 1999). In order to investigate the factors driving dialect change in Swabian, the next section dives into multivariate analyses to systematically evaluate the myriad interactions between the different sociolinguistic constraints on dialect density across the lifespan and the community, in both real- and apparent-time.

4.4.4. Multivariate analysis of dialect change in Swabian

The preceding sections provided a frequency-based distributional analysis of the Swabian linguistic situation. This section turns to a multivariate analysis to evaluate the interactions between the different drivers of change in Swabian. Because of a large number of variables and a broad range of social factors, the corpus is quite complex; hence, it was necessary to break the multivariate analysis down into several different models – six in total. First, because the number of tokens is insufficient to analyse every predictor with every individual variable, I created separate models for the social factors with dialect density (see Section 4.4.4.1) and for the individual linguistic variables with the three main predictors: recording year, speaker birth year, and community (see Section 4.4.4.2). Second, because of the different underlying data structures (notably, duplicate speakers across two recording periods in the panel study and a broader set of age groups in the trend study), I built separate models for the panel study and the trend study. Third, the models would not converge with all 20 linguistic variables, thus, I built separate models for the 10 phonological and the 10 morphosyntactic variables. Factors that were tested and turned out not to be significant in any of the models evaluated are speaker sex, interviewer closeness (previously acquainted or not), interviewer-interviewee same-sex, principal investigator presence, and number of persons in the interview. These factors have been excluded from the models and any further analysis and discussion.

4.4.4.1. Predictors of dialect density

The results of the multivariate analyses are presented in Table 4-8 for the panel study and in Table 4-9 for the twin study. In interpreting the results, note that positive estimates favour and negative estimates disfavour dialect density. For the panel study (Table 4-8), recording year 2017 is highly significant, demonstrating that, overall, the panel speakers have changed over their lifespan to disfavour dialect usage ($p < .001$). Swabian orientation also shows an overall disfavouring of dialect usage, signalling the diminishing effect of SOI over time on speakers' propensity to speak dialect. Mobility reveals an interesting split with greater distances disfavouring dialect and broader dispersions favouring dialect usage. The nature of the variable exposes two significant effects, with Swabian-specific and low-salience variables disfavouring dialect usage, suggesting Trudgill's (2008:241) process of "quasi-automatic accommodation" occurring with conservative features below the level of perceptual awareness.

RANDOM EFFECTS:					
Groups	Name	Variance	Std.Dev.	Tokens = 57,876	
Speaker	(Intercept)	0.1811	0.4256	Speakers = 20	
Variable	(Intercept)	0.6467	0.8042	Variables = 23	
FIXED EFFECTS:					
	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	2.66495	0.65781	4.051	5.09e-05	***
MAIN EFFECTS:					
Recording Year 2017	-1.37531	0.08134	-16.909	< 2e-16	***
Speaker Birth Year	-0.11979	0.11755	-1.019	0.30818	
Speaker Community Stuttgart	-0.35341	0.20712	-1.706	0.08795	.
Swabian Orientation (SOI)	-0.17698	0.05395	-3.280	0.00104	**
Mobility (SMI) Distance	-0.64222	0.06175	-10.401	< 2e-16	***
Mobility (SMI) Dispersion	1.19855	0.12554	9.547	< 2e-16	***
Variable Variety Swabian	-1.15996	0.56124	-2.067	0.03876	*
Variable Salience Low	-1.29018	0.39843	-3.238	0.00120	**
Variable Stigma Low	0.18328	0.54182	0.338	0.73517	
Variable Status Stable	-0.28018	0.51260	-0.547	0.58466	
INTERACTION EFFECTS:					
Year 2017 : Community Stuttgart	-0.34017	0.06844	-4.970	6.69e-07	***
Year 2017 : SOI	0.41965	0.05732	7.321	2.46e-13	***
Year 2017 : SMI Distance	0.72410	0.07893	9.173	< 2e-16	***
Year 2017 : SMI Dispersion	-1.18676	0.14136	-8.395	< 2e-16	***
Year 2017 : Stigma Low	-0.15690	0.05116	-3.067	0.00216	**
Year 2017 : Status Stable	0.58590	0.05504	10.646	< 2e-16	***
Birth Year : Community Stuttgart	-0.39537	0.23028	-1.717	0.08600	.
Birth Year : SOI	0.73137	0.04858	15.054	< 2e-16	***
Birth Year : Variety Swabian	-0.21348	0.02101	-10.159	< 2e-16	***
Birth Year : Variable Salience Low	-0.24219	0.01984	-12.208	< 2e-16	***

Table 4-8. Multivariate Analysis of Social Factors and Dialect Density – Panel Study
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10*
Intercept values: recording year = 1982; birth year = 1929; community = Gmünd; Swabian orientation and mobility = 0; variety = regional; salience = high; stigma = high; status = changing

Examining the interaction effects reveals a more nuanced picture. While birth year and community are not significant on their own, they are highly significant in interaction with other factors. In real-time (i.e., in 2017), speakers in Stuttgart who have moved around a lot (high SMI dispersion) disfavour dialect with low-stigma variables, while speakers with high levels of SOI who have moved greater distances favour dialect usage with stable variables. Overall, younger panel speakers in Stuttgart (i.e., later birth years) disfavour dialect with Swabian-specific and low-salience variables; however, younger speakers with high SOI strongly favour dialect usage. The younger generation favouring greater dialect usage suggests that a "Swabian renaissance" may be underway, or at least a resurgence of pride in speaking Swabian. The panel study findings demonstrate that time (real and apparent), community, Swabian orientation, mobility, and the nature of the variable all play significant roles in predicting dialect-standard language usage.

Turning to the twin study analysis (Table 4-9), mirroring the panel study, the main effects show that Stuttgart speakers, with Swabian-specific and low-salience variables, disfavour dialect, while high SOI speakers favour dialect usage. Birth year, education, variable salience, and variable status are not significant on their own but are in interaction with other factors. Across apparent-time, younger speakers (i.e., later birth years) in Stuttgart disfavour dialect usage with Swabian-specific, low-salient, and low-stigma variables; whereas, speakers with higher levels of education (with *Abitur)* favour dialect usage with stable variables.

RANDOM EFFECTS:					
Groups	Name	Variance	Std.Dev.		Tokens = 61,217
Speaker	(Intercept)	0.4548	0.6744		Speakers = 40
Variable	(Intercept)	0.7627	0.8733		Variables = 23

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	1.23410	0.72447	1.703	0.088483	.
MAIN EFFECTS:					
Speaker Birth Year	-0.07940	0.21409	-0.371	0.710723	
Speaker Community Stuttgart	-0.77231	0.22935	-3.367	0.000759	***
Swabian Orientation (SOI)	0.31770	0.12310	2.581	0.009853	**
Speaker Education (Abitur)	-0.30421	0.23934	-1.271	0.203726	
Variable Variety Swabian	-1.42783	0.60894	-2.345	0.019039	*
Variable Salience Low	-1.37265	0.43220	-3.176	0.001493	**
Variable Stigma Low	-0.14309	0.58719	-0.244	0.807473	
Variable Status Stable	0.45049	0.55477	0.812	0.416772	
INTERACTION EFFECTS:					
Birth Year : Community Stuttgart	-0.88057	0.23737	-3.710	0.000208	***
Birth Year : Education Abitur	0.64265	0.25293	2.541	0.011059	*
Birth Year : Variety Swabian	-0.24338	0.04013	-6.065	1.32e-09	***
Birth Year : Variable Salience Low	-0.08729	0.03360	-2.598	0.009387	**
Birth Year : Variable Stigma Low	-0.15969	0.04023	-3.970	7.19e-05	***
Birth Year : Variable Status Stable	0.17548	0.03995	4.393	1.12e-05	***

Table 4-9. Multivariate Analysis of Social Factors and Dialect Density – Twin Study
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10*
Intercept values: birth year = 1930; community = Gmünd; Swabian orientation and mobility = 0; variety = regional; salience = high; stigma = high; status = changing

There are three notable differences in comparing the results between the panel and twin studies. As expected, higher Swabian orientation favours greater dialect density; however, it does not interact with birth year as in the panel study, signalling that dialect identity is not a significant predictor across the generations for the 2017 twin study participants. In addition, variable stigma was not significant in the panel study yet has become highly significant in the twin study, suggesting that the stigmatisation of certain variables may be a development that has arisen over the last 35 years. Another telling difference between the panel and the twin study is education, which is not significant in the panel study but is significant in the twin study in interaction with birth year; yet, it is the younger speakers with an *Abitur* who favour greater dialect density, providing further evidence of the emerging “Swabian renaissance” among the youth.

Figure 4-19 summarises the significant effects ($p < .05$) from the two regression models (blue squares for the panel study and red circles for the twin study) using the R *plotCoeffs* function[24] to illustrate the relative difference in weight between the predictors. The effects are sorted by the estimated coefficient of the panel study such that positive estimates favouring Swabian are shown at the top and to the right, while negative effects favouring the standard language are shown toward the bottom and to the left. Effects that are not significant in either sample are not shown. For effects that are significant in one model but not in the other, the non-significant effect is plotted at the 0 point. This graphic provides an informative visualisation of the sociolinguistic predictors influencing dialect density in both real-time and apparent-time (Note: real-time effects are established by recording year and apparent-time effects by birth year).

Corroborating the preceding analyses in this chapter, one of the clearest and strongest effects on dialect density is the community: speakers from Stuttgart (Community-Stuttgart) disfavour dialect in both real-time (2017:Community-Stuttgart) and apparent-time (Birthyear:Community-Stuttgart). A second formidable effect, also established in the preceding analyses, is Swabian orientation: speakers with high orientation favour higher levels of dialect density in both real-time (2017:Swabian Orientation) and apparent-time (Birthyear:Swabian Orientation). As seen in Section 4.4.1.4, speaker mobility turns out to be significant only in real-time for the panel study participants, with greater distances from home in 2017 (2017:Mobility-Distance) favouring dialect density and more highly dispersed movement (2017:Mobility-Dispersion) disfavouring dialect, a significant change since 1982. That greater distances from home would favour greater use of Swabian at first comes as a surprise; however, comments made during the interviews reveal that most Swabians are proud of their heritage and, hence, the further from home their travels take them, the more likely they seem to reinforce their use of Swabian, as the following excerpts from Jurgen (35) and Anneliese (36) show (both of whom exhibit high mobility and high dialect density).

[24] I wish to thank Fabian Tomaschek from the Universität Tübingen for sharing and adapting his R function *plotCoeffs* which aids in visually comparing estimates across multiple regression models.

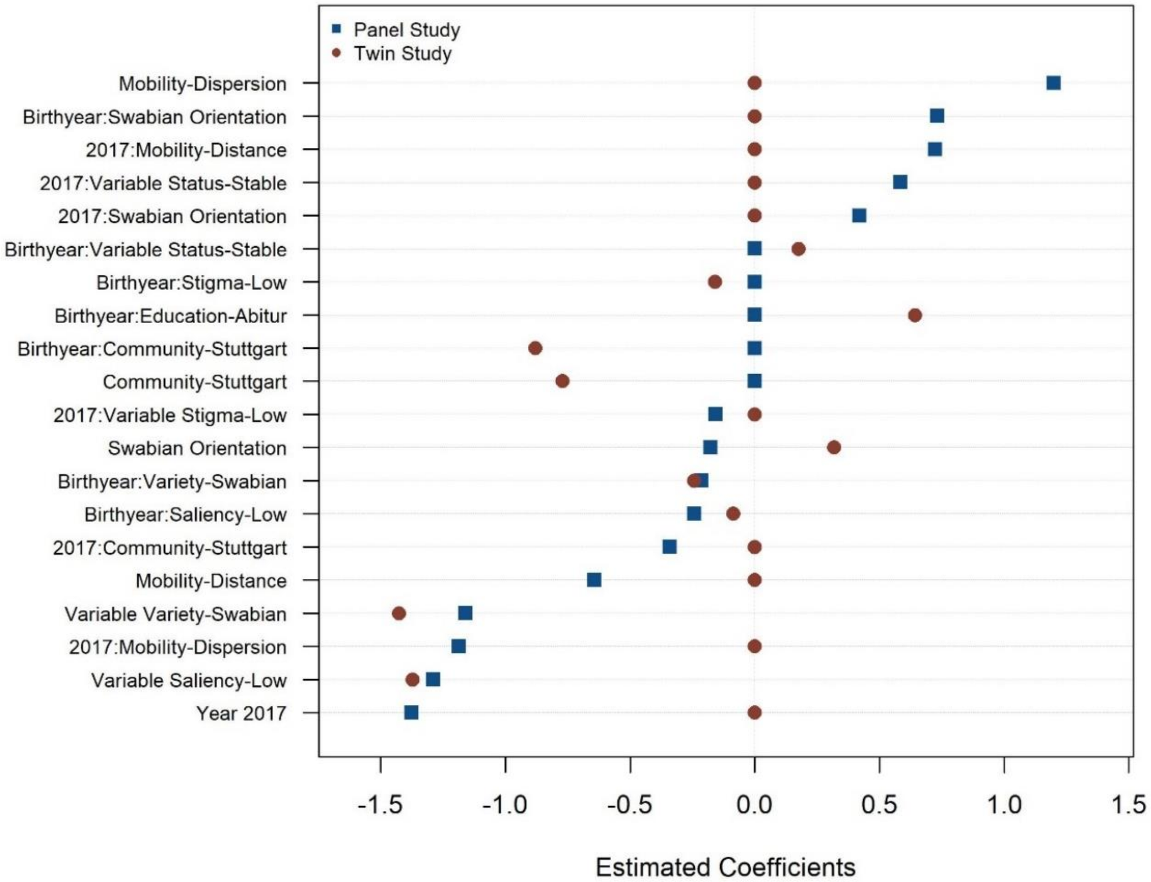

Figure 4-19. Dialect Density Relative Strength of Coefficients – External Factors

(35) Jurgen (2017)

und i bin e bissle traurich	'and I am little sad
dass ich jetzt in Hamburg lääb	that I now live in Hamburg
und meine Kinder verstandet mi	and my kids understand me
wenn i Schwäbisch schwätz	when I speak Swabian
i schwätz au Schwäbisch mit meine Kinder	I speak Swabian with my kids
und mit der {Sarah} au	and with {Sarah} also
aber die sprechet überhaupt kei Schwäbisch	but they don't speak one bit of Swabian
da trifft mã wenich Schwâbe	you meet very few Swabians there
also i bin halt weit weg	so I'm really far away
und schwätz außer mit	and I speak [Swabian] except with
so-zu-sage nur mit mi selbe ja	that is only with myself yeah
i schwätz schwäbisch niemand andersch	so I speak Swabian [but] no one else [does]'
	[S031-17-I-1-Jurgen-00:35:32]

(36) Anneliese (2017)

mit dr Schweizer schwätz i Schwäbisch	'with the Swiss I speak Swabian
un zwar richtich brôit	and in fact really broad
so brôit wie eigentlich	so broad actually like
in Deutschland net --- net schwätz,	I don't speak in Germany'
	[S027-17-I-1-Anneliese-00:20:08]

For the twin study participants, speakers' varying levels of geographic mobility show no significant effects on dialect density, confirming that mobility has become the new normal for modern Swabians. Figure 4-19 patently shows that younger twin study speakers with an *Abitur*

(Birthyear:Education-Abitur) favour greater use of Swabian, a finding that I attribute to two factors: first, *Abitur* achievement is not as differentiating a factor today as it was in the past (see discussion in Section 4.4.1.5); and, second, a Swabian resurgence or "Swabian renaissance" is emerging with the youth, a topic further considered in subsequent sections in this thesis.

There are a number of complex interaction effects with respect to the nature of the linguistic variable. Variables that are stable (less than 15% change) favour Swabian in both real-time (2017:Variable Status-Stable) and apparent-time (Birthyear:Variable Status-Stable), while variables with low levels of stigma favour the standard language in both real-time (2017-Variable Stigma-Low) and apparent-time (Birthyear:Stigma-Low). Swabian-specific variables (Birthyear:Variety-Swabian) and variables with low-salience (Birthyear:Salience-Low) favour the standard language in apparent-time for the twin speakers but are not significant in real-time for the panel participants, providing further evidence that the traditional variants for the Swabian-specific variables are in greater decline.

In order to more readily grasp the varying strength of these different predictors on dialect density, Figure 4-20 visualises the interaction effects for community, orientation, and education, using the *plotLMER.fnc* function from the R package *languageR*, version 1.5.0 (Baayen 2008), which plots the partial effects of a (generalised) linear mixed-effects model. The panel study is shown on the left and the twin study on the right. The vertical axes show the correlation coefficient of dialect density, and the horizontal axes plot rescaled birth year (recall that negative numbers represent earlier birth years, hence older speakers). The z-axis depicts one predictor and its interaction with birth year with respect to dialect density.

The top two plots in Figure 4-20 illustrate the interaction between speaker birth year and community concerning dialect density, revealing a critical difference between the panel study and twin study: interaction between speaker birth year and community membership is not significant for the panel study participants, whereas it is highly significant for the twin study participants ($p < .001$). Younger twin study speakers in Stuttgart use significantly less dialect than younger speakers in Schwäbisch Gmünd. This stark decline in dialect density for the younger speakers in Stuttgart is not nearly so prominent for Schwäbisch Gmünd. Note that for the panel speakers, both birth year and recording year interact with community (see Table 4-8 and Figure 4-19) confirming that the decline in dialect density is a function of both birth year and the 35-year time lag, an effect which is more pronounced in Stuttgart than in Schwäbisch Gmünd.

The two lower plots in Figure 4-20 depict the interaction between Swabian orientation and speaker birth year, revealing the strong effect of identity in the panel participants' likelihood of speaking dialect, an effect that is not significant for the twin study participants. Rather, *Abitur* attainment and birth year show strong interaction for the twin study participants, while Swabian orientation and birth year are not significant. This shifting influence, from a focus on *Heimat* 'homeland' and local culture with the panel participants toward higher educational achievement with the twin study participants, reflects a fundamental transformation in Swabian society over the 35-years of this study – a movement away from a traditional closed, tightly connected, village-like mentality to a more open, widely connected, pan-regional community. This transformation is also echoed in the changing effect of mobility: in 1982 mobility played no significant role in dialect density; however, by 2017 it is a highly significant predictor of dialect density for the panel participants (see Table 4-8) and simply "a way of life" for the twin participants (i.e., no longer significant) (see Table 4-9 and Figure 4-19).

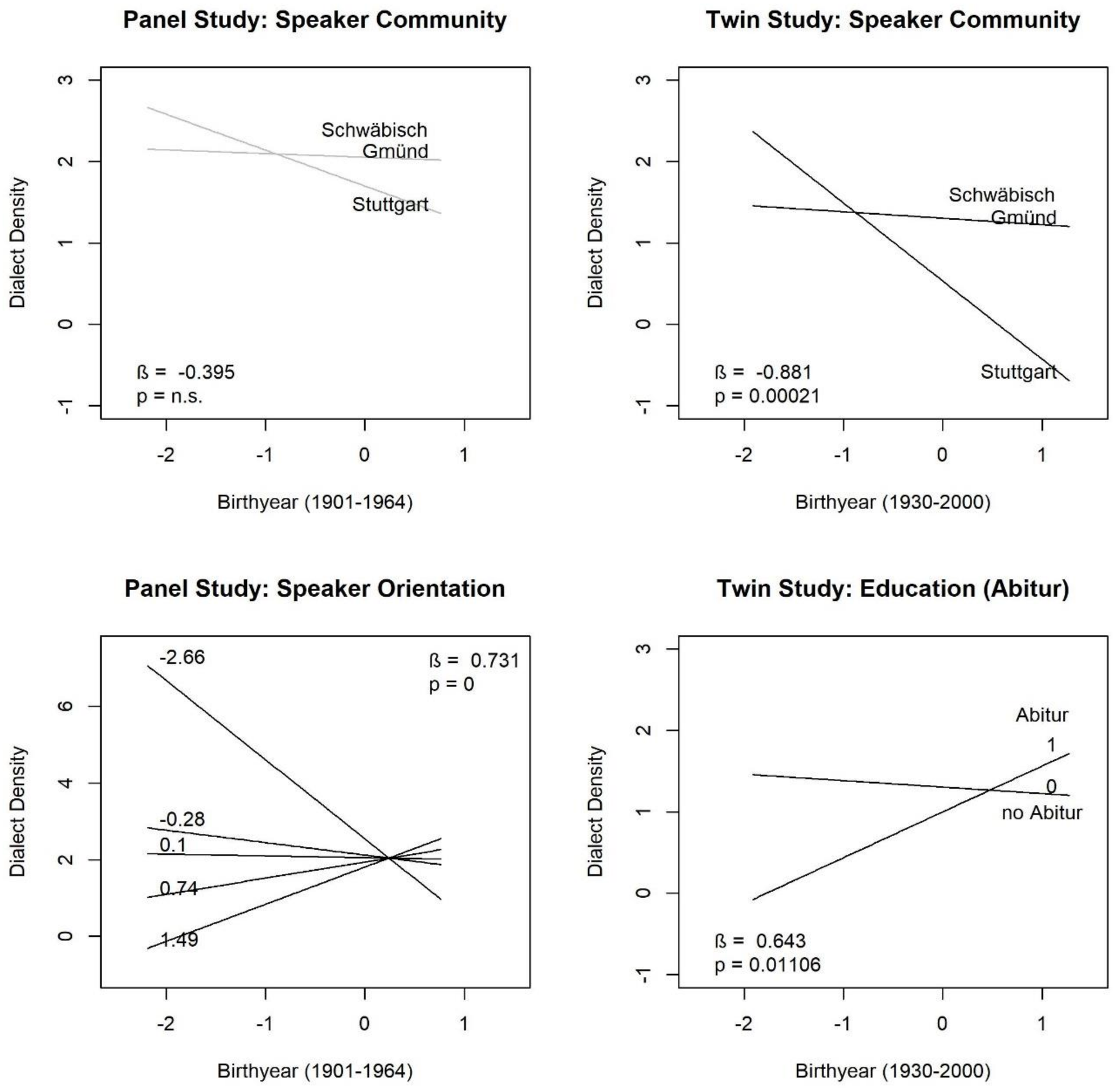

Figure 4-20. Multivariate Analysis Interaction Effects – Speaker Characteristics

Figure 4-21 depicts the interaction effects between speaker birth year and dialect density for the four variable characteristics: variety, salience, stigma, and status. The top two plots show that, although overall dialect density is lower in the twin study, Swabian-specific variables disfavour dialect density ($p < .001$), a powerful effect in both study types, confirming the role of Swabian-specific variables in UNDER THE COUNTER change as discussed in Section 4.4.1.6. The second row of plots in Figure 4-21 shows that low-salience is also an inhibiting effect for dialect variants in both studies, albeit somewhat more robust for the panel speakers than for the

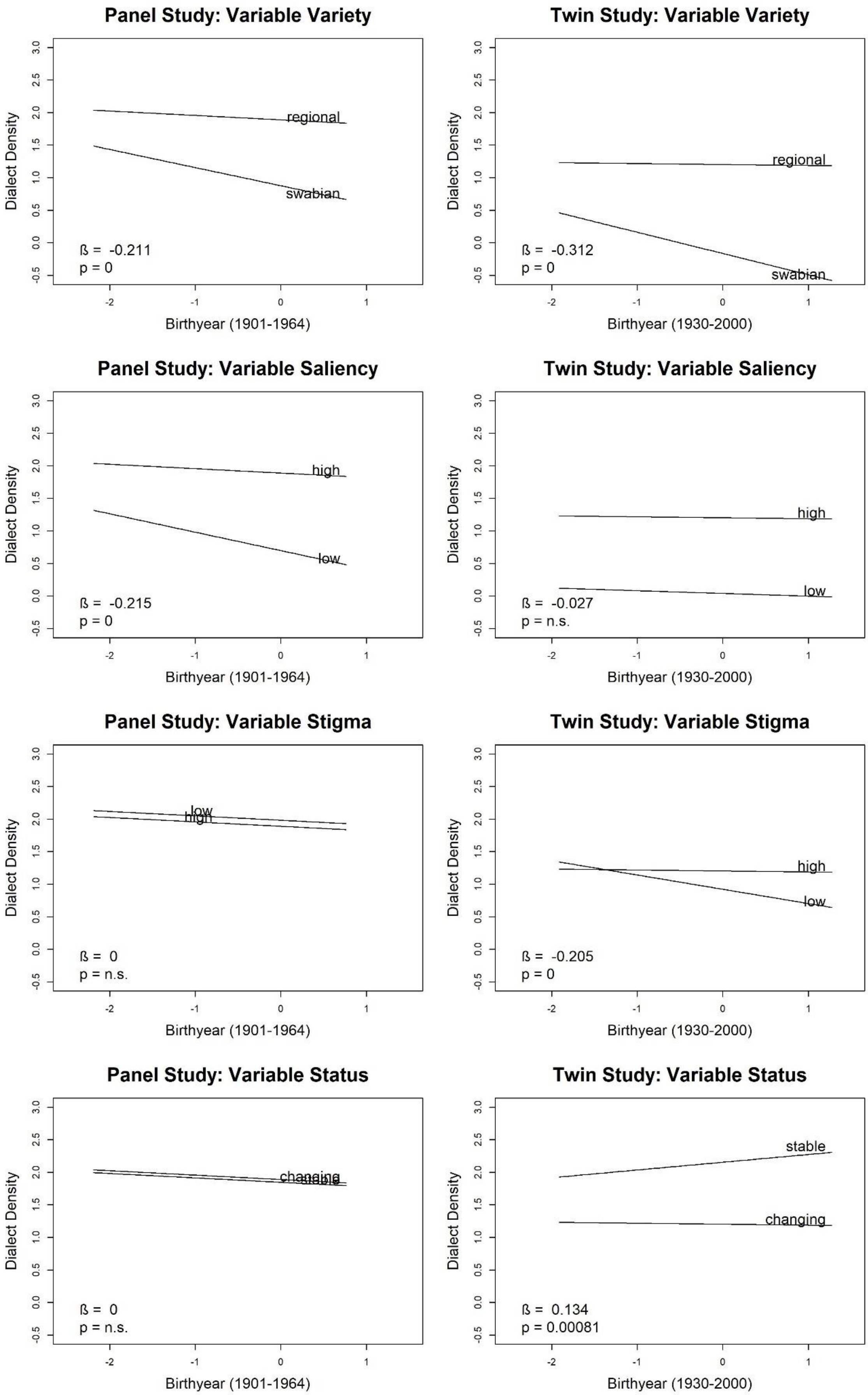

Figure 4-21. Multivariate Analysis Interaction Effects – Variable Characteristics

twin speakers. This finding is contrary to Auer et al. (1998:163) who found that features perceived as salient retreat more readily than those perceived as less salient. However, these researchers also found some contradictions in their data; therefore, they conclude that "salience is a necessary but insufficient condition for dialect loss and acquisition" (Auer et al. 1998:184). The role of salience in language change remains uncertain: empirical studies have shown that it can contribute both to the maintenance and the loss of a feature (Hinskens 1996:17).

The third row of plots in Figure 4-21 illustrates that variable stigma is not significant in the panel study, yet is highly significant in the twin study. Trudgill (1986:11) says stigmatisation occurs when "there is a high-status variant of the stigmatized form *and* this high-status variant tallies with the orthography, while the stigmatized variant does not," which is the situation with the Swabian variants. The findings imply that the stigmatisation of the Swabian-specific variables developed sometime between 1982 and 2017, concurrent with rising levels of education in Germany, suggesting that an overriding motivation behind dialect levelling in Swabia may lie in speakers' associations of the dialect with *einfache Leute* 'simple people' (Helmut, example (3)), *der letschte Bauer* 'the last farmer' (Michaela, example (18)) or *Bauersäcke* 'simple-minded lazy bums' (Marius, example (19)).

The bottom row of plots in Figure 4-21 depicting the correlation of variable status with birth year and dialect density suggest that, once variables start changing, the momentum moves forward quickly, with variables in the process of change exhibiting lower levels of dialect density than those that are stable. In sum, these findings reveal that dialect levelling in Swabian is influenced not only by the passage of time (i.e., 35 years), the effects of modernisation (e.g., urbanity, mobility, educational achievement), and concepts of identity and accommodation, but also by the sociohistorical context of the variable itself (e.g., traditional Swabian-specific variables, stigma, and salience). Some of these effects are uncovered only in the apparent- time analysis of the twin study (e.g., stigmatisation), which likely emerge from the larger dataset (i.e., 40 speakers, three age groups) versus the smaller dataset of the panel study (i.e., 20 speakers, two age groups). Labov (1994:76) has pointed out that while panel studies may suffer from a "reduced sample, perhaps too small for statistical significance, [they are] nonetheless extremely valuable for the interpretation of the original observations."

4.4.4.2. Predictors of dialect variants

While an analysis of dialect density is effective for understanding the overall extent of dialect levelling occurring in Swabian, the nature of the levelling is exposed by examining the differences among the individual linguistic variables. This section reports on four multivariate models for the individual variables: 10 phonological variables for the panel study (Table 4-10) and the twin study (Table 4-11) and 9 morphosyntactic variables for the panel study (Table 4-12) and the twin study (Table 4-13).[25] Interaction effects with the individual variables were modelled for recording year, birth year, and community and the comparative results between the panel and the twin studies are shown in Figure 4-22 for the phonological variables and Figure 4-23 for the morphosyntactic variables. As before, these figures show only the significant predictors ($p < .05$), and the variables are sorted from highest to lowest by the panel study coefficient, with the variables most likely to be realised as Swabian at the top. While it is beyond the scope of this chapter to review each variable independently, in what follows, I discuss a couple of the more illuminating variables as examples.

Looking first at the phonological variables (Figure 4-22), the top four rows show the strongest favouring of the dialect variant is with palatal coda -*st* (STP). As previously seen in Figure 4-15 and Table 4-4, palatal coda -*st* is stable with all verbs (STPV) with a frequency of use between 70% and 80% across the years, except with the common verb *ist~isch(t)* 'is' (STPI) where it is changing in the direction of the standard variant. The first row in Figure 4-22 shows that the dialect form is highly favoured in both the panel and the trend study (STPI-Palatal 'ist-isch' -st [ʃt ~ st]), yet is less favoured by the panel speakers in Stuttgart (Stuttgart:STPI-Palatal 'ist') and has become disfavoured by the twin speakers in Stuttgart (Stuttgart:STPI-Palatal 'ist'). In contrast, palatal -*st* in six high-frequency verbs is favoured by the panel study speakers in both 2017 (2017:STP6-Palatal Six Verbs) as well as in Stuttgart (Stuttgart:STP6-Palatal Six Verbs). It appears to be disfavoured only by the youngest twin study speakers (Birthyear:STP6-Palatal Six Verbs). Since this study implicates young people as the forerunners of change in Swabian, these findings suggest that word frequency is playing a role in the change in the use of palatal coda -*st* with these six common verbs.

Turning to the morphosyntactic variables, Figure 4-23 confirms the stability of the definite article *das~des* (DAS) as seen in Table 4-6 by showing a strong favouring of the dialect variant (DAS-Definite Neuter Article: *des ~ das*) in both real-time (2017:DAS-Definite Article *das*) and apparent-time (Birthyear:DAS-Definite Article *das*). Figure 4-23 also establishes the changing nature of negative marker *ned* (NEG) which was highly favoured in 1982 (NEG-Negative Marker: ned~nich(t)) and becoming disfavoured by in 2017 in real-time (2017:NEG-Negative Marker *ned*) and apparent-time by the youngest age groups (Birthyear:NEG-Negative Marker *ned*), as well as by speakers from Stuttgart (Stuttgart:NEG-Negative Marker *ned*). Space restrictions on this thesis prohibit me from discussing more of the individual variables individually. Appendix A provides detailed frequency distributions for each linguistic variable.

[25] Since the diminutive affix -*le* (SAF1 and SAF1B) is coded as a normed frequency rather than as a variation-based frequency, it has been excluded from the multivariate analyses.

RANDOM EFFECTS:					
Groups	Name	Variance	Std.Dev.	Tokens = 41,662	
Speaker	(Intercept)	0.2406	0.4905	Speakers = 20	

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	1.60316	0.13932	11.507	< 2e-16	***
Recording Year 2017	-1.30612	0.03219	-40.570	< 2e-16	***
Speaker Birth Year	-0.19950	0.11221	-1.778	0.075420	.
Community Stuttgart	-1.33389	0.23286	-5.728	1.01e-08	***
AIS1	-2.38434	0.05315	-44.857	< 2e-16	***
AIS2	-1.36936	0.05692	-24.057	< 2e-16	***
ANN	-1.25378	0.05572	-22.501	< 2e-16	***
FRV1	-1.32388	0.09158	-14.456	< 2e-16	***
FRV2	-1.86057	0.06748	-27.572	< 2e-16	***
FRV3	-1.46225	0.06536	-22.372	< 2e-16	***
FRV4	-2.78812	0.07151	-38.988	< 2e-16	***
SFV	-1.02653	0.09673	-10.612	< 2e-16	***
STPV	-0.33030	0.14040	-2.352	0.018649	*
STP6	-1.02455	0.10891	-9.407	< 2e-16	***
STPI	1.09423	0.06195	17.662	< 2e-16	***
STPO	-0.86598	0.06844	-12.653	< 2e-16	***
Year 2017 : AIS1	0.62951	0.07322	8.597	< 2e-16	***
Year 2017 : AIS2	0.27677	0.07217	3.835	0.000126	***
Year 2017 : ANN	0.66913	0.06754	9.907	< 2e-16	***
Year 2017 : FRV1	0.33765	0.12791	2.640	0.008299	**
Year 2017 : FRV3	0.54922	0.08675	6.331	2.43e-10	***
Year 2017 : FRV4	0.26484	0.10899	2.430	0.015106	*
Year 2017 : SFV	0.98383	0.11468	8.579	< 2e-16	***
Year 2017 : STPV	1.08352	0.16182	6.696	2.14e-11	***
Year 2017 : STP6	0.99162	0.12718	7.797	6.33e-15	***
Year 2017 : STPO	0.28961	0.08137	3.559	0.000372	***
Birth Year : AIS2	0.07589	0.03183	2.384	0.017129	*
Birth Year : ANN	0.20687	0.03077	6.723	1.78e-11	***
Birth Year : FRV4	-0.19073	0.04357	-4.378	1.20e-05	***
Birth Year : STPV	0.33997	0.08639	3.935	8.31e-05	***
Birth Year : STPI	0.11444	0.04915	2.328	0.019897	*
Birth Year : STPO	0.12231	0.04142	2.953	0.003144	**
Community Stuttgart : AIS2	-0.41218	0.08345	-4.939	7.84e-07	***
Community Stuttgart : ANN	0.83601	0.06941	12.044	< 2e-16	***
Community Stuttgart : FRV1	-0.57076	0.17123	-3.333	0.000858	***
Community Stuttgart : SFV	0.54990	0.11655	4.718	2.38e-06	***
Community Stuttgart : STPV	0.82777	0.16486	5.021	5.14e-07	***
Community Stuttgart : STP6	0.71671	0.12900	5.556	2.76e-08	***
Community Stuttgart : STPI	0.59696	0.09965	5.990	2.09e-09	***
Community Stuttgart : STPO	1.00262	0.08360	11.993	< 2e-16	***

Table 4-10. Multivariate Analysis for Phonological Variables – Panel Study

RANDOM EFFECTS:				
Groups	Name	Variance	Std.Dev.	Tokens = 42,626
Speaker	(Intercept)	0.8315	0.9119	Speakers = 20

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	0.12605	0.18014	0.700	0.484091	
Speaker Birth Year	-0.46182	0.14764	-3.128	0.001759	**
Community Stuttgart	-1.27235	0.04494	-28.312	< 2e-16	***
ANN	-0.47256	0.04309	-10.967	< 2e-16	***
FRV1	-1.55100	0.08822	-17.580	< 2e-16	***
FRV2	-1.92171	0.08339	-23.046	< 2e-16	***
FRV3	-1.90576	0.06434	-29.620	< 2e-16	***
FRV4	-2.99060	0.09141	-32.716	< 2e-16	***
SFV	-0.10583	0.06974	-1.517	0.129153	
STPV	1.30261	0.10221	12.744	< 2e-16	***
STP6	0.22920	0.06641	3.451	0.000558	***
STPI	1.76497	0.06019	29.323	< 2e-16	***
STPO	-0.34896	0.04682	-7.453	9.11e-14	***
Birth Year : AIS2	-0.24666	0.04222	-5.842	5.16e-09	***
Birth Year : ANN	0.34160	0.03588	9.521	< 2e-16	***
Birth Year : FRV1	-0.19618	0.08356	-2.348	0.018889	*
Birth Year : FRV2	-0.20923	0.08273	-2.529	0.011440	*
Birth Year : FRV3	-0.34371	0.05983	-5.745	9.21e-09	***
Birth Year : FRV4	-0.42018	0.07742	-5.427	5.73e-08	***
Birth Year : SFV	0.54449	0.06412	8.491	< 2e-16	***
Birth Year : STP6	-0.29340	0.07318	-4.009	6.09e-05	***
Birth Year : STPI	0.18234	0.04597	3.967	7.28e-05	***
Birth Year : STPO	0.34487	0.04028	8.563	< 2e-16	***
Community Stuttgart : AIS2	-0.58519	0.09716	-6.023	1.71e-09	***
Community Stuttgart : ANN	0.65127	0.07636	8.529	< 2e-16	***
Community Stuttgart : FRV1	0.39073	0.17508	2.232	0.025633	*
Community Stuttgart : FRV3	0.25122	0.12343	2.035	0.041822	*
Community Stuttgart : FRV4	0.67388	0.14969	4.502	6.74e-06	***
Community Stuttgart : SFV	0.34392	0.12434	2.766	0.005675	**
Community Stuttgart : STPV	0.45493	0.17936	2.536	0.011198	*
Community Stuttgart : STPI	-0.87482	0.08798	-9.943	< 2e-16	***
Community Stuttgart : STPO	0.34203	0.08587	3.983	6.81e-05	***

Table 4-11. Multivariate Analysis for Phonological Variables – Twin Study

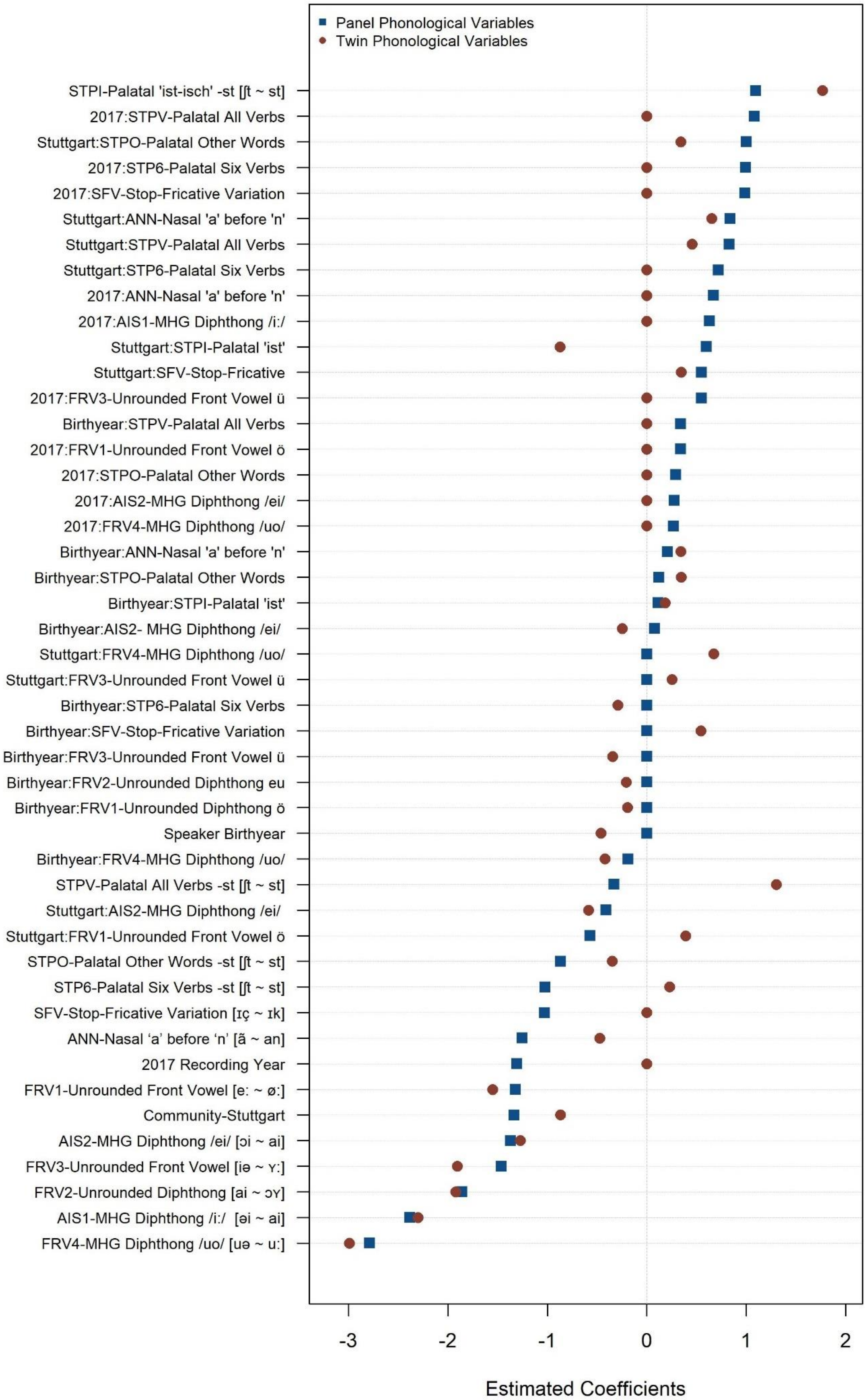

Figure 4-22. Dialect Density Relative Strength of Coefficients – Phonological Variables

RANDOM EFFECTS:				
Groups	Name	Variance	Std.Dev.	Tokens =22,669
Speaker	(Intercept)	0.2316	0.4813	Speakers = 20

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	0.13101	0.13481	0.972	0.331156	
Recording Year 2017	-0.71174	0.02223	-32.012	< 2e-16	***
Speaker Birth Year	-0.14341	0.10994	-1.304	0.192069	
Community Stuttgart	-0.90655	0.22793	-3.977	6.97e-05	***
DAS	2.60337	0.10493	24.810	< 2e-16	***
EDP	1.86422	0.10001	18.640	< 2e-16	***
IRV1	1.55918	0.18194	8.570	< 2e-16	***
IRV2	0.97402	0.13600	7.162	7.96e-13	***
IRV3	0.86547	0.07917	10.932	< 2e-16	***
NEG	3.71495	0.13923	26.682	< 2e-16	***
PVB	1.04021	0.13448	7.735	1.03e-14	***
SAF3	1.13448	0.20349	5.575	2.47e-08	***
SAF5	0.87978	0.09965	8.828	< 2e-16	***
Year 2017 : DAS	0.46639	0.12159	3.836	0.000125	***
Year 2017 : EDP	-1.35659	0.10163	-13.348	< 2e-16	***
Year 2017 : IRV1	-0.97567	0.20994	-4.647	3.36e-06	***
Year 2017 : IRV3	-0.64831	0.09203	-7.045	1.86e-12	***
Year 2017 : NEG	-1.50845	0.13041	-11.567	< 2e-16	***
Year 2017 : SAF3	-0.91427	0.27734	-3.297	0.000979	***
Year 2017 : SAF5	-0.44535	0.11530	-3.863	0.000112	***
Birth Year : DAS	0.23100	0.05441	4.246	2.18e-05	***
Birth Year : EDP	-0.12317	0.04557	-2.703	0.006872	**
Birth Year : IRV3	-0.34448	0.04354	-7.912	2.54e-15	***
Birth Year : NEG	0.42283	0.05164	8.187	2.67e-16	***
Community Stuttgart : DAS	1.73294	0.13685	12.663	< 2e-16	***
Community Stuttgart : EDP	-0.62878	0.09307	-6.756	1.42e-11	***
Community Stuttgart : IRV1	-1.64892	0.24984	-6.600	4.11e-11	***
Community Stuttgart : IRV2	-0.87092	0.24995	-3.484	0.000493	***
Community Stuttgart : IRV3	-0.24546	0.09514	-2.580	0.009883	**
Community Stuttgart : NEG	-1.01998	0.10951	-9.314	< 2e-16	***
Community Stuttgart : PVB	-1.07165	0.28246	-3.794	0.000148	***
Community Stuttgart : SAF5	-0.41272	0.11562	-3.570	0.000357	***

Table 4-12. Multivariate Analysis for Morphosyntactic Variables – Panel Study

RANDOM EFFECTS:				
Groups	Name	Variance	Std.Dev.	Tokens = 25,144
Speaker	(Intercept)	0.2316	0.4813	Speakers = 20

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	-0.89591	0.16030	-5.589	2.28e-08	***
Speaker Birth Year	-0.37722	0.13140	-2.871	0.004095	**
Community Stuttgart	-0.60651	0.27216	-2.228	0.025848	*
DAS	3.90099	0.07735	50.431	< 2e-16	***
EDP	0.48622	0.04759	10.216	< 2e-16	***
IRV1	0.58927	0.09670	6.094	1.10e-09	***
IRV2	0.49209	0.10505	4.684	2.81e-06	***
IRV3	0.31873	0.04345	7.335	2.22e-13	***
NEG	2.32018	0.05817	39.885	< 2e-16	***
PVB	0.87494	0.13660	6.405	1.50e-10	***
SAF3	0.67684	0.12762	5.304	1.14e-07	***
SAF5	1.09805	0.06623	16.578	< 2e-16	***
Birth Year : DAS	0.20548	0.07432	2.765	0.005694	**
Birth Year : IRV2	0.24370	0.11550	2.110	0.034857	*
Birth Year : IRV3	-0.43428	0.04543	-9.559	< 2e-16	***
Birth Year : NEG	-0.23448	0.04856	-4.828	1.38e-06	***
Birth Year : PVB	-0.53213	0.12739	-4.177	2.95e-05	***
Birth Year : SAF5	0.20831	0.05643	3.692	0.000223	***
Community Stuttgart : DAS	1.92981	0.19174	10.065	< 2e-16	***
Community Stuttgart : EDP	-0.38904	0.09652	-4.030	5.57e-05	***
Community Stuttgart : IRV1	-1.30482	0.24000	-5.437	5.42e-08	***
Community Stuttgart : NEG	-0.58694	0.09463	-6.202	5.56e-10	***
Community Stuttgart : PVB	-0.79124	0.28617	-2.765	0.005693	**
Community Stuttgart : SAF5	-0.45084	0.11464	-3.933	8.40e-05	***

Table 4-13. Multivariate Analysis for Morphosyntactic Variables – Twin Study

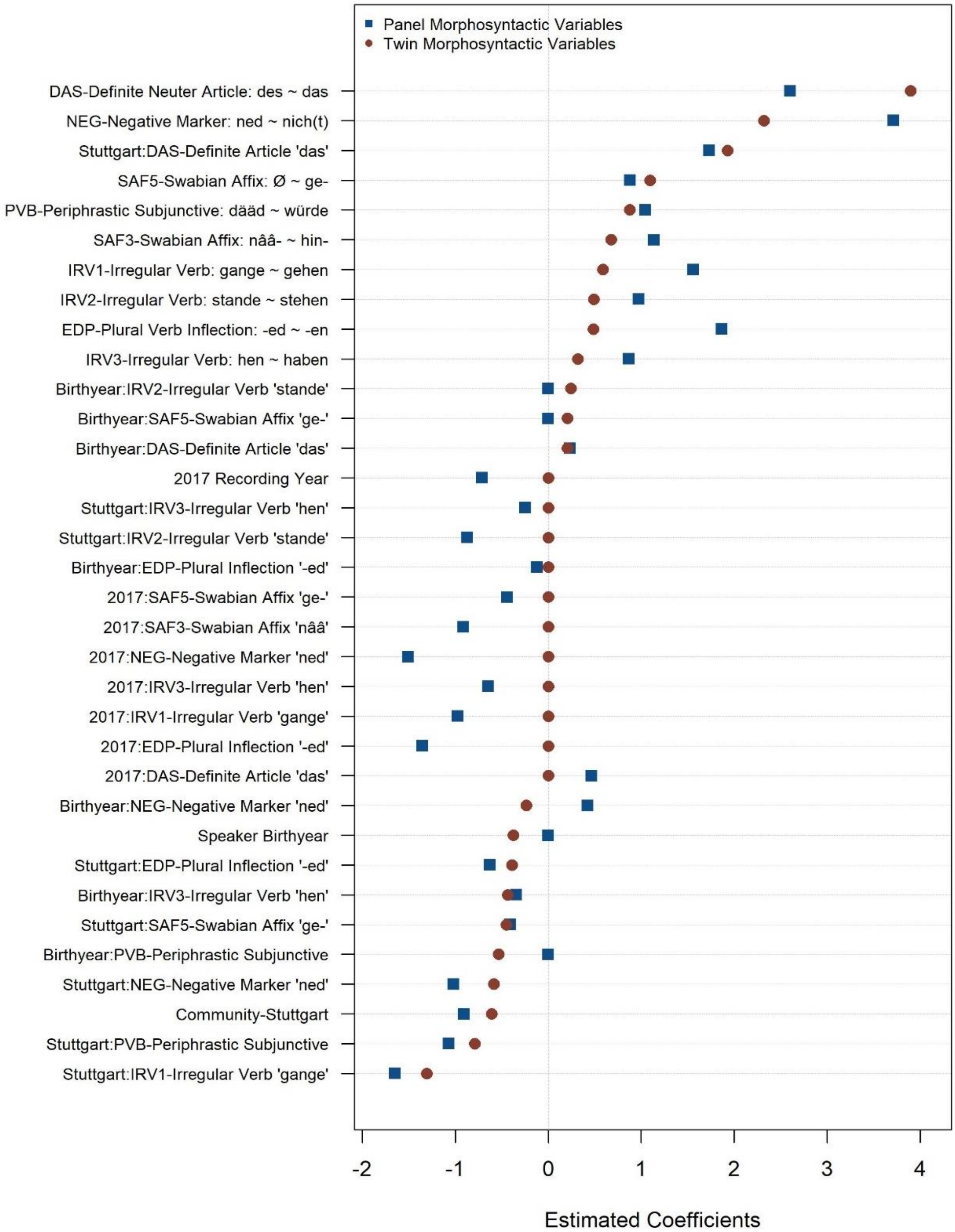

Figure 4-23. Dialect Density Relative Strength of Coefficients – Morphosyntactic Variables

4.5. Discussion

This combined panel and trend study of Swabian confirms other decisive research which shows apparent-time change mirrors real-time change, supporting the uniformitarian principle and validating Labov's (1974) heuristic for studying language change: "the use of the present to explain the past." The real-time analysis across the lifespan of the panel study participants, the real-time analysis between the 1982 panel study and the 2017 twin study, as well as the apparent-time analysis across the generations in the 2017 twin study expose pervasive dialect levelling in

Swabian. The real-time findings across these study types unmistakably reveal that the nature of change lies in the shifting lifestyles of the Swabian speakers: greater mobility, increased contact with diverse speakers, and rising levels of education oblige speakers to accommodate their language to non-Swabian interlocutors. The apparent-time results distinctly point to the younger generation as the harbingers of change, particularly those from Stuttgart, who are embracing the prestigious supraregionalised standard variety.

Nevertheless, local orientation can compel speakers to exploit dialect variants in various ways in constructing their identities to index group membership, local belonging, successful and educated, as well as other personas (cf. Auer and Hinskens (2005) "identity-projection model", Le Page and Tabouret-Keller (1985) "acts of identity"). The findings from this analysis validate the irrefutable influence of dialect identity and interlocutor accommodation on language choice and change. The relevance and interrelatedness of these two concepts are evident in speakers such as Willard who proclaims in example (10) that "standard German has no soul" and in example (1) that he could "never have married a woman who didn't speak Swabian" because "the cultural differences are too elementary." On the other hand, there are ample speakers, such as Belinda, who maintain in example (23) that it is essential for people to accommodate to speakers of other varieties because "there are so many kids from other regions" and "with all the immigrants now … you have to speak a little more standard German" so they can understand. Anneliese succinctly sums up how automatically she accommodates her language to her peers:

(37) <u>Anneliese (2017)</u>

i pass mei Sprach an	I adapt my language
mach i scho seit Kindheit	I do that since childhood
ab meinem sechste Lebensjahr	since I was six years old
im Schwââbeland aufgwachse	I grew up in Swabia
hab zu Hause Hochdeutsch gredet	I spoke standard German at home
und sobald i da Kopf gwendet hab	and as soon as I turned my head
zu irgendwelche Freunde	to any friends
und Verwandtschaft	and relatives
hab i Schwäbisch gschwätzt	I spoke Swabian
also i hab midde im Statz hab i gswitched	so I switched in the middle of a sentence
des mach i immer noch so	I still do that
je nach dem wer mir gegeüber steht	depending on who is standing in front of me
	[S027-17-I-1-Anneliese-26:59]

While this study does not profess to resolve the conundrum over which theoretical construct, identity or accommodation, is more germane to language change, both approaches suggest a robust influence on language choice. In the current study, the results of the two composite indices, Swabian orientation (SOI) and interlocutor choice (ICI), are collinear, hindering the ability to tease apart the differences, which a carefully designed sociolinguistic-psycholinguistic investigation in the future may be able to accomplish.

As copious other studies have shown, the results of this investigation establish the large urban centre of Stuttgart as the impetus for change and the linguistic norm for the region. As discussed in Section 1.4.3, processes of SUPRAREGIONALISATION are taking over, and smaller communities are converging toward the larger, richer, more powerful regional centre of Stuttgart. The dialect of Schwäbisch Gmünd is becoming more like that of Stuttgart; as Siegfried says, *Gmiind isch nimmer Gmiind* 'Gmünd is no longer Gmünd' (see example (33)). While some speakers, such as Siegfried, may lament the loss of the old ways, it is an unfortunate by-product of progress that the great diversity of dialects is giving way to a smaller set of regionalised varieties. However, such developments are not without countermovements. Auer (2013) professes that the "New Regionalism" in southwestern Germany is a response to state centrism and globalisation. Indeed, the apparent-time results suggest the emergence of a "Swabian renaissance", as the younger, more highly educated speakers in Stuttgart show greater use of dialect variants than would be expected in a typical apparent-time trend.

This study divulges that there are clear-cut differences in the density and rate of change between the phonological and the morphosyntactic variables. Research into language change across different levels of the grammar has produced divergent results. Labov (1993) claims that syntax may lie "too deep" below the level of consciousness to signal social differentiation, and Cheshire (1998:20) contends that grammatical variation may simply not be available "for social evaluation and the consequent marking of social groups." Eckert (2018:190) asserts that syntactic variables generally have "quite fixed social meanings associated with external facts like class and particularly education." Sankoff (1972), like (Wolfram 1969), maintains that grammatical variation is more sharply stratified (i.e., stigmatised) than phonological variation, making grammatical variables more likely to converge to the standard language in the face of pressure "from above". The difference between the phonological and morphosyntactic findings from this investigation support the position that the prestige of the standard language and the resultant stigma associated with nonstandard variants are propelling the morphosyntactic variables to converge to the standard more quickly than the phonological ones.

One of the prominent drivers of change in Swabian which this study has exposed is the nature of the linguistic variable: highly local Swabian-specific variables are in extreme attrition, reflecting the social indexicalities associated with UNDER THE COUNTER change, whereas the regional variables are largely stable, with just two signalling OFF THE SHELF change, palatal *-st* (STP) particularly in verbs (STPV), and the diminutive affix *-le* (SAF1), particularly with the word *bissle* 'a little' (SAF1B). As the results of the multivariate analyses show, variable variety is heavily intertwined with aspects of salience and stigma. While variable stigma was not significant for the panel study, it has become highly significant for the 2017 twin study participants, leading to the view that the stigmatisation of specific variables has arisen over the last 35 years, indicating that speaking *derb* 'deep' or 'bawdy' Swabian is more disparaged today than it was in 1982. As Marius says, it is possible to speak Swabian so that others can understand (example (19)). Consequently, speakers today call contemporary Swabian a *verwässertes Schwäbisch* 'watereddown Swabian' or an *Honorationsschwäbisch* 'noble Swabian'. While Swabian is ever-present, the density of dialect variants is not as high as with the traditional variety of years past.

Cheshire (2006:1558) has argued for quantitative studies to include more qualitative, ethnographic analyses that consider individual experiences and life histories to augment the purely statistical findings. The lifespan trajectories of the speakers in this study unveil a number of complementary and competing dynamics that influence speakers' choice of dialect or standard variants. Over their lifespan, individuals develop and foster differing identities, formed from the outcomes of their personal histories and life experiences. For example, both Ricarda and Elke are kindergarten teachers, Ricarda in the sprawling suburbs of Stuttgart and Elke in a small rural town outside of Schwäbisch Gmünd. Ricarda has moved around a lot and even lived outside Swabia for a few years. In 1982, her orientation score was 3.5, and her dialect density was 29.8%; by 2017 her orientation score had dropped to 2.0 (the lowest of all the speakers in this study) and her dialect density to only 6.9%. Even at an early age, Ricarda felt that speaking Swabian did not "fit" with who she was; she said it would make her sound *lätschig* 'slouchy'. In contrast, Elke has never moved and, in fact, still lives in the childhood home where she was born. Her Swabian orientation scores have remained stable (4.2 to 4.4), and her dialect density has changed very little over the years (from 42.8% in 1982 to 40.1% in 2017). Elke feels she can express herself better in Swabian, something she claims she cannot do in standard German. These two speakers of the same age, sex, education, occupation, and socioeconomic status typify very different dialect identities, which can be attributed in large part to their diverse mobilities and the substantial urban-rural divide between Stuttgart and Schwäbisch Gmünd.

Individuals can change their orientation and develop opposing worldviews over their lifetime. Rupert, Angela, Jurgen, and Berdine are siblings. In 1982, all four showed similar levels of dialect density and Swabian orientation scores and maintained close connections to their home and family in Schwäbisch Gmünd. Rupert wrote Swabian poetry, publishing a small collection of his poems. However, as he went off to college and completed his PhD, he began to distance himself from his family. By 2017, his Swabian orientation had dropped from 4.0 to 2.4, and he expressed many negative attitudes towards the dialect, saying that speaking Swabian is a sign of lack of education and commenting that he is proud that he has been able to "raise his social status over his parents' generation." Rupert's siblings have also achieved high-level degrees and exhibit high mobility scores: Berdine and Jurgen are teachers in the north of Germany, and Angela is a medical doctor in Stuttgart. However, their Swabian orientation scores have barely changed over the years, and they all demonstrate relative stability in their dialect usage (see Appendix B.1 for speaker details). Jurgen, in particular, is saddened by the fact that Swabian appears to be going the way of *Plattdeutsch* 'Low German', which has largely died out of everyday usage. The linguistic behaviour of these siblings suggests that personal orientation usurps mobility and education in the influence it evinces over the linguistic choices that individuals make.

4.6. Summary

This chapter set out to discover the extent and nature of dialect levelling in Swabian and to compare and contrast the findings from a panel study and a twin study, analysing change in both real- and apparent-time. The findings confirm both hypotheses of this research: dialect levelling is pervasive in Swabian, which is mitigated by factors of personal identity and interlocutor choice (HYPOTHESIS 1); and, apparent-time largely mirrors real-time in projecting the direction of the change (HYPOTHESIS 2); yet, individuals can move either with or against the change and can shift more quickly or more slowly, depending on their personal orientation and desire to accommodate. What is, however, not clear from this investigation is the "true" rate of change; while it appears that generational change in the twin study is moving more quickly than lifespan change in the panel study, more than two recording periods are needed to validate this presumption – a clarion call for future research!

Chapter 5. The social meaning of a diphthong merger

i bin e Schwââb und blêib ôiner
'I'm a Schwab and I'm staying one'
-Louise 2017

5.1. Introduction

Chapter 4 established significant dialect levelling for 17 of the 20 linguistic variables under investigation in this study. This chapter dives deep into the analysis of one of the most prototypical Swabian phonological variables, the (ai) diphthong (AIS1 and AIS2), which has two variants based on the etymological origin of the phoneme: phones originating from MHG /ī/ (AIS1) are typically realised as [əɪ] in Swabian as in *Zeit* 'time' [zəɪt] (MHG /zīt/, standard German [zaɪt]); whereas phones deriving from MHG /eɪ/ (AIS2) are typically realised as [ɔɪ] in Swabian as in *klein* 'small' [glɔɪ] (MHG /klein/, standard German [klaɪn]). This chapter investigates the growing loss of contrast in Swabian between these two phonemes as they converge toward a single standard German variant. With a continued focus on the first two research questions of this study – the nature and extent of dialect levelling occurring in Swabian (RESEARCH QUESTION 1) and the compatibility and complementarity of a combined real- and apparent-time analysis (RESEARCH QUESTION 2) – this analysis shows how sound change is governed by the intricate interplay between internal linguistic factors and notions of social meaning and identity (Eckert and Labov 2017; Moore and Carter 2015; Wolfram and Schilling-Estes 1996). This chapter begins with a short review of the theoretical background concerning lexical frequency, phonetic conditioning and social meaning (Section 5.2), followed by a description of the data and methods employed (Section 5.3), the analysis of the results (Section 5.4), and a discussion of the overall findings (Section 5.5).

5.2. Theoretical background

Sociolinguistic studies have repeatedly found that both internal and external factors influence the nature and direction of language change (Labov 1994, 2001). Confounding these influences are lexical frequency effects, a linguistic force that has received minimal attention in sociolinguistic variationist research, even less in longitudinal panel studies, and none to my knowledge in Swabian. Indeed, there is considerable controversy regarding the nature and impact of lexical frequency on linguistic processes and sound change. Bybee (2002) claims that frequently used words or phrases undergo "special reduction", yielding differing results based on lexical word class and showing that synchronic change occurs first in more frequently used words and then progresses to the less frequent ones (Bybee 2017:273-275). Aylett and Turk (2006) suggest that high-frequency words are usually found in contexts in which they are more predictable and therefore provide less information than low-frequency words, which, as a consequence, makes them more likely candidates for change and reduction.

However, Tomaschek et al. (2018) found that high-frequency words “get more practice” and thus are produced with greater proficiency, making them more resistant to change. Higher proficiency reduces variability, which is generally accepted as a precursor to change (WLH 1968). Erker and Guy (2012:526) claim that frequency acts as a “gatekeeper and potentiator”, meaning that constraints show different effects above certain thresholds. “Items that are highly practiced and very familiar will be recognized more quickly, articulated more easily, changed more or less readily, perceived as more grammatical, and accorded distinctive mental status; in effect, practice makes perfect, or at least, practice makes different” (*Ibid*.).

Hay et al. (2015) show that once a sound change is in progress, it spreads faster through low-frequency words due to analogical processes, hence it is the high-frequency words that show more resilience to change. Based on a listener-oriented exemplar model, Todd, Pierrehumbert, and Hay (2019) propose that frequency effects interact with the discriminability of the phone. Their research shows that when a sound change increases the similarity to other phones, then change occurs first in high-frequency words; conversely, when a sound change reduces the similarity to other phones, change occurs first in low-frequency words.

Other research related to word frequency claims that FUNCTIONAL LOAD, the amount of work a phoneme does in distinguishing words, can predict the likelihood of a phonemic merger occurring which results in linguistic change (Hockett 1967; Jakobson 1931). In a comprehensive cross-linguistic corpus study of nine language varieties, Wedel, Kaplan, and Jackson (2013:180) established that phonemes with greater numbers of MINIMAL PAIRS are more resistant to mergers, while those with fewer minimal pairs are more likely to merge. Another critical factor is PHONETIC ASYMMETRY, the tendency for a diphthong to assimilate to its nucleus before voiced codas and to its offglide before voiceless ones (Moreton and Thomas 2007). Relatedly, the allophonic variation in which a higher variant of (ai) is found before voiceless consonants, known as CANADIAN RAISING (albeit not restricted to Canada), demonstrates the importance of voicing on diphthong production (Britain 1997; Chambers 1973). In Central Swabian, the voicing distinction is realised by what is considered a *lenis/fortis* (i.e., tense/lax) opposition. According to Frey (1975:21), “*alle harten Konsonanten stimmlos sind, alle weichen stimmhaft sein können aber nicht in jeder Umgebung stimmhaft sein müssen*”, ‘all strong [tense] consonants are voiceless, all weak [lax] ones can be voiced but must not be voiced in every environment.’

Considerable sociolinguistic research shows that phonological variables, due to their frequency, elasticity, and referential independence, are readily available for constructing social meaning (Eckert and Labov 2017:467). This study adopts Eckert and Labov’s (2017:468) definition of social meaning which asserts that “systematic social variability of form is generally said to have social meaning, hence to be available for social expression.” Much social meaning is well below the level of speaker awareness, indexing qualities or categories only indirectly (Ochs

1992), and can naturally change over time (cf. Silverstein's (2003) “orders of indexicality”). Other studies show that speakers’ interpretation of meaning varies based on the situation, their perception of their interlocutor, as well as their mood at the time (Campbell-Kibler 2008). It has been argued that variables move along a continuum of awareness as they become status emblems with distinct variants linked to specific cultural values in the emergence of a linguistic norm (cf. Agha's (2003) “enregisterment”). It is within this theoretical backdrop that the ensuing analysis on the social meaning of the Swabian (ai) diphthong is conducted.

5.3. Data and methods

This chapter follows the data and methods outlined in Chapter 3. This section provides a definition of the Swabian (ai) linguistic variable (Section 5.3.1) and describes the formant extraction process (Section 5.3.2), the internal and external predictors (Section 5.3.3), and the statistical methods (Section 5.3.4 and Section 5.3.5).

5.3.1. Linguistic variable

The target variable for this investigation is the standard German (ai) diphthong, which evolved from the merger of two Middle High German (MHG) phonemes, /ī/ and /ei/ (Schwarz 2015:51,161), a change that did not occur in the upper German dialect of Swabian (see Table 5-1). The typical Swabian phonetic realisation of lemmata originating from the MHG phoneme /ī/ is [əɪ]; for example, the word *Zeit* ‘time’ (MHG /zīt/) is pronounced [tsaɪt] in standard German and [tsəɪt] in Swabian. The typical Swabian realisation of lemmata stemming from the MHG /ei/ is [ɔɪ]; for example, the word *klein* ‘small’ (MHG /klein/) is realised as [klaɪn] in standard German and as [glɔɪ] in Swabian. In contemporary Swabian, standard German [klain] also varies with a more centralised, vernacular realisation [kləɪ], which is the object of this study. In analysing the (ai) diphthong based on the *Sprachatlas des deutschen Reichs* ‘The Linguistic Atlas of Germany’ (Wenker and Wrede 1895) and the *Südwestdeutscher Sprachatlas* ‘Linguistic Atlas of Southwest Germany’ (Steger, Gabriel, and Schupp 1989), Schwarz (2015:488) found statistically significant differences between lemmata based on MHG origin.

	Standard German		Swabian German		English
	orthography	IPA	orthography	IPA	
MHG /ī/					
blībe	bleibe	[blaɪbə]	blêib	[bləɪb]	stay
wīʒ	weiß	[vaɪs]	wêiß	[vəɪs]	white
zīt	Zeit	[tsaɪt]	Zêit	[tsəɪt]	time
MHG /ei/					
breit	breit	[bʁaɪt]	brôid	[bʁɔɪd]	wide
klein	klein	[klaɪn]	klôin	[glɔɪ]	small
weiʒ	weiß	[vaɪs]	wôiß	[vɔɪs]	know

Table 5-1. (ai) Diphthong Examples based on MHG Origin

The (ai) diphthong is an ideal variable for analysis in Swabian because: (1) it occurs with relatively high frequency in the corpus, (2) it is well-researched from a dialectology perspective, and, (3) it is a prototypical and non-salient feature of the Swabian dialect (Russ 1990; Schwarz 2015). This investigation aims to explore, in both real- and apparent-time, the variation in lemmata stemming from these two MHG phonemes to determine whether the historical phonetic distinction is collapsing in modern Swabian, such that [ai] and [əɪ] are merging or at least becoming more similar to one another, as has happened in modern standard German. To date, no longitudinal sociolinguistic study has been conducted on (ai) diphthong variation in Swabian to examine whether it is stable or changing and what factors are impacting its usage.

5.3.2. Diphthong extraction

Following standard sociophonetic methodology, this analysis of the (ai) diphthong focuses on the shape of the movement of the first (F1) and second (F2) resonances of the vocal tract as a function of time in the diphthong. Since F1 negatively correlates with vowel height, and F2 positively correlates with vowel backness, the shape of the diphthong can be visualised and analysed in the quadrilateral vowel space (Ladefoged 1982). All MHG /ī/ and MHG /ei/ tokens were annotated based on the Swabian-German Lexicon (SGL) (see Section 3.5.5) and tokens (see Table 3-5) were extracted into PRAAT 4.0 (Boersma and Weenink 2015) with signals digitised at a sampling rate of 4.4 kHz and a low pass filter at 2.2 kHz. The audio files were aligned with the orthographic transcription using the Hidden-Markov-Model-based Forced Aligner (Rapp 1995) which uses word forms from the German part of the CELEX lexicon. Due to the size of the database, no manual corrections were made. Word types with [aɪ] at the onset were excluded, as onset positions in German are frequently articulated with creaky voice, an allophone of glottal stops rendering the extraction of vowel formants nearly impossible (Pompino-Marschall and Żygis 2010).

The PRAAT dataset was built by automatically extracting the F1 and F2 formants for all AIS1 and AIS2 tokens every 2.5 milliseconds with the upper bound frequency set at 5500 Hz for the female speakers and 5000 Hz for the male speakers. In order to reduce the effect of formant variances resulting from the physiological differences between speakers, the formants were z-scaled for each speaker (Lobanov 1971). To eliminate potential noise from formant extraction as well as strong outliers, diphthongs with F1 greater than 1000 Hz and less than 200 Hz and those with F2 greater than 2500 Hz and less than 800 Hz were excluded. To eliminate duration outliers, diphthongs longer than 400 milliseconds were removed. Since vowel duration varies considerably between instances, time in the diphthong was normalised between 0 and 1 to support GAM modelling. The 80 speakers produced a total of 9,715 [aɪ] tokens in the panel study and 10,248 in the twin study, for an average of 221 tokens per speaker/interview. Table 5-2 reports the number of types (i.e., unique words), tokens (i.e., instances of a word type), and data points (i.e., number of F1/F2 frequency measurements) of the (ai) diphthong in the Swabian corpus.

(ai) Diphthong Variants	Panel 1982	Panel 2017	Twin Older	Twin Younger	TOTAL
TYPES:					
AIS1 - MHG /ī/ Diphthong [əɪ ~ aɪ]	453	581	508	487	2,029
AIS2 - MHG /ei/ Diphthong [əɪ ~ aɪ]	495	744	543	557	2,339
TOTAL TYPES	948	1,325	1,051	1,044	4,368
TOKENS:					
AIS1 - MHG /ī/ Diphthong [əɪ ~ aɪ]	2,530	3,886	3,270	3,629	13,315
AIS2 - MHG /ei/ Diphthong [əɪ ~ aɪ]	1,199	2,100	1,555	1,794	6,648
TOTAL TOKENS	3,729	5,986	4,825	5,423	19,963
FREQUENCY MEASUREMENTS:					
AIS1 - MHG /ī/ Diphthong [əɪ ~ aɪ]	126,707	191,277	170,834	170,960	659,778
AIS2 - MHG /ei/ Diphthong [əɪ ~ aɪ]	76,690	126,633	99,002	102,104	404,429
TOTAL MEASUREMENTS	203,397	317,910	269,836	273,064	1,064,207

Table 5-2. (ai) Diphthong Types, Tokens, and Frequency Measurements

5.3.3. Predictors

As stated, this chapter aims to explore, in both real- and apparent-time, to what extent the two MHG phonemes /ī/ and /ei/ are undergoing change in Swabian by losing their historical phonetic contrast. With this goal, this chapter investigates the following predictions:

1. Diphthong origin: diphthongs were coded for MHG /ī/ or MHG /ei/, based on the etymological origin of the lemma as documented in the *Digitales Wörterbuch der deutschen Sprache* 'Digital Dictionary of the German Language' (DWDS 2020).
   - ➔ PREDICTION 1: as a result of dialect levelling in Swabian and ongoing convergence to the standard language (as seen in Chapter 4), the two (ai) diphthong variants in Swabian are expected to reveal characteristics of a merger or least a measurable loss of phonetic contrast.
2. Real- or apparent-time: diphthongs were coded for recording year, either 1982 or 2017, or age group, either younger or older as determined via an age median split.
   - ➔ PREDICTION 2: as a result of dialect levelling, greater loss of phonetic contrast between the two diphthongs is expected in real-time for the 2017 panel speakers and in apparent-time for the younger twin speakers.
3. Speech community: diphthongs were coded for the community to which the speaker belongs: Stuttgart or Schwäbisch Gmünd.
   - ➔ PREDICTION 3: Given that large metropolitan areas are more likely to promote innovations than smaller ones (Nerbonne and Heeringa 2007; Trudgill 1986), greater loss of phonetic contrast is expected for speakers in the large urban centre of Stuttgart versus the mid-sized, semi-rural town of Schwäbisch Gmünd.
4. Swabian orientation: diphthongs were coded for the speakers' level of Swabian orientation. Because SOI values were unequally distributed across the communities and time periods and in order to reduce the complexity of the analysis, factorial

predictors were created for SOI, and high and low values were determined based on a median split by year (panel study) or age group (twin study) within community.

- ➔ PREDICTION 4: Based on studies of dialect identity and local orientation (Auer and Hinskens 2005; Dodsworth 2017), as well as the findings from Chapter 4, greater loss of phonetic distinction between the two diphthongs is expected with speakers who have a low orientation to Swabian.

5. Phonetic context: diphthongs were automatically coded for the manner of articulation and the voiced/voicelessness of the following consonant based on the output from the German Forced Aligner, which uses standard German IPA annotation based on a voicing distinction; hence, the Swabian fortis/lenis contrast will be referred to as voiced/voiceless. Given the robust effects of anticipatory coarticulation in the preceding environment, the current study focuses only on the following environment (Hoole, Nguyen-Trong, and Hardcastle 1993; Sziga 1992; Tomaschek et al. 2018).
   - ➔ PREDICTION 5: In light of prior studies of the (ai) diphthong (Britain 1997; Labov 1962; Schwarz 2015), greater loss of contrast is expected in environments with following voiceless consonants as opposed to other environments (Beaman and Tomaschek 2021; Denes 1955; Kluender, Diehl, and Wright 1988).
6. Word frequency: word frequency was calculated internally based on the Swabian corpus; based on the results, representative log frequencies of 1.0 for low and 3.0 for high were selected for analysis.
   - ➔ PREDICTION 6: As the current study focuses on a sound change that increases the similarity between two phones (Todd et al. 2019), greater loss of distinction between the two diphthongs is expected in high-frequency words.

5.3.4. Statistical methods

Generalised Additive Mixed Models[26] (GAM or GAMM) (R package *mgcv*, version 1.8-23) (Wood 2011) were used to account for the non-linear spatio-temporal behaviour of formants. GAMMs model non-linear functional relations between a dependent variable and one or more predictors using "smooths", which provides an effective method for visualising complex relationships between dependent and independent variables, such as the case with diphthong formants. The statistical validity of an effect in a GAMM analysis is determined through significant non-linear effects ($\alpha = 0.001$), i.e., whether the F1 or F2 values show a curved behaviour across time for any given condition and through comparisons between a less complex and a more complex model. Only if the addition of an effect significantly improves the model and

[26] For a detailed description of GAMMs and their application to non-linear data, see Tomaschek et al. (2018); in particular, see Wieling et al. (2016) who used GAMMs to investigate articulatory differences between Dutch dialects. For an introduction to spline smooths, see Baayen et al. (2017).

only if the effect is significantly non-linear is it considered valid. Random effects for word and speaker were included in all models.

The modelling process comprised both bottom-up and top-down steps (Baayen 2008). With bottom-up modelling, the most basic model is built with one predictor, and each additional predictor is added one-by-one. Each subsequent model is compared with the previous model using the *compareML* function (R package *itsadug*, version 2.3). With top-down modelling, the process is reversed: one predictor is taken out of the model, and the *compareML* function is again used to determine the better fitting model. The *compareML* function performs a chi-square test on the difference in the scores and degrees of freedom between the two models, which is a more reliable test than using AIC values when an AR(1) autoregressive model is involved (Wood 2017). Once the best-fit model was determined, to ensure homoscedasticity and the normal distribution of residuals, data points with residuals larger than 2.5 standard deviations from the mean were excluded, and the models were refit. The model was then tested for concurvity (*concurvity* in R package *mgcv*, version 1.8-28), a generalisation of multi-collinearity that can make for unstable estimates which are sensitive to innocuous modelling details and can thereby create interpretation problems: none of the predictors selected in the best-fit model showed multi-collinearity. Finally, inspections of the model summaries and individual estimates were conducted using the *plot.gam* (R package *mgcv*, version 1.8-28), *plot_smooth* and *plot_diff* functions (R package *itsadug*, version 2.3).

To test the predictions about the Swabian (ai) diphthong claimed in the previous section, four sets of GAM models were developed, split by formant (F1 and F2), study type (panel and twin) (PREDICTION 2), and community (Schwäbisch Gmünd and Stuttgart) (PREDICTION 3), creating eight individual models for each set:

1. Origin and time. The first set of models examined whether a significant difference exists in real- and apparent-time between the two diphthongs based on the etymological origin of the phone (MHG /ī/ and MHG /ei/) (PREDICTION 1) and recording year or age group (PREDICTION 2). F1/F2 formant values were fit with a smooth for normalised time and a two-way interaction for diphthong origin and recording year (panel study) or speaker age group (twin study) (see Table 5-3).

```
BAM(F1HZZ ~  AIS.YEAR {OR AIS.AGE}
           + S(NORMALIZED_TIME, BY=AIS.YEAR, K=4)
           + S(SPK_NAME, BS = 'RE') + S(WORD_GERMAN, BS = 'RE')
           , DATA = {DATASET SPLIT BY COMMUNITY AND FORMANT}
           , DISCRETE = TRUE, NTHREADS = 8, METHOD = 'FREML'
           , RHO = .7, AR.START = AR_START_SEG
```

Table 5-3. GAM Model for (ai) Diphthong Origin and Time

2. Swabian orientation. The second set of models evaluated whether a significant difference exists in real- and apparent-time between the two diphthongs based on diphthong origin, recording year or age group, and Swabian orientation (PREDICTION

4). With this model, the F1/F2 formants were fit with a smooth for normalised time and a three-way interaction for diphthong origin, recording year/speaker age group, and SOI (see Table 5-4)).

```
BAM(F1HZZ ~  AIS.YEAR.SOI {OR AIS.AGE.SOI}
           + S(NORMALIZED_TIME, BY=AIS.YEAR.SOI, K=4)
           + S(SPK_NAME, BS = 'RE') + S(WORD_GERMAN, BS = 'RE')
           , DATA = {DATASET SPLIT BY COMMUNITY AND FORMANT}
           , DISCRETE = TRUE, NTHREADS = 8, METHOD = 'FREML'
           , RHO = .7, AR.START = AR_START_SEG
```

Table 5-4. GAM Model for (ai) Diphthong Origin, Time, and SOI

3. Phonetic environment. The third set of models targeted the following phonetic environment, i.e., manner of articulation and voicing (PREDICTION 5), and its effect on diphthong production based on diphthong origin and recording year or age group. With this model, the F1/F2 formants were fit with a smooth for normalised time and a four-way interaction for diphthong origin, recording year/speaker age group, manner of articulation, and voicing (see Table 5-5).

```
BAM(F1HZZ ~  AIS.YEAR.MAN.VOI {OR AIS.AGE.MAN.VOI}
           + S(NORMALIZED_TIME, BY=AIS.YEAR.MAN.VOI, K=4)
           + S(SPK_NAME, BS = 'RE') + S(WORD_GERMAN, BS = 'RE')
           , DATA = {DATASET SPLIT BY COMMUNITY AND FORMANT}
           , DISCRETE = TRUE, NTHREADS = 8, METHOD = 'FREML'
           , RHO = .7, AR.START = AR_START_SEG
```

Table 5-5. GAM Model for (ai) Diphthong Phonetic Environment

4. Frequency and orientation. The fourth set of models incorporated Swabian word frequency (PREDICTION 6) to investigate the interaction between frequency and Swabian orientation on diphthong production in real- and apparent-time. With this model, the F1/F2 formants were fit with a tensor for normalised time, Swabian word log frequency, and a three-way interaction for diphthong origin, recording year/speaker age group, and SOI (see Table 5-6).

```
BAM(F1HZZ ~  AIS.YEAR.SOI {OR AIS.AGE.SOI}
           + TE(NORMALIZED_TIME, FREQ_SWG.L, K=C(4,4), BY=AIS.YEAR.SOI)
           + S(SPK_NAME, BS = 'RE') + S(WORD_GERMAN, BS = 'RE')
           , DATA = {DATASET SPLIT BY COMMUNITY AND FORMANT}
           , DISCRETE = TRUE, NTHREADS = 8, METHOD = 'FREML'
           , RHO = .7, AR.START = AR_START_SEG
```

Table 5-6. GAM Model for (ai) Diphthong Best-Fit Factors

5.3.5. Calculating diphthong differences

In order to operationalise to what extent the two diphthongs have become more or less similar over time, Beaman and Tomaschek (2021) devised a heuristic, called TOTAL EUCLIDEAN DISTANCE SQUARED (TEDS), to calculate the difference between the two diphthong trajectories across normalised time. In contrast to other methods that use simple Euclidean distance or Pillai scores to calculate differences based on means (Nycz and Hall-Lew 2014), TEDS measures the distance between the two diphthongs across normalised time in the segment despite its non-linear behaviour. TEDS is defined by the following formula:

$$TEDS = \sum_{i=1}^{n}(\sqrt{\Delta_{F1}^2 + \Delta_{F2}^2})^2$$

where Δ_{F1} and Δ_{F2} denote vectors of the pointwise differences between the F1/F2 trajectories of the two diphthong variants, *n* denotes the length of the vectors (i.e., number of data points) in the F1/F2 trajectory, and *i* represents the individual data points in the F1/F2 difference vectors (Δ_{F1} and Δ_{F2}).[27] Note that the square root term defines the Euclidean distance for each predicted data point, which more strongly penalises large distances between trajectories than small ones. Since TEDS are calculated based on the GAMMs, any TEDS greater than zero represents a significant difference in the F1/F2 trajectories between the two diphthongs.

Figure 5-1 presents three illustrations to demonstrate how the difference between the two diphthong trajectories is calculated. The left plot shows two similar diphthongs with a small difference between the trajectories while the middle plot illustrates two diphthongs with a larger difference. The red vertical lines in the right plot demonstrate the measurement of pointwise distances between the two trajectories, which is the input vector to the TEDS calculation. For the current study, four sets of TEDS values were calculated, one for each GAM model described in the preceding section.

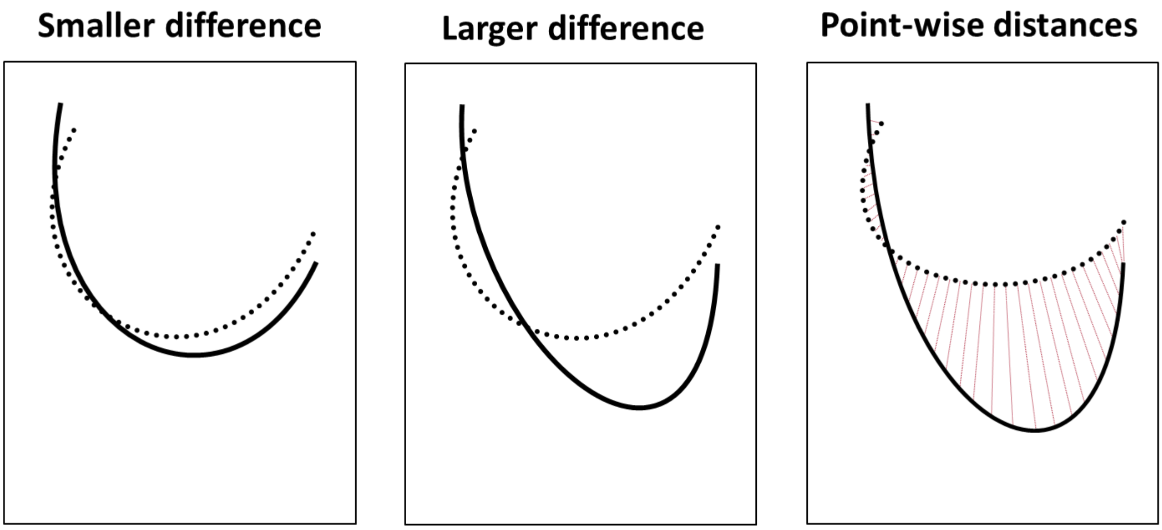

Figure 5-1. Schematic Illustration of TEDS Calculation

[27] TEDS is calculated in normalised vowel space: zero represents complete identity between the two diphthongs, whereas increasing values represent greater differences.

5.4. Analysis and results

This analysis of the differences between the two Swabian (ai) diphthongs, in real- and apparent-time, is organised as follows: changing diphthong trajectories by community and time (Section 5.4.1); the use of TEDS to measure differences in diphthong trajectories (Section 5.4.2); the prominence of Swabian orientation in diphthong realisation (Section 5.4.3); the effect of the linguistic environment on diphthong production (Section 5.4.4), and, the interaction of linguistic and social factors affecting change in the (ai) diphthong (Section 5.4.5).

5.4.1. Changing diphthong trajectories

Figure 5-2 through Figure 5-5 plot smooths across normalised time for the two (ai) diphthongs in real- and apparent-time (plotted with *plot_smooth* function from the *itsadug* package, version 2.3, van Rij et al. 2017)). For each figure, F1 is shown on the left and F2 on the right. The 1982 (panel study) or older speakers (twin study) are shown in the top plots and 2017 (panel study) or younger speakers (twin study) in the bottom plots. Lemmata originating from MHG /ī/ are represented by green curves and lemmata originating from MHG /ei/ by blue curves. Red curves depict the estimated difference between the green (MHG /ī/) and blue (MHG /ei/) curves (calculated with the *plot_diff* function from the *itsadug* package, version 2.3, van Rij et al. 2017). The shaded areas portray the 95% confidence interval. The solid red line along the horizontal axis of each plot indicates portions of the normalised time sequence in which the estimated difference between the two diphthongs is significant ($p < .05$).

The plots reveal overall deeper F1 trajectories for MHG /ei/ (blue curves) than MHG /ī/ (green curves), particularly in Schwäbisch Gmünd in 2017 (Figure 5-2, left plots) and for the older twin study speakers (Figure 5-4, left plots). Stuttgart shows a clear distinction between the diphthongs in 1982 and a closing of the gap in 2017 (Figure 5-3, left plots). A similar trend is observable in apparent-time (Figure 5-4 and Figure 5-5): the younger speakers in Schwäbisch Gmünd show less distinction between the two diphthongs than the older speakers; however, in Stuttgart, it is the older speakers who show greater merging of the two diphthongs.

These plots identify three general outcomes: (1) a loss of distinction between the two (ai) diphthongs is evident over time, confirming PREDICTION 1 of this chapter; (2) the loss of distinction between the two diphthongs is perceptible in both real- and apparent-time, supporting PREDICTION 2; and (3) the loss is greater in the urban centre of Stuttgart than in the semi-rural township of Schwäbisch Gmünd, validating PREDICTION 3. While such graphical displays of the diphthong trajectories provide practical insight into the differences between the diphthongs, the quantitative measurement of pointwise distances between the diphthongs as provided by the TEDS measure allows for greater discrimination into the differences and the change taking place.

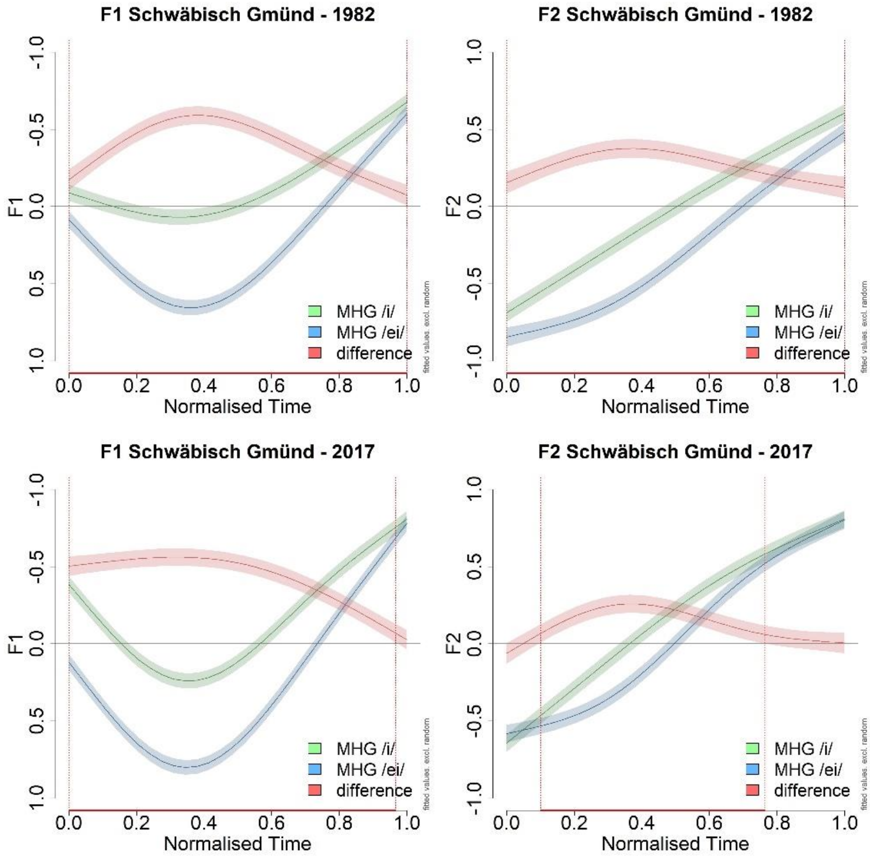

Figure 5-2. (ai) Diphthong in Real-Time for Schwäbisch Gmünd – Panel Study

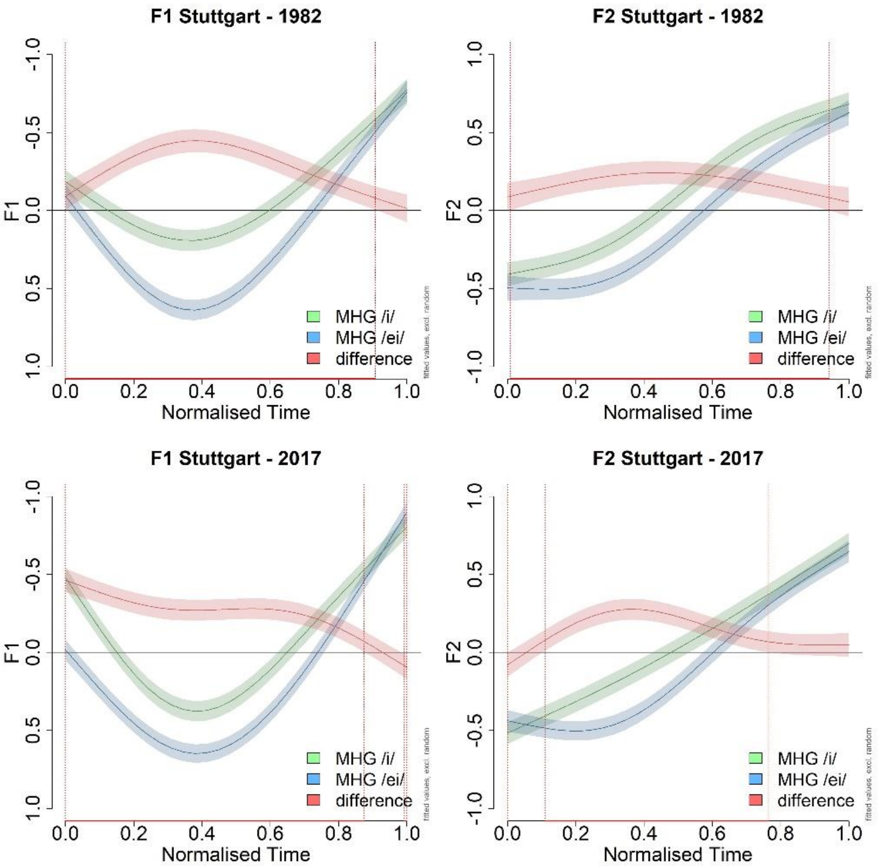

Figure 5-3. (ai) Diphthong in Real-Time for Stuttgart – Panel Study

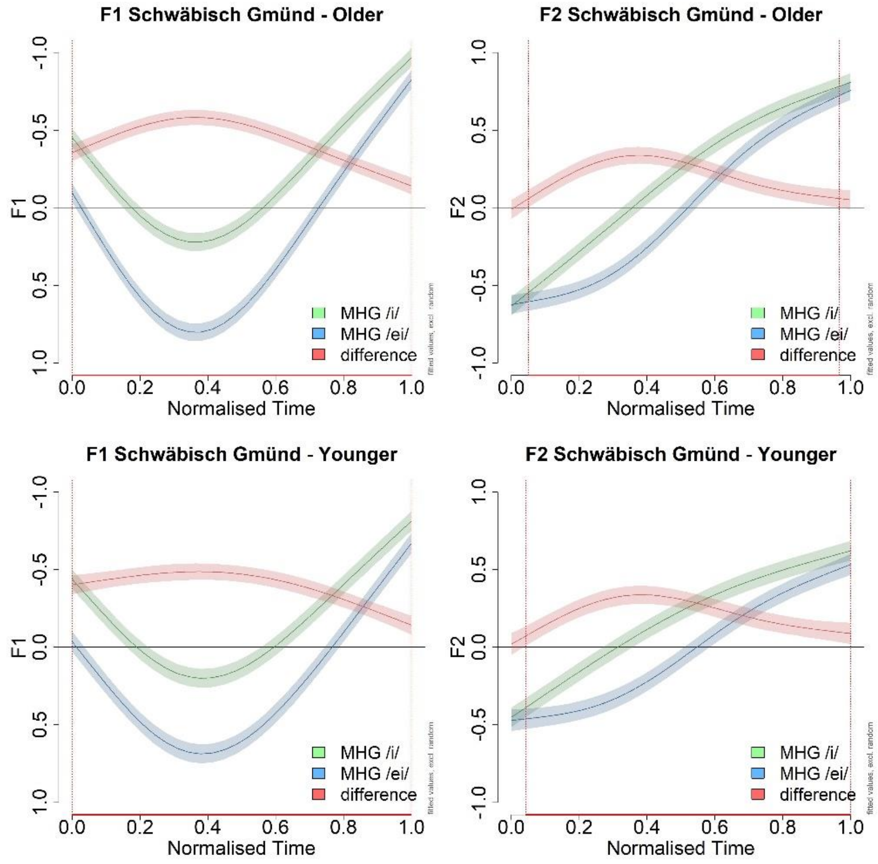

Figure 5-4. (ai) Diphthong in Apparent-Time for Schwäbisch Gmünd – Twin Study

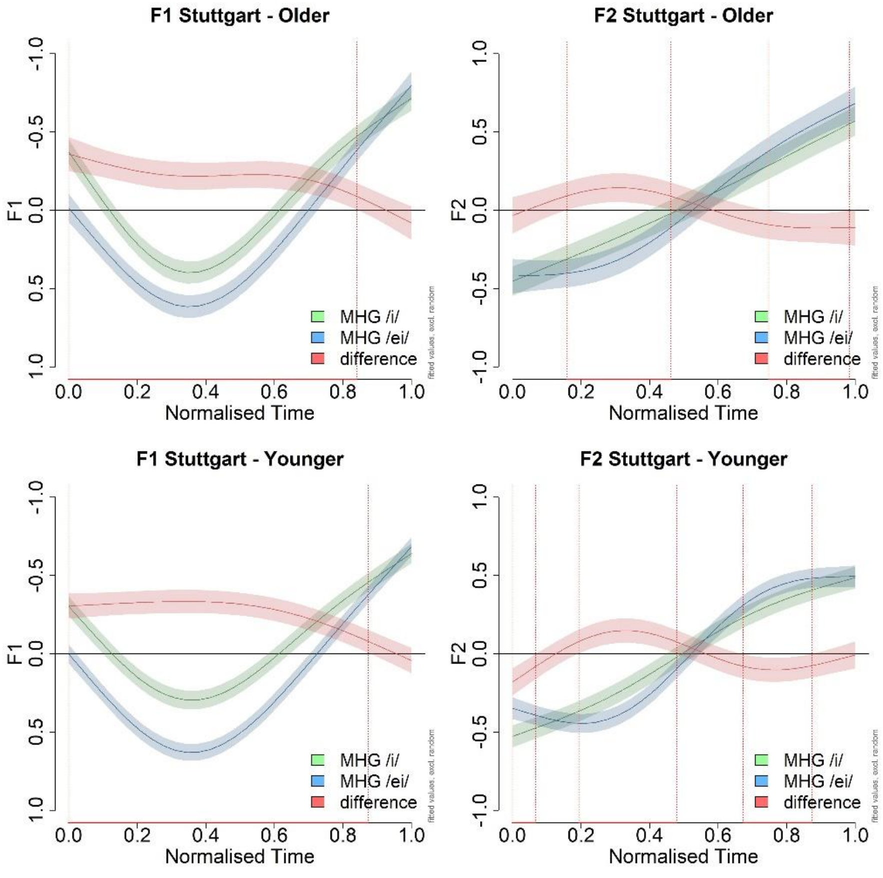

Figure 5-5. (ai) Diphthong in Apparent-Time for Stuttgart – Twin Study

5.4.2. Measuring diphthong differences

Figure 5-6 (panel study) and Figure 5-7 (twin study) depict the predicted trajectories for the two diphthongs using the first GAM model (Table 5-3). The trajectories are plotted with the *get_predictions* function (from the *itsadug* package, version 2.3), with inverted F1 values on the y-axis indicating vowel height and inverted F2 values on the x-axis representing fronting and backing (the left of the figure denotes the front of the mouth). The coloured dot indicates the onset of the diphthong, and curly brackets show the anchor vowels, {i} and {a}. Dashed lines designate diphthongs stemming from MHG /ī/ origin and solid lines those with MHG /ei/ origin. Blue lines represent 1982 speakers (panel study) or younger speakers (twin speakers) and red lines signify 2017 or older speakers. These figures confirm a distinct difference between the two diphthong trajectories based on the etymological origin of the lemma. The trajectories of MHG /ī/ (dashed lines) and those of MHG /ei/ (solid lines) are more similar to one another in both real- and

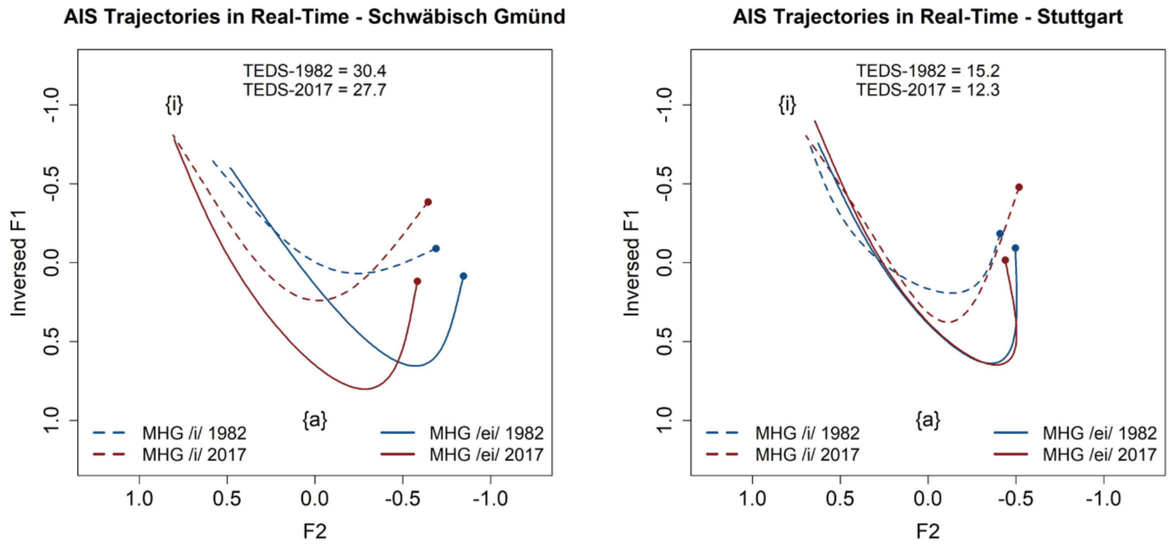

Figure 5-6. (ai) Diphthong Predicted Trajectories – Panel Study

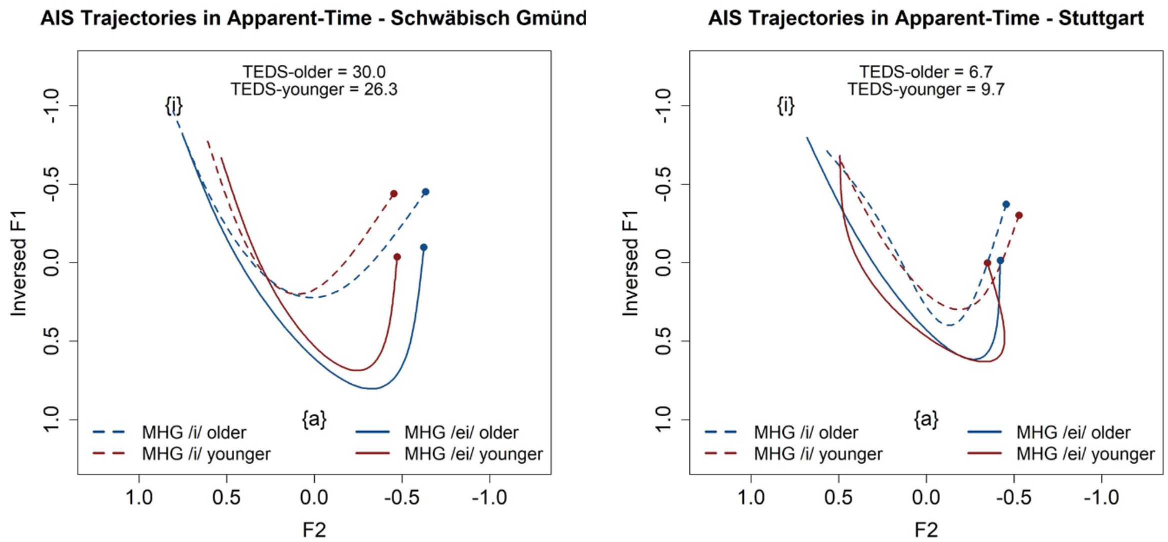

Figure 5-7. (ai) Diphthong Predicted Trajectories – Twin Study

apparent-time, yet distinctly different from each other. Corroborating the prior results, the Stuttgart trajectories illustrate shorter trajectories for both F1 and F2, as well as less distinction between the two diphthongs, in comparison to the Schwäbisch Gmünd trajectories which exhibit longer durations and a greater distinction.

The top of each figure displays the TEDS values for the community and time slice; a summary of the TEDS values for this GAM model follows in Table 5-7. Most prominent are the larger TEDS values in Schwäbisch Gmünd than in Stuttgart. Moreover, the trajectories reveal a similar TEDS reduction in both real- and apparent-time across all speaker groups, except for the younger speakers in Stuttgart who show a slightly greater distinction between the diphthongs than the older speakers. This unexpected pattern towards greater diphthong distinction with the younger speakers provides further evidence for an emerging “Swabian renaissance” (see Section 4.4.4.1), as younger speakers with strong dialect identities portray themselves as modern, educated, globally oriented, yet locally connected to their Swabian heritage. The TEDS measure quantitatively confirms the first three predictions of this chapter: the loss of phonetic distinction between the two diphthongs (PREDICTION 1), in real-time across the lifespan of the panel speakers (PREDICTION 2), and in the urban centre of Stuttgart (PREDICTION 3). The following section searches for more insight into this unexpected apparent-time pattern by considering the diphthong differences based on Swabian orientation.

Community	Panel 1982	Panel 2017	*TEDS difference*	Twin Older	Twin Younger	*TEDS difference*
Schwäbisch Gmünd	30.4	27.7	-2.8	30.0	26.3	-3.7
Stuttgart	15.2	12.3	-2.9	6.7	9.7	3.0
difference	15.3	15.4	0.2	23.2	16.5	-6.7

Table 5-7. TEDS from (ai) Diphthong Model for Origin and Time

5.4.3. The prominence of Swabian orientation

PREDICTION 4 of this chapter claims that the loss of phonetic contrast between the two Swabian diphthongs will be larger with speakers who have a low orientation to Swabia as these speakers are more likely to show greater convergence to the standard language. Table 5-8 substantiates this prediction in real-time, with TEDS values showing greater loss of contrast between the diphthongs with low SOI speakers (-11.3 in Schwäbisch Gmünd and -19.9 in Stuttgart) than with high SOI speakers (6.4 in Schwäbisch Gmünd and 4.3 in Stuttgart) who have remained remarkably constant over their lifespans. In apparent-time, the low SOI speakers in Schwäbisch Gmünd show a similar trend in the loss of distinction between the diphthongs (-13.3); however, younger speakers with high Swabian orientation show a slightly greater diphthong distinction than their older cohorts (8.9 in Schwäbisch Gmünd and 3.4 in Stuttgart).

These results provide additional support for the ostensible emergence of a “Swabian renaissance” in which younger speakers index their Swabian identities by maintaining the traditional diphthong distinction. Twenty-four-year-old Fabian remarked, *gewisserweise isch mã* *da scho e bissle Stolz drauf ã* ‘in a certain way you’re really kinda proud [to speak Swabian]’ (see example (8)). Twenty-two-year-old Patrizia commented that she receives lots of compliments on her Swabian, particularly when she is in the north, upholding Swabian as *total niedlich* ‘totally cute’ and *sympathisch* ‘friendly’ (see example (9)). The influential role of Swabian orientation is reflected in the words of Winfried Kretschmann, the governor of Baden-Württemberg, who maintains that speaking Swabian has a *bestimmte Ebene* ‘certain niveau’ which generates a *Rückkoppelung* ‘feedback-loop’ that not only portrays characteristics about the people themselves but in turn shapes who they are (see example (27)).

Community	Panel 1982	Panel 2017	*TEDS difference*	Twin Older	Twin Younger	*TEDS difference*
Schwäbisch Gmünd - High SOI	38.7	45.1	6.4	22.5	31.4	8.9
Schwäbisch Gmünd - Low SOI	25.1	13.8	-11.3	36.8	23.5	-13.3
difference	13.6	31.3	17.8	-14.4	7.8	22.2
Stuttgart - High SOI	15.1	19.4	4.3	6.6	10.0	3.4
Stuttgart - Low SOI	28.5	8.6	-19.9	*	9.2	*
difference	-13.4	10.8	24.2	6.6	0.9	-5.7

*Table 5-8. TEDS for two (ai) Diphthongs by Swabian Orientation – Panel and Twin Study (*Note: Due to the small sample size, there were no older, low SOI speakers in the twin study)*

5.4.4. The effect of the linguistic environment

I now turn to the differences between the two diphthongs based on the manner of articulation and voicing of the following consonant (see Table 5-5 for the GAMM and Table 5-9 for the TEDS values). Figure 5-8 (panel study) and Figure 5-9 (twin study) plot the TEDS for each community in real- and apparent-time. TEDS for 1982 (panel study) and older speakers (twin study) are plotted on the x-axis, and TEDS for 2017 and younger speakers are on the y-axis. The diagonal line represents equal TEDS for both periods, signalling no change in the distance between the diphthongs across time. Solid squares represent environments with following voiced consonants and open circles voiceless ones; circles with an “x” represent other following environments, i.e., pauses and vowels.

In both real- (Figure 5-8) and apparent-time (Figure 5-9), many factors lie on or close to the diagonal, indicating relative stability in the distinction between the diphthongs across the 35-year timeframe and generational span based on phonetic context. The smallest distinctions and the most stable environments are (ai) diphthongs before sonorants and pauses or vowels (i.e., “other”); the smaller TEDS for sonorants may be attributed to the co-articulatory aspects of the sonorant’s vowel-like quality (Hickey 2004:12). In real-time, voiced fricatives and voiceless plosives show the greatest reduction across the lifespan in Schwäbisch Gmünd (-89.3 and -65.7, respectively), while voiced and voiceless plosives show the greatest reduction in Stuttgart (-36.4 and -47.7, respectively). In apparent-time, voiced plosives in Schwäbisch Gmünd and voiced fricatives in Stuttgart show the greatest change (-25.5 and -172.2, respectively).

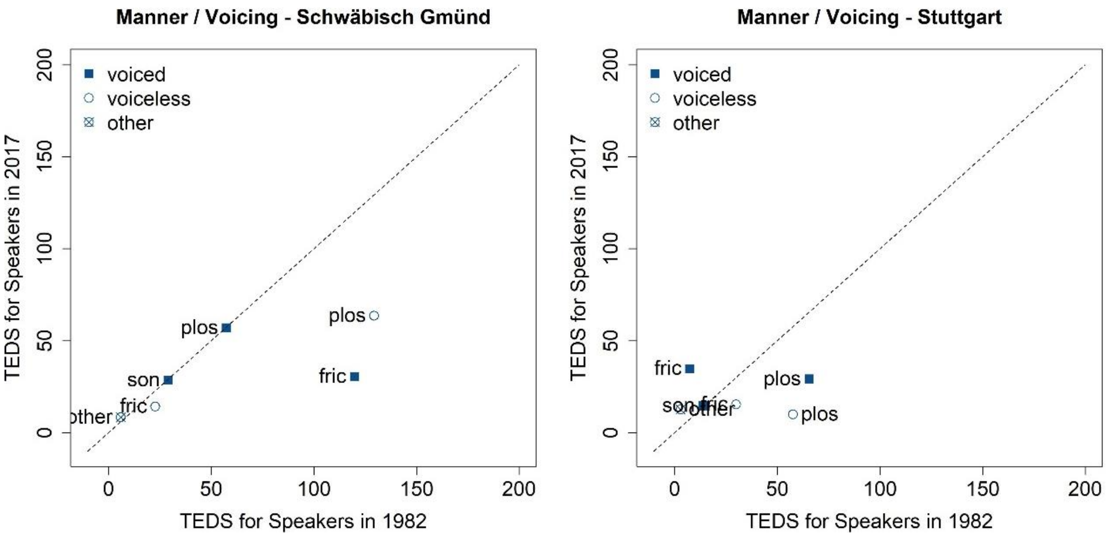

Figure 5-8. (ai) Diphthong TEDS for Phonetic Environment – Panel Study (fric = fricatives; plos = plosives; son = sonorants; other = pauses and vowels)

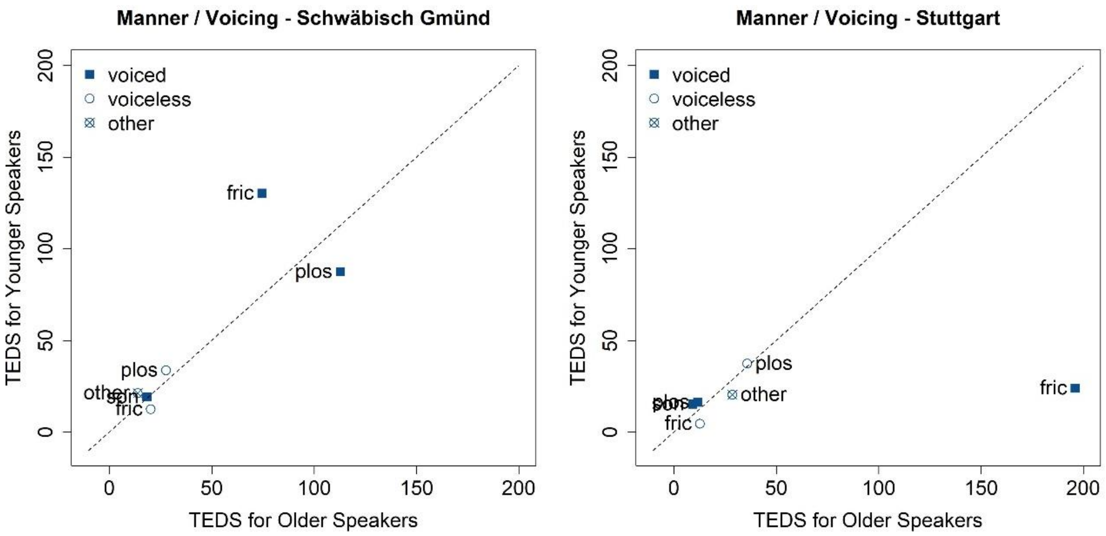

Figure 5-9. (ai) Diphthong TEDS for Phonetic Environment – Twin Study (fric = fricatives; plos = plosives; son = sonorants; other = pauses and vowels)

Community	Panel 1982	Panel 2017	*TEDS difference*	Twin Older	Twin Younger	*TEDS difference*
SCHWÄBISCH GMÜND						
Voiced Fricatives	119.8	30.5	-89.3	74.6	130.2	55.6
Voiceless Fricatives	22.8	14.2	-8.6	20.3	12.4	-7.9
Voiced Plosives	57.4	57.0	-0.4	112.9	87.4	-25.5
Voiceless Plosives	129.3	63.6	-65.7	27.7	33.7	6.0
Sonorants	29.0	28.5	-0.5	18.4	19.1	0.7
Open Syllables	6.0	8.3	2.3	14.0	21.2	7.2
STUTTGART:						
Voiced Fricatives	7.4	34.8	27.4	196.0	23.8	-172.2
Voiceless Fricatives	30.0	15.4	-14.6	12.8	4.5	-8.3
Voiced Plosives	65.6	29.2	-36.4	11.7	16.2	4.5
Voiceless Plosives	57.6	9.9	-47.7	35.9	37.4	1.5
Sonorants	14.0	14.6	0.6	9.2	15.2	6.0
Open Syllables	2.9	12.6	9.7	28.7	20.4	-8.3

Table 5-9. TEDS from (ai) Diphthong Model for Phonetic Environment

Strikingly, voiced fricatives show a contradictory effect across the two communities and time spans: voiced fricatives reveal dramatic reductions in TEDS in real-time in Schwabisch Gmünd (-89.3) and in apparent-time in Stuttgart (-172.2), while they show significant increases in TEDS in real-time in Stuttgart (27.4) and in apparent-time in Schwäbisch Gmünd (55.6). These divergences suggest change in progress, which is further advanced in Stuttgart, while Schwäbisch Gmünd appears to be holding on to the traditional diphthong distinction. It may also be that voiced fricatives are an environment tapped for marking local indexicalities, allowing Schwäbisch Gmünd speakers to demonstrate a degree of disconnectedness with the more standardised, supra-regionalised variety centred in Stuttgart.

Such discontinuities also suggest that some lexical effects may be at play, in which individuals rely on individual lexical items in constructing a Swabian identity. For example, words such as *bissle* 'little', *desch* 'it's', *Breschdlingsgsältz* 'strawberry marmalade, are strong indicators of Swabian; perhaps certain words with the (ai) diphthong serve this role as well, such as the common words *vielleicht* 'perhaps' (MHG /līht/) and *heißt* 'to be called' (MHG /heiʒ/) and the productive suffix -*weise* 'in a way' (MHG /wīs/). The findings from this analysis of the following phonetic environment are inconclusive and appear to be shifting over space and time; hence, this study is unable to confirm or refute PREDICTION 5, which claims there will be a greater loss of phonetic contrast between the diphthongs in environments with following voiceless consonants. Thus, this aspect of the (ai) diphthong merger must be consigned to future research.

5.4.5. The interaction of the linguistic and social

The fourth GAM model (Table 5-6) reports on the change in phonetic contrast between the two (ai) diphthongs across four predictors – one linguistic (word frequency) and three social (community, real-/apparent-time, and Swabian orientation). Recall that because this sound change increases the similarity between two phones, PREDICTION 6 assumes that a greater loss of phonetic contrast between the two diphthongs will be found in high-frequency over low-frequency words. Figure 5-10 (panel study) and Figure 5-11 (twin study) present the results. Schwäbisch Gmünd is presented on the left and Stuttgart on the right; TEDS is plotted on the y-axis and frequency on the x-axis; low SOI is represented by blue circles and lines and high SOI by red triangles and lines; earlier periods (1982 and older speakers) are designated by open circles, triangles and dotted lines, while later periods (2017 and younger speakers) are indicated by solid circles, triangles and lines.

As in previous analyses, the real-time results (Figure 5-10) show smaller TEDS in 2017 (solid lines) than in 1982 (dotted lines), further supporting the loss of phonetic contrast between the two diphthongs across the lifespan. As expected, the distinction between the diphthongs is greater for speakers with high SOI (red lines higher than blue lines), except for the low SOI speakers in Stuttgart, who exhibited exceptionally large diphthong distinctions in 1982 (39.1 for high-frequency words and 66.6 for low-frequency words, blue dotted line) and reveal the greatest change by 2017 (-22.5 and -64.7, respectively, solid blue line). This real-time change in Stuttgart supports Todd et al.'s (2019) claim that change which reduces the discriminability between phones, begins with high-frequency words and then spreads to low-frequency words. Schwäbisch Gmünd exhibits the same trend with lower TEDS and greater change across the lifespan occurring in high-frequency words for the high SOI speakers. In fact, as seen in Section 5.4.3, low SOI speakers have lost the greatest amount of contrast between the diphthongs, showing the lowest values in 2017 with low-frequency words.

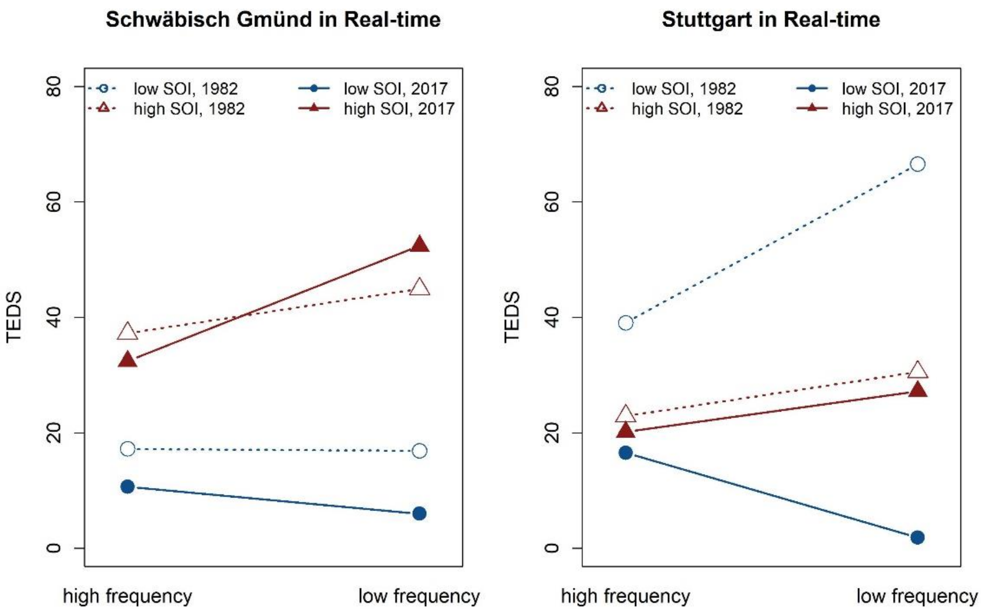

Figure 5-10. (ai) Diphthong TEDS Interaction Effects – Panel Study

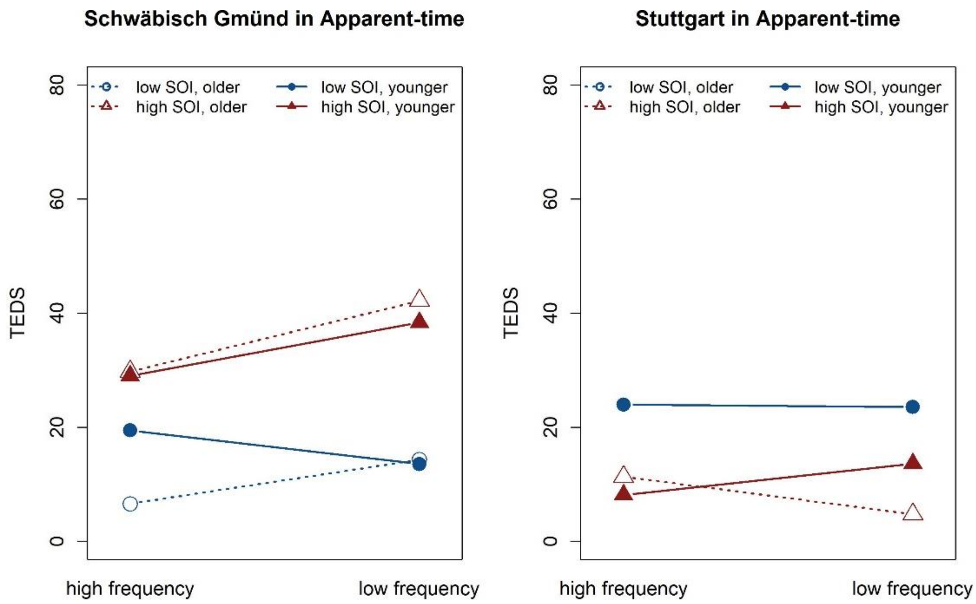

Figure 5-11. (ai) Diphthong TEDS Interaction Effects – Twin Study

The apparent-time results (Figure 5-11) show a further decline in TEDS with the younger speakers (solid lines) showing less contrast than the older speakers, particularly in Stuttgart. Surprisingly, as already discussed, low SOI speakers in Stuttgart show greater diphthong distinction than high SOI speakers, supporting the supposition that SOI is a less influential factor with younger speakers in 2017 than it has been in the past (see Section 4.4.4.1). The apparent-time results in Stuttgart also show little distinction based on lexical frequency, suggesting that the change of contrast between the diphthongs likely occurred sometime over the last 35-years and is beginning to stabilise in the most advanced community, the urban centre of Swabia.

Community	Panel 1982	Panel 2017	*TEDS difference*	Twin Older	Twin Younger	*TEDS difference*
SCHWÄBISCH GMÜND						
High-frequency words:						
high SOI	37.2	32.4	-4.8	29.8	29.0	-0.8
low SOI	17.2	10.7	-6.5	6.6	19.5	12.9
Low-frequency words						
high SOI	44.9	52.4	7.5	42.2	38.4	-3.8
low SOI	16.9	6.0	-10.9	14.3	13.5	-0.8
STUTTGART:						
High-frequency words:						
high SOI	22.9	20.2	-2.8	11.3	8.1	-3.2
low SOI	39.1	16.5	-22.5	*	24.0	n/a
Low-frequency words:						
high SOI	30.5	27.2	-3.3	4.7	13.6	8.9
low SOI	66.6	1.8	-64.7	*	23.5	n/a

Table 5-10. TEDS from (ai) Diphthong Model for Best-Fit Factors

These results provide support for PREDICTION 4 that high orientation to Swabian restricts innovations and promotes retention of conservative dialect forms; however, they also echo earlier findings that the role of SOI in the choice of linguistic variants has diminished over time (see Section 4.4.4.1). The findings also support PREDICTION 6, demonstrating that change has progressed further with the high-frequency words in real-time in both communities and in apparent-time in Schwäbisch Gmünd, exposing modern-day Stuttgart to be relatively stable, suggesting that the change is nearing completion in this community. The crucial finding is that the collapse of the diphthong distinction appears to be still underway in Schwäbisch Gmünd, leaving its expected further progression to low-frequency words to a follow-up investigation.

5.5. Discussion

The interaction between Swabian orientation and word frequency brings to light the powerful intersectional effect that socio-cognitive factors such as local identity, in combination with linguistic constraints such as lexical frequency, have on sound change. This analysis uncovers an intricate set of factors driving the loss of phonetic contrast between the two Swabian (ai) diphthongs, supporting several common themes throughout this research. First and foremost is the interplay between inexorable dialect levelling, particularly in the urban centre of Stuttgart, and irrefutable reluctance to relinquish “too much” dialect in the semi-rural community of Schwäbisch Gmünd. As seen in Chapter 4, this change is a reflection of the immense societal transformation that has transpired in Germany (indeed across western Europe) over the last 30 years. Rising levels of education, ever-increasing mobility, pervasive dialect contact, and tenacious peer-pressure (e.g., Conrad 2017) are pushing more and more dialect speakers toward the standard language. Wieling and his colleagues support these findings with data from the Netherlands and Italy, showing that larger, more affluent and younger communities move away from the dialect and toward the standard language (Wieling et al. 2014; Wieling, Nerbonne, and Baayen 2011). Conrad (2017) reports similar effects for the younger generation in Luxembourg. Yet, Auer's (2013) contention that a "New Regionalism" is emerging in opposition to obtrusive nationalisation and the indications of a budding "Swabian renaissance" among the youth pose a formidable counterbalance to the inescapable pressures "from above" and the collective trend toward supraregionalism.

A second overarching finding from this study reveals that greater change has occurred in real-time across the lifespan of the panel speakers than in apparent-time between the older and younger generations of twin speakers. This incongruity suggests that the change was likely initiated in the 35-years between 1982 and 2017 and is now slowing as the merger begins to stabilise across the community. This finding supports HYPOTHESIS 2 of this study, demonstrating that apparent-time change mirrors real-time change, although various subgroups of the population may naturally progress through the stages of change at varying speeds. The (ai) diphthong merger appears to have progressed more quickly through Stuttgart and is heading toward completion, while it lags behind Schwäbisch Gmünd, following the GRAVITY (Trudgill 1986) and CASCADE (Labov 2003) models of linguistic dispersion.

A third critical influence on the Swabian (ai) diphthong change concerns speakers' dialect identities and local orientation. This investigation establishes that high orientation to the local culture and community can arrest and impede linguistic change. High SOI speakers in both communities are resisting the merger and retaining the diphthong distinction as a marker of local identity, while low SOI speakers are embracing the merger in their ongoing convergence to the standard language. Research shows (e.g., Labov 1962; Wolfram and Schilling-Estes 1996) that diphthong trajectories can be recruited to project notions of local identity (e.g., locals who feel their traditional way of life is being threatened with the encroachment of modernisation). Thus, it is not surprising that speakers with strong Swabian identities are resisting the change. Despite the high prestige awarded to the standard language, Swabian appears to be losing some of the stigma it had 30 years ago, rousing a "Swabian renaissance". Winfried Kretschmann, the governor of Baden-Württemberg and a proud proponent of Swabian, exclaims, *ich spreche schwäbischer als früher*, 'I speak more Swabian-like now than before' (Frankfurter Allgemeine Zeitung 2018).[28] Helmut who describes the *Wechselspiel* 'interplay' in his mind and his heart: he "knows" that he

[28]Kretschmann is 70 years old; hence his return to his Swabian roots might be explained by the sociolinguistic principle that speakers revert to more conservative dialect features later in life.

should not speak Swabian publicly because he fears he will not be taken *in ernst* 'seriously', yet he "feels" a deep *Sehnsucht* 'longing' for it (see example (11)). Testaments such as these confirm the enduring and entrenched role that Swabian plays in modern society.

5.6. Summary

This analysis of the (ai) diphthong in Swabian has demonstrated the importance of combining intra- and extralinguistic factors in investigating sound change and, crucially, the imperative of considering the social meaning underlying of the feature under investigation. The findings confirm pervasive dialect levelling occurring with the (ai) diphthong in Swabian (HYPOTHESIS 1) and illustrate the value of a combined real- and apparent-time analysis to untangle the complexities in the speed and diffusion of change (HYPOTHESIS 2). In sum, Milroy (2003:163) maintains that "changing local ideologies shape trajectories of linguistic change" and shifting indexicalities help speakers preserve or construct their linguistic identities in ways that reflect their lifespan trajectories and project what is important to them. In Swabia, the indexicalities and social meaning attributed to the (ai) diphthong paint a highly multifaceted picture with respect to the interaction between sociocultural factors and internal linguistic processes: speakers such as Rupert and Markus index progress and success by adopting the new supralocal forms; speakers such as Angela and Siegfried, on the other hand, impart the traditional values of "home and hearth" by conserving the historical diphthong distinction. The choice to speak Swabian or not is confirmed by prolific comments in the interviews. Pepin, with a low orientation to Swabian, commented, *von dem her war i mal typisch und zum Glück nimme so arg* 'at that time [when I was a Schwab] I was typical and luckily not so much anymore', while Louise, with high Swabian orientation, exclaimed, *i bin e Schwââb und blêib ôiner* 'I'm a Schwab and I'm staying one'.

Chapter 6. Swabian relatives and the role of prescriptivism

des beschde Daitsch wo es gib
'the best German that there is'
– Angela 1982

6.1. Introduction

Chapter 4 exposed a crucial dichotomy in how phonological and morphosyntactic variables respond under pressure of supralocalisation and pervasive dialect change. With the exception of two stable variables, all of the morphosyntactic variables are receding more rapidly than the phonological ones (see Figure 4-16). Some sociolinguists theorise that this arises because morphosyntactic variables are not as socially stratified as phonological ones, causing them to lie outside the range of the sociolinguistic monitor (e.g., Labov 1993; Labov et al. 2011; Lavandera 1978; Levon, Buchstaller, and Mearns 2020; Scherre and Naro 1992; Walker 2020). Others suggest that morphosyntactic variables convey a different type of social meaning than phonological or lexical variables and thus change in different ways (e.g., Cheshire 2003; Eckert and Labov 2017; Labov 2001; Levon and Buchstaller 2015; Meyerhoff and Walker 2013).

To investigate the constraints on morphosyntactic variation, this chapter explores a variable widespread in Swabian and in other southern German varieties: variation in the use of traditional relative pronouns prescribed in standard German (e.g., *der, die, das, dem, den, dessen, deren*) (henceforth referred to as *d*-relatives) and the use of *wo*, literally 'where', in place of a standard relativiser, which commonly occurs in spoken language (henceforth referred to as *wo*-relatives).[29] Some linguists have proposed that *wo*-relatives spread from referring to notions of place to a broader set of linguistic environments (Brandner and Bräuning 2013). Many have argued that pronouns originally used as interrogatives are logical candidates for relativisers due to their close relationship with indirect questions: both involve phrases with declarative illocutionary force and exhibit a high level of referentiality (Keenan and Hull 1973; Matos and Brito 2013; G. Sankoff and Brown 1976). There is also considerable evidence from other languages that locative adverbs have evolved into generalised relative markers (e.g., Brook 2011; Katis and Nikiforidou 2010; Krapova 2010). To date, no sociolinguistic variation analysis has been conducted on the use of *wo*-relatives in German dialects. Thus, this chapter continues the focus on the first two research questions of this thesis: the nature and degree of dialect levelling occurring in Swabian (RESEARCH QUESTION 1) and the compatibility and complementarity of a combined real- and apparent-time analysis (RESEARCH QUESTION 2). With respect to *wo*-relatives in Swabian, this

[29] This socio-grammatical variable is dedicated to Jenny Cheshire, whose ground-breaking academic scholarship and personal and professional munificence have been an inspiration for me.

chapter aims to answer three specific questions: (1) what are the internal and external factors influencing the use of *wo* as a relative marker in Swabian, (2) is the usage of the *wo*-relativiser stable or changing and, if changing, (3) what are the drivers and inhibitors of the change?

6.2. Theoretical background

Due to the lack of variationist sociolinguistic studies of German relatives, the extensive work carried out on English relative clauses provides the theoretical background for the current investigation. While there are some expectations that German and English relatives will react in similar ways due to universal cognitive processes, the primary reason for considering the work on English relatives is methodological. I start with a brief review of the main findings from the body of research on English relatives (Section 6.2.1), followed by a description of relativiser use in modern German and a review of a few key studies that have been conducted on German relatives (Section 6.2.2).

6.2.1. English relatives

The system of relativisation has been extensively researched in many varieties of English by both sociolinguists and formal syntacticians (e.g., Cheshire 2003; Meyerhoff, Birchfield, Ballard, Watson, et al. 2020; Tagliamonte, Smith, and Lawrence 2005), from a sociohistorical perspective (e.g., Ball 1996; Hendery 2012; Romaine 1982, 1992), in spoken and written genres (e.g., Guy and Bayley 1995; Hinrichs, Szmrecsanyi, and Bohmann 2015; Jankowski 2009, 2013), and in vernacular speech (e.g., Cheshire, Adger, and Fox 2013; D'Arcy and Tagliamonte 2010; Jankowski 2009, 2013; Levey 2006). Much early sociolinguistic work has suggested that relative pronoun usage is a "covert variable" not readily available for social evaluation (Tottie and Rey 1997:245). However, researchers in the 1980s and 1990s working within the variationist framework began to find that variation in relative pronoun usage was not only constrained by linguistic conditioning and syntactic position but was also correlated with various social factors, such as genre, style, education, and socioeconomic status. Romaine (1982) observed that *wh*-pronouns are generally restricted to written texts and to specific groups of speakers, that is, educated individuals with middle-class aspirations. Quirk (1957), and later Tottie (1995), found that *zero* relatives are strongly favoured with animate subjects, while *wh*-relatives are correlated with speakers' educational level. Guy and Bayley (1995) established that the channel of communication (spoken or written), the animacy of the antecedent, the syntactic position of the relativiser, and the distance between the antecedent and the relativiser all have significant effects on speakers' choice of relative pronouns.

Recent research on variation in relative pronoun usage considers both changes imposed from above (such as social status, education, prescriptivism, and language ideologies) as well as changes arising from within (such as grammatical and structural constraints). Investigating relativiser use in three varieties of English, Tagliamonte, Smith, and Lawrence (2005) uncovered universal constraints (e.g., clause length, clause complexity), situation-specific influences (e.g., level of education and local involvement), and dialect-distinctive factors. D'Arcy and Tagliamonte (2010:384) argued that speakers' use of relative pronouns "evince their social position within the community and indicate accommodation to their interlocutors"; however, Meyerhoff et al. 2020 argue that this study contains some miscalculations, and in fact, as with their own study of relative pronoun use in Auckland, relativiser choice is not constrained by any of the social constraints tested. Considering discourse and pragmatic factors in a study of multiethnic friendship networks in Hackney London, Cheshire, Adger, and Fox (2013) observed that relative *who* has developed into a "topic-marking strategy." Investigating lexical density and information status, Jankowski (2013) found "changing stylistic notions" in relativiser usage brought on by prescriptivist conventions and literacy (i.e., "change from above"). Hinrichs, Szmrecsanyi and Bohmann (2015) adopted a machine-learning-based method to retrieve *zero* relative clauses automatically and evaluate 22 language-internal, language-external, stylistic, and prescriptivism-related predictors. Their multivariate analysis unveiled a complex set of factors driving relativiser choice, principal among them genre and prescriptivism. Investigating aspects of dialect levelling and urban-rural differences, Britain (2021) exposed variation in relativiser use between localities in East Anglia and their distance from London. In all of these studies of relative pronoun use in varieties of English, a dominant standard language ideology is prevalent, along with an overriding influence of internal linguistic constraints.

6.2.2. German relatives

The wealth of research on relatives in various English varieties leads to the question: which of these factors and findings are relevant for varieties of German? I begin with a description of the German system of relativisation. In German, relatives occur post-nominally and are head-external. According to Duden, there are three[30] standard ways to introduce a relative clause (Duden 2016:1045-1055):

(1) inflected *d*-pronouns (e.g., *der, die, das, den, dem, denen, deren, dessen*) which can refer to a nominal, pronominal or adverbial phrase;

(2) inflected *w*-pronouns (e.g., *welcher, welche, welches, welchen, welchem*) are generally restricted to the written language or to highly stylised spoken varieties (there were only 4 tokens in the panel study and none in the trend study); since they pattern the same way as *d*-relatives, they have been merged with the *d*-relatives in this analysis;

(3) non-inflected complementisers (e.g., *wo* 'where'; *wie* 'how'; 'as'; *was* 'what'*; wer*

[30] Duden also describes three other types of relatives: (1) free relatives with *wer/was* 'who/what' (also called "headless relatives" because they do not appear to have an accompanying noun phrase), (2) relative adverbs such as *als/wie* 'as/how', and (3) *Gradpartikeln* 'correlative conjunctions' *je…desto* 'the…the'; however, since these relatives do not vary with *wo*, they have been excluded from this analysis.

‘who’*;* and *als* ‘as’, ‘than’, ‘when’, ‘while’) which have both standard and nonstandard usages in many southern German varieties, including Swabian; only *wo* and *als* have been considered in the current analysis, as they are the only complementisers which vary with the *d*-relatives.

Swabian, along with other southern German dialects, also has a resumptive relative or the doubly-filled complementiser, *der wo* ‘he who’ or *da wo* ‘there that’, which is considered nonstandard. Due to its infrequent usage in the current corpus (3.8% n=59 in the panel study and 2.1% n=24 in the twin study), resumptive relatives have been merged with *wo*-relatives (see Section 6.4.1.1 for further discussion), and resumptiveness has been coded as a constraint.

Thus, the primary variation in relative pronoun usage is between the standard inflected *d*-relative pronouns and the nonstandard use of the invariant complementiser *wo* (or *als*), as overtly demonstrated by Angela in example (38):

(38) *Angela (1982)*

es gibt erfolgreiche Mensche	‘there are successful people
wo Karriere gmacht hen	who have made their careers
und jetzt en Haufe Geld verdienet	and now earn a ton of money
es gibt au andere	there are also others
die vielleicht gar net so viel Geld hen	who perhaps don’t have so much money’

This example is particularly enlightening because of Angela’s sequential use of a nonstandard and standard relativiser referring to the same human referent, *erfolgreiche Mensche* ‘successful people’.

6.2.3. Typology for wo

Pittner (2004) provides a functional typology for the lexical item *wo*. First, and most common, *wo* can be used as an interrogative adverb with locative meaning, as in example (39):

(39) *Herbert (1982)*

wo warn mr dabêi? ‘where were we in the process?’

Second, *wo* is commonly used as a locative adverb, as in example (40):

(40) *Angela (2017)*

Schwââbe blêibet gern dâ wo se gebore sin ‘Swabians like to stay there where they were born’

Less commonly, and only in spoken language Pittner states, *wo* can be used as a temporal adverb, as in example (41):

(41) *Ema (1982)*

wo i noch jung war ‘when I was still young’

Pittner considers (41) to be nonstandard usage (as does Duden); in standard German, the conjunction *als* ‘as’ or ‘when’ would typically be used. Also considered nonstandard, Pittner affirms that invariant *wo* can be used as a relativiser, as in example (42):

(42) Angela (1982)
des beschde Daitsch ***wo*** *s gib* 'the best German **that** there is'

The standard German equivalent for example (42) requires the nominative neuter pronoun, *das*, as is: *das beste Deutsch,* ***das*** *es gibt.* Duden (2016:1050-1052) patently declares examples (38), (41) and (42), in which *wo* refers to a non-locative, to be *landschaftlich salopp* 'country slang' (Duden Online 2018) and *nicht standardsprachlich* 'not standard language' (Duden 2016:1052).

6.2.4. Constraints on wo-relativisers

Previous analyses of relative pronouns in German have focused solely on formal, linguistic constraints (i.e., syntactic structure, semantic content, prosodic realisation, and functional role) (Bayer 1984; Brandner and Bräuning 2013; Fleischer 2004, 2005, 2006; Pittner 1995, 2004; van Riemsdijk 1989; Salzmann and Seiler 2010; Schaffranietz 1999; Schubö et al. 2015; de Vries 2002, 2013; Weise 1916). Salzmann and Seiler's (2010) analysis of variation in the Swiss German system of relativisation established that the distribution of resumptive relative pronouns follow the Keenan and Comrie (1977) ACCESSIBILITY HIERARCHY (AH), which predicts that relatives are most common in subject position (nominative), followed by the direct (accusative) and indirect (dative) object cases. These researchers found that resumptive pronouns are not permitted in subject and direct object clauses, are obligatory for oblique relations (i.e., objects of prepositions), and optional with datives; in addition, usage is influenced by the morphosyntactic environment, in particular, case matching and the semantics of the head noun (Salzmann and Seiler 2010:80). Günthner (2002) took a different approach in her investigation of the "polyfunctional" use of *wo* (temporal, causal, and conjunctive) in spontaneous conversations across several middle and southern German varieties, contending that the use of *wo* as a complementiser is "ambiguous", interpretable solely from the pragmatics of the situation (i.e., context and performance):

> *Die jeweilige Interpretation scheint also nicht am Konnektor 'wo' selbst festmachbar zu sein, vielmehr markiert 'wo' einen Zusammenhang zwischen zwei Syntagmen, wobei das eine dem anderen untergeordnet ist und die im syntaktisch untergeordneten Teilsatz präsentierte Information zugleich als evident und nicht weiter fraglich gilt (Günthner 2002:25).*
>
> *'The particular interpretation thus does not seem to be fixed on the 'wo' connector itself, rather 'wo' marks a relationship between two syntagmas, in which one is subordinate to the other, and the information in the syntactically subordinate clause is simultaneously presented as evident and no longer questionable' (my translation).*

Despite these diverse descriptive and pragmatic investigations of *wo*-relatives, no studies have conferred any consideration to extralinguistic factors, such as speaker age, sex, education, occupation, community, orientation/identity, hence the purpose for this analysis.

6.3. Data and methods

This chapter follows the data and methods described in Chapter 3. The following sections define the linguistic variable, its envelope of variation, and the coding conventions followed (Section 6.3.1), along with the predictors evaluated in the subsequent distributional and multivariate analyses (Section 6.3.2).

6.3.1. Linguistic variable

The linguistic variable in this investigation is defined as the variation in the use of the relative clause introducer: the more explicit *d*-relatives (with their number, gender, and case declensions) versus the less explicit *wo*-relatives (without reference to number, gender or case). In defining syntactic variables, Cheshire (1987:269) points out several methodological challenges, chief among them is finding a method to determine whether different variants constitute "different ways of saying the same thing" (Cheshire 2016:264). The first challenge, however, is deciding what to count as a relative clause. Although some linguists propose identifying relative clauses in terms of function (e.g., Keenan and Comrie 1977:63, Lehman 1984:47), this analysis is based on a strict syntactic definition of grammatical functional equivalency (Fleischer 2004; de Vries 2002). Hence, I follow de Vries (2002:14-15) who offers two "defining" properties and one "essential" property for identifying relative clauses in German:

(1) a subordinate clause, which is conveniently disambiguated in German with a finite verb-final syntactic structure (see also Duden 2016:1046);

(2) connected to the matrix clause by a "semantically shared" pivot constituent or relative clause introducer, i.e., either a *d*-relative, *w*-relative, or a *wo*-relative;

(3) independent from the matrix clause in its semantic and syntactic roles.

Thus, it follows that other relative-like structures such as the following have been excluded from the analysis:

(a) participial constructions, e.g., *der in seinem Büro arbeitende Mann* 'the in his office working man' (Keenan and Comrie 1977:64);

(b) pronominalisation, in which a personal pronoun is used as an anaphoric marker in place of a relative pronoun, e.g., *she teaches young people, they [who] have not finished school ye*t;

(c) reduced relatives and appositive structures, e.g., *the man, he [who] drove a blue car*;

(d) unmarked relative clauses, in which only prosodic cues designate the relative.

Relative clauses are not very common in speech: 4.8% of the total clauses[31] in the panel study (n=32,498) and 3.3% of the clauses in the twin study (n=34,720) are relatives. It may be

[31] In this study, a clause is considered an utterance with a finite verb structure (excluding affirmations, interjections, and various filler utterances) and is used only for analytical and explanatory purposes.

interesting to speculate why the number of relative clauses in the twin study dropped by 1.5% over the 35 years; however, the difference is only marginally significant ($\chi^2 = 10.83$; $p = .062$; $df = 1$), and I can think of no obvious explanation: the data collection methods and the socio-demographics of the speakers sampled are quite similar. Following the three criteria outlined above, relative clauses were manually extracted from the ELAN transcripts, hand-coded for the predictors (see following section), and loaded into R for analysis (R Core Team 2014). This approach resulted in a total of 1575 relative clauses from the panel study and 1162 relative clauses from the twin study for analysis.

6.3.2. Predictors

Cheshire (1999:65) points out that "in variationist analyses we are limited in what we discover by what we set out to look for." Hence, since no sociolinguistic investigation has previously been conducted on *wo*-relatives, I felt it was essential to cast a wide net to uncover the critical constraints influencing the choice of relativisers in Swabian.

6.3.2.1. Linguistic predictors

Based on findings from other research and to avoid confounds with any potential "hidden variables" (Ball 1996:228), I selected a broad palette of previously attested internal constraints on relative markers in English for exploratory analysis in Swabian. The following list describes each of the 18 linguistic predictors, cites references to other relevant studies, and states the predictions of the current study.

1. <u>Restrictiveness</u>: although studies of English relativisers exclude non-restrictive clauses, this distinction does not appear relevant for German; however, in order to test this assumption, relative clauses with defining, essential, specifying, or propositional information were coded as restrictive, whereas those with non-essential, amplifying, supplementary, or parenthetical information were coded as non-restrictive (Ball 1996; Cheshire, Adger, and Fox 2013; Hinrichs, Szmrecsanyi, and Bohmann 2015; Quirk 1957; Schubö et al. 2015; Tagliamonte 2002; Wiltschko 2013).
   - ➔ <u>PREDICTION 1</u>: based on previous studies of relative clauses in German, no significant differences are expected in the use of *d*- and *wo*-relativisers in restrictive and non-restrictive relative clauses in Swabian.
2. <u>Resumptiveness</u>: relative clauses were coded for the presence or absence of resumptiveness, the doubly-filled complementiser, i.e., *der wo* 'that where' (Fleischer 2005; Pittner 2004; Salzmann and Seiler 2010; Suñer 1998).
   - ➔ <u>PREDICTION 2</u>: due to their more explicit nature, resumptive relative pronouns are expected to be favoured with definite and human antecedents.
3. <u>Place</u>: antecedents were coded for referring to a physical place or location (e.g., 'from his environment', 'in a family', 'in a professional world', 'in a committee', 'in

heaven', 'another source', 'in a film', 'in school') or not to any notion of place (Brandner and Bräuning 2013; Bräuning 2009; Pittner 2004).

➔ PREDICTION 3: since the literal sense of *wo* refers to a physical place, abstract notions of place are also expected to favour the use of *wo*.

4. Time: antecedents were coded for referring to a specific date/time or to an abstract notion of time (e.g., 'in a situation', 'from that moment', 'at a time', 'in a phase', 'currently', 'in a while', 'before and after', 'during school') or not to any notion of time (Pittner 2004).

   ➔ PREDICTION 4: in addition to specific dates and times, abstract notions of time are also expected to favour the use of *wo*.

5. Relative Case: relative pronouns were coded for case, i.e., nominative, accusative, dative, or genitive (Cheshire, Adger, and Fox 2013; Fleischer 2006; Hinrichs, Szmrecsanyi, and Bohmann 2015; Levey 2001; Rohdenburg 1996; Salzmann and Seiler 2010; Tottie and Rey 1997).

   ➔ PREDICTION 5: following the ACCESSIBILITY HIERARCHY (Keenan and Comrie 1977), which states that linguistic constraints on relative clause formation pattern in an implicational hierarchy based on the grammatical function of the relativiser and hence the ease with which noun phrases can be relativised, less explicit *wo*-relatives are expected to be more common in the more accessible positions, e.g., first nominatives, then accusatives, then datives.

6. Case Matching: relative pronouns were coded for whether the case between the antecedent and the relativiser were the same or not (Fleischer 2006; Salzmann and Seiler 2010).

   ➔ PREDICTION 6: because *wo*-relatives are less explicit, they are expected to be favoured when the cases between the relativiser and antecedent do not match.

7. Structural Persistence: relativisers were coded for whether the current one used is the same or different from the previous one (Hinrichs, Szmrecsanyi, and Bohmann 2015).

   ➔ PREDICTION 7: for reasons of parallelism, consistency, and priming, the same relativiser is expected to be used as the previous one (up to a maximum of 10 intervening clauses, under the assumption that greater distances are unlikely to have an influence on relativiser choice).

8. Structural Count: relative clauses were coded for the number of non-relative clauses occurring in between relativisers (up to a maximum of 10 clauses).

   ➔ PREDICTION 8: due to limitations on cognitive processing, succeeding relativisers will more likely be the same when they occur relatively close to one another (i.e., three or fewer intervening clauses).

9. Topic Persistence: relative clauses were coded for whether the same or a different

topic is talked about over consecutive clauses, without intervening material, up to a maximum of 10 clauses (Cheshire, Adger, and Fox 2013; Givón 2015).

- ➔ <u>PREDICTION 9</u>: topics that speakers intend to persist over a greater number of clauses are expected to be favoured by less explicit *wo*-relatives.

10. <u>Relative Clause Length:</u> a continuous measure of the number of words in the relative clause, including the relativiser and its antecedent (Hinrichs, Szmrecsanyi, and Bohmann 2015; Levey 2006; Meyerhoff et al. 2021; Quirk 1957; Tagliamonte, Smith, and Lawrence 2005).

    - ➔ <u>PREDICTION 10</u>: following the Complexity Principle (Rohdenburg 1996), more cognitively complex (i.e., longer) clauses are expected to be favoured with more explicit *d*-relative pronouns.

11. <u>Antecedent Category</u>: antecedents were coded for different grammatical categories, i.e., noun, pronoun, adverbial (Fleischer 2006; Hinrichs, Szmrecsanyi, and Bohmann 2015).

    - ➔ <u>PREDICTION 11</u>: due to their lower level of specificity and markedness, *wo*-relatives are expected to be favoured with pronominal antecedents.

12. <u>Antecedent Gender</u>: antecedents were coded for the grammatical gender of the noun, i.e., masculine, feminine, or neuter. Studies of gender congruency effects (Schriefers and Teruel 2000), Greenberg's markedness claim which states that masculine is the unmarked gender (Greenberg 1963), and considerable other research show that gender assignment in German is not arbitrary (Steinmetz 1986).

    - ➔ <u>PREDICTION 12</u>: based on prior research, less explicit *wo*-relatives are expected to be favoured in less marked environments, i.e., masculine gender.

13. <u>Antecedent Number</u>: antecedents were coded for grammatical number, i.e., singular, plural. Experimental studies on the effect of number congruency and the selection of grammatical features (Regel et al. 2018; Schiller and Caramazza 2002) have shown singular forms to be more marked; however, the research is inconclusive.

    - ➔ <u>PREDICTION 13</u>: following general theories of markedness, less explicit *wo*-relatives are expected to be favoured in less marked environments, i.e., plural forms which lack a gender distinction.

14. <u>Antecedent Case:</u> antecedents were coded for case, i.e., nominative, accusative, dative, or genitive (Fleischer 2006; Hinrichs, Szmrecsanyi, and Bohmann 2015).

    - ➔ <u>PREDICTION 14</u>: following the ACCESSIBILITY HIERARCHY (Keenan and Comrie 1977), less explicit *wo*-relatives are expected to be favoured by antecedents in more accessible positions, e.g., first nominatives, then accusatives, then datives.

15. <u>Antecedent Animacy</u>: antecedents were coded as animate, i.e., living, ambulatory things such as humans, animals, plants, robots, or inanimate, i.e., non-living,

immobile things, such as places and concepts (Cheshire, Adger, and Fox 2013; D'Arcy and Tagliamonte 2010; Levey 2006; Meyerhoff et al. 2021; Quirk 1957; Zaenen et al. 2004).

➔ PREDICTION 15: as inanimate antecedents are non-human, they are expected to be favoured by the less explicit *wo*-relatives.

16. Antecedent Definiteness: antecedents were coded as definite, i.e., containing a definite article, demonstrative or possessive pronoun, numeral, proper name or as indefinite (Givón 2015; Hinrichs, Szmrecsanyi, and Bohmann 2015; Levey 2006; Meyerhoff et al. 2020).

    ➔ PREDICTION 16: as indefinite antecedents are less explicit, they are expected to be favoured by the less explicit *wo*-relatives.

17. Antecedent Length: a continuous measure of the number of words in the antecedent, excluding the relativiser itself (Guy and Bayley 1995; Hinrichs, Szmrecsanyi, and Bohmann 2015; Rohdenburg 1996).

    ➔ PREDICTION 17: following the Complexity Principle (Rohdenburg 1996), longer antecedents are more complex and hence are expected to be favoured by the more explicit *d*-relatives.

18. Antecedent Distance: also called adjacency, a continuous measure of the number of words between the antecedent head and the relativiser (Guy and Bayley 1995; Hinrichs, Szmrecsanyi, and Bohmann 2015; Lopes Câmara 2018; Poschmann and Wagner 2016; Rohdenburg 1996; Tagliamonte, Smith, and Lawrence 2005).

    ➔ PREDICTION 18: following the Complexity Principle (Rohdenburg 1996), more distant antecedents are expected to favour the more explicit *d*-relative pronouns, which can help in clarifying ambiguities.

6.3.2.2. Social predictors

Eight social predictors, described in detail in Section 3.7, were evaluated for relativiser use. Each is listed below, along with the expected outcome.

1. Recording year: relative clauses were coded for recording year, i.e., 1982 or 2017.

    ➔ PREDICTION 1: as a result of increasing education, standard language convergence, and pervasive prescriptivism, the use of *wo*-relatives is expected to be decreasing and thus be less frequent in 2017 than in 1982.

2. Speech community: relative clauses were coded for community, i.e., Schwäbisch Gmünd or Stuttgart (see Section 3.7.1.1).

    ➔ PREDICTION 2: *wo*-relatives are expected to be less frequent in the urban centre of Stuttgart, where a more standardised, supralocalised variety is spoken in contrast to the semi-rural town of Schwäbisch Gmünd, where more nonstandard features are typically found (see Chapter 4).

3. Speaker age: speaker age was coded both as a binned variable (for explanatory purposes) and a continuous variable (for multivariate analyses) (see Section 3.7.1.3).
   - ➔ PREDICTION 3: assuming age is an indicator of change, younger speakers, who have been influenced by higher levels of education, are expected to disfavour the use of *wo*-relatives versus older speakers.
4. Speaker sex: speakers were coded for self-reported sex (see Section 3.7.1.2).
   - ➔ PREDICTION 4: following previous sociolinguistic research which shows women to be the leaders of change, *wo*-relatives are expected to be disfavoured by women who generally more quickly adopt changes to the standard language.
5. Speaker education: relative clauses were coded for whether speakers had completed their *Abitur* or not (see Section 3.7.1.4).
   - ➔ PREDICTION 5: *wo*-relatives are expected to be disfavoured by more highly educated speakers who have been more heavily influenced by prescriptivism in the schools (i.e., "change from above").
6. Swabian orientation: speakers were coded for Swabian Orientation (see Section 3.7.2.1).
   - ➔ PREDICTION 6: based on prior studies that show high levels of local orientation correlate with greater dialect density, speakers with high Swabian Orientation Indices (SOI) are expected to use more *wo*-relatives than those with low scores.
7. Interlocutor choice: relative clauses were coded for speakers' choice of interlocutor (see Section 3.7.2.2).
   - ➔ PREDICTION 7: based on accommodation studies, speakers with high Interlocutor Choice Indices (ICI) are expected to use more *wo*-relatives than those with low scores.
8. Speaker mobility: relative clauses were coded for speakers' mobility score (see Section 3.7.2.3).
   - ➔ PREDICTION 8: as greater levels of mobility bring speakers into more contact with interlocutors of diverse dialects, speakers with high geographic mobility scores are expected to use fewer *wo*-relatives that those with low mobility.

6.4. Analysis and results

The analysis begins with an investigation into the distribution of relativisers across the corpus (Section 6.4.1), followed by a multivariate analysis to examine the impact of the various predictors on relativiser choice (Section 6.4.2). The discussion synthesises the results and situates Swabian relativiser usage within the broader sociocultural-historical context (Section 6.5).

6.4.1. *Distributional analysis of relativiser use in Swabian*

Table 6-1 (panel study) and Table 6-2 (twin study) show the token counts and percentages for the three relativiser categories by community and recording year (panel study) or age group (twin study). The data show that *wo*-relatives and *d*-relatives are similarly distributed across both datasets, with *als*-relatives for temporal relative constructions comprising a small minority. A crucial difference is the lower frequency of *wo*-relatives in Stuttgart in 2017 (panel study), 31.1%, and particularly for the youngest age group in Stuttgart (twin study), 30.2%, signalling that younger speakers in the urban centre of Swabia are moving away from *wo*-relatives in the direction of standard *d*-relatives (67.6%) – a theme returned to regularly in this analysis.

Community and Recording Year	wo-relatives		d-relatives		als-relatives		Total
	%	*n*	%	*n*	%	*n*	n
Schwäbisch Gmünd 1982	52.0%	255	47.8%	234	0.2%	1	490
Schwäbisch Gmünd 2017	48.2%	226	47.8%	224	4.1%	19	469
Stuttgart 1982	46.4%	110	52.3%	124	1.3%	3	237
Stuttgart 2017	31.1%	118	63.9%	242	5.0%	19	379
Total (all speakers)	45.0%	709	52.3%	824	2.7%	42	1575

Table 6-1. Distribution of Three Types of Relativisers – Panel Study

Community and Age Group	wo-relatives		d-relatives		als-relatives		Total
	%	*n*	%	*n*	%	*n*	n
Schwäbisch Gmünd >60 years	43.3%	74	55.6%	95	1.2%	2	171
Schwäbisch Gmünd 30-60 years	54.8%	195	42.4%	151	2.8%	10	356
Schwäbisch Gmünd <30 years	45.0%	99	49.1%	108	5.9%	13	220
Stuttgart >60 years	41.3%	33	55.0%	44	3.8%	3	80
Stuttgart 30-60 years	54.9%	84	41.8%	64	3.3%	5	153
Stuttgart <30 years	30.2%	55	67.6%	123	2.2%	4	182
Total (all speakers)	46.5%	540	50.3%	585	3.2%	37	1162

Table 6-2. Distribution of Three Types of Relativisers – Twin Study

Figure 6-1 (panel study) and Figure 6-2 (twin study) graphically display the data from Table 6-1 and Table 6-2 for the three types of relativisers in real-time and apparent-time (on the left) and by community (on the right). For the panel study, the findings show that use of *d*-relatives increased by 5.7% between 1982 and 2017 and are 11.7% more common in Stuttgart than in Schwäbisch Gmünd, which chi-square tests for independence[32] indicate as significant (recording year: $\chi^2 = 4.57$; $p < .05$; df = 1; community: $\chi^2 = 11.16$; $p < .001$; df = 1). The twin study confirms a similar trend with Stuttgart speakers using 8.3% more *d*-relatives than Schwäbisch Gmünd speakers, although the difference between communities is no longer statistically significant. In line with the results in Chapter 4, this increase in the use of *d*-relatives is a first indication that Schwäbisch Gmünd is converging toward Stuttgart and moving closer to the

[32] For all figures in this chapter, levels of statistical significance were calculated using Pearson's chi-square test and are denoted as: *** = p < .001, ** = p < .01, *, p < .05, and . = p < .10).

standard language. The apparent-time data, however, reveal an unexpected pattern: the 30-60-year-olds are using more *wo*-relatives at 54.8% (<30 and 30-60 year olds: $\chi^2 = 11.58$; $p < .001$; $df = 1$; 30-60 and >60 year olds: $\chi^2 = 5.79$; $p < .05$; $df = 1$), while the youngest and the oldest age groups show similar patterns of use at 38.3% and 42.6%, respectively.

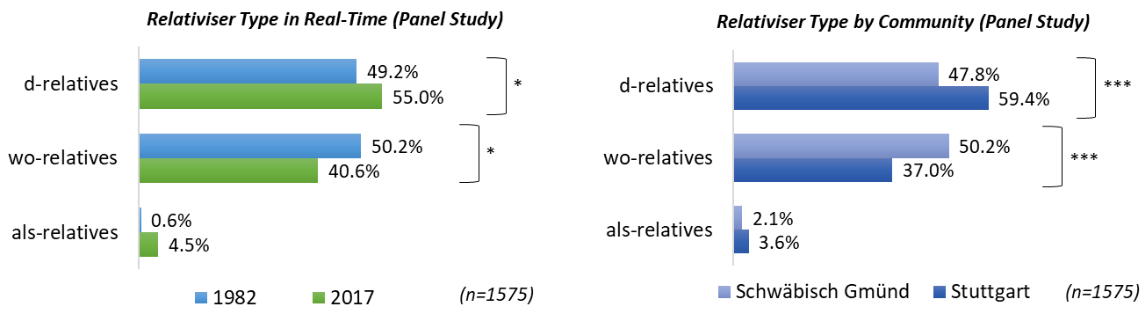

Figure 6-1. Relativiser Types in Real-Time – Panel Study

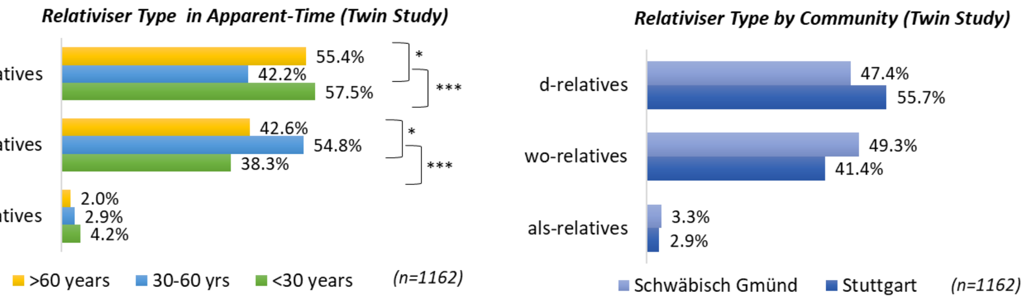

Figure 6-2. Relativiser Types in Apparent-Time – Twin Study

To understand this pattern of relativiser choice, a glimpse into standard and nonstandard relativiser use provides some indications. All relativisers were manually coded for whether they conform to prescriptivist conventions of standard or nonstandard usage (as defined in Section 6.2.2). Figure 6-3 (panel study) and Figure 6-4 (twin study) present the results. As expected, the panel speakers use 10.1% more standard relativisers in 2017 than they did in 1982, and those from Stuttgart use 13.4% more than speakers from Schwäbisch Gmünd, both significant differences (recording year: $\chi^2 = 6.44$; $p < .05$; $df = 1$; community: $\chi^2 = 10.87$; $p < .001$; $df = 1$), again demonstrating the relentless trend toward the standard language.

The twin study speakers continue with the unexpected pattern with the middle age group using more nonstandard relativisers than either the younger or the older age groups (<30 and 30-60-year olds: $\chi^2 = 9.08$; $p < .01$; $df = 1$; 30-60 and >60-year olds: $\chi^2 = 5.05$; $p < .05$; $df = 1$). In looking at the individual speakers in the middle age group, there are several factors which can explain this unanticipated pattern. First, recall that the speakers in the twin study were chosen as "social twins" with speakers in the panel study. The majority are in their late forties and fifties (only two are in their thirties), have slightly higher Swabian orientation scores (4.1 versus 3.9 and 3.8), and most do not have an *Abitur* (58.8%), three indicators which generally point to greater nonstandard usage. Note also, there were only two distinctive age groups in the panel study, while there are three in the twin study. Most significantly, several speakers show extremely high percentages of nonstandard relativiser use, such as Klaus, Gustav, Urs, Marius, and Wendall, all between 60-86%, and Jarvis at 91%, who did not use a single *d*-relative. Thus, it appears that this pattern with the 30-60-year-olds is the result of the unique characteristics of the speakers in this group.

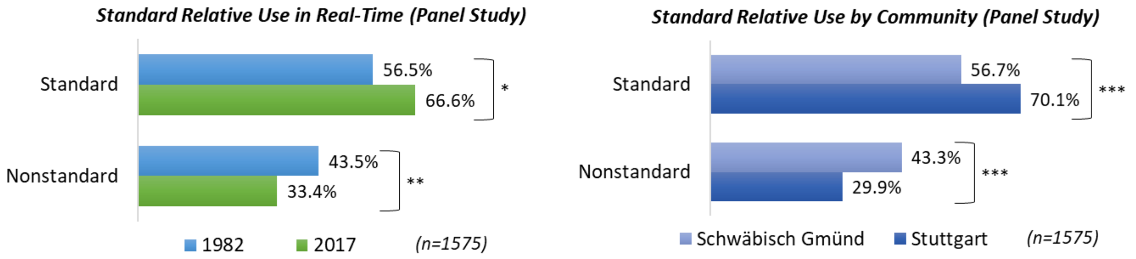

Figure 6-3. Standard and Nonstandard Relativisers in Real-Time – Panel Study

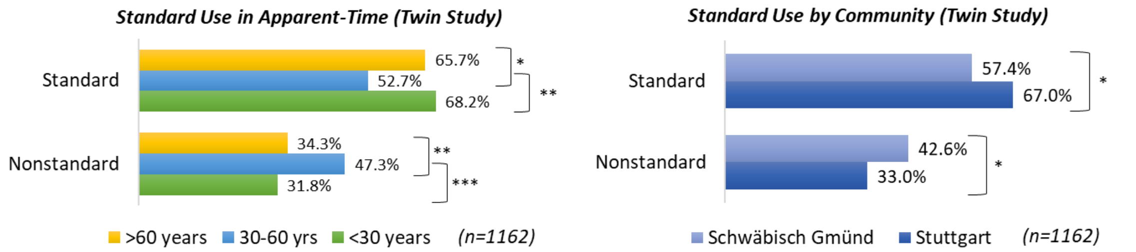

Figure 6-4. Standard and Nonstandard Relativisers in Apparent-Time – Twin Study

6.4.1.1. Resumptive pronouns

Before delving deeper into the analysis, I diverge to present a summary of the Swabian resumptive relative, *der wo* 'he who' (LINGUISTIC PREDICTOR #2), as in the following:

(43) *Ema (1982)*

des seid die Faule-Weiber-Spätzle	'they are the lazy-wife-noodles
die wo durch Press dorchdricket	those that they put through the press'

(44) *Louise (2017)*

wie alt war dn der	'how old was he then
der wo Pfarrer worre isch	he who became [a] preacher'

While resumptive relative pronouns are common in Swiss German, as discussed in Section 6.2.2, in Swabian this usage is considered *von der Alb ra* 'from the mountains there', reflective of rural and uneducated speech, a Labovian (1972) SOCIOLINGUISTIC STEREOTYPE, and thus highly stigmatised. Figure 6-5 (panel study) shows that the resumptive relative (as a percent of the total relatives) is in stark decline in real-time, across the 35-years of the panel study ($\chi^2 = 19.48$; $p < .001$; $df = 1$), which can be attributed to stigmatisation and increasing levels of education ("change from above"). Figure 6-6 (twin study), however, shows no significant difference across the generations, likely because the frequency of occurrence has dropped quite low by 2017. There were 59 resumptive relatives in the panel study, of which 69% appeared in 1982 and only 24 in the twin study, spread across all three age groups. While it is important not to draw strong generalisations with such low token counts, the use of resumptive relatives has unmistakeably declined in real-time and shows an extremely low level of usage in apparent-time.

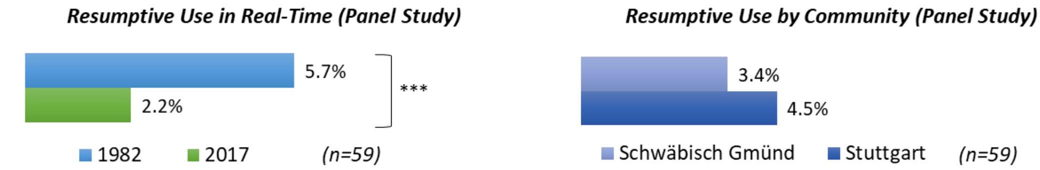

Figure 6-5. Resumptive Relatives in Real-Time – Panel Study

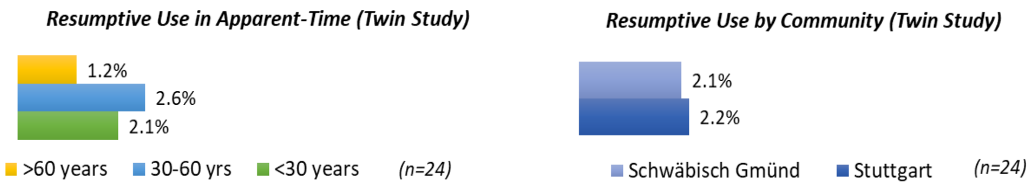

Figure 6-6. Resumptive Relatives in Apparent-Time – Twin Study

6.4.1.2. Locatives and temporals

As discussed in Section 6.2.2, a typical use of *wo* is when the antecedent is a physical place (locative) or a notion of time (temporal) (LINGUISTIC PREDICTORS #3 AND #4). While the use of *wo* as a locative is standard in German, its use as a temporal indicator is considered nonstandard (see example (41)). Figure 6-7 (panel study) and Figure 6-8 (twin study) present the use of *wo* as a locative and temporal relative pronoun (as a percent of the total relatives). The differences for *wo* locatives are not significant, demonstrating that its use has remained constant. In contrast, the use of *wo* as a temporal relative pronoun has dropped considerably for the panel speakers in 2017 ($\chi^2 = 4.33$; $p < .05$; $df = 1$) and for Stuttgart ($\chi^2 = 6.25$; $p < .05$; $df = 1$), implying that this change must have occurred over that last 35 years and is now reaching completion. The decline of *wo* as a temporal marker continues across the generations for the twin speakers,

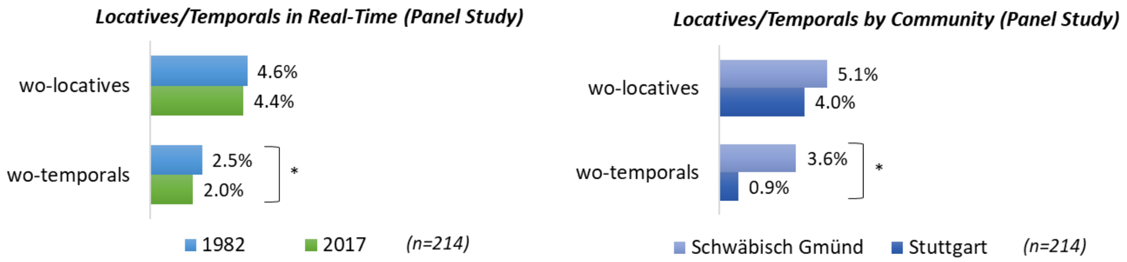

Figure 6-7. Locative and Temporal Relatives in Real-Time – Panel Study

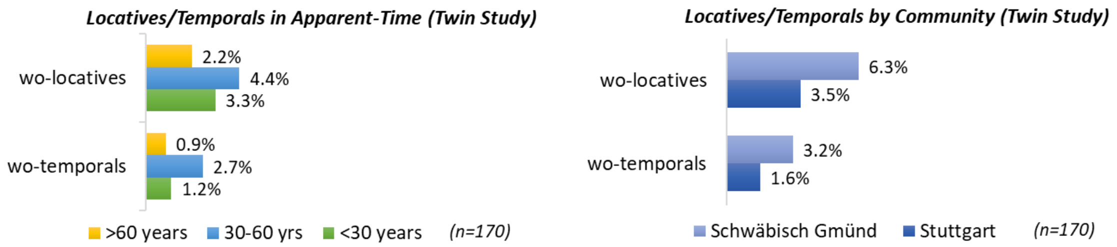

Figure 6-8. Locative and Temporal Relatives in Apparent-Time – Twin Study

although the differences are not significant, which is likely due to the low token count as the change nears completion.

6.4.1.3. Restrictiveness

When analysing relatives in English varieties, researchers typically exclude non-restrictive relative clauses because they have different semantic and discourse functions (Tagliamonte, Smith, and Lawrence 2005:85). In English, the restrictiveness distinction can be "fuzzy" (see Meyerhoff et al. 2020) and, in German, it is definitely questionable. For example, in a relative clause extraposition production experiment in German, Poschmann and Wagner (2016:36) ascertained that both restrictive and non-restrictive clauses were "equally natural" when controlling for function, distance, temporal, and anaphoric elements. However, to ensure that there is indeed no essential restrictiveness distinction in the choice of relative markers in Swabian, both restrictive and non-restrictive relatives have been coded in the analysis (see Section 6.3.2.1). Figure 6-9 (panel study) and Figure 6-10 (twin study) show the distribution of relative clauses in real-time and apparent-time and by community based on the restrictiveness distinction (LINGUISTIC PREDICTOR #1). As expected, there are significantly more restrictive relative clauses than non-restrictive ones in the corpus, and there are no significant differences in usage in real- or apparent-time or by community. There is a slightly greater, yet insignificant tendency (circa 15%) to use the *wo*-relativiser with non-restrictive relative clauses, an aspect analysed further in the subsequent multivariate analyses which takes into account the interactions among predictors.

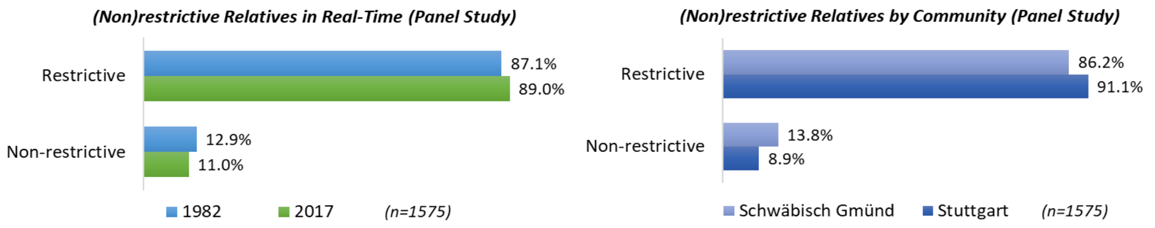

Figure 6-9. Restrictive and Non-Restrictive Relatives in Real-Time – Panel Study

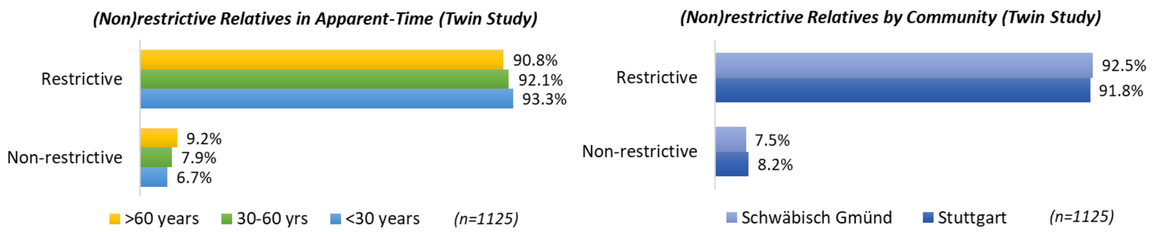

Figure 6-10. Restrictive and Non-restrictive Relatives in Apparent-Time – Twin Study

6.4.1.4. Speech community

One of the strongest factors influencing the choice of relativisers is the urban/rural distinction. Figure 6-11 (panel study) and Figure 6-12 (twin study) report the distribution of relativisers by community in real- and apparent-time (excluding *als* due to the small token count).

The panel speakers from Schwäbisch Gmünd are remarkably stable in their relativiser use across their 35-year lifespans in contrast to the Stuttgart panel speakers who show a significant drop in *wo*-relatives (from 47% to 33%, $\chi^2 = 7.48$; $p < .01$; $df = 1$) and a corresponding increase in *d*-relatives (from 53% to 67%, $\chi^2 = 4.66$; $p < .05$; $df = 1$). A similar pattern can be seen in the twin study, with the Schwäbisch Gmünd speakers showing greater stability in the use of *wo*, in contrast to the Stuttgart speakers who demonstrate a significant decline between the middle and the youngest generations (from 57% to 31%, $\chi^2 = 12.67$; $p < .001$; $df = 1$).

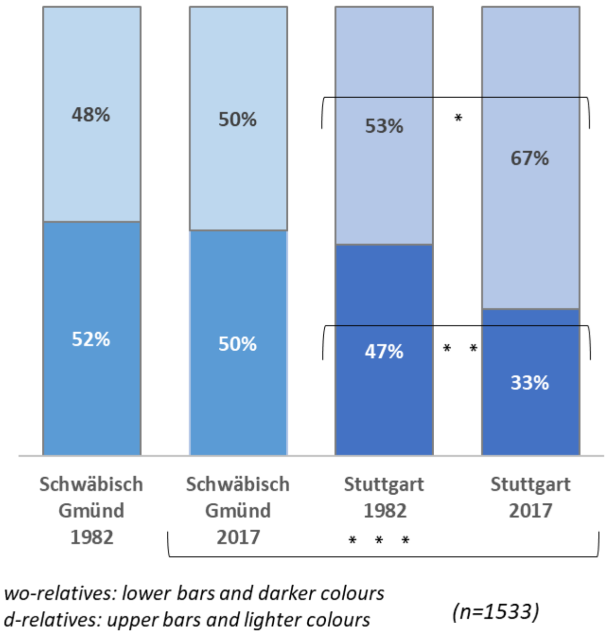

Figure 6-11. Relativiser Use by Community in Real-Time– Panel Study

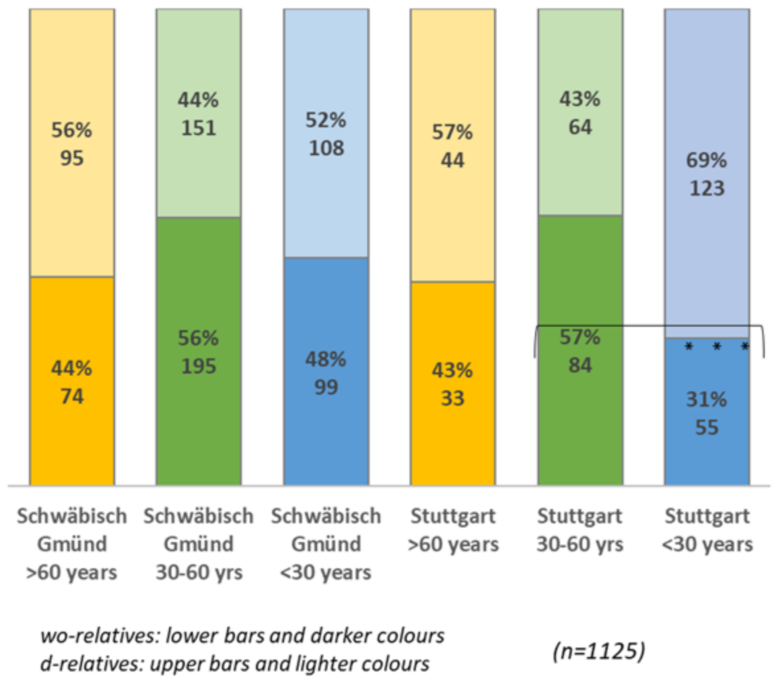

Figure 6-12. Relativiser Use by Community in Apparent-Time – Twin Study

These results support the predictions from Section 6.3.2.2 which claim that the use of *wo*-relatives is decreasing in real-time (SOCIAL PREDICTOR #1), primarily in the urban variety of Stuttgart (SOCIAL PREDICTOR #2), and is most advanced in the youngest generation (SOCIAL PREDICTOR #3). These results concur with those from Chapter 4, pointing to wide-ranging processes of standard language convergence and supraregionalisation in Swabian.

6.4.1.5. Case and case matching

A second key factor constraining variation in the use of *wo*-relativisers is the case of the relative marker. Table 6-3 (panel study) and Table 6-4 (twin study) show the distribution of relative clauses by case. As expected, usage follows the Keenan and Comrie (1977) ACCESSIBILITY HIERARCHY, with relative clauses being most common in the nominative case, followed by similar levels of frequency for the accusative and dative cases.[33]

Community and Recording Year	Nominative		Accusative		Dative		Total
	%	*n*	%	*n*	%	*n*	n
Schwäbisch Gmünd 1982	65.3%	267	16.1%	66	18.6%	76	409
Schwäbisch Gmünd 2017	55.0%	208	22.0%	83	23.0%	87	378
Stuttgart 1982	65.0%	134	14.6%	30	20.4%	42	206
Stuttgart 2017	68.5%	213	14.8%	46	16.7%	52	311
Total (all speakers)	63.0%	822	17.3%	225	19.7%	257	1304

Table 6-3. Distribution of Relative Clauses by Case – Panel Study

Community and Age Group	Nominative		Accusative		Dative		Total
	%	*n*	%	*n*	%	*n*	n
Schwäbisch Gmünd >60 years	63.4%	85	16.4%	22	20.1%	27	134
Schwäbisch Gmünd 30-60 years	57.2%	163	18.9%	54	23.9%	68	285
Schwäbisch Gmünd <30 years	61.7%	108	15.4%	27	22.9%	40	175
Stuttgart >60 years	73.0%	46	6.3%	4	20.6%	13	63
Stuttgart 30-60 years	58.3%	67	13.0%	15	28.7%	33	115
Stuttgart <30 years	62.7%	101	16.1%	26	21.1%	34	161
Total (all speakers)	61.1%	570	15.9%	148	23.0%	215	933

Table 6-4. Distribution of Relative Clauses by Case – Twin Study

Figure 6-13 (panel study) and Figure 6-14 (twin study) depict the use of *wo*-relatives by case, demonstrating that the *wo*-relativiser is more common in the dative case (LINGUISTIC PREDICTOR #5), followed by the accusative and nominative cases – the inverse of the Keenan and Comrie ACCESSIBILITY HIERARCHY. One tell-tale real-time change that stands out: an 18% decrease in the use of *wo* in nominative relative clauses ($\chi^2 = 21.30$; $p < .001$; df = 2) for the 2017 panel speakers and an 16% increase of *wo* in dative relatives ($\chi^2 = 15.45$; $p < .001$; df = 2), an effect not differentiated by community. There is significant change in apparent-time, suggesting that this change likely occurred prior to 2017.

[33]There were six genitives in the panel study and two in the twin study, hence they have been omitted.

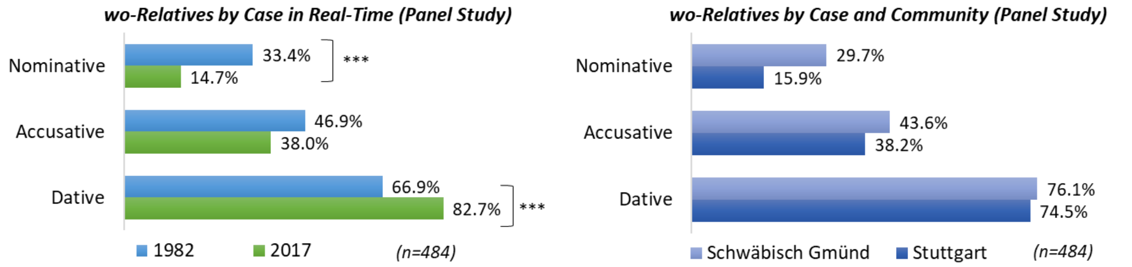

Figure 6-13. wo-Relatives by Case in Real-Time – Panel Study

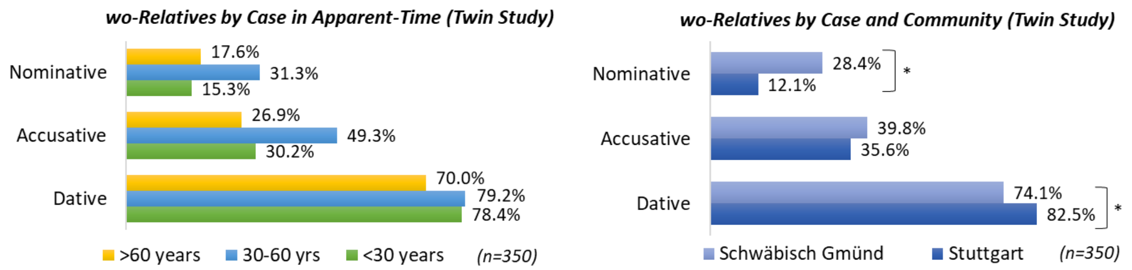

Figure 6-14. wo-Relatives by Case in Apparent-Time – Twin Study

Figure 6-15 (panel study) and Figure 6-16 (twin study) evaluate the relativiser case within community. The findings expose that the change in the use of *wo* from nominative to dative relatives has occurred across the lifespan of the Schwäbisch Gmünd panel speakers (nominatives: $\chi^2 = 19.48$; $p < .001$; df = 2; datives: $\chi^2 = 17.72$; $p < .001$; df = 2), providing additional evidence for post-critical-age change and underscoring the crucial role of a combined real- and apparent-time study.

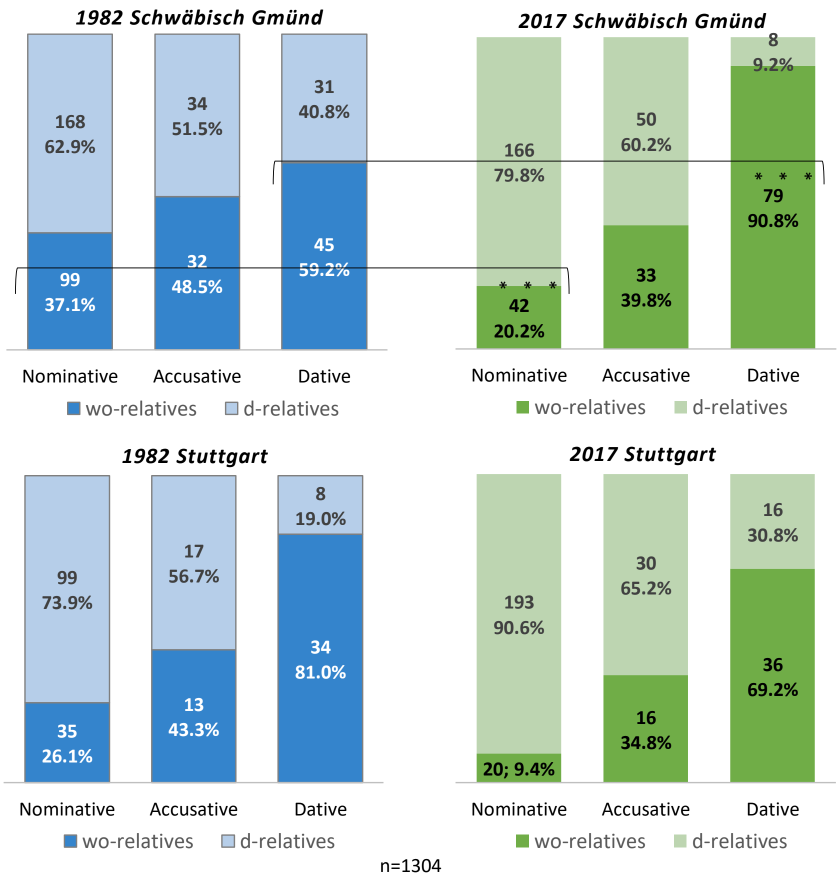

Figure 6-15. Relativisers by Case and Community in Real-time– Panel Study

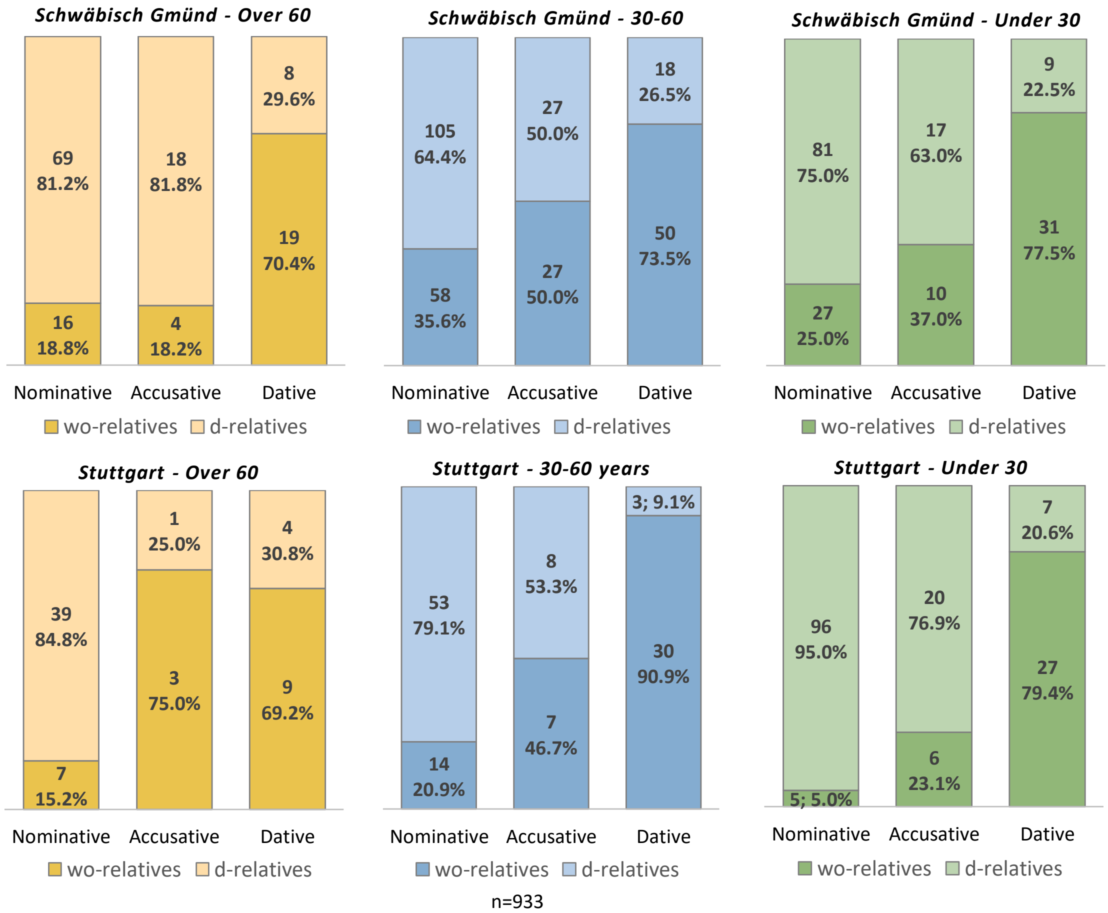

Figure 6-16. Relativisers by Case and Community in Apparent-time – Twin Study

A related prediction outlined in Section 6.3.2.1 expects *d*-relatives to be favoured when the relative case and the antecedent case match and for *wo*-relatives to be favoured when the cases do not match (LINGUISTIC PREDICTOR #6). Figure 6-17 (panel study) and Figure 6-18 (twin study) present the case matching results. The only significant difference can be seen with the panel study participants who were more likely to match cases in 1982 than in 2017 (matched: $\chi^2 = 7.96$; $p < .01$; df = 1; unmatched: $\chi^2 = 8.48$; $p < .01$; df = 1), implying that case matching between the relativiser and the antecedent was an integral constraint 35-years ago, yet is no longer essential today (the role of case is addressed further in the discussion session).

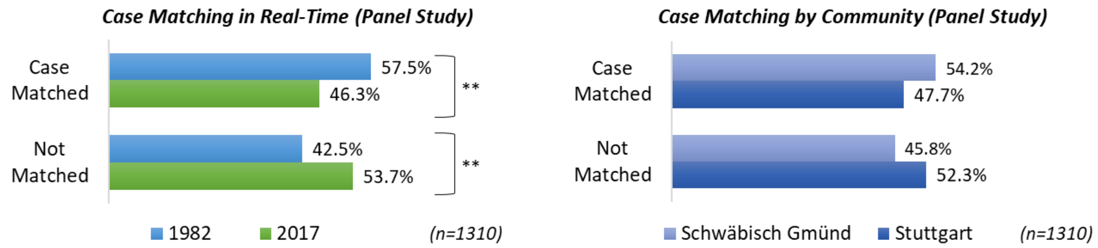

Figure 6-17. Relative Case Matching in Real-time – Panel Study

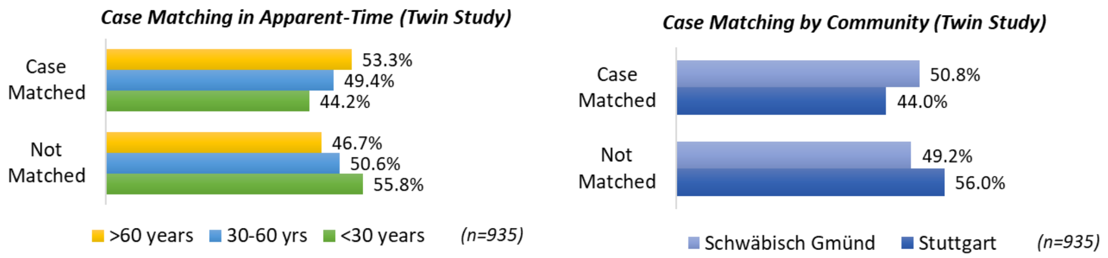

Figure 6-18. Relative Case Matching in Apparent-time – Twin Study

6.4.1.6. Animacy and definiteness

Previous research on relativiser use in English found differences based on the animacy and definiteness of the antecedent (Levey 2006; Tagliamonte, Smith, and Lawrence 2005). Based on this prior research, LINGUISTIC PREDICTORS #15 and #16 expect *wo*-relatives to be favoured with less explicit antecedents, that is with inanimate and indefinite referents. Figure 6-19 (panel study) and Figure 6-20 (twin study) show the percent of *wo*-relatives based on the animacy of the antecedent (i.e., percent of animate and inanimate antecedents using the *wo*-relativiser). The results show a significant difference in real-time, with the panel speakers in 2017 using *wo*-relatives with animate antecedents 11.9% less often than they did in 1982 ($\chi^2 = 5.06$; $p = .02$; $df = 1$). There is no corresponding difference in apparent-time or across communities which may indicate that animacy was a prominent factor influencing the use of *wo*-relativisers in the past and that this constraint has diminished over time. These results are based on small token counts, however, and so should be treated with caution and followed up with additional data.

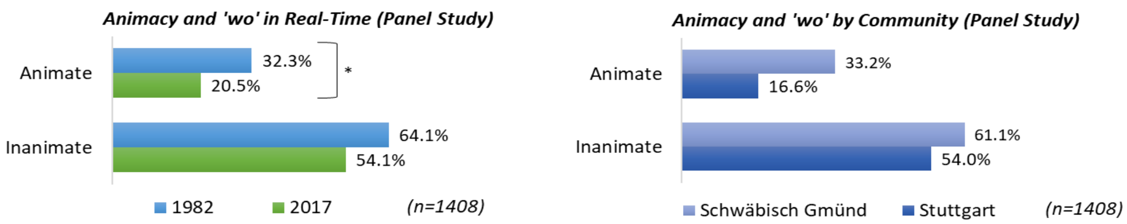

Figure 6-19. wo-Relatives and Animacy in Real-time – Panel Study

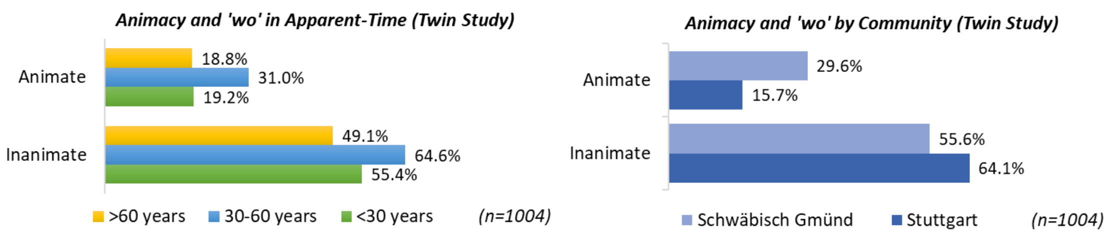

Figure 6-20. wo-Relatives and Animacy in Apparent-time – Twin Study

Figure 6-21 (panel study) and Figure 6-22 (twin study) present the distribution of *wo*-relatives based on the definitiveness of the antecedent (i.e., percent of all definite and indefinite antecedents using the *wo*-relativiser). The results show a similar significant difference in real-time, with the panel speakers in 2017 using *wo*-relatives with definite antecedents 11.5% less frequently than they did in 1982 ($\chi^2 = 5.12$; $p = .02$; $df = 1$). Again, there is no corresponding difference in apparent-time or across communities, although the difference between the oldest and middle age groups shows marginal significance difference ($\chi^2 = 2.97$; $p = .08$; $df = 1$). Whether there is an ostensible change in progress occurring with *wo*-relatives in Swabian based on animacy and definiteness is analysed further in the following multivariate analysis.

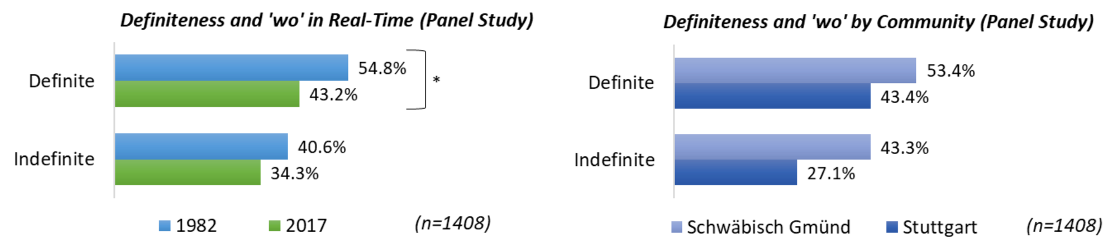

Figure 6-21. wo-Relatives and Definiteness in Real-time – Panel Study

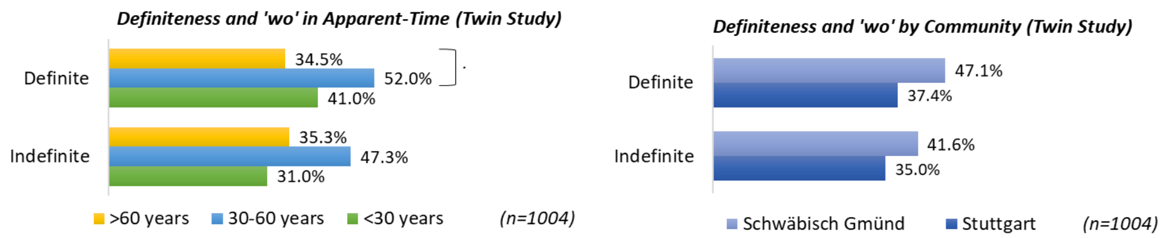

Figure 6-22. wo-Relatives and Definiteness in Apparent-Time – Twin Study

6.4.1.7. Length and distance

Two cognitive internal constraints on relativiser choice have been considered in this analysis: the length of the relative clause and the distance between the relativiser and its antecedent (in number of words). Figure 6-23 (panel study) and Figure 6-24 (twin study) present the results, split by median relative clause length, five or fewer words and more than five words (LINGUISTIC PREDICTOR #10). No significant differences were found in real- or apparent-time.

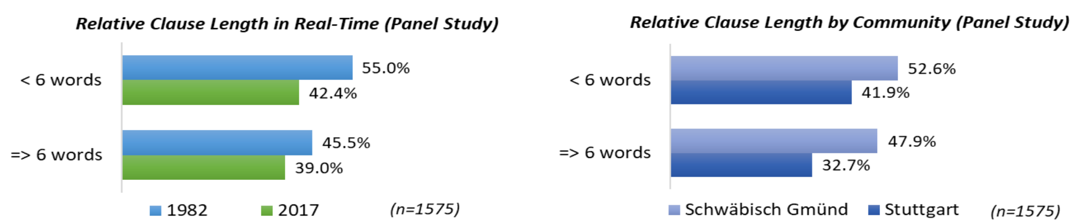

Figure 6-23. wo-Relatives and Clause Length in Real-time – Panel Study

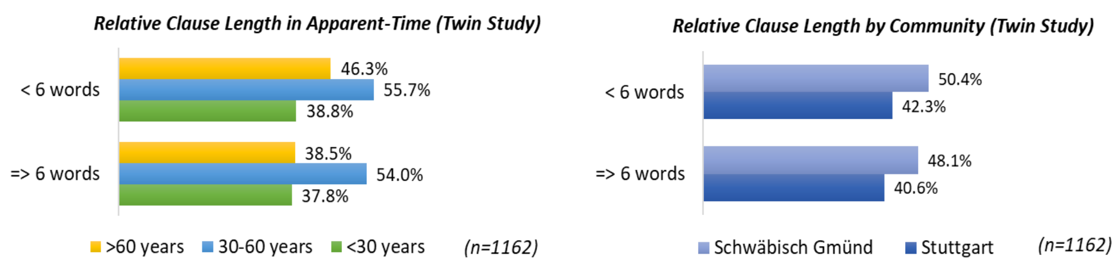

Figure 6-24. wo-Relatives and Clause Length in Apparent-time – Twin Study

Figure 6-25 (panel study) and Figure 6-26 (twin study) present the distribution of *wo*-relativisers based on the distance between the antecedent and the relativiser, split by median distance, one word or more than one word (LINGUISTIC PREDICTOR #18). No significant differences are evident in real- or apparent-time.

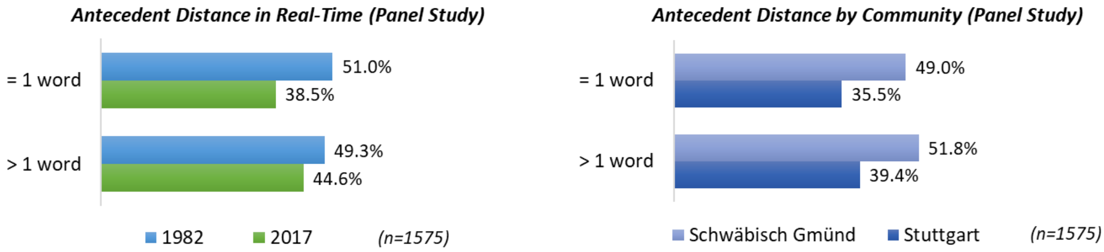

Figure 6-25. wo-Relatives and Antecedent Distance in Real-time – Panel Study

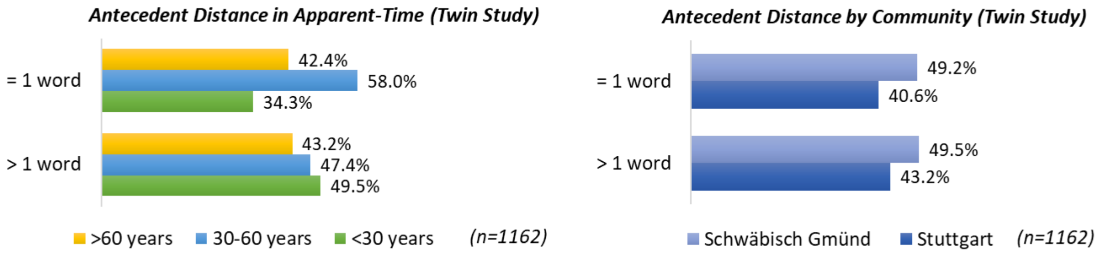

Figure 6-26. wo-Relatives and Antecedent Distance in Apparent-time – Twin Study

6.4.1.8. Gender and number

Figure 6-27 (panel study) and Figure 6-28 (twin study) show the distribution of *wo*-relativisers based on the gender of the antecedent (LINGUISTIC PREDICTOR #12). Masculine gender is the most common (over 50% in both studies), followed by feminine (27-28%) and neuter (18-19%). However, *wo*-relatives are more common with neuter antecedents ($\chi^2 = 8.09$; $p < .05$; df = 1), while relatives with feminine and neuter antecedents ($\chi^2 = 11.52$; $p < .01$; df = 1) have slightly increased in real-time. Schwäbisch Gmünd shows greater use of *wo*-relatives across all genders, particularly with feminine antecedents ($\chi^2 = 9.41$; $p < .01$; df = 1). There are no corresponding significant differences in apparent-time (Figure 6-28). This change may point to a balancing and generalisation of the relativisation constraint system for grammatical gender which has occurred in real-time and now stabilised in apparent-time (see Section 6.4.2.3 for further discussion).

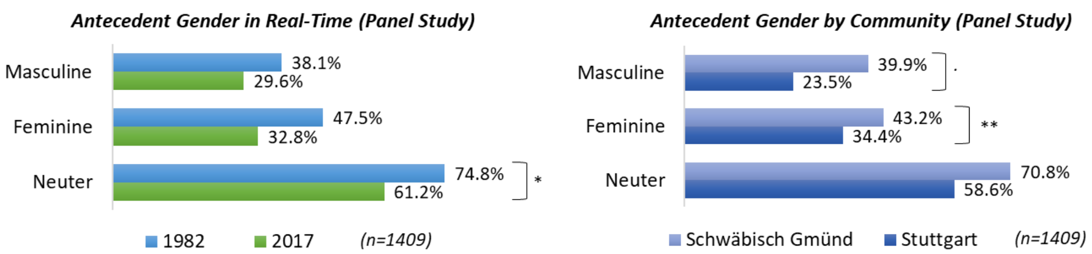

Figure 6-27. wo-Relatives and Antecedent Gender in Real-time – Panel Study

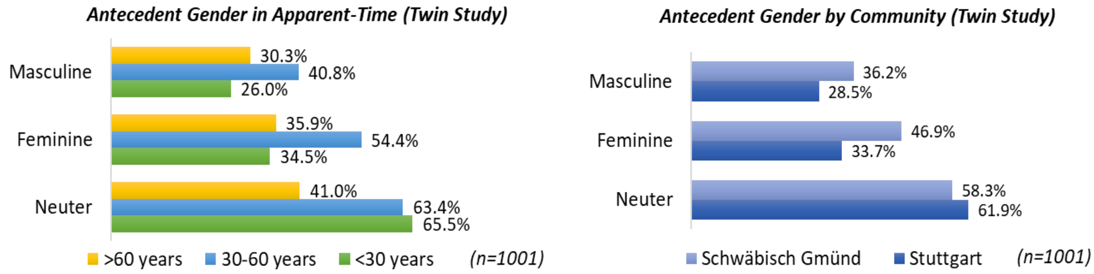

Figure 6-28. wo-Relatives and Antecedent Gender in Apparent-time – Twin Study

Figure 6-29 (panel study) and Figure 6-30 (twin study) depict the distribution of *wo*-relativisers based on the number of the antecedent, singular or plural (LINGUISTIC PREDICTOR #13). Overall singular referents are more common than plural referents (71.8% in the panel study and 63.4% in the twin study), yet no significant differences are discernible in the real- or apparent-time distributions. To further investigate these factors, the multivariate analysis in the following section considers the interaction of gender and number along with the other linguistic constraints considered in this study.

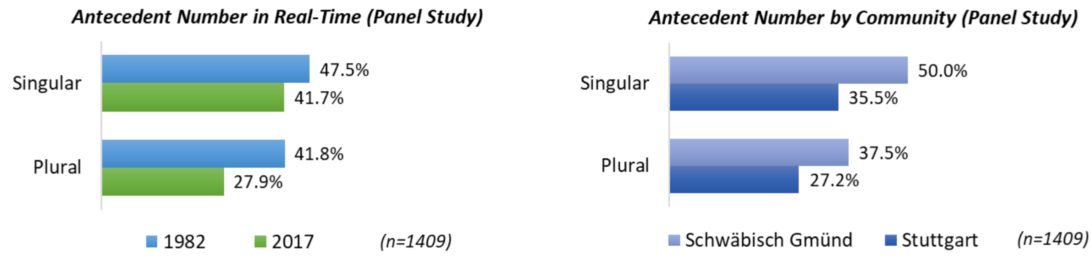

Figure 6-29. wo-Relatives and Antecedent Number in Real-time – Panel Study

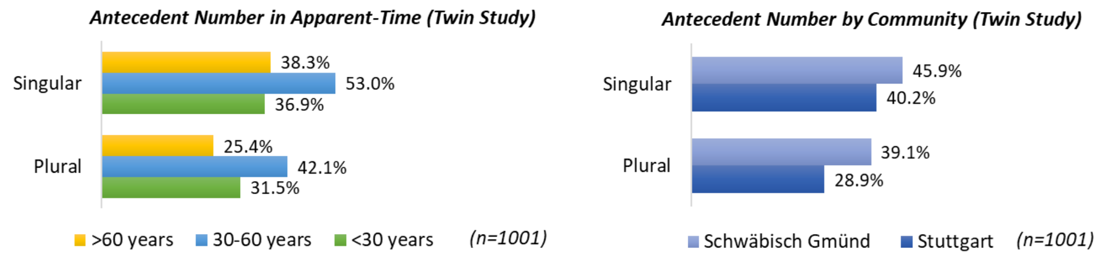

Figure 6-30. wo-Relatives and Antecedent Number in Apparent-time – Twin Study

6.4.2. Multivariate analysis of wo-relativiser use in Swabian

To understand the full picture of relativiser choice in Swabian, I conducted iterative, bottom-up multivariate analyses to investigate the social and linguistic constraints (described in Section 6.3.2) impacting the choice of relativisers in isolation and in interaction with each other. Table 6-5 (panel study) and Table 6-6 (twin study) present the summary results of the best-fit linear mixed-effects regression models (*glmer* function from the R package *lme4*, version 1.1-21 (Bates et al. 2015; R Core Team 2014)), evaluated with Akaike's Information Criterium (AIC) and the model statistics recommended by Hinrichs, Szmrecsanyi, and Bohmann (2015). Note that positive estimates favour the use of *wo*-relatives, while negative estimates favour *d*-relatives.

With a concordance[34] values of .908 (panel study) and .918 (twin study) and percents correctly predicted of 82.5% (panel study) and 80.9% (twin study), these models can be considered quite good at explaining the variability in the use of *wo*- versus *d*-relatives in Swabian (see Hinrichs, Szmrecsanyi, and Bohmann (2015) on how the model statistics are calculated).

RANDOM EFFECTS:					
Groups	Name	Variance	Std.Dev.		Tokens = 1575
Speaker	(Intercept)	1.486	1.219		Speakers = 20

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	-0.35698	0.41723	-0.856	0.392228	
MAIN EFFECTS:					
Recording Year: 2017	0.12193	0.23349	0.522	0.601543	
Community: Stuttgart	-0.09943	0.60631	-0.164	0.869737	
Speaker Mobility: increasing	-0.45071	0.12622	-3.571	0.000356	***
Place: yes and abstract	2.97750	0.26477	11.246	< 2e-16	***
Time: yes and abstract	1.75537	0.25320	6.933	4.13e-12	***
Clause Length: > 5 words	-0.47582	0.14365	-3.312	0.000925	***
Antecedent Gender: masculine	-0.43627	0.16201	-2.693	0.007084	**
Case Matching: no	-0.49788	0.17170	-2.900	0.003736	**
Relative Case: dative	1.25542	0.37072	3.386	0.000708	***
Definiteness: indefinite	-1.14817	0.21394	-5.367	8.02e-08	***
Animacy: inanimate	0.43294	0.23749	1.823	0.068308	.
Antecedent Category: pronoun	0.68200	0.19659	3.469	0.000522	***
INTERACTION EFFECTS:					
Indefinite : Dative Case	1.16738	0.44258	2.638	0.008348	**
Indefinite: Inanimate	1.15710	0.30609	3.780	0.000157	***
Recording Year 2017 : Stuttgart	-0.61340	0.31085	-1.973	0.048461	*

MODEL STATISTICS:			
R2 Marginal	.4427	Concordance Index:	.9078
R2 Conditional	.6161	Correctly Predicted:	82.5%
		Baseline Percent:	52.3%

Table 6-5. Multivariate Analysis of wo-Relativiser Use in Swabian – Panel Study
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10*
R2 Marginal includes only fixed effects; R2 Conditional includes both fixed and random effects

RANDOM EFFECTS:					
Groups	Name	Variance	Std.Dev.		Tokens = 1162
Speaker	(Intercept)	1.54	1.241		Speakers = 40

FIXED EFFECTS:	Estimate	Std.Error	z-value	Pr(>|z|)	
(Intercept)	-0.2794	0.3725	-0.750	0.453141	
MAIN EFFECTS:					
Speaker Education: Abitur	-1.4678	0.4408	-3.330	0.000868	***
Place: yes and abstract	1.9730	0.2781	7.094	1.30e-12	***
Relative Case: dative	2.3761	0.2617	9.079	< 2e-16	***
Animacy: inanimate	1.0366	0.2032	5.103	3.35e-07	***
Antecedent Case: adverb	2.2378	0.3313	6.754	1.44e-11	***
Case Matching: no	-0.7237	0.2009	-3.601	0.000316	***
Antecedent Gender: masculine	-0.4846	0.1960	-2.472	0.013441	*

MODEL STATISTICS:			
R2 Marginal	.4428	Concordance Index:	.9183
R2 Conditional	.6205	Correctly Predicted:	80.9%
		Baseline Percent:	50.3%

Table 6-6. Multivariate Analysis of wo-Relativiser Use in Swabian – Twin Study
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10*

[34] Related to rank correlation between predicted and observed values, the concordance index is a global measure that evaluates the predictive ability of a model. It is calculated as the proportion of concordant pairs divided by the total number of possible pairs (Harrell 2001).

R2 Marginal includes only fixed effects; R2 Conditional includes both fixed and random effects

Table 6-7 provides a summary of all the predictors tested in both models (see Section 6.3.2), revealing nine significant linguistic factors and four significant social factors, thus confirming considerable prior research that syntactic variables are more linguistically constrained than socially-driven. For the panel study, recording year and community are not significant on their own, but they are significant in interaction with each other (as indicated by the arrow followed by the interacting predictor number, e.g., *→ #1 and *→ #2). It is interesting to note that the number of constraints influencing the use of *wo*-relatives is considerably narrower for the twin study than for the panel study (7 versus 12) and that there are no significant interaction effects. Most notable is the loss of the community distinction in the twin study, further evidence for the convergence of the two varieties into a shared, supraregional, more standardised variety. As previously seen in Figure 6-3 and Figure 6-4, use of standard relativisers has increased in both real- and apparent-time, particularly in the city of Stuttgart, signalling a more coherent system of relativisation with the standard language.

Predictors	Panel Study	Twin Study
Social Predictors		
1. Recording year	*→ #2	*n.s.*
2. Speech community	*→ #1	*n.s.*
3a. Speaker age group	*n.s.*	*n.s.*
3b. Speaker birth year	*n.s.*	*n.s.*
4. Speaker sex	*n.s.*	*n.s.*
5. Speaker education (“Abitur”)	*n.s.*	***
6. Swabian orientation (SOI)	*n.s.*	*n.s.*
7. Interlocutor choice (ICI)	*n.s.*	*n.s.*
8. Speaker mobility (SMI)	***	*n.s.*
Linguistic Predictors		
1. Restrictiveness (“yes”)	*n.s.*	*n.s.*
2. Place (“yes”)	***	***
3. Time (“yes”)	***	*n.s.*
4. Antecedent category (“pronoun” vs “adverb”)	***	***
5. Antecedent case	*n.s.*	*n.s.*
6. Relative case (“dative”)	**→ #10	***
7. Case matching (“no”)	***	***
8. Resumptiveness	*n.s.*	*n.s.*
9. Animacy (“inanimate”)	***→ #10	***
10. Definitiveness (“indefinite”)	***→ #9	*n.s.*
11. Topic persistence	*n.s.*	*n.s.*
12. Antecedent gender (“masculine”)	*	**
13. Antecedent number	*n.s.*	*n.s.*
14. Structural persistence	*n.s.*	*n.s.*
15. Structural count	*n.s.*	*n.s.*
16. Relative clause length (> 5 words)	***	*n.s.*
17. Antecedent length	*n.s.*	*n.s.*
18. Antecedent distance	*n.s.*	*n.s.*

Table 6-7. Summary of Significant/Not Significant Predictors for wo-Relatives
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10; n.s. = not significant*

To more clearly illustrate the relative difference between the predictors across both regression models, Figure 6-31 provides a summary of the significant constraints (p < .05), using the R *plotCoeffs* function (blue squares represent the coefficients from the panel study and red circles the twin study). The effects are sorted with positive estimates favouring *wo*-relativisers at the top and to the right and negative effects favouring *d*-relativisers at the bottom and to the left. Recall that for effects that are significant in one model but not in the other, the non-significant effect is plotted at the 0 point. This figure provides a visual overview of the factors influencing the choice of relativisers in Swabian from both the panel and the twin study. The most significant predictors from Figure 6-31 are discussed in the following subsections

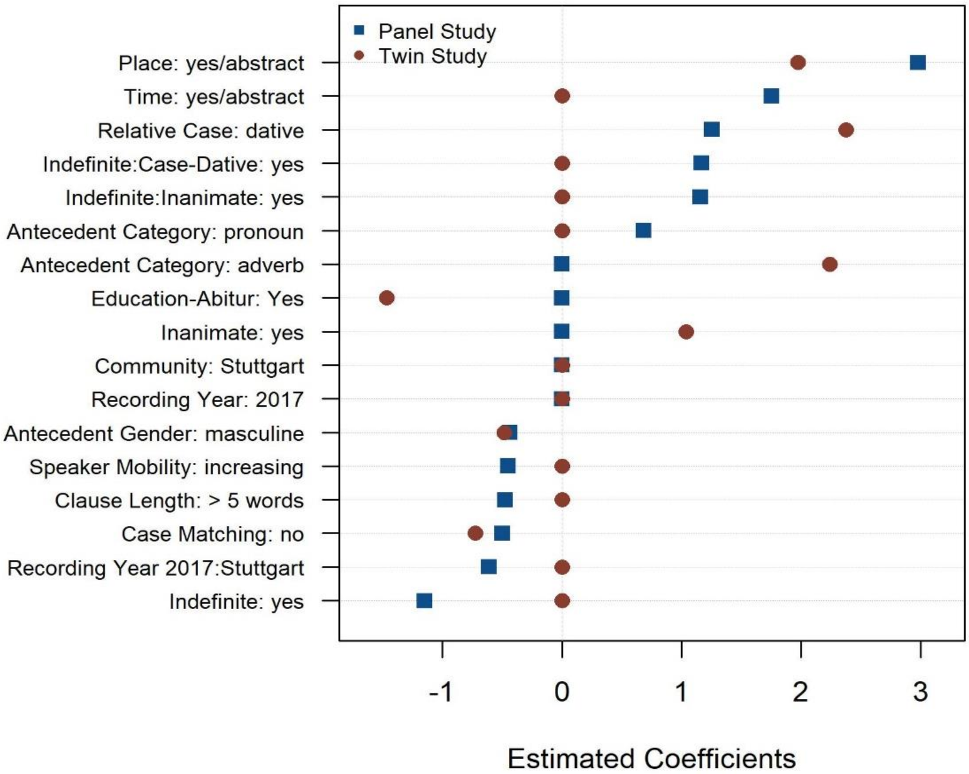

Figure 6-31. wo-Relativiser Use and Comparative Strength of Predictors

6.4.2.1. Change in real- and apparent-time

The most striking finding in the multivariate analysis is the change in the use of *wo*-relatives in real-time between 1982 to 2017 in Stuttgart (Recording Year 2017:Stuttgart, Figure 6-31), without a concomitant change across the community in apparent-time. As Sankoff's (2006, 2019) work shows, and as Chapter 4 demonstrated, lifespan change generally mirrors community change; thus, the change in *wo*-relativiser use across the lifespan seen here can likely be attributed to AGE-GRADING, in which speakers change their linguistic choices at different stages in their lifetime as a result of external societal pressures, commonly the linguistic market, while the rest of the community remains stable (Hockett 1950; Wagner 2012a) (see Section 2.4.3 for a discussion of AGE-GRADING). In 2017, five of the seven panel speakers from Stuttgart were at the height of their careers: Egbert and Ricarda as school teachers, Manni, Pepin, and Helmut as business executives. It is highly predictable that these speakers would use fewer nonstandard forms in their 50's than they did when they were still in school in their 20's. In fact, it is perplexing not to see this same effect in the 30-60-year-old group in the twin study. However, as the previous distributional analyses show (see Section 6.4.1), the 30-60-year-olds in the current study use more *wo*-relatives than would typically be expected in an environment of generational change; hence, I interpret these results to suggest that the move away from nonstandard *wo*-relatives is relatively recent, originating with the youngest generation.

6.4.2.2. Changing social structure

Another socioculturally relevant difference between the panel and twin study speakers' use of *wo*-relativisers is the significance of greater speaker mobility for the panel speakers (Speaker Mobility: increasing, Figure 6-31) and the importance of higher education for the twin speakers (Education-Abitur: yes, Figure 6-31), factors previously discussed in Chapter 4. These two effects patently expose the profound change that has occurred in Swabia over the last 35 years. Greater mobility is a deterrent of *wo*-relative usage for the panel study speakers: increased mobility generally promotes greater contact with speakers from other regions and hence exposure to other linguistic varieties, presumably ones that do not use *wo*-relatives. However, as Section 4.4.1.4 revealed, mobility is no longer a driving force in 2017 as it was in 1982, and, as Section 4.4.1.5 showed, higher education has become a paramount predictor of standard relativiser use. Labov (2001:60) maintains that education is the single best predictor for assessing the social evaluation of a feature, with higher levels of education correlating with features of higher prestige, specifically, those taught in schools. Not surprisingly, the influence of prescriptivism in the educational system can reduce and even eradicate nonstandard forms, as these data show, even within one generation. This pattern of *wo*-relativiser usage is another indicator pointing to the acute transformation occurring in the sociocultural environment in Swabia (see Section 6.5.5 for further discussion).

6.4.2.3. Changing grammatical system

The two strongest factors favouring the use of *wo*-relatives are antecedents representing either physical or abstract notions of place (Place: yes/abstract, Figure 6-31) or specific or abstract notions of time (Time: yes/abstract, Figure 6-31). As expected, based on the etymological origin of *wo* 'where' as a locative marker (however, see Section 6.5.2), the panel speakers strongly favour *wo* for notions of both place and time; however, the twin speakers favour *wo* only for notions of place, and not with nonstandard temporal constructions (as in example (41)). These results echo the increasing influence of prescriptivism, which reproaches the use of *wo* for time referents (see Section 6.5.5 for further discussion).

The third strongest factor favouring the use of *wo*-relativisers is the dative case (Relative Case: dative, Figure 6-31), which is a powerful predictor for both the panel and twin study speakers. While relatives overall are more common in the nominative case (see Table 6-3 and Table 6-4), *wo*-relatives are more common in the dative case (see Figure 6-13 and Figure 6-14), an effect that is increasing in both real- and apparent-time. These results suggest that a structural change may be occurring in the German case system toward uninflected relativisation in dative constructions (see Sections 6.5.1 and 6.5.3 for further discussion).

The fourth and fifth strongest predictors favouring the use of *wo* involve the interaction of animacy and definiteness, specifically indefinite and inanimate antecedents (Indefinite:Inanimate: yes, Figure 6-31) and the interaction of definiteness and case, in particular, indefinite antecedents in the dative case (Indefinite: Case-Dative, Figure 6-31). These interaction constraints are highly significant for the panel study speakers ($p < .01$), yet only inanimacy turns out to be significant for the twin study speakers, signalling a "simplification" or "generalisation" (cf. koinéisation) of the constraint system in the supraregional variety evolving in southern Germany.

Additional evidence for a change in the Swabian grammatical system can be found in the next strongest constraint on *wo*-relatives: antecedent category (i.e., noun, pronoun or adverb). The findings show that pronominal antecedents are favoured by the panel speakers (Antecedent Category: pronoun, Figure 6-31), whereas adverbial antecedents are favoured by the twin speakers (Antecedent Category: adverb, Figure 6-31), providing further substantiation for the move away from the use of *wo* as a relative marker toward its more standard prescribed usage as an adverbial construction.

Finally, the constraints that favour the use of *d*-relatives over *wo* include antecedent gender (Antecedent gender:masculine, Figure 6-31), relative clause length (Clause Length: >5 words, Figure 6-31), and case matching (Case Matching: no, Figure 6-31). A previous exploratory study of *wo*-relatives that I conducted with a smaller Swabian panel dataset indicated that greater distance between the antecedent head and the relativiser also favoured the use of *d*-relatives (Beaman 2021b); however, this factor turns out to be of marginal significance ($p < .10$) in the combined panel and twin studies, overtaken by many more powerful constraints.

In sum, the results of the multivariate analysis reveal that, over the 35 years of this study, use of *wo*-relatives has increased in the dative case, in both real- and apparent-time, circumventing the use of inflected *d*-relatives (see following discussion section). The constraints of inanimacy and indefiniteness are significant over the lifespan of the panel study speakers; however, these factors have slackened off for the twin study speakers. While there are many significant internal linguistic constraints, the social constraints of increasing mobility and higher education are driving greater use of standard *d*-relativisers over nonstandard *wo*-relativisers. Crucially, the youngest generation and the urban centre of Stuttgart are taking the lead in this transition to the standard language, with Schwäbisch Gmünd not far behind.

6.5. Discussion

The preceding analysis has exposed a complex array of interacting factors, encompassing both internal linguistic constraints and external social factors, that affect speakers' choice of relative pronouns in Swabian. From these detailed analyses, four general trends emerge: (1) the potential demise of the dative; (2) the evolution of *wo* based on sociohistorical factors; (3) the effects of grammaticalisation and semantic bleaching; and (4) the role of prescriptivism in language variation and change. Each of these is discussed in turn.

6.5.1. Demise of the dative

For *wo*-relatives to be favoured in the dative case is not surprising considering the fact that the dative (like the genitive) has a different case structure in German than the nominative and accusative paradigms.[35] Could this distinctive, "more complicated" structure be driving the dative the way of the genitive, which has completely died out in modern spoken German? Could Swabian be moving toward a two-case system as with many of the Low German dialects, at least for relative pronouns? One insight can be drawn from Google Books Ngram Viewer (Jean-Baptiste et al. 2011), which shows that use of the dative article and relative pronoun *dem* is in stark decline, from a high of 0.7% in 1860 to 0.6% in 1940 to 0.5% in 2019 (see Figure 6-32). Whether all dative case markings in German are in decline is clearly beyond the scope of the current analysis; however, evidence from the current study shows that *wo* is preferred over *dem* and *der* for marking dative relative clauses in Swabian.

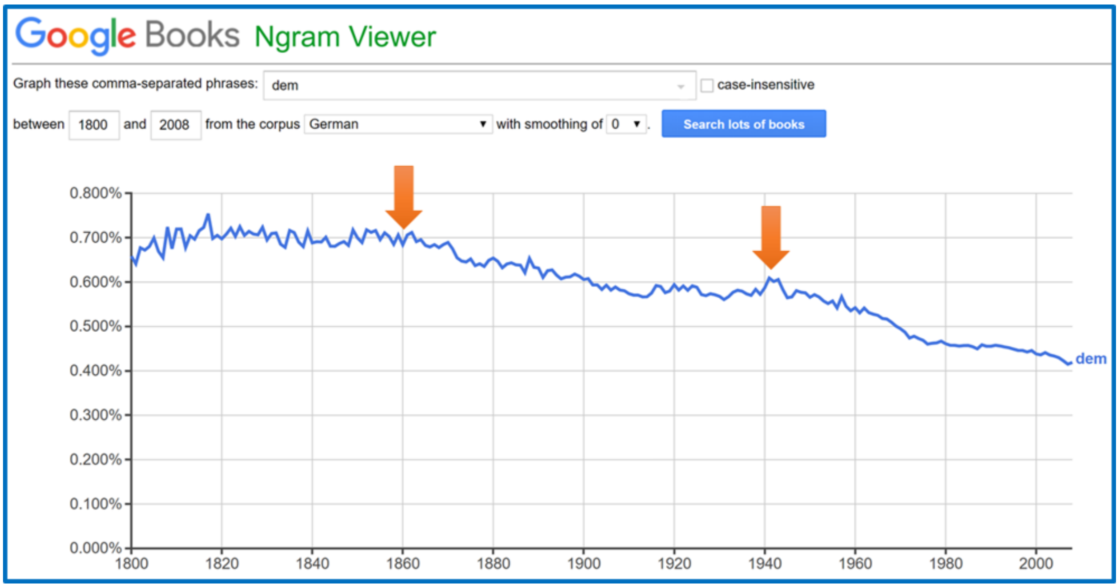

Figure 6-32. Google Books Ngram View for German 'dem'

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[35] The case paradigms for the nominative and accusative pronouns in standard German are similar (nominative = *der/die/das*; accusative = *den/die/das*) in stark contrast to the paradigms for the dative and genitive paradigms (dative = *dem/der/dem*; genitive = *des/der/dem*), which are more similar to each other.

6.5.2. *The sociohistorical context*

In unravelling the use of *wo* as a relative pronoun, it is essential to consider evidence from the sociohistorical context and its etymological evolution. The use of *wo* as a relativiser in German is not a new phenomenon: both Hermann Paul (1897) and the Grimm Brothers confirm frequent use of *wo*-relativisers. Some linguists contend that *wo*-relatives evolved from the locative use of *wo*, meaning 'where'. Indeed, the results of the current study show that *wo*-relatives are highly favoured with both physical and abstract notions of place. However, there is some controversy over this interpretation. Brandner and Bräuning (2013) argue quite convincingly that, despite its homophony with the locative adverb *wo*, the *wo*-relativiser originates from the Middle High German equative particle *so/som*, which was widely used as a complementiser in Early New High German and the southern Alemannic dialects. Their claim is supported by the semantics of *wo* and through a historical and comparative analysis based on four arguments:

1. *so*-relatives were widespread in the Early New High German period in the same areas where *wo*-relatives are present today, precisely the Upper German dialect areas, e.g., Swabian and Bavarian (Paul 1920:238) and Swiss German;
2. *wo*-relatives started appearing in the literature about the same time when the equative particle *als* changed to the *w*-series and became *wie* (Jäger 2010);
3. use of the equative particle *som* to introduce a relative clause is also well-established in other Germanic languages, specifically various Scandinavian varieties; and,
4. interpreting *wo* as an equative particle provides an explanation for its use in both restrictive and non-restrictive relative clauses as well as for the resumptive or the doubly filled complementiser, *der wo*, which is common in the southern German dialects, Bavarian as well as Swabian (Bayer 1984).

If indeed *wo*-relatives developed from the Early New High German complementiser *so*, this could provide some explanation for the differing levels of usage found in Stuttgart and Schwäbisch Gmünd: greater use of *wo*-relatives in the more conservative dialect of Schwäbisch Gmünd may simply be a reflection its more traditional, historical usage.

6.5.3. *Effects of grammaticalisation*

As mentioned, many linguists assume that *wo* evolved from denoting a physical place to referring to an abstract notion of place. The results from the multivariate analysis show that the favouring of *wo* for notions of place has diminished for twin study speakers in 2017 in comparison to the panel study speakers and has disappeared for notions of time (see Figure 6-31). One explanation for the changing role of *wo* may be that it is becoming "semantically bleached" and losing its traditional meaning of 'where'. According to Hopper and Traugott (2003:85), grammaticalisation of relative pronouns through spatiotemporal metaphoric extensions is not uncommon. It appears that *wo* may be going through a process of decategorisation (Brook 2011; Bybee and Pagliuca 1985; Cheshire 2007; Hopper and Traugott 2003), losing the semantic and syntactic characteristics of an adverbial pronoun and taking on the full properties of a relative pronoun. “[H]uman language users have a natural propensity for making metaphorical extensions that lead to the increased use of certain items” (Bybee and Pagliuca 1985:75). Support for this claim can also be seen in Bavarian, which uses the doubled-filled complementiser with both a relative pronoun and the complementiser *wo* in forming relative clauses (Bayer 1984).

6.5.4. Narrowing urban-rural divide

This study demonstrates that the German urban/rural divide is ever-present, although narrowing. The Stuttgart dialect is evolving into a supraregional standard variety (Auer 2018), and while the Schwäbisch Gmünd dialect retains more of its traditional features, it is rapidly converging toward the regional standard set by Stuttgart. The emerging ethnolect in Stuttgart provides some insights into *wo*-relativiser usage. Auer (2020) cites Stuttgart as one of the cities with the highest number of foreigners in all of Germany: 46% of the population have at least one parent not from the region, twice as many as in the rest of Germany overall. His research on the developing ethnolect of immigrants in Stuttgart shows exceptionally high use of *wo*-relatives, to the complete exclusion of *d*-relative pronouns with some speakers. The lack of gender, number, and case markings with *wo*-relatives make them an ideal candidate for koinéisation, in which “new varieties of a language are brought about as a result of contact between speakers of mutually intelligible varieties of that language” (Kerswill 2004:669) (see Section 2.3.5). Certainly, Stuttgart today comprises an amalgam of standard German speakers, Swabian speakers, and speakers with an immigration background. Nevertheless, education and prescriptivism play a critical counter-role in language usage, and as the data in this study show, education and intractable teacher prescriptivism can disrupt the natural trajectory of language change.

6.5.5. Role of prescriptivism

While the constraints between the two communities appear to be the same, the difference in *wo*-relativiser usage lies in the speed and diffusion of the change. In 2017, *wo*-relatives have become disfavoured in Stuttgart, while their use in Schwäbisch Gmünd has stayed mainly the same. Stuttgart appears to be moving more rapidly away from *wo*-relatives to standard German *d*-relatives, which are becoming an integral part of the supraregional southwestern variety. As discussed, this change is presumably attributable to greater teacher prescriptivism and standard language convergence (recall Duden’s comment from Section 6.2.2 regarding the use of *wo* in reference to a person or thing as *landschaftlich salopp* ‘country slang’ (Duden Online 2018)). Increasing education (i.e., “change from above”), greater geographic mobility and thereby more contact with non-Swabian speakers, and rampant prescriptivism are stemming the use of *wo* as a relative pronoun, most notably among the younger, more highly educated speakers.

6.6. Summary

This investigation of relative markers in Swabian has highlighted the intricate interaction between intra- and extralinguistic factors and the role they play in morphosyntactic change. The findings concur with those in previous chapters that Swabian is undergoing a process of dialect levelling and supraregionalisation (RESEARCH QUESTION 1). A comparison of the panel and twin study results exposes the changing grammatical structure of the relativisation system in Swabian (RESEARCH QUESTION 2). The outcome of this research provides support for the generally accepted premise that morphosyntactic variables are so heavily syntactically constrained that they are not widely available for social conditioning. Nevertheless, the findings show that higher levels of education and community belonging can also convey a different type of social meaning (Cheshire 2003) – the persona of a modern, mobile, and highly educated Swabian, speaking *des beschde Daitsch wo es gib* 'the best German there is'.

Chapter 7. Patterns of sociolectal coherence and dialect change

wie der Ochs vor der Apothek
'like the ox in front of the pharmacy'
-Klaus (2017)

7.1. Introduction

Since Guy's (2013) thought-provoking article investigating the cognitive coherence of sociolects in Brazilian Portuguese, considerable debate has ensued as to whether the notion of COVARIATION of multiple linguistic features across different levels of the grammar and within specific social groups constitutes SOCIOLECTAL COHERENCE. With some studies uncovering some level of covariation and others finding little or none (see detailed review in Section 2.5.4), the verdict is still out on the viability of covariation as a meaningful heuristic for determining sociolectal coherence. In fact, Guy's (2013) own research established that "some sociolectal cohesion does exist, but it may be weaker and more multidimensional, than is commonly assumed" (Guy 2013:63). Correlational analysis of variable frequencies is, however, not the only method linguists have pursued in the quest for sociolectal coherence: principal components analysis, constrained correspondence analysis, conditional inference trees, random forests, other clustering techniques, as well as implicational scaling, have all brought varying degrees of insight into the notion of whether and to what extent linguistic features across the grammar co-occur in systematic ways reflecting orderly heterogeneity (WLH 1968).

The overarching premise underlying a theory of sociolectal coherence, as operationalised in this chapter, is that linguistic features within a speech community are consistent and act in unison in indexing different lects – dialects, regiolects, sociolects – as well as different styles, registers, stances, and so on (Guy 2013; Guy and Hinskens 2016). Specifically, greater lectal coherence implies that changes in one variant trigger changes in another variant such that multiple related variables co-occur within a unified variety. To further investigate the concept of sociolectal coherence, this chapter takes up the third hypothesis of this thesis (as formulated in Sections 1.2.3 and 2.5): lects with greater levels of sociolectal coherence (i.e., clusters of linguistic features and their relationships) are more resistant to change, while lects with lower levels of coherence are more vulnerable (HYPOTHESIS 3), paralleling Milroy's (1987) findings that closed social networks (i.e., clusters of individuals and their relationships) are more impervious to change, while open ones are more accepting of innovations.

My aim with this chapter is to explore the concept of sociolectal coherence more broadly than has traditionally been done in the literature by investigating 20 linguistic variables, in two speech communities, in both real- and apparent-time. Specifically, this research takes up three questions posed by Guy and Hinskens (2016:4): (1) do linguistic features cluster, correlate or co-occur within a speech variety, and if so, to what extent; (2) are some kinds of language varieties (e.g., local dialects) more coherent than others; and (3) which covarying linguistic features are involved in change and which tend to be constant? To address these questions, a variety of statistical methods are employed and their effectiveness evaluated, including correlational analysis, multiple linear regression, principal components, implicational scaling, and lattice theory. This chapter concludes with a discussion of the major empirical findings and some thoughts on the theoretical role of coherence in studies of language variation and change.

7.2. Theoretical background

The theoretical background for sociolectal coherence is reviewed in Section 2.5.

7.3. Data and methods

The data collection processes and methods used in this chapter are drawn from Chapter 3. This section describes the dependent (Section 7.3.1) and independent (Sections 7.3.2 and 7.3.3) variables and the measures used to identify and evaluate coherence (Section 7.3.4).

7.3.1. Dependent variables

The ten phonological and ten morphosyntactic variables analysed in Chapter 4 and documented in Appendix A serve as the dependent variables in this analysis of coherence. As discussed in Section 3.6, all variables were coded for a binary distinction between the dialect and standard variant. Table 3-5 (phonological variables) and Table 3-6 (morphosyntactic variables) provide the token counts for each variable.

7.3.2. Sociolinguistic predictors

Section 3.7.3 describes the five sociolinguistic predictors considered in this analysis. The following lays down the expected outcomes of these predictors with respect to coherence.

1. <u>Variable level</u>: phonological or morphosyntactic.
    - ➔ <u>PREDICTION L1</u>: morphosyntactic variables are expected to show greater coherence than phonological ones since they exhibit lower levels of frequency and thus are more likely to cohere via analogous processes as opposed to high-frequency forms which can be more idiosyncratic in their behaviour (Erker and Guy 2012); morphosyntactic variables also tend to exhibit multiple dependencies with other grammatical constructs making them more linguistically than socially constrained (Cheshire 1999; Scherre and Naro 1992).
2. <u>Variable type</u>: Swabian or regional.
    - ➔ <u>PREDICTION L2:</u> Swabian-specific variables are expected to cohere more tightly than regional variables, due to their common etymological origin and sociohistorical evolution (Nycz 2016; Woo, Gadanidis, and Nagy, submitted).

3. Variable status: stable or changing.
   - ➔ PREDICTION L3: due to the extensive dialect levelling underway in Swabian (see Chapter 4), variables currently undergoing change are expected to exhibit higher levels of coherence as a result of speakers' "shared social motivation" (Tamminga 2019) for the move to a consistent, standardised variety (This expectation runs counter to Labov's concept of the "vernacular", which he claims is more systematic than superimposed or careful varieties. It also runs counter to traditional dialectology which seeks isolated varieties not as influenced by external factors. However, there are no "pure" vernaculars or "isolated" varieties; such varieties tend to represent a mix of standard and nonstandard variants, which make them less consistent, hence coherent.)
4. Variable salience: high or low.
   - ➔ PREDICTION L4: low-salient variables are expected to show higher levels of coherence since forms functioning below the level of awareness may be more automatic and uniform; higher salient forms are expected to show greater variation as they are more readily available for stylisation and identity construction (Erker 2017b; Levon 2014; Oushiro and Guy 2015).
5. Variable stigma: high or low.
   - ➔ PREDICTION L5: highly stigmatised variables are expected to show higher levels of coherence because, as speakers converge toward the standard language, they first try to avoid nonstandard syntactic structures, which are more directly associated with lower levels of education and hence stigmatisation (Cheshire 2003; Sharma 2005; Trudgill 1986).

7.3.3. Social predictors

Section 3.7.1 and 3.7.2 describe in detail the three social predictors considered. The following defines the expected outcomes of these predictors with respect to coherence.

1. Recording year (panel study), 1982 or 2017, or age group (twin study), older or younger (two groups based on a median split to reduce complexity and for ease of comparison and interpretation across the two study types).
   - ➔ PREDICTION S1: speakers in 2017 and in the younger age group are expected to show higher levels of coherence due to the dialect levelling occurring in Swabian as the standard language provides a common, stabilising and "consistency factor" (Woo, Gadanidis, and Nagy, submitted).
2. Speech community: Schwäbisch Gmünd or Stuttgart.
   - ➔ PREDICTION S2: speakers from Stuttgart are expected to show higher levels of coherence since the urban regiolect of Stuttgart is a prestige variety, closer to the prescribed standard language, thereby providing greater consistency and

predictability in use; speakers from Schwäbisch Gmünd are expected to show lower levels of coherence as they are more likely to use a greater mix of traditional dialect and standard language variants (Britain 2016; Trudgill 1986).

3. Swabian Orientation: low or high.
   - ➔ PREDICTION S3: speakers with low orientation to Swabian are expected to show greater levels of coherence since low orientation drives speakers toward the standard language which brings greater unity and consistency across speakers (Woo, Gadanidis, and Nagy, submitted); speakers with high Swabian orientation are expected to show lower levels of coherence as they more readily mix Swabian and standard variants in identity construction.

As with most sociolinguistic features, many of these constraints are expected to interact, which is evaluated through mixed-effects linear regression modelling. One particular focus, for example, variables with high levels of salience and stigma will likely be correlated with variables that are undergoing change based on Trudgill's (1986) observation that "speakers modify those features of their own varieties of which they are most aware" (Trudgill 1986:11).

7.3.4. Measures of coherence

One approach to the study of coherence uses cross-correlations to measure covariation across multiple linguistic features (see Section 2.5.4). The theoretical basis for this approach is that groups of speakers who are consistent in their frequency of dialect or standard usage will exhibit high covariation across variables. However, if variable usage is *ad hoc* (or influenced by personal, context or other situational and interactional aspects), then speakers will exhibit a random mix of high and low correlation indices (Guy 2013). There is, unfortunately, no single "best" measure or generally agreed-upon set of conventions for measuring covariation in a dataset: "all models are wrong but some are useful" (attributed to Box 1976). According to Box (1976:792), "we cannot know that any statistical technique we develop is useful unless we use it." Consequently, I tested over a dozen methods cited in the literature for assessing covariation in a dataset and settled on the following six measures as most indicative and representative of the relative differences in the levels of covariation between different sets of predictors.

1. Significant pairs: the percentage of variable pairs (within a given variety) that show significant correlations; larger values reveal a greater number of correlated variables (Guy 2013; Oushiro 2016; Woo, Gadanidis, and Nagy, submitted).
2. Correlation mean: the mean [36] of the values in a correlation matrix using Spearman's *rho* to properly handle non-normal distributions typical of sociolinguistic data; higher values

[36] Since mean values are affected by both positive and negative correlations, they more appropriately reflect the level of coherence when correlations are working in opposite directions.

imply higher levels of correlation (both positive and negative) with values close to 0 signifying non-correlation (*cor* and *mean* functions in the R package *stats*, version 3.6.0).

3. Standard deviation: a measure of the spread of the correlation coefficient and how far it is from the mean. The normal expectation is that 95% of the values fall within two standard deviations of the mean (*sd* function in the R package *stats*, version 3.6.0).
4. Correlation median: a measure which shows the centre of the dataset; large differences between the median and the mean signal whether the data are skewed to the left or right of the mean (*median* function in the R package *stats*, version 3.6.0).
5. Principal components: a linear clustering method that reduces the dimensionality of the dataset with the aim of explaining the greatest proportion of variation; the values of the first three principal components are used for comparison purposes (*prcomp* function in the R package *stats*, version 3.6.0) (Horvath and Sankoff 1987).
6. Steiger chi-square: the sum of the squared Fisher transformed correlations distributed as chi-square, shown to be particularly effective for controlling Type I errors, a potential issue in large correlation matrices with small sample sizes; higher chi-square (χ^2) scores indicate greater collinearity (Steiger 1980) (*cortest.normal* function in the R package *psych*, version 1.8.12).

7.4. Analysis and results

The analysis and results of this investigation into sociolectal coherence are organised into four sections: measuring covariation through correlation analyses (Section 7.4.1), predicting coherence through multivariate analysis (Section 7.4.2), identifying coherent social groups and variable weightings via principal components analysis (Section 7.4.3), and exploring a new theoretical model for depicting coherence based on lattice theory (Section 7.4.4).

7.4.1. Covariation analysis

Although correlation matrices are the foundation of all traditional multivariate analyses, few techniques are available for visually depicting the patterns of underlying relationships between linguistic features, particularly for a large set of variables. One approach is a CORRELOGRAM, a graphical construct that depicts (1) the sign (i.e., whether variables are positively or negatively correlated), (2) the scale (i.e., how strongly or weakly the variables are correlated), and (3) the relationships between variables (i.e., clustering "similar" variables together using principal components) (Friendly 2002; Murdoch and Chow 1996).

7.4.1.1. Covariation and community

Figure 7-1 through Figure 7-3 present the correlograms for the frequencies of dialect variants for the 20 linguistic features (using *cor* function in the R package *stats*, version 3.6.0). The bottom left triangle of each plot reports the correlation coefficient for each pair of variables, and the top right triangle graphically displays the significance levels (*** = $p < .001$; ** = $p < .01$; * = $p < .05$), ranked from the highest correlation coefficient to the lowest, with positive correlations in the upper left represented by darker shades of blue and negative correlations in the lower right by darker shades of red. The correlograms were rendered with the *corrplot.mixed* function in the R package *corrplot*, version 0.84, and significance tests for each pair of variables were conducted with the *cor.mtest* function at a .95 confidence level, using Spearman's rank correlation coefficient.

Through visual inspection of the correlograms in real-time (see Figure 7-1), Stuttgart and 2017 appear to be more coherent than Schwäbisch Gmünd in 1982 as portrayed by the greater number of stronger correlations (i.e., darker shaded boxes). The Steiger χ^2 test (calculated using the *cortest.normal* function in R *psych* package, version 1.8.12) confirms that the patterns across recording years are statistically different (Schwäbisch Gmünd 1982 versus 2017: $\chi^2 = 554.16$, df = 190, $p < 0.001$; Stuttgart 1982 versus 2017: $\chi^2 = 2784.01$, df = 190, $p < 0.001$), as well as the patterns between the communities within recording year (1982 Schwäbisch Gmünd versus Stuttgart: $\chi^2 = 716.88$, df = 190, $p < 0.001$; 2017 Schwäbisch Gmünd versus Stuttgart: $\chi^2 = 2770.48$, df = 190, $p < 0.001$). While each of the correlograms in Figure 7-1 is statistically significant within itself, as well as significantly different from the others (see the last two rows of Table 7-2), the questions this chapter seeks to address are "how" coherent is each speech variety (question 1) and are some varieties "more" coherent than others (question 2)?

In partial answer to these questions, Table 7-1 presents a summary of the correlation statistics (as defined in Section 7.3.4) for the panel study. As seen in Chapter 4, dialect density has significantly declined between 1982 and 2017, with Schwäbisch Gmünd 1982 showing the highest (61.2%) and Stuttgart 2017 the lowest dialect density (26.6%). Conspicuously, Schwäbisch Gmünd in 1982 with the highest dialect density has the lowest number of significant variable pairs (39%, 74 out of 190 pairs), while Stuttgart in 2017 with the lowest dialect density shows a modicum of significant variable pairs (50.5%, 96 out of 190 pairs). This conundrum brings to light one core distinction in how the current study views coherence: while the number of significant pairwise correlations indicates "how many" variables covary, the strength of the correlations between the variables indicates "how tightly" they covary and hence how difficult they may be to decouple. The correlation mean ($\overline{x}$) (Table 7-1, third row) indicates the strength of the correlation across the 20 variables, exposing the weakest covariation in Schwäbisch Gmünd in 1982 ($\overline{x} = .302$) and the strongest in Stuttgart in 2017 ($\overline{x} = .543$). The lower dialect density and higher correlation mean for Stuttgart in 2017 provide support for the first and second social predictions in this chapter (as defined in Section 7.3.3) that the standard language acts as a stablising and "consistency factor" (cf. Woo, Gadanidis, and Nagy, submitted) with the large urban centre of Stuttgart, bringing uniformity and prestige which boosts sociolinguistic

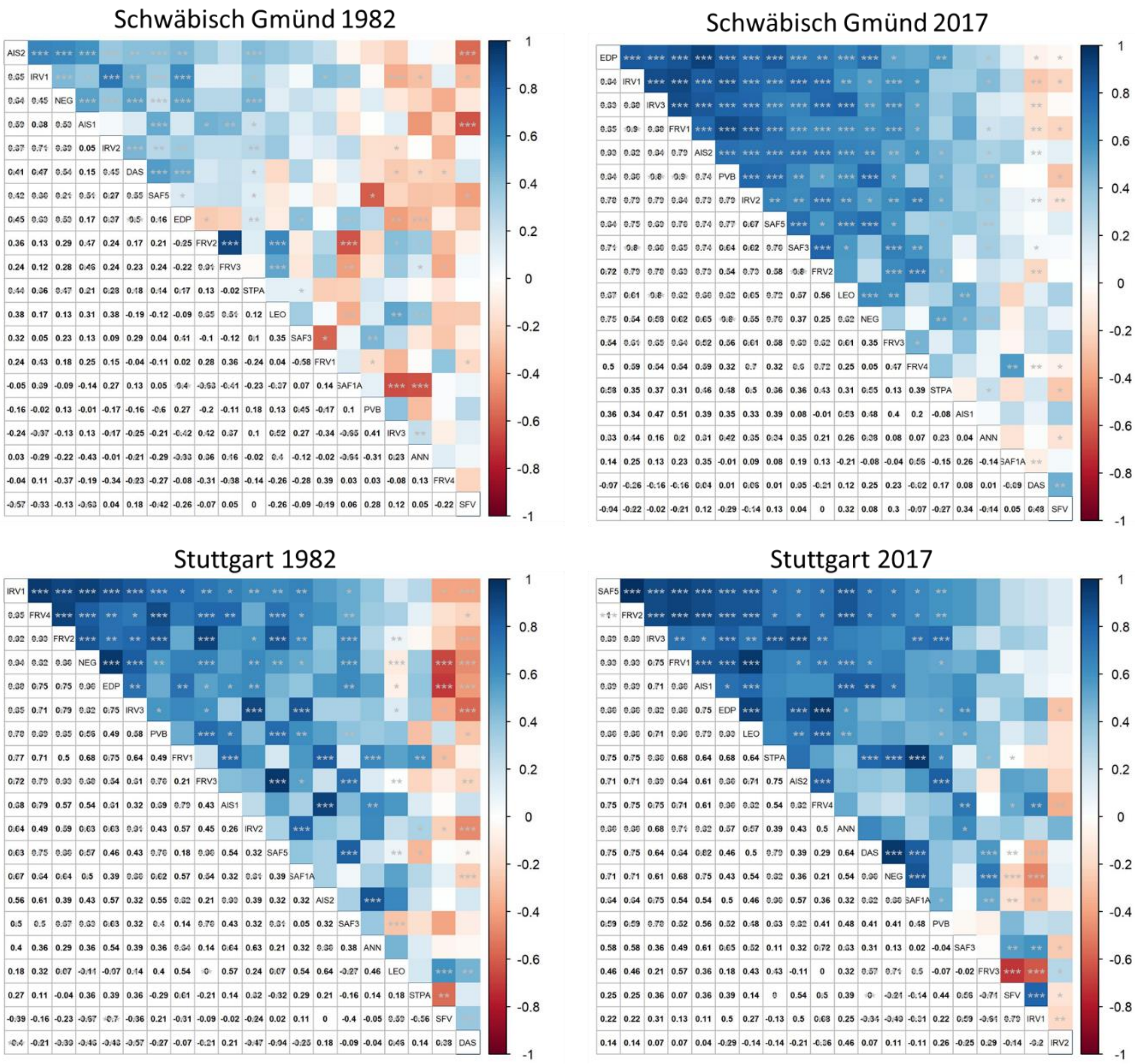


Figure 7-1. Correlation Matrices in Real-Time – Panel Study

Correlation Metrics	Schwäbisch Gmünd		Stuttgart	
	1982	2017	1982	2017
Dialect Density Index (DDI)	61.2%	47.4%	47.9%	26.6%
Percent of Significant Pairs	39.0% (74/190)	51.0% (97/190)	63.7% (121/190)	50.5% (96/190)
Correlation Mean ($\overline{x}$)	.302	.500	.468	.543
Correlation Standard Deviation (σ)	.360	.400	.334	.359
Correlation Median ($\tilde{x}$)	.130	.464	.484	.557
Proportion of Variance (PC1-PC3)	.542	.865	.744	.857
Steiger X^2 Test of Significance	237.56	557.32	899.09	559.67
Steiger X^2 Significance Level	**	***	***	***

Table 7-1. Correlation Measures in Real-Time – Panel Study

coherence. Interestingly, these data suggest that the Stuttgart variety in 1982 was already more coherent ($\bar{x}$ = .468, $\tilde{x}$ = .484) in comparison to Schwäbisch Gmünd in 1982 ($\bar{x}$ = .302, $\tilde{x}$ = .130), implying that the variety with the weakest coherence has become more coherent as it has levelled with the standard language. This distinction is particularly striking in considering the correlation median (Table 7-1, fifth row): in Schwäbisch Gmünd in 1982 the median ($\tilde{x}$ = .130) is considerably different from the mean ($\bar{x}$ = .302), signifying a non-normal distribution of variable pairs skewed in the direction of lower coherence (recall that values closer to zero indicate no correlation). This skew likely reflects a greater number of individual differences between the Schwäbisch Gmünd speakers in 1982 than with the Stuttgart speakers for whom the mean and median correlations are roughly the same. These findings provide support for HYPOTHESIS 3 of this thesis: weaker coherence makes varieties more vulnerable to change and levelling. However, weaker coherence may be the result of ongoing pressure from above may, which breaks down the coherence of socially subordinate lects.

Turning to the twin study, Figure 7-2 provides the correlation matrices, and Table 7-2 reports the corresponding correlation statistics for the oldest and youngest age groups. The apparent-time analysis shows consistency across the four varieties (both means and medians); however, the youngest generation in Stuttgart has declined dramatically in dialect density (20.5%), accentuating that multiple factors interact to affect language change. As Chapter 4 showed, higher levels of education and stronger feelings of Swabian identity may actually usurp structural factors, such as linguistic coherence. While there is a highly significant difference in the levels of coherence between the two communities in real-time (1982 panel study: χ^2 = 716.88, df = 190, $p < 0.001$; 2017 panel study: χ^2 = 2270.48, df = 190, $p < .001$), the community difference is non-existent across the age groups in apparent-time (2017 twin study: χ^2 = 200.69, df = 190, p = n.s.), providing further support for the convergence of the two communities into a single supraregional standard variety and corroborating previous findings in this investigation.

7.4.1.2. Covariation and orientation

Considering the vital role of local identity and community belonging in language change, as previous chapters have shown, Figure 7-3 presents the correlation matrices for the 20 variables based on Swabian Orientation (SOI) in both real- and apparent-time. Speakers with high SOI show greater dialect density (57.9% (panel study) and 45.2% (twin study), see Table 7-3) as well as weaker coherence, as measured via correlation means (low SOI: $\bar{x}$ = .431 (panel study) and $\bar{x}$ = .456 (twin study); high SOI: $\bar{x}$ = .637 (panel study) and $\bar{x}$ = .531 (twin study)). The correlation matrices are significantly different for the high and low SOI speakers in the panel study (χ^2 = 361.2, df = 190, $p < .001$), which is not the case for the twin study speakers (χ^2 = 128.2, df = 190, p = n.s.). These results reveal substantially greater change across the lifespans of the low SOI panel speakers, who have vigorously abandoned their dialect features and converged toward the

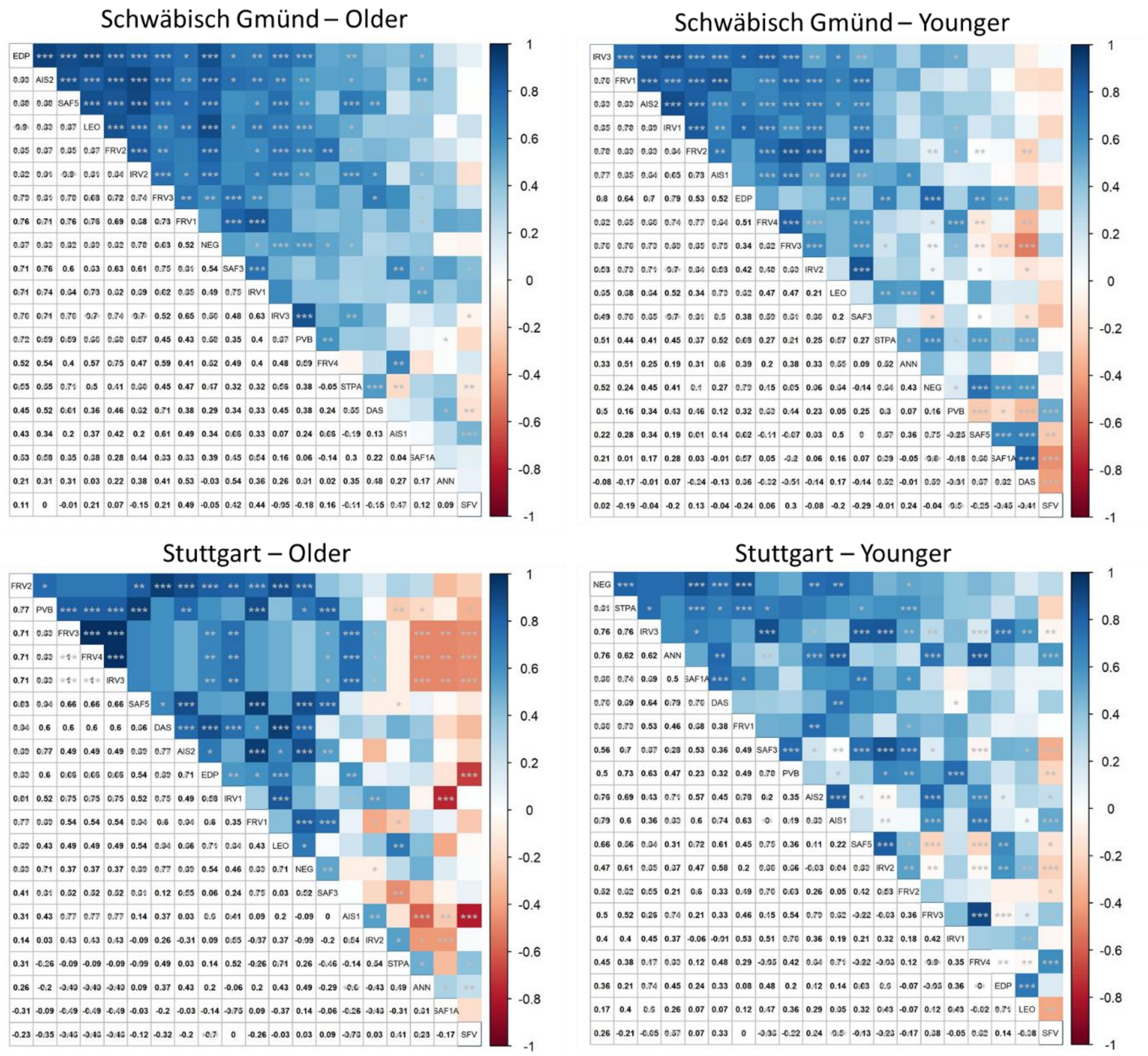


Figure 7-2. Correlation Matrices in Apparent-Time – Twin Study

Correlation Metrics	Schwäbisch Gmünd		Stuttgart	
	Older	Younger	Older	Younger
Dialect Density Index (DDI)	44.4%	41.8%	45.1%	20.5%
Percent of Significant Pairs	51.6% (98/190)	55.3% (105/190)	48.9% (93/190)	47.9% (91/190)
Correlation Mean ($\overline{x}$)	.526	.449	.498	.462
Correlation Standard Deviation (σ)	.283	.356	.455	.312
Correlation Median ($\tilde{x}$)	.534	.438	.486	.454
Proportion of Variance (PC1-PC3)	.764	.790	.888	.783
Steiger X^2 Test of Significance	1215.32	645.04	314.31	405.44
Steiger X^2 Significance Level	***	***	***	***

Table 7-2. Correlation Measures in Apparent-Time – Twin Study

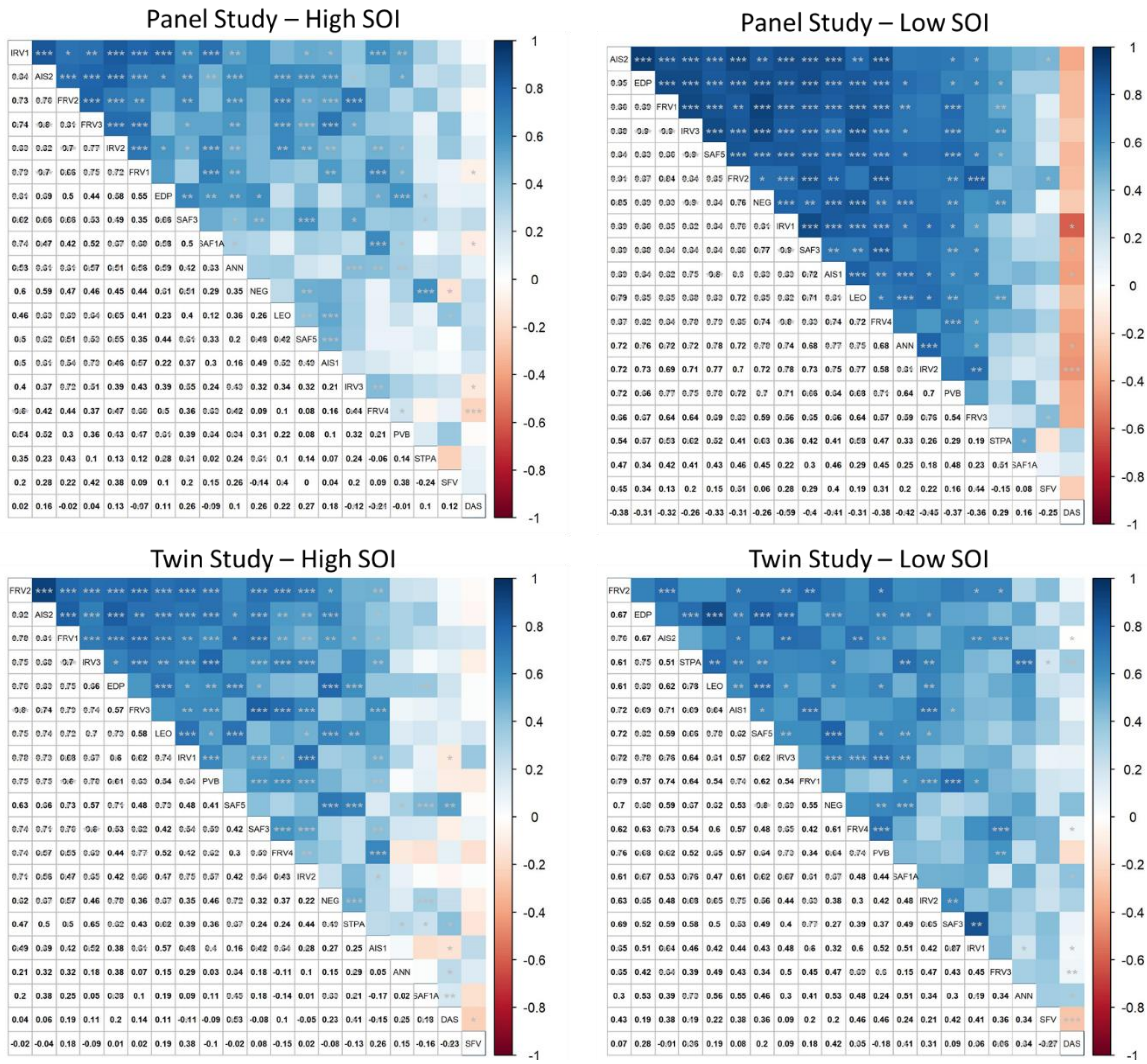


Figure 7-3. Correlation Matrices based on SOI in Real- and Apparent-Time

Correlation Metrics	Panel Study		Twin Study	
	High SOI	Low SOI	High SOI	Low SOI
Dialect Density Index (DDI)	57.9%	39.5%	45.2%	31.3%
Percent of Significant Pairs	46.8% (89/190)	60% (114/190)	51.6% (98/190)	36.3% (69/190)
Correlation Mean	.431	.637	.456	.531
Correlation Standard Deviation	.263	.365	.301	.224
Correlation Median	.425	.716	.467	.539
Proportion of Variance (PC1-PC3)	.648	.837	.680	.734
Steiger X^2 Test of Significance	1019.81	2526.09	1142.19	1421.83
Steiger X^2 Significance Level	***	***	***	***

Table 7-3. Correlation Measures based on SOI in Real- and Apparent-Time

regional standard, while the high SOI panel speakers have held on to more of their traditional dialect usage. This difference between high and low SOI speakers is not as pronounced in the twin study, upholding the findings from Chapter 4 that the role of local dialect identity in modern Swabian society has diminished over time.

7.4.1.3. Malleability

In sum, a covariation analysis provides insight into the first two questions this chapter has posed: (1) linguistic features do cluster within varieties to varying degrees which can be measured in multiple ways; and indeed, (2) some language varieties are more coherent than others. However, coherence is malleable, influenced by a plethora of factors, and can change over time. In real-time, the more standardised variety of Stuttgart in 2017 reflects the highest level of coherence, while in apparent-time, the younger and older speakers show similar levels of coherence. For covariation, it appears that apparent-time does not necessarily mirror real-time. I suspect this is due to the dramatic levelling that has been occurring in Swabian over the last 35 years. It is likely that in situations of less intense linguistic volatility, a similar gradual transition in coherence would be observed across both study types. These findings lead to the next two questions: what factors are responsible for driving higher or lower levels of coherence, a topic addressed in Section 7.4.2; and which features are responsible for carrying the most coherence weight, the third question of this chapter and the focus of Section 7.4.3.

7.4.2. Multivariate analysis

To investigate the factors driving coherence in Swabian, multivariate analyses using the correlation coefficients for the 20 linguistic features as dependent variables (760 correlation coefficients per study, i.e., 20 * 20 – 20 variables * 2 years/age groups) were modelled for community and year (panel study) or age group (twin study) with each of the five predictors described in Section 7.3.2, excluding mismatched pairs (e.g., phonological-morphosyntactic pairs). The following figures depict the results of the regression analyses (*lm* function in R package *stats*, version 3.6.0), plotted with the *visreg* function (R package *visreg*, version 2.6-0), a opportune tool for visualising the estimates, the differences between categorical variables, and the level of variability as well as outliers and other deviations (Breheny and Burchett 2017). Each figure plots the predicted values, pointwise confidence bands, and partial residuals, by community and recording year (panel study) or age group (twin study); higher values represent positive effects and lower values negative ones, with coefficients of zero signalling no effect. The summary output for each model follows in Table 7-4 (panel study) and Table 7-5 (twin study).

7.4.2.1. Grammatical level

The first model investigates covariance based on the grammatical level of the variable. Figure 7-4 (panel study) and Figure 7-5 (twin study) depict the phonological variables on the left and the morphosyntactic ones on the right. The real-time results show no significant differences in covariation for either set of variables (ß̂ = -0.1664; p = n.s.; Table 7-4, section 1), although Stuttgart (purple boxes and dots) does exhibit higher levels of covariation than Schwäbisch Gmünd (turquoise boxes and dots) for both sets of variables. By 2017, however, Schwäbisch Gmund is joining Stuttgart, exhibiting similar levels of covariation in converging toward the more standard variety. In contrast, the apparent-time findings do show significant differences across the generations based on grammatical level: the younger speakers in Stuttgart show higher levels of covariation for the morphosyntactic variables (ß̂ = 0.3912; $p < .05$, see Table 7-5, section 1) than the older speakers. Hence, while the real-time findings are inconclusive, the apparent-time findings support PREDICTION L1 (see Section 7.3.2), and confirm other findings from the literature, which suggest that younger speakers, particularly in Stuttgart, are more likely to avoid nonstandard morphosyntactic variables which more clearly mark lower levels of education (Cheshire 2003; Sharma 2005).

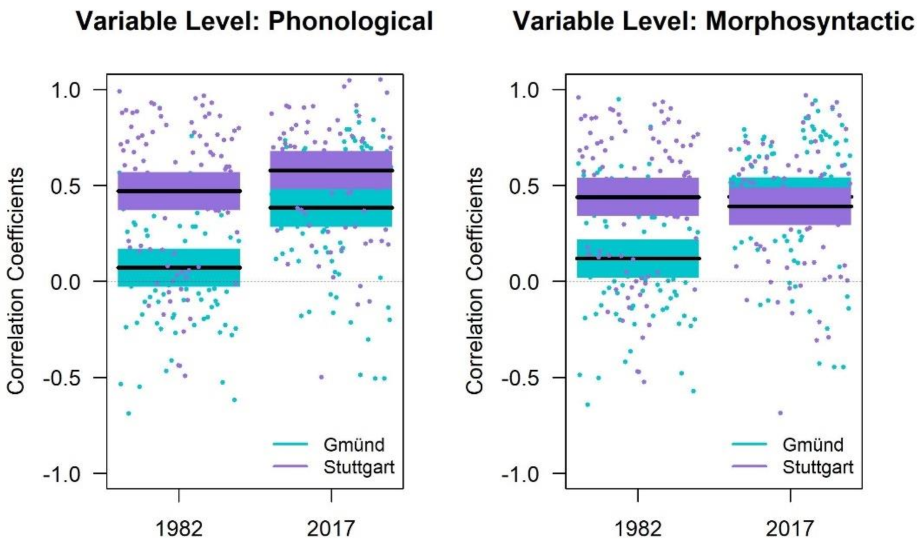


Figure 7-4. Covariance Model by Variable Level in Real-Time – Panel Study

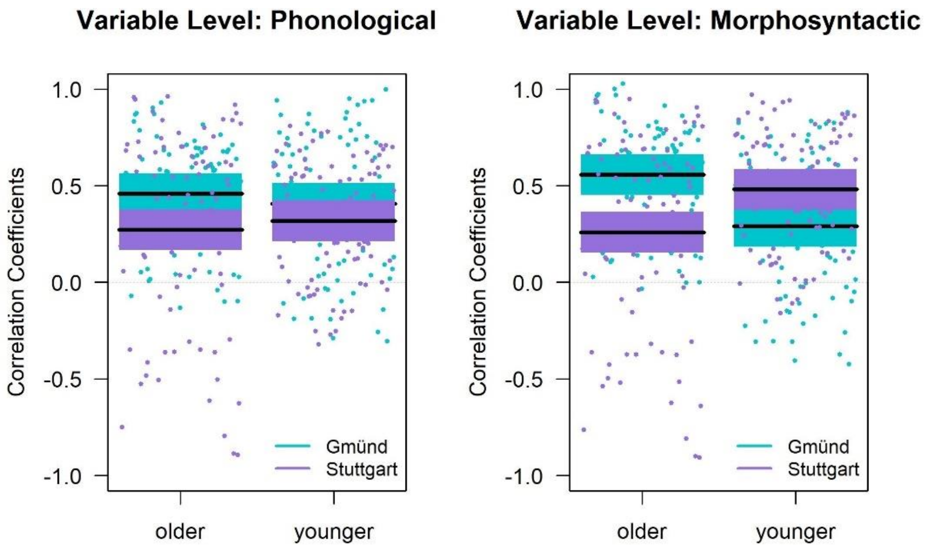


Figure 7-5. Covariance Model by Variable Level in Apparent-Time – Twin Study

Coefficients	Estimate	Std.Error	t-value	p-value	sig
1. VARIABLE LEVEL: (R^2 = 0.1943; Adjusted R^2 = 0.1783, df = 352, p < .001)					
(Intercept)	0.07170	0.05036	1.424	0.1554	
Community: Stuttgart	0.39874	0.07122	5.599	4.35e-08	***
Recording Year: 2017	0.31189	0.07122	4.379	1.57e-05	***
Level: Morphosyntactic	0.04717	0.07122	0.662	0.5082	
Stuttgart : 2017	-0.20441	0.10072	-2.029	0.0432	*
Stuttgart : Morphosyntactic	-0.07874	0.10072	-0.782	0.4349	
2017 : Morphosyntactic	0.01082	0.10072	0.107	0.9145	
Stuttgart : 2017 : Morphosyn	-0.16643	0.14244	-1.168	0.2434	
2. VARIABLE TYPE: (R^2 = 0.4578; Adjusted R^2 = 0.4480, df = 388, p < .001)					
(Intercept)	0.063947	0.059493	1.075	0.28310	
Community: Stuttgart	0.007956	0.084135	0.095	0.92472	
Recording Year: 2017	0.195856	0.084135	2.328	0.02043	*
Type: Swabian	0.060946	0.067024	0.909	0.36375	
Stuttgart : 2017	0.224645	0.118985	1.888	0.05977	.
Stuttgart : Type Swabian	0.604422	0.094787	6.377	5.15e-10	***
2017 : Type Swabian	0.289227	0.094787	3.051	0.00243	**
Stuttgart : 2017 : Swabian	-0.898896	0.134049	-6.706	7.10e-11	***
3. VARIABLE STATUS: (R^2 = 0.253; Adjusted R^2 = 0.242, df = 496, p < .001)					
(Intercept)	0.10731	0.02869	3.741	0.000205	***
Community: Stuttgart	0.45102	0.04057	11.118	< 2e-16	***
Recording Year: 2017	0.39664	0.04057	9.777	< 2e-16	***
Variable Status: Stable	-0.03473	0.13145	-0.264	0.791730	
Stuttgart : 2017	-0.45857	0.05737	-7.993	9.32e-15	***
Stuttgart : Status Stable	-0.26232	0.18590	-1.411	0.158858	
2017 : Status Stable	-0.18859	0.18590	-1.014	0.310852	
Stuttgart : 2017 : Stable	0.49541	0.26291	1.884	0.060100	.
4. VARIABLE SALIENCE: (R^2 = 0.2429; Adjusted R^2 = 0.2285, df = 368, p < .001)					
(Intercept)	0.07415	0.03884	1.909	0.056987	.
Community: Stuttgart	0.45868	0.05492	8.351	1.39e-15	***
Recording Year: 2017	0.39639	0.05492	7.217	3.06e-12	***
Salience: high	0.17638	0.07116	2.479	0.013634	*
Stuttgart : 2017	-0.33845	0.07767	-4.357	1.71e-05	***
Stuttgart : Salience high	-0.38056	0.10063	-3.782	0.000182	***
2017 : Salience high	-0.30078	0.10063	-2.989	0.002988	**
Stuttgart : 2017 : Salience high	0.27226	0.14232	1.913	0.056518	.
5. VARIABLE STIGMA: (R^2 = 0.2398; Adjusted R^2 = 0.228, df = 452, p < .001)					
(Intercept)	0.07279	0.03217	2.262	0.024140	*
Community: Stuttgart	0.28695	0.04550	6.307	6.79e-10	***
Recording Year: 2017	0.28169	0.04550	6.191	1.34e-09	***
Stigma: high	0.02275	0.10910	0.209	0.834923	
Stuttgart : 2017	-0.08799	0.06434	-1.368	0.172133	
Stuttgart : Stigma high	0.37295	0.15429	2.417	0.016036	*
2017 : Stigma high	0.25101	0.15429	1.627	0.104465	
Stuttgart : 2017 : Stigma high	-0.81804	0.21820	-3.749	0.000201	***

Table 7-4. Multivariate Analyses of Correlation Matrices – Panel Study

*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10; n.s. = not significant*

<u>Intercept values:</u> Community=Gmünd; Year=1982; (1) Level=phonological; (2) Type=regional; (3) Status=changing; (4) Salience=low; (5) Stigma=low

Coefficients	Estimate	Std.Error	t-value	p-value	sig
1. VARIABLE LEVEL: (R^2 = 0.0786; Adjusted R^2 = 0.0603, df = 352, p < .100)					
(Intercept)	0.45925	0.05368	8.556	3.66e-16	***
Community: Stuttgart	-0.18663	0.07591	-2.459	0.0144	*
Age: younger	-0.05154	0.07591	-0.679	0.4976	
Level: morphosyntactic	0.09805	0.07591	1.292	0.1974	
Stuttgart: younger	0.09742	0.10736	0.907	0.3648	
Stuttgart: morphosyntactic	0.11110	0.10736	-1.035	0.3014	
Age: younger: morphosyntactic	-0.21567	0.10736	-2.009	0.0453	*
Stuttgart : younger : morphosyn	0.39117	0.15182	2.576	0.0104	*
2. VARIABLE TYPE: (R^2 = 0.1533; Adjusted R^2 = 0.1380, df = 388, p < .001)					
(Intercept)	0.37176	0.07113	5.227	2.82e-07	***
Community: Stuttgart	-0.20337	0.10059	-2.022	0.043877	*
Age: younger	-0.18733	0.10059	-1.862	0.063304	.
Type: Swabian	0.23949	0.08013	2.989	0.002979	**
Stuttgart: younger	0.45359	0.14225	3.189	0.001545	**
Stuttgart: Type Swabian	0.06273	0.11332	0.554	0.580187	
Younger : Type Swabian	0.15281	0.11332	1.348	0.178289	
Stuttgart : younger : Swabian	-0.54599	0.16026	-3.407	0.000726	***
3. VARIABLE STATUS: (R^2 = 0.0812; Adjusted R^2 = 0.0682, df = 496, p < .001)					
(Intercept)	0.54955	0.03186	17.246	< 2e-16	***
Community: Stuttgart	-0.23409	0.04506	-5.195	3e-07	***
Age: younger	-0.13919	0.04506	-3.089	0.002123	**
Variable Status: Stable	-0.29417	0.14602	-2.015	0.044492	*
Stuttgart: younger	0.22990	0.06373	3.607	0.000341	***
Stuttgart : Status Stable	0.01021	0.20651	0.049	0.960605	
Younger : Status Stable	-0.09863	0.20651	-0.478	0.633143	
Stuttgart : younger : Stable	0.37778	0.29205	1.294	0.196418	
4. VARIABLE SALIENCE: (R^2 = 0.0710; Adjusted R^2 = 0.0533, df = 368, p < .001)					
(Intercept)	0.49705	0.04365	11.387	<2e-16	***
Community: Stuttgart	-0.14569	0.06173	-2.360	0.0188	*
Age: younger	-0.12749	0.06173	-2.065	0.0396	*
Salience: high	0.04496	0.07998	0.562	0.5744	
Stuttgart: younger	0.05581	0.08730	0.639	0.5231	
Stuttgart : Salience high	-0.19763	0.11311	-1.747	0.0814	.
Younger : Salience high	-0.05604	0.11311	-0.495	0.6206	
Stuttgart : younger : high	0.40141	0.15996	2.509	0.0125	*
5. VARIABLE STIGMA: (R^2 = 0.0711; Adjusted R^2 = 0.0567, df = 452, p < .001)					
(Intercept)	0.46967	0.03655	12.851	< 2e-16	***
Community: Stuttgart	-0.17905	0.05169	-3.464	0.000583	***
Age: younger	-0.20156	0.05169	-3.900	0.000111	***
Stigma: high	0.20391	0.12394	1.645	0.100621	
Stuttgart : younger	0.27034	0.07310	3.698	0.000244	***
Stuttgart: Stigma high	-0.35829	0.17528	-2.044	0.041523	*
Younger: Stigma high	0.15202	0.17528	0.867	0.386258	
Stuttgart : younger : high	0.05125	0.24789	0.207	0.836303	

Table 7-5. Multivariate Analyses of Correlation Matrices – Twin Study
*Significance levels: *** = 0.001; ** = 0.01; * = 0.05; . = 0.10*
Intercept values: Community=Gmünd; Age=older; (1) Level=phonological; (2) Type=regional; (3) Status=changing; (4) Salience=low; (5) Stigma=low

7.4.2.2. Variable type

Figure 7-6 (panel study) and Figure 7-7 (twin study) display the results of the covariance modelling for the second sociolinguistic predictor: the type of linguistic variable (i.e., Swabian-specific or regional) (see Appendix A for which features are uniquely Swabian versus regional). Looking first at the regional features across real-time, in 1982, no significant differences are evident in the level of covariation between the communities. However, by 2017 a difference has emerged in Stuttgart, which shows an increase in covariation between 1982 and 2017 ($\widehat{ß} = -0.2044$; $p < .05$) (Figure 7-6, left plot, right purple bar), which is likely the result of speakers' greater movement to the standard language. A similar situation is visible in apparent-time with the younger speakers in Stuttgart showing greater covariation with the regional features (Figure 7-7, left plot, right purple bar) ($\widehat{ß} = 0.4536$; $p < .01$), although the younger speakers in Schwäbisch Gmünd show lower covariation than their older cohorts.

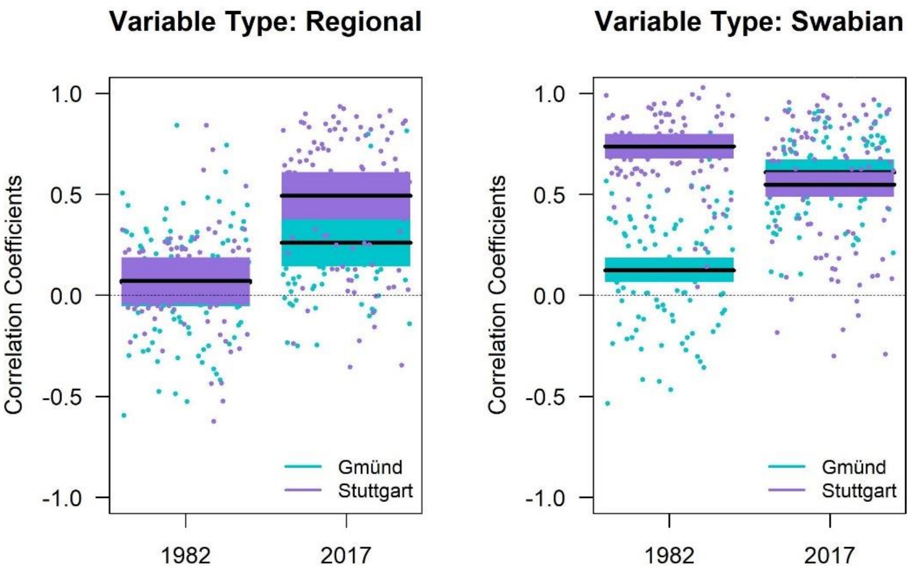


Figure 7-6. Covariance Model by Variable Type in Real-Time – Panel Study

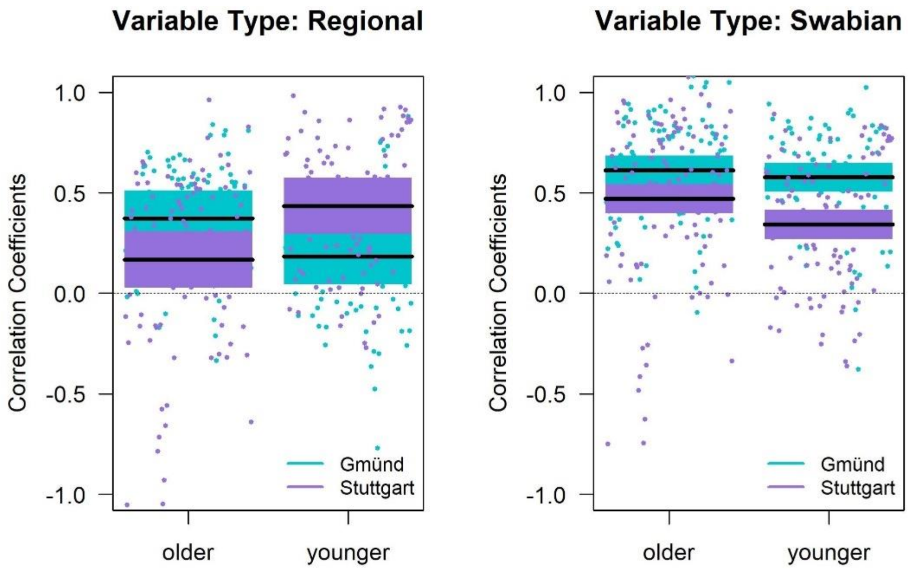


Figure 7-7. Covariance Model by Variable Type in Apparent-Time – Twin Study

For the Swabian-specific features (Figure 7-6 and Figure 7-7, right plots), Stuttgart already exhibited a very high degree of covariation in 1982, and by 2017, Schwäbisch Gmünd is following suit and converging with Stuttgart. Both studies reveal significant differences in covariation in real- and apparent-time between the regional and Swabian features by community (panel study: $\widehat{\beta} = -0.8989$, $p < .001$; twin study: $\widehat{\beta} = -0.5460$, $p < .001$), thereby providing support for PREDICTION L2 (see Section 7.3.2) that Swabian-specific features cohere more tightly than regional ones (see Table 7-4 and Table 7-5, section 2). I attribute this finding to the common sociohistorical background of the Swabian features and to speakers' desire to mark group membership, facets that cannot be conveyed with the regional features which have spread into Swabian from other regions (Nycz 2016; Woo, Gadanidis, and Nagy, submitted).

7.4.2.3. Variable status

The third sociolinguistic predictor investigated is the evolutionary status of the variable: the difference between stable variables and those undergoing change (i.e., those variables changed by more than 10% in real- or apparent-time (see Table 4-4 and Table 4-6)). In 1982, Stuttgart was already demonstrating a high level of covariation with the changing variables (Figure 7-8, left plot, purple bar), implying that convergence toward the standard language was previously in progress at that time. And by 2017, Schwäbisch Gmünd is following their lead. A notable difference with this predictor is that, while the changing and stable variables show significant differences on their own, this distinction is not significant by community or time slice for either the panel or the twin study, which may be due to the smaller number of tokens available with the stable variables. Nevertheless, both studies visually demonstrate a convergence of the communities for the changing variables, with the 2017 speakers in real-time mirroring the younger speakers in apparent-time (Figure 7-8 and Figure 7-9, left plots, turquoise bars are hidden by the purple bars).

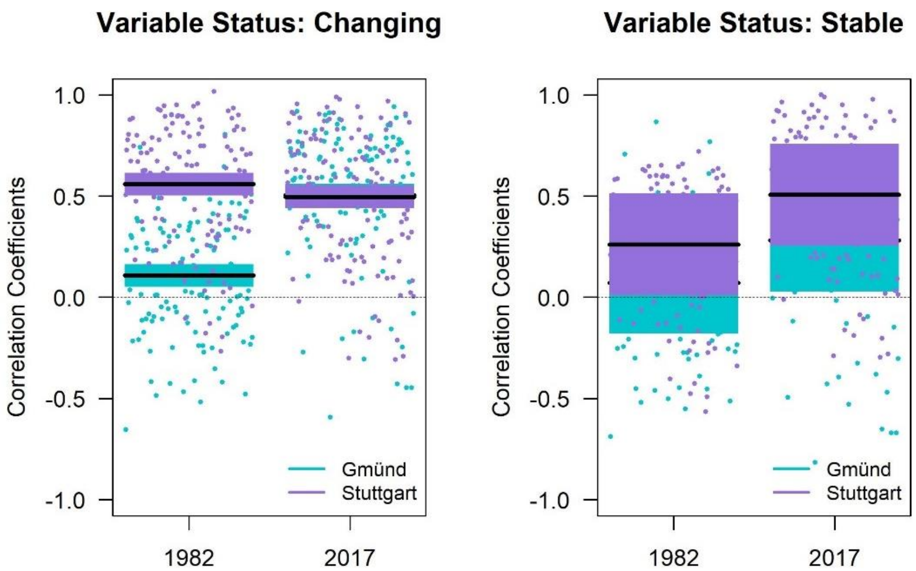


Figure 7-8. Covariance Model by Variable Status in Real-Time – Panel Study

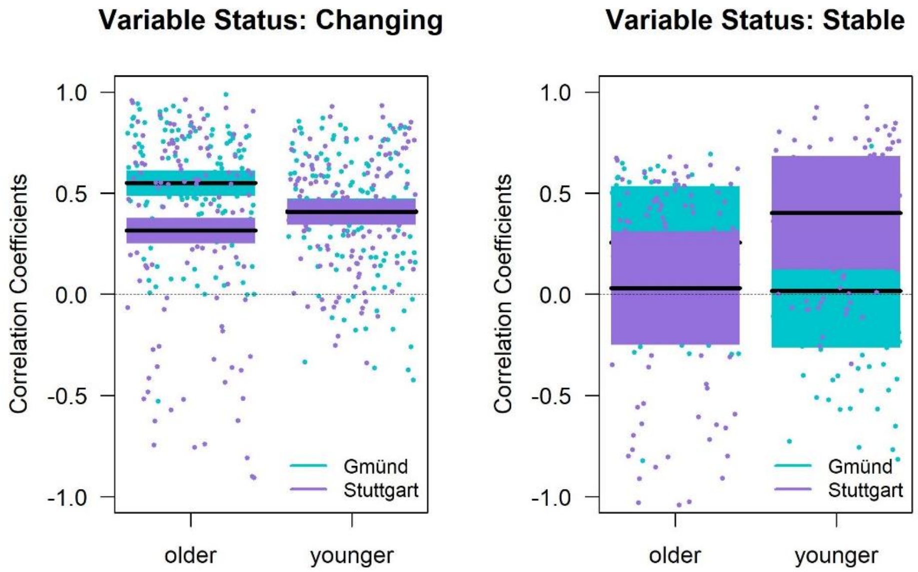


Figure 7-9. Covariance Model by Variable Status in Apparent-Time – Twin Study

These results provide some support for PREDICTION L3 (Section 7.3.2), which claims that greater coherence is achieved by reducing complexity through fewer variants and by increasing consistency with the standard language. The changing variables are those moving from Swabian to the standard language, thus providing less variability between the different variants. The lack of a community or time distinction provides evidence for a "shared social motivation for the change" (Tamminga 2019), revealing that the speakers in the current study are changing in similar ways.

7.4.2.4. Variable salience

Turning to the fourth sociolinguistic predictor, Figure 7-10 (panel study) and Figure 7-11 (twin study) depict the results of the covariance models for the salience of the variable (see Section 3.7.3.2 for how salience is defined in this study and Appendix A for which variables are identified as more or less salient). While the difference between the communities for the high-salience variables is only marginally significant in real-time ($\widehat{ß}$ = 0.2723, p = .056), Schwäbisch Gmünd demonstrates a familiar shift, converging with Stuttgart in 2017 toward greater covariation, particularly noticeable with the low-salience variables (Figure 7-10, right plot, right turquoise bar).

The apparent-time results, however, present a conflicting picture between the communities and age groups: the older speakers in Schwäbisch Gmünd and the younger speakers in Stuttgart demonstrate greater covariation for the high-salience variables ($\widehat{ß}$ = 0.4014, $p < .05$), a distinction which is not evident for the low-salience variables (see Figure 7-11). This finding refutes PREDICTION L4, which claims that, because the low-salient variables function below the level of awareness and hence are more automatic and uniform, they should demonstrate higher levels of covariation. However, as discussed in Chapter 4 (see Figure 4-21), the effect of salience on language change remains ambiguous in the literature, with some studies showing it promotes change and others claiming it retards change (see discussion around Figure 4-21). Unfortunately, the results of the Swabian investigation of dialect density in Chapter 4, as well as the findings of the covariation analysis in this section, are similarly conflicting and inconclusive, leaving the role of salience as a factor in language change for future investigation.

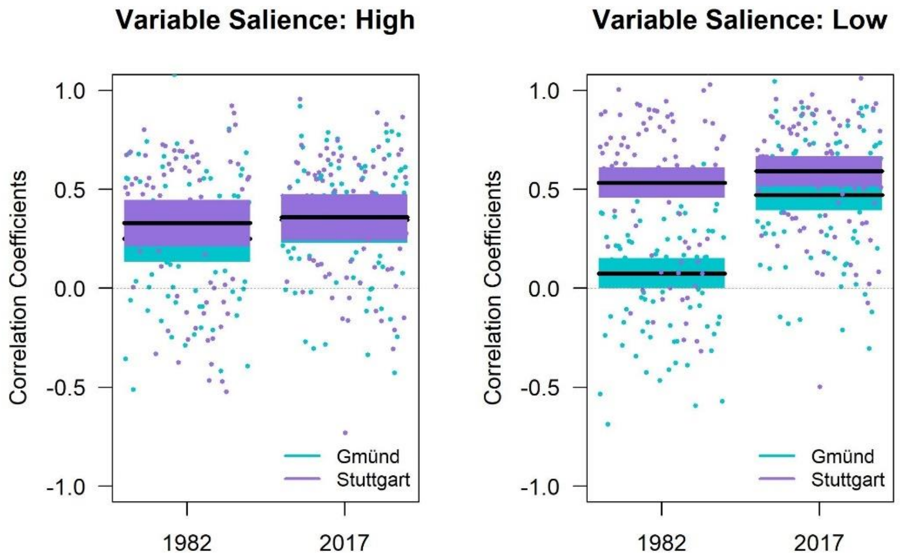


Figure 7-10. Covariance Model by Variable Salience in Real-Time – Panel Study

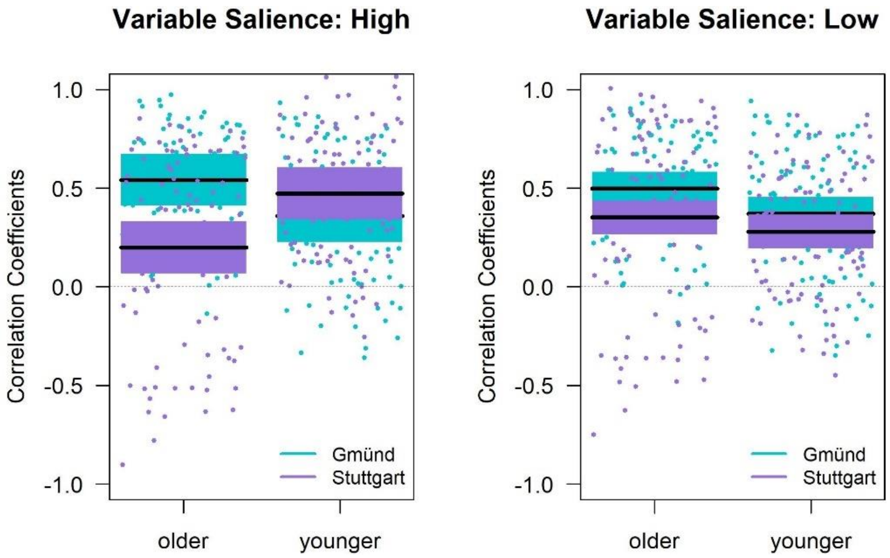


Figure 7-11. Covariance Model by Variable Salience in Apparent-Time – Twin Study

7.4.2.5. Variable stigma

The results of the covariance modelling effort for the fifth sociolinguistic predictor, variable stigmatisation, are shown in Figure 7-12 (panel study) and Figure 7-13 (twin study) (see Appendix A for which variables are classified as stigmatised). PREDICTION L5, which states that more highly stigmatised variables would show higher levels of covariation, is confirmed in the real-time analysis (see Figure 7-12): Stuttgart in 1982 shows an unusually high level of covariation for the highly stigmatised variables, and by 2017, Schwäbisch Gmünd is following the trend ($\hat{ß}$ = -0.8180; $p < .001$). The apparent-time analysis (see Figure 7-13), however, does not show a significant difference in stigmatisation ($\hat{ß}$ = 0.0513; p = n.s), and in fact, this predictor appears to have become less indicative, with the high- and low-stigma variables reflecting similar levels of covariation. However, there is greater variation with the high-stigma variables than with the low-stigma ones (observed by the wider bars in the left plot than in the right), which is likely due to some of the high-stigma variables being co-opted for Swabian identity formation. I suspect that the lack of distinction between the high- and low-stigma variables is because the high-stigma variables have died out of the language or have at least significantly receded, a point I return to in the discussion section.

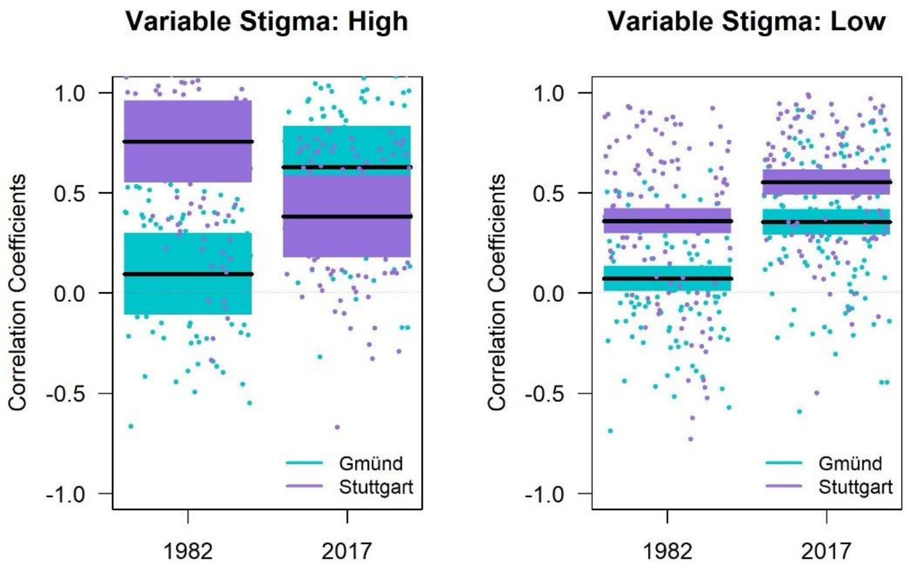


Figure 7-12. Covariance Model by Variable Stigma in Real-Time – Panel Study

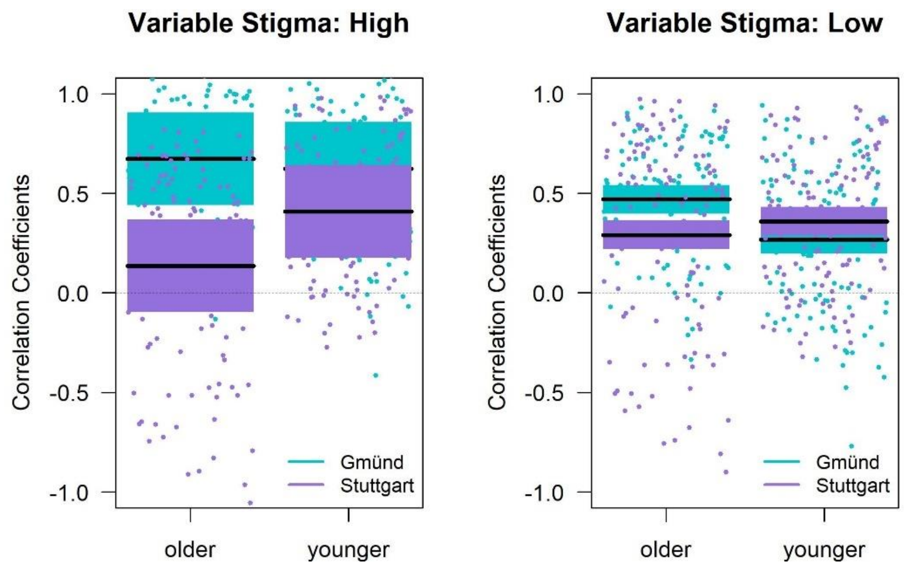


Figure 7-13. Covariance Model by Variable Stigma in Apparent-Time – Twin Study

7.4.2.6. Summary predictions

Table 7-6 (panel study) and Table 7-7 (twin study) provide summaries of the five sociolinguistic predictors (created with the *predict* function in the R package *stats*, version 3.6.0). Recall that correlation coefficients of zero indicate no coherence; for purposes of this discussion, proportions over .500 are considered more coherent than those under .500. Because all of the variables in the current corpus are either stable or in decline, there are no negative correlations. Significant interactions from the multiple regression analysis ($p < .01$) are indicated in bold type.

Most noteworthy in the real-time study (see Table 7-6) is that none of the five sociolinguistic predictors investigated has an effect on the coherence of the sociolect of Schwäbisch Gmünd in 1982 (i.e., all correlations are below .200), yet all show higher levels of coherence in the sociolect of Stuttgart in 2017 (i.e., all above .500). Based on correlation coefficients alone, the Swabian spoken in Schwäbisch Gmünd in 1982 would be considered "incoherent", while the variety spoken in Stuttgart in 2017 would be considered "coherent". However, as the previous analyses show, the critical difference is that speakers in Schwäbisch Gmünd in 1982 used a greater mix of Swabian and standard German variants while speakers in Stuttgart in 2017 have moved to more consistent and uniform usage of the standard language. Thus, if coherence is measured as approximation to the standard language, then Stuttgart in 2017 would indeed be considered more coherent. However, if coherence is measured as the optimal mix of Swabian and standard German features (cf. Benor's (2010) "repertoire model"), then Schwäbisch Gmünd in 1982 would be considered coherent as well.

It is puzzling to observe that the apparent-time study shows the opposite effect: the older speakers in Schwäbisch Gmünd (Table 7-7, leftmost column) demonstrate higher levels of coherence (based on correlation coefficients greater than .500) than the younger speakers in Stuttgart (Table 7-7, rightmost column). Why would the younger speakers in Stuttgart, the harbingers of language change who are moving closer to the standard language (see Chapter 4), reflect lower levels of coherence? To interpret these results, it is essential to look at the populations in these two studies. The 2017 panel speakers fall in the same age bracket as the older 2017 twin speakers, i.e., between 53 and 88 years), while the 1982 panel speakers are the same age as the 2017 younger twin speakers, i.e., between 18 and 52, albeit 35 years later. From this perspective, the differences between the speakers in the two studies are not dissimilar.

Crucially, when pooled together, not all of these factors are significant, either alone or in interaction with other predictors. Variable type (regional or Swabian) is the only factor significant in real-time (Table 7-6), while variable type and variable stigma are significant in apparent-time (Table 7-7). While not intending to appear overly reliant on p-values (Krueger and Heck 2019), this approach underscores the critical role of advanced statistical modelling in filtering out the meaningful factors from the "noisy" ones in the interpretation of the findings. In sum, these results corroborate those from Chapter 4 concerning the distinction between Swabian-specific and regional variables, as well as the role of variable stigma in suppressing dialect variants and promoting convergence toward the standard language.

Predictors	Schwäbisch Gmünd		Stuttgart	
	1982	2017	1982	2017
(1) Variable Level:				
Phonological	0.154	0.631	0.687	0.603
Morphosyntactic	0.117	0.555	0.579	0.569
(2) Variable Type:				
Regional	**0.093**	**0.291**	**0.130**	**0.560**
Swabian	**0.144**	**0.661**	**0.747**	**0.591**
(3) Variable Status:				
Changing	0.135	0.601	0.647	0.586
Stable	0.093	0.291	0.130	0.560
(4) Variable Salience				
Low	0.166	0.665	0.736	0.615
High	0.083	0.441	0.404	0.540
(5) Variable Stigma				
Low	0.152	0.574	0.586	0.605
High	0.073	0.591	0.677	0.521

Table 7-6. Predicted Correlation Coefficients in Real-Time – Panel Study (significant interactions (p < .01) indicated in bold type)

Predictors	Schwäbisch Gmünd		Stuttgart	
	Older	Younger	Older	Younger
(1) Variable Level:				
Phonological	0.617	0.525	0.573	0.295
Morphosyntactic	0.588	0.482	0.347	0.369
(2) Variable Type:				
Regional	**0.366**	**0.128**	**0.095**	**0.501**
Swabian	**0.658**	**0.591**	**0.535**	**0.295**
(3) Variable Status:				
Changing	0.610	0.516	0.464	0.329
Stable	0.366	0.128	0.095	0.501
(4) Variable Salience				
Low	0.635	0.552	0.654	0.267
High	0.520	0.376	0.116	0.455
(5) Variable Stigma				
Low	**0.565**	**0.441**	**0.536**	**0.319**
High	**0.674**	**0.624**	**0.136**	**0.408**

Table 7-7. Predicted Correlation Coefficients in Apparent-Time – Twin Study (significant interactions (p < .01) indicated in bold type)

7.4.3. Principal components analysis

The use of correlation coefficients to assess covariation between researcher-defined speech varieties is one way of assessing lectal coherence. Another method is to look at differences in the area or volume in a latent space create by a principal component analysis, (PCA), as introduced in Chapter 4 and further expanded upon here.

7.4.3.1. Patterns of variability

Figure 7-14 through Figure 7-19 present the results of the PCA, which reduces the 20 linguistic variables to six principal components (PC). Six PCs have been chosen as they explain 83.5% of the variance in the data and because the unexplained parts are of similar size in all four speaker groups (PC1/PC2 accounts for 68.0%, PC3/PC4 for 9.5%, and PC5/PC6 for 6.3%). Figure 7-14 depicts the 20 panel speakers, purple for Schwäbisch Gmünd and turquoise for Stuttgart; dotted lines and open circles and triangles represent 1982, and solid lines and filled circles and triangles 2017. The 1982 Schwäbisch Gmünd speakers (small purple box with dashed lines and open purple circles) show the tightest coherence (i.e., the least variability), followed by the 1982 Stuttgart speakers (turquoise box with dashed lines and open turquoise triangles) with no overlap, signalling two distinct varieties. As seen in Chapter 4, the extensive dialect levelling which has been occurring in Swabia over the last 35 years has resulted in a fusion of the two varieties by 2017 (Figure 7-14, purple and turquoise boxes with solid lines and solid circles and triangles) and the emergence of southwestern supraregional variety, providing additional support for HYPOTHESIS 1 of this research (see Figure 4-6 and Section 4.4.1.1 for further discussion).

The results from the apparent-time analysis signal a different but congruent picture (Figure 7-15). The older speakers, in both Stuttgart and Schwäbisch Gmünd (dashed lines and open circles and triangles), are more similar to each other, as are the younger speakers (solid lines and filled circles and triangles), supporting HYPOTHESIS 2 of this study: apparent-time change mirrors real-time change. However, lifespan change for the panel speakers also appears to mirror apparent-time as reflected in these two generations of 2017 speakers. Recall that the 2017 panel speakers are the same ages as the older 2017 twin speakers (median ages of 57 and 60, respectively). The changes in dialect density and the results of the PCA demonstrate that dialect usage for the panel speakers has changed extensively across their lifespan, questioning the basic assumptions of the CRITICAL-AGE HYPOTHESIS (Lenneberg 1967) (see also Wagner and Buchstaller 2017). These findings reveal that individuals can dramatically change their speech and grammars across their lifespan, particularly in dynamic situations of dialect levelling, impelled by formidable extralinguistic factors such as increasing education and heightened social stigma. If the current investigation comprised only the trend study component, the supposition that older speakers use an older variety of the language would not tell the full story. What older variety and at what point in time? With a combined panel and trend analysis, the older variety is precisely documented in the previous time slice, and no suppositions are necessary. These results accentuate the power of combining both real- and apparent-time components in investigating the speed of change. Unfortunately, to realistically establish the rate of change, a third time-slice (e.g., ideally a point halfway between 1982 and 2017) is needed.

The PC1/PC2 results are somewhat incongruent with the findings in the previous section on correlation analysis, which showed Schwäbisch Gmünd in 1982 to have the lowest correlation mean (see Table 7-1). However, this is due to the fact that a greater amount of the variability in Schwäbisch Gmünd, in both real- and apparent-time, can be found in PC3 and PC4 (Figure 7-16 and Figure 7-17), demonstrated by the larger purple boxes versus the smaller turquoise boxes for Stuttgart. Investigating the variable loadings on the third and fourth components, two variables stand out, stop-fricative variation (SFV) and the definite neuter article (DAS), non-traditional Swabian features that have moved into the dialect from northern varieties and have become more prominent in 2017 (see Section 7.4.3.3 for further discussion).

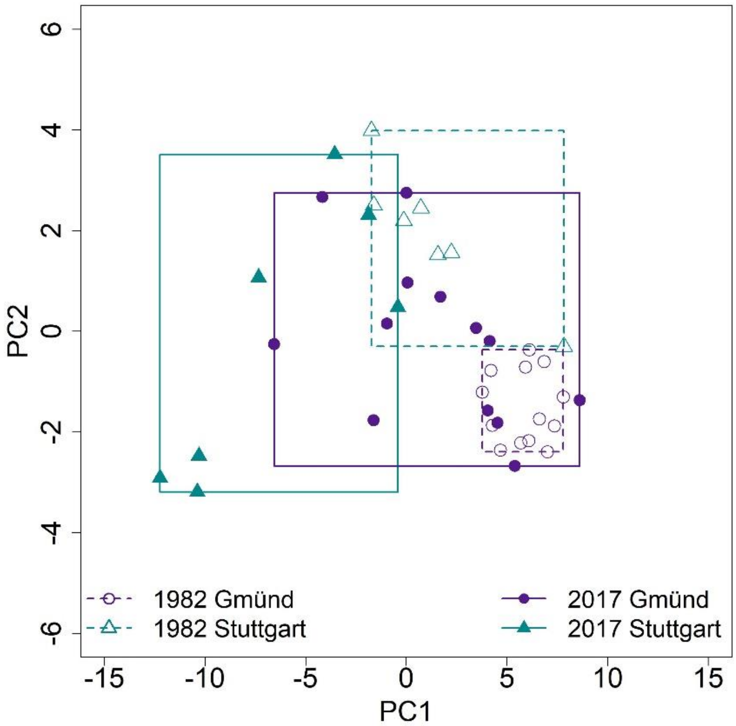


Figure 7-14. PC1 and PC2 for 20 Swabian Linguistic Features – Real-Time

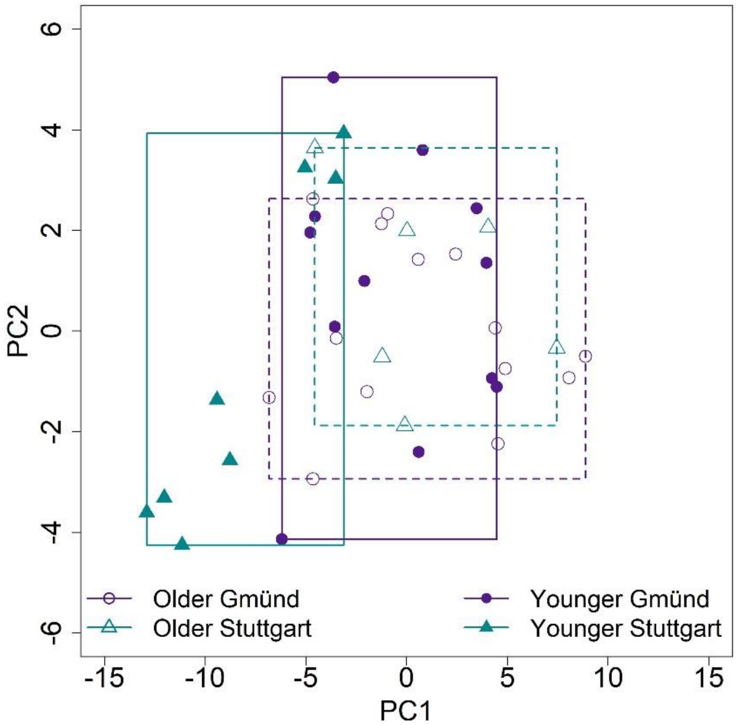


Figure 7-15. PC1 and PC2 for 20 Swabian Linguistic Features – Apparent-Time

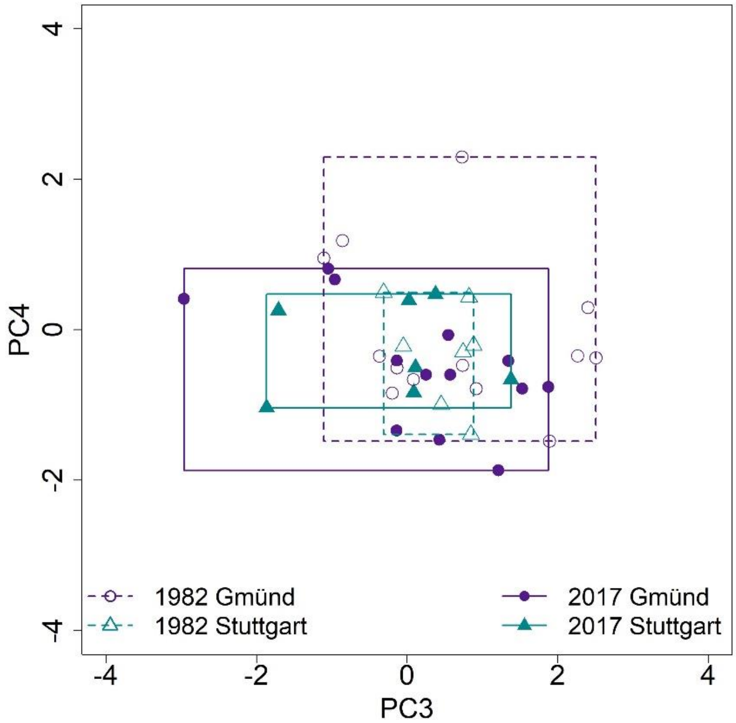


Figure 7-16. PC3 and PC4 for 20 Swabian Linguistic Features – Real-Time

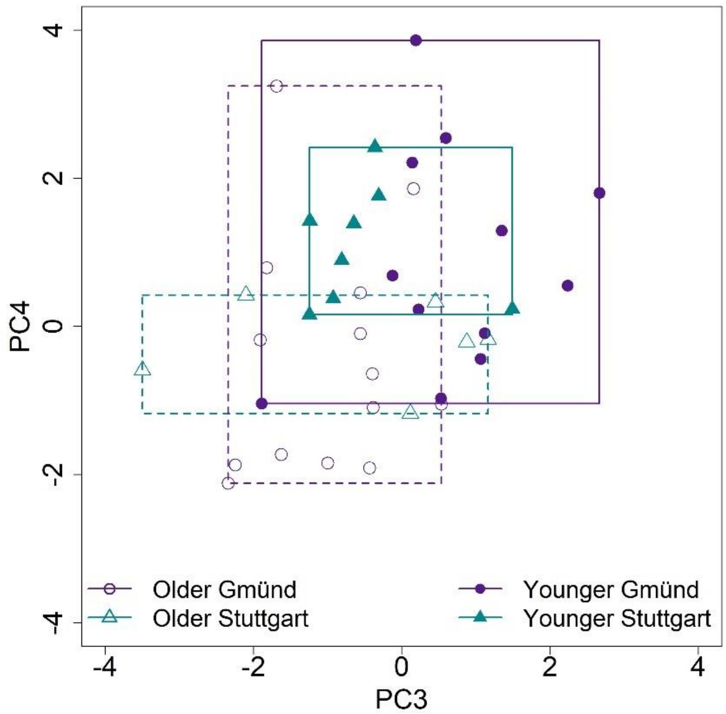


Figure 7-17. PC3 and PC4 for 20 Swabian Linguistic Features – Apparent-Time

Two additional variables stand out on PC5 and PC6 (see Figure 7-18 and Figure 7-19): nasalisation (ANN) and the diminutive affix -*le* (SAF1B). The variable loadings provided by PCA provide a finer-grained analysis than the correlation analyses in the previous section. But, how much of the variability can be explained for each lect and how much do they differ, quantitatively? The following section on measuring lectal variability attempts to address this.

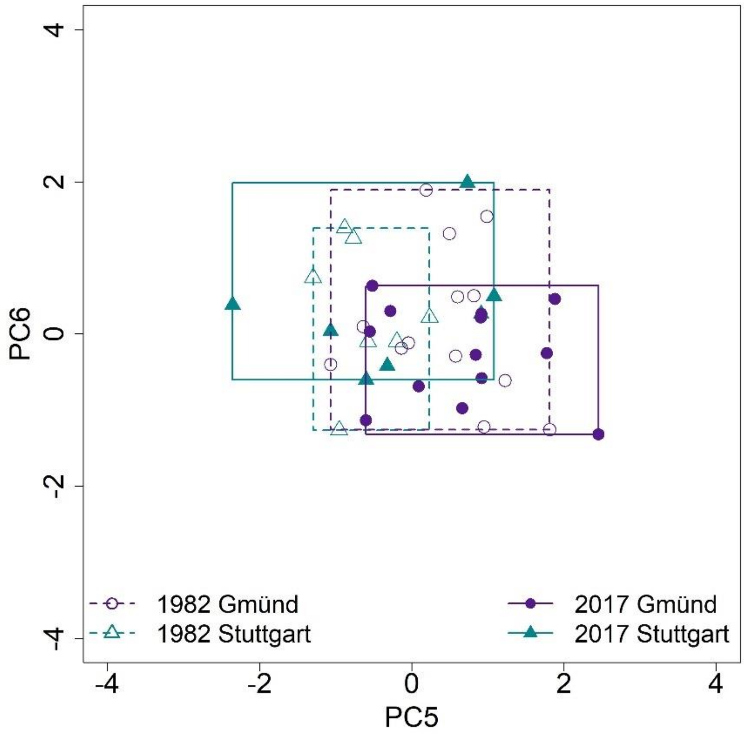


Figure 7-18. PC5 and PC6 for 20 Swabian Linguistic Features – Real-Time

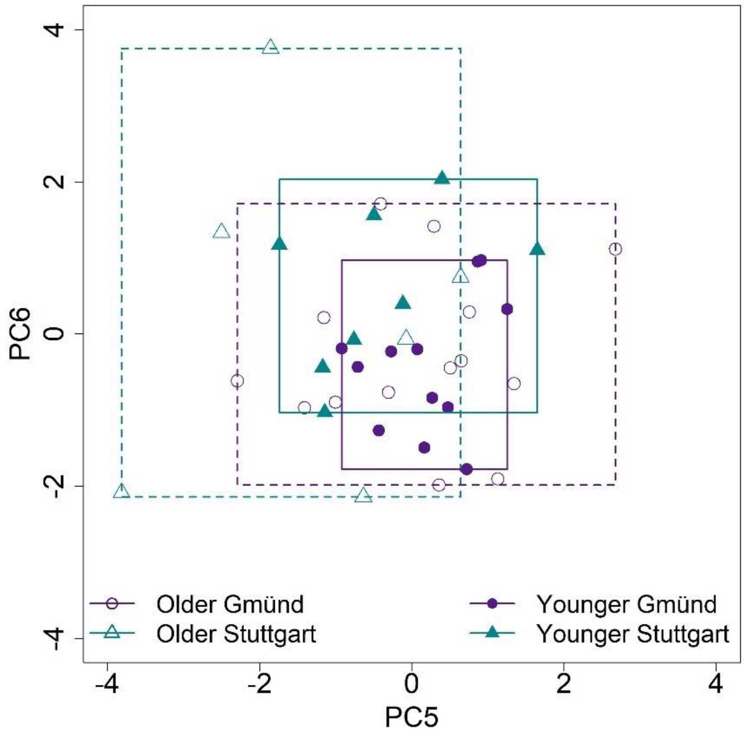


Figure 7-19. PC5 and PC6 for 20 Swabian Linguistic Features – Apparent-Time

7.4.3.2. Measuring variability

To quantitatively measure the amount of variability in a lect, four different metrics have been considered (see Table 7-8). The first and most straightforward measure of variability is the RECTANGLE VOLUME, that is, the size and capacity of the rectangle which contains all of the points in a given lect as identified in the previous figures. Volume is calculated as the rectangle's length times its width times its height times the amount of variance explained by each dimension in six-dimensional space (i.e., the first six principal components). The volume metric points to increasing variability between 1982 and 2017 for the panel study participants, with further increases for the younger and older twin study participants. This increase in variability is likely due to two factors which are a result of the 35-year time gap: first, the individuals with greater variability are older in each study and hence have vaster life experiences; and second, the world itself has become increasingly more disparate and complex. Both of these aspects enrich diversity and variability in language use. Both studies cover time spans of 35-37 years, yet the real-time decline in coherence is significantly greater than the apparent-time decline, reflecting the immense societal changes that have occurred over the 35 years. It appears that the panel speakers are playing “catch-up” in order to “keep up” with the massive changes and incessant dialect levelling transpiring in Swabia. These findings indicate that real-time change can sometimes occur more rapidly than apparent-time change, at least concerning these two communities in the current situation of persistent, pervasive, and precipitous dialect levelling.

	Real-Time (Panel Study)			Apparent-Time (Twin Study)		
Community & Metric	1982	2017	decrease in coherence	Younger	Older	decrease in coherence
Rectangle volume (PC1-PC6)						
Schwäbisch Gmünd	2640	16675	531.5%	34162	64594	89.1%
Stuttgart	980	9010	819.7%	13418	33874	152.4%
Confidence ellipsoid area (PC1-PC2)						
Schwäbisch Gmünd	17.5	113.1	546.3%	194.9	161.3	-17.2%
Stuttgart	29.7	136.9	360.9%	69.6	154.3	121.7%
Convex hull area (PC1-PC2)						
Schwäbisch Gmünd	5.8	47.3	715.5%	59.1	55.1	-6.8%
Stuttgart	7.0	30.4	334.3%	17.9	31.9	78.2%
Functional Diversity (PC1-PC6)						
Schwäbisch Gmünd	0.005	0.099	2055.1%	0.100	0.112	12.6%
Stuttgart	0.021	0.052	145.5%	0.015	0.051	237.7%

Table 7-8. Lectal Variability Measurements in Real- and Apparent-Time

One advantage of the volume measure is its breadth, covering six (or more) principal components, and the ease with which it can be calculated. However, a major setback is its extreme sensitivity to outliers and to rotations of the latent space. Thus, a second metric considered for assessing lectal variability is the CONFIDENCE ELLIPSOID for PC1 and PC2, which is calculated as the square root of the eigenvalues of the covariance matrix times π times a 95% confidence interval. The area of the ellipsoid shows a similar decrease in coherence across real- and apparent-time, although significantly smaller than with the volume metric, particularly for Stuttgart in real-time and Schwäbisch Gmünd in apparent-time. This is easily explained because the ellipsoid is two-dimensional, whereas the rectangle supports multiple dimensions; and, as seen earlier, much of the variation lies on the third and fourth PCs which are not accounted for in the confidence ellipsoid. Hence, a major drawback to the ellipsoid is its limited dimensionality.

A third approach to calculating the variability in a lect is the area of the CONVEX HULL, i.e., the smallest shape that encloses the outermost points in a given set, regardless of the shape or distribution of the points. A convex hull can be visualised as a string wrapped around the points along the border of the set. Figure 7-20 depicts eight convex hulls, one for each lect (calculated with the chull function in the R Package grDevices, version 3.6.0). A similar pattern as with the ellipsoid emerges: real-time indicates a greater decrease in coherence than apparent-time. While the area of the convex hull represents an improvement over the volume of a rectangle because it avoids unused "white space", it poses a similar limitation to the ellipsoid by the complexity of incorporating more than two dimensions. All three of these metrics are highly sensitive to low token counts, making smaller groups appear more coherent than they really are.

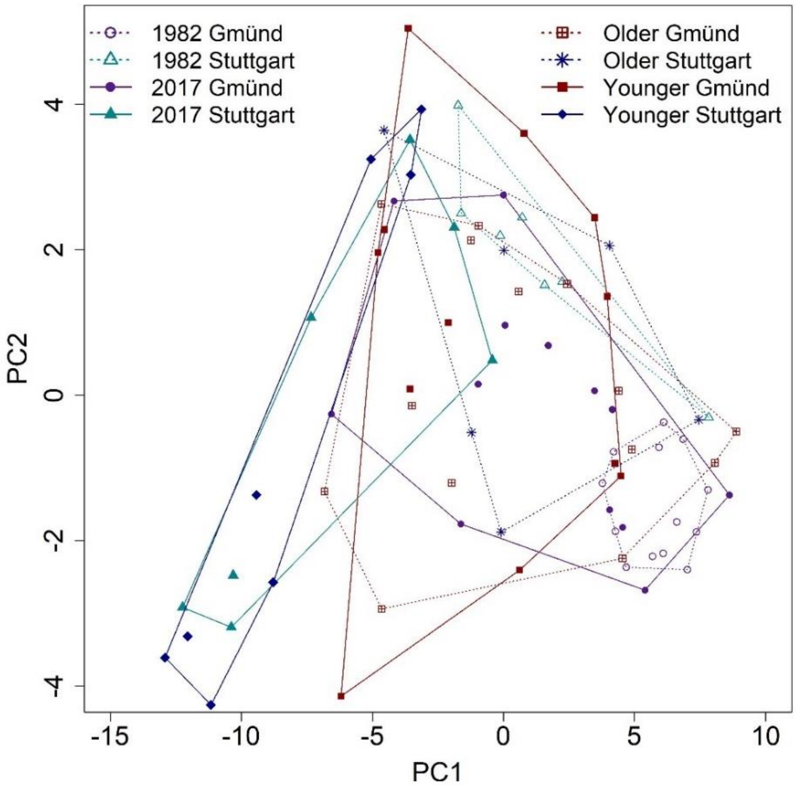


Figure 7-20. Convex Hulls by Speech Community in Real- and Apparent-Time

Due to these limitations, a fourth metric is considered, FUNCTIONAL DIVERSITY (FD), a concept borrowed from ecology for measuring ecosystem processes and resilience to environmental changes (Laliberté and Legendre 2010; Villéger, Mason, and Mouillot 2008). FD provides a method for understanding and interpreting the patterns of co-occurrence and the role of different "traits" (cf. linguistic features) on the functioning of an ecosystem (Tilman 2001). One component of functional diversity, FUNCTIONAL RICHNESS, uses principal coordinates analysis (PCoA) to estimate the volume of data in the minimum convex hull for a community (Laliberté and Legendre 2010:310). Functional richness is defined as the amount of "niche space" filled by a feature or set of features in a community: the more functionally different the variables are, the higher the index (Legras, Loiseau, and Gaertner 2018). The results are presented in the fourth section of Table 7-8 (calculated using FRic option with the dbFD function in FD R package, version 1.0-12 (Laliberté, Legendre, and Shipley 2015)). The FD metric shows a similar trend as the other metrics, with the greatest decrease in coherence occurring in Schwäbisch Gmünd over the lifespan and the second-largest decrease appearing in Stuttgart between the younger and older generations. The advantages of FD over other methods of calculating variability explored here are its ability to handle multiple dimensions, asymmetric binary variables, variable weights, and empty cells (due to sparse data), all critical parameters with sociolinguistic data.

In sum, the younger speakers in both study samples show greater coherence, i.e., less diversity, than the older speakers. Recall that the real- and apparent-time analyses both cover time spans of 35-37 years, meaning that the 1982 panel speakers and the younger 2017 twin speakers are roughly the same age, albeit separated by 35 "real" years. Younger speakers may exhibit greater lectal coherence because they are more conditioned by using a single variety, the standard language, in school, and quite naturally, have had more limited life experiences. Older speakers have developed more extensive and more diverse repertoires over their lifespans, reflecting a mixture of both Swabian and standard German, thereby providing them with a broader feature pool to select from (see Baayen, Beaman, and Ramscar (2021) for an empirical analysis of dialect and standard vocabulary growth across the lifespan of the 20 Swabian panel speakers).

7.4.3.3. Variable weightings

The third coherence question this chapter addresses is in what ways do the linguistic features characteristic of a sociolect covary and which ones carry the most coherence weight? Since PCA predicts the proportion of variance explained by each variable, the variable loadings can be visualised, as seen in Figure 7-21 for PC1 and PC2 (plotted with the function *autoplot* in R package *ggplot2*, version 3.2.1). The arrows show the loadings and clustering for the 20 linguistic features. The angles of the arrows indicate the degree of correlation between the linguistic feature and the principal component, and their length signifies how much of the variation is explained by that feature: specifically, the more horizontal or vertical the arrow, the stronger the correlation with PC1 or PC2, respectively, while the longer the arrow, the greater the explained variance.

Figure 7-21 exposes two meaningful clusters which have been enlarged for readability in Figure 7-22. The first cluster is primarily defined by the first principal component: four front rounded vowels (FRV1, FRV2, FRV3, FRV4), two (ai) diphthongs (AIS1, AIS2), three irregular verb stems (IRV1, IRV2, IRV3), and three Swabian-specific morphosyntactic constructions (EDP, SAF3, PVB). All of these variables are the traditional, conservative features unique to the Swabian dialect (see Appendix A); thus, I call this cluster Traditional Swabian (TS). The second cluster lies between PC1 and PC2 and consists of regional features that are prevalent throughout southern Germany, including Bavaria to the east, Baden to the west, and Switzerland to the south:

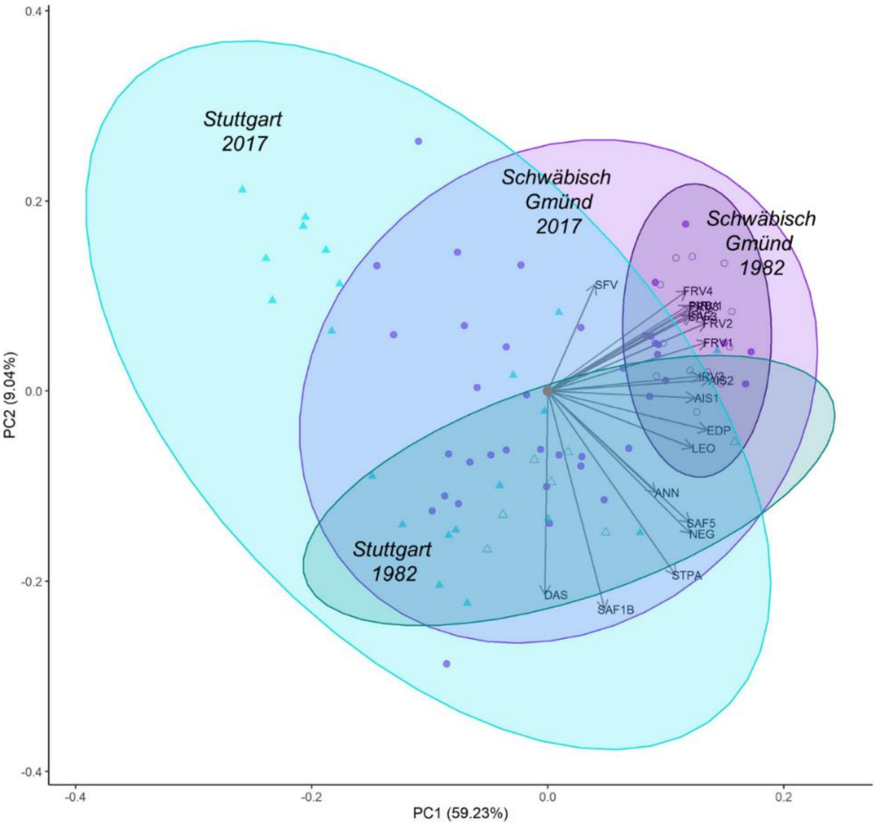


Figure 7-21. Variable Loadings across Space and Time – Panel and Twin Study

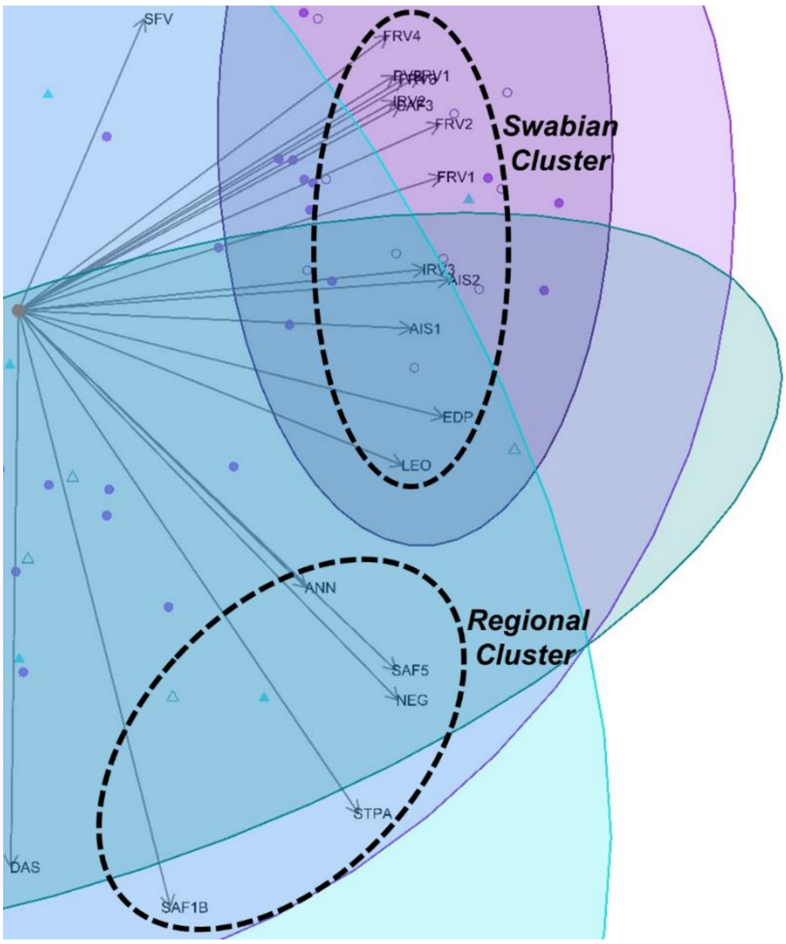


Figure 7-22. Traditional Swabian and Southern Regional Clusters – Panel and Twin Study

palatalisation of coda -*st* (STPA), diminutive affix -*le* (SAF1), dropping of the past participle *ge*- (SAF5), negative markers (NEG), and nasalisation of *an* (ANN). Since these dialect features are common in many southern German varieties, I call this cluster Southern Regional (SR). There are two exceptions, the periphrastic subjunctive (PVB) and the lowering of [eː] (LEO), southern regional features which pattern more closely with the Swabian-specific variables. Although LEO lies on the cusp and thus could theoretically be grouped with either cluster, based on its correlation coefficient (see Table 7-9), it fits better with the Traditional Swabian variables.

This leaves two remaining features that do not cluster with the others: the definite neuter article (DAS) and stop-fricative variation (SFV), both of which are strongly aligned along the second principal component, one positive and one negative. While these features are also regional, they are spreading into Swabian from the north (Spiekermann 2008:186), rather than from the south; thus, I call this group: Northern Influence (NI). Further support for the patterning of these two NI features can be seen in Figure 7-3 (and to a lesser extent in Figure 7-1 and Figure 7-2), which shows the weakest correlations for DAS and SFV with respect to the other features.

Table 7-9 reports the correlation coefficients for the first three principal components for the 20 linguistic variables, with respect to a "reference variable", sorted by cluster and then descending by the proportion of explained variance. The unrounded front round vowel [eː ~ øː] (FRV1) was chosen as the reference for the TS cluster, and the negative marker (NEG) was chosen for the SR cluster. Both features are at or near the centre of their cluster and can be considered prototypical dialect variants. Correlations over .8 (shaded in green) and under -.8 (shaded in blue) are considered to be the most coherent features, divulging that the strongest coherence is with the TS features, followed by the SR features, and finally, the NI features which show negative correlations. Another exception is nasalisation of *an* (ANN), which shows a strong negative correlation as opposed to the positive correlations of the other TS features in the first two PCA components, supporting Auer's claim that ANN may be lexically constrained.

These findings support principal components as a measure of coherence and underscore two fundamental principles: the ultimate influence of the sociohistorical and etymological background of the variable and the suggestive coercive power of shared social motivation across the community (Tamminga 2019), inciting individuals to move in a concerted, unified direction.

Linguistic Features	Type	Cluster	TS	SR
IRV3 – Irregular Verb: hen ~ haben	SWG	TS	n/a	0.188
FRV1 – Unrounded Front Vowel [e: ~ ø:]	SWG	TS	0.998	0.127
FRV2 – Unrounded Diphthong [ai ~ ɔʏ]	SWG	TS	0.978	-0.023
IRV1 – Irregular Verb: gange ~ gehen	SWG	TS	0.945	-0.143
SAF3 – Swabian Affix: nââ- ~ hin-	SWG	TS	0.943	-0.149
IRV2 – Irregular Verb: stande ~ stehen	SWG	TS	0.942	-0.154
FRV3 – Unrounded Front Vowel [iə ~ ʏ:]	SWG	TS	0.936	-0.170
PVB – Periphrastic Subjunctive: dääd ~ würde	REG	TS	0.933	-0.177
AIS2 – MHG /ei/ Diphthong [ɔi ~ ai]	SWG	TS	0.910	0.577
FRV4 – MHG /uo/ Diphthong [uə ~ u:]	SWG	TS	0.862	-0.335
EDP – Plural Verb Inflection: -ed ~ -en	SWG	TS	0.827	0.708
AIS1 – MHG /i:/ Diphthong [əi ~ ai]	SWG	SR	0.287	0.995
SAF5 – Swabian Affix: Ø ~ ge-	REG	SR	0.744	0.796
NEG – Negative Marker: ned ~ nich(t)	REG	SR	0.489	0.949
LEO – Lower Long Vowel [ɛ: ~ e:]	REG	SR	0.462	0.958
ANN – Nasal 'a' before 'n' [ã ~ an]	SWG	SR	0.346	0.987
STPA – Palatal Coda -st [ʃt ~ st]	ALM	SR	0.188	n/a
SAF1A – Swabian Affix: -le ~ -chen	ALM	SR	-0.368	0.844
DAS – Definite Neuter Article: des ~ das	REG	NI	0.983	0.365
SFV – Stop-Fricative Variation [ɪç ~ ɪk]	REG	NI	-0.965	0.078

Table 7-9. Correlations of Explained Variances by Variable – Panel and Twin Study
TS=Traditional Swabian (reference: IRV3); SR=Southern Regional (reference: STPA); NI=Northern Influence; correlations greater than .8 shaded in green (positive) or blue (negative)

7.4.4. Lectal Lattice

This section explores a new theoretical construct for modelling coherence, which I call the Lectal Lattice.[37] The aim of this section is two-fold: (1) to explore a new method for modelling and measuring linguistic coherence to gain greater insight across linguistic varieties and (2) to analyse coherence with 20 variables in two communities in real- and apparent-time.

7.4.4.1. Lattices

The concept of a LATTICE, a construct from the order theory of mathematics and universal algebra (Partee, Ter Meulen, and Wall 1993, chapter 11) provides an alternative explanatory method for depicting and measuring sociolectal coherence. Linguists have used lattices in phonology, syntax, semantics, neurolinguistics and computational linguistics, but not yet in sociolinguistics or variation studies. A lattice is an abstract structure that uses binary relations to examine the hierarchical or implicational relationships within a given set of elements. It consists of a PARTIALLY ORDERED SET, called a POSET, in which an order relation ($\leq$) exists between some

[37] I am indebted to Jim Garrett for suggesting the lattice concept to depict lectal coherence and for creating the R script for visualisation. Of course, any deficiencies in the model or results are entirely my own.

of the elements in the set. A lattice generalises the data from a straight line (such as x implies y implies z) to a multidimensional picture, which can be depicted by a Hasse diagram, as illustrated in Figure 7-23. In a Hasse diagram, the elements of the poset are represented as NODES, and the order relations between the elements are represented as links between the nodes.

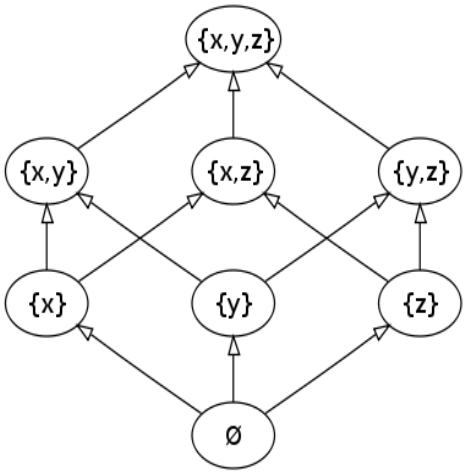


Figure 7-23. Lattice with Sets and Subsets visualised as a Hasse Diagram

To somewhat overgeneralise in the interest of brevity, every two elements in a lattice have a least upper bound, called a JOIN, and a greatest lower bound, called a MEET. The relationship between the elements is one of inclusion: for any two elements, you can move up the lattice to find an element that is included by both (the JOIN), and, dually, step down the lattice to find an element that is included by both (the MEET). Lattices exhibit the principle of DUALITY, meaning they function equally in both directions – top-down or bottom-up. Thus, in turning a lattice upside down, the MEETS become JOINS, and the JOINS become MEETS (see Partee, Ter Meulen, and Wall (1993), on the construction and interpretation of LATTICES).

7.4.4.2. Pairwise comparisons

Borrowing from these theoretical concepts, a Lectal Lattice can be constructed to depict the hierarchical and implicational relationships among the variables in a lect which can be visualised as a Hasse diagram. The first step in developing a Lectal Lattice is to create post hoc PAIRWISE COMPARISONS for each speaker's set of linguistic variables, arranged in two-by-two contingency tables. Figure 7-24 (left pane) illustrates an example poset for Angela in 1982, showing 23 linguistic variables creating a poset of 506 pairs of variables (23 * 23 - 23). Using the Suissa and Shuster Exact test with the Holm-Bonferroni method (Holm 1979), each pair of variables is tested to determine whether there is a significant difference in frequency of use (i.e., proportion of nonstandard variants divided by the total variants). When a statistically significant difference is found ($p < .05$), i.e., when the variable in the row is lower than the variable in the column maintaining the implicational order, the pair is assigned a 1 (shown by the cells highlighted in green in Figure 7-24), otherwise it is assigned a 0. In a poset every pair of variables need not be related significantly for the poset to be valid, allowing for uncertainties or inadequacies or unknowns in the dataset, which of course is common with sociolinguistic data.

In the next step, the speakers' posets are sorted by significant pairs and the frequency of the dialect variant, generating a new sorted poset as exemplified as in Figure 7-24 (right pane). The posets are assigned a RANK by summing the significant pairwise comparisons. Rank provides a method to calculate the DISTANCE between two different lects, a value that denotes the number of pairs that would have to change for the two lects to be identical. In the final step, neighbouring posets, i.e., those that are most similar, are mathematically joined; specifically, all neighbours with the same minimum distance are joined one by one. To build the lattice, all posets are connected with their nearest neighbours and joined into new posets. It's posets within posets – or "turtles all the way down" – and up, of course, to maintain the duality of the lattice.

Angela 1982

	AIS1	AIS2	ANN	DAS	EDP	FRV1	FRV2	FRV3	FRV4	IRV1	IRV2	IRV3	LEO	NEG	PVB	SAF1I	SAF3	SAF5	SFV	STPV	STP6	STPI	STPO
AIS1		1	1	1	1	1	0	0	0	1	0	1	0	1	1	1	0	1	0	0	1	1	1
AIS2	0		0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
ANN	0	0		1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0
DAS	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EDP	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FRV1	0	0	0	1	1		0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
FRV2	0	0	0	1	1	0		0	0	1	0	1	0	1	1	1	0	1	0	0	1	1	1
FRV3	0	0	0	1	1	0	0		0	0	0	1	0	1	0	1	0	1	0	0	1	1	1
FRV4	1	1	1	1	1	1	0	1		1	1	1	1	1	1	1	0	1	1	0	1	1	1
IRV1	0	0	0	0	0	0	0	0	0		0	0	0	1	0	0	0	0	0	0	1	0	0
IRV2	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	0	0	0	0	0	0	0
IRV3	0	0	0	1	1	0	0	0	0	0	0		0	1	0	0	0	0	0	0	1	0	0
LEO	0	0	0	1	1	0	0	0	0	0	0	0		1	0	0	0	1	0	0	1	1	0
NEG	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
PVB	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
SAF1I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
SAF3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	1	0	0
SAF5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0		0	0	1	0	0
SFV	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	1		0	1	0	0
STPV	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0		1	0	0
STP6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
STPI	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1		0
STPO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Angela 1982 SORTED Rank = 95

	FRV4	AIS1	FRV2	FRV3	LEO	SFV	ANN	AIS2	FRV1	IRV3	STPI	SAF3	STPV	IRV1	SAF5	IRV2	PVB	STPO	SAF1I	DAS	EDP	STP6	NEG
FRV4		1	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
AIS1	0		0	0	0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1
FRV2	0	0		0	0	0	0	0	0	1	1	0	0	1	1	0	1	1	1	1	1	1	1
FRV3	0	0	0		0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	1	1	1	1
LEO	0	0	0	0		0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	1	1	1
SFV	0	0	0	0	0		0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1
ANN	0	0	0	0	0	0		0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1
AIS2	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
FRV1	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1	1	1	1
IRV3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	1	1	1	1
STPI	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1	1	1	1
SAF3	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	1	1
STPV	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1	1
IRV1	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	1	1
SAF5	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	1	1
IRV2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	1
PVB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
STPO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
SAF1I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
DAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
EDP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
STP6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
NEG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Figure 7-24. Illustration of a Speaker POSET with Pairwise Comparisons for 20 Variables

It is important to note that posets can represent elements at many different levels. The Lectal Lattice comprises two types: (1) posets in which the elements are individual linguistic variables, which are then aggregated into an idiolect for a single speaker (as illustrated for Angela in Figure 7-24), and (2) posets in which the elements are the idiolects of individual speakers which can then be aggregated into different linguistic varieties, such as dialects, regiolects, sociolects (as illustrated in the next section).

7.4.4.3. The Lectal Lattice

Figure 7-25 presents the Lectal Lattice for the 20 panel speakers in 1982. The vertical axis represents the RANK, and the horizontal axis represents the FILE, i.e., the left-to-right right line-up of the individual lects which is based on the first principal component (see PC1 in Figure 7-14). The lattice was created with standard R functions, including plot, points, lines and text. It is a SEMI-LATTICE because it does not display all of the points in the lattice, rather only the significant ones, which greatly simplifies visualisation by eliminating redundant and irrelevant information. The points for each speaker's idiolect form the foundation of the lattice, which are labelled with the speakers’ pseudonyms. Each node in the Lectal Lattice represents a lect, either a single idiolect or a group of lects that have been joined. Node numbers themselves are arbitrary; they are assigned sequentially and used to uniquely identify the individual nodes in the LATTICE.

From this picture, speakers plainly fall into two distinct groups, those from Schwäbisch Gmünd on the left and those from Stuttgart on the right, with only one exception. Ema is one of the oldest speakers in the study (55 in 1982); her parents were farmers, and she completed only *Grundschule* ‘elementary school’. Her dialect contains many traditional Swabian forms which are more in line with the conservative variety spoken in Schwäbisch Gmünd.

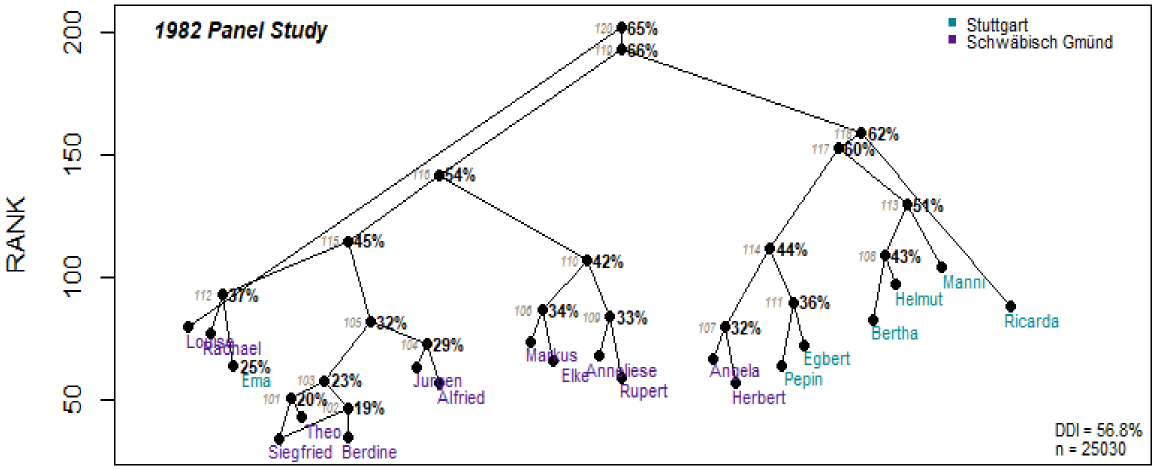


Figure 7-25. Lectal Lattice – 1982 Panel Study

Turning to 2017, Figure 7-26 presents the Lectal Lattice for the 20 panel speakers 35 years later. A large group of Schwäbisch Gmünd speakers is still visible on the left; however, on the right, speakers from Schwäbisch Gmünd have “fused” with those from Stuttgart, following other findings in this study which establish the formation a new regional standard variety. The Lectal Lattice supports the findings in Chapter 4 that the Swabian dialect is levelling, changing from a geographical or horizontal variety to a sociolectal or vertical variety, as a result of the extensive social and demographic transformation taking place in contemporary German society.

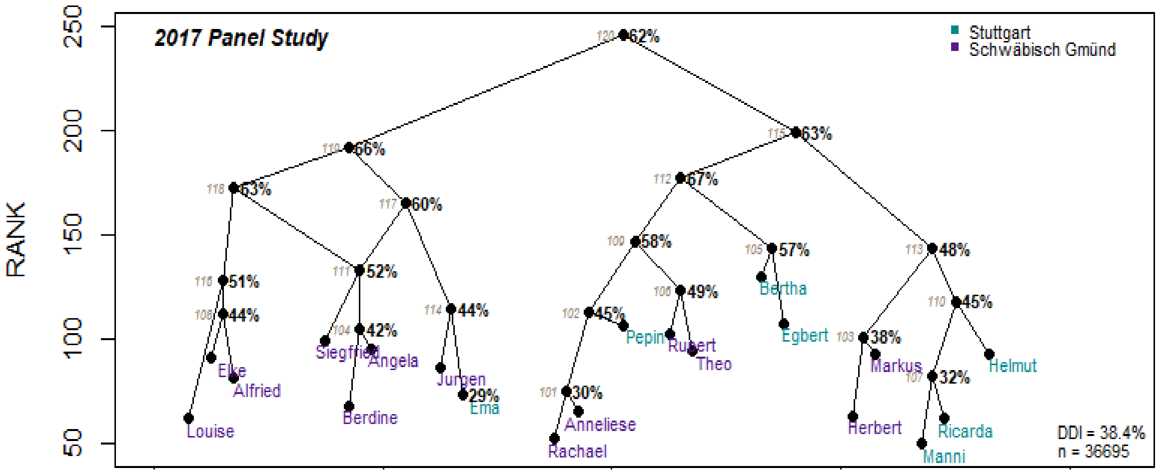


Figure 7-26. Lectal Lattice – 2017 Panel Study

Figure 7-26 also reveals that many Schwäbisch Gmünd speakers have retained their conservative dialect features over the years. As Chapter 4 established, dialect attrition and retention are highly influenced by Swabian orientation. Many of the speakers who have moved away from the conservative local dialect to the fused, supraregional variety are those who live and regularly communicate with speakers from other dialect groups (cf. Ammon 1973), such as Herbert, Markus and Rupert who travel extensively across Germany for work. Speakers who have retained the conservative dialect, such as Ema, Jurgen, Angela and Siegfried, show the most decisive local orientation to Swabia (see also Baayen, Beaman, and Ramscar 2021).

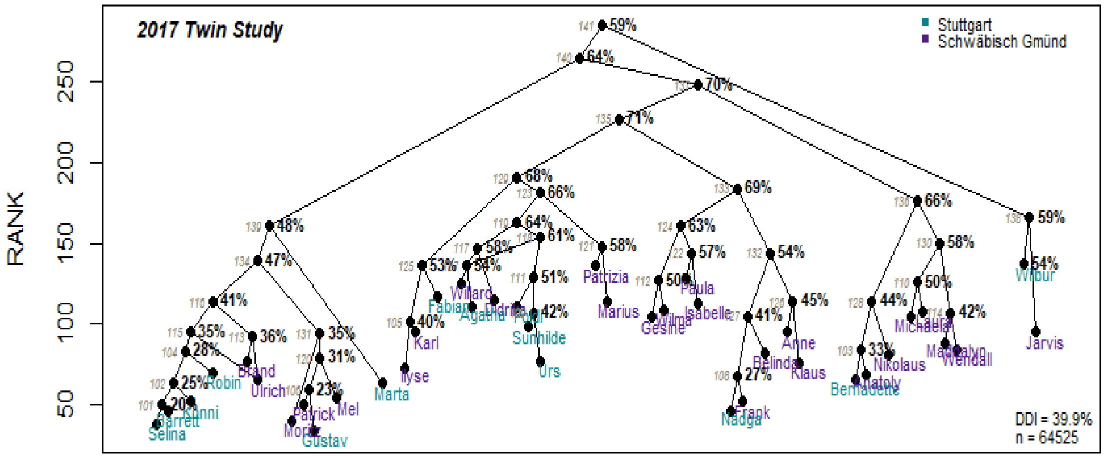


Figure 7-27. Lectal Lattice – 2017 Twin Study

In comparing the results across real- and apparent-time, the 2017 twin speakers, with similar dialect density to the 2017 panel speakers, show analogous mixing and lectal fusing among the Stuttgart and Schwäbisch Gmünd speakers, demonstrating that apparent-time change mirrors real-time. The three most conservative Stuttgart speakers, Wilbur, Bernadette, and Nadga, have low levels of education, not having completed their *Abiturs*.

The Lectal Lattice produces results similar to PCA, as discussed in Chapter 4, albeit with a different graphical representation. Both approaches reveal two distinct lects, Stuttgart and Schwäbisch Gmünd. Both PCA and the Lectal Lattice are data reduction methods that unveil significant groupings of speakers based on linguistic factors alone. One advantage of the Lectal Lattice over PCA is in the graphical display: the hierarchical depiction of related lects exposes the underlying relationships between lects without dissecting multiple principal components and drawing ellipses or rectangles to identify specific groups of speakers. Another crucial advantage of the Lectal Lattice over PCA is in the calculation of the distance between lects: with principal components, distance is calculated based only on the frequencies of the variables; with the Lectal Lattice, distance is determined based on both the frequencies and the implicational order of the variables. However, the ultimate advantage of the Lectal Lattice over PCA and other data reduction methods is the ability to calculate, measure and compare how closely different lects and groups of lects cohere, as explained in the following section.

7.4.4.4. Implicational coherence

A central motivation behind the Lectal Lattice is the development of a method to evaluate the coherence of lects, that is, how tightly (or loosely) multiple variables co-occur within a given lect. With a quantifiable measure of coherence, HYPOTHESIS 3 of this research effort can be tested: are more coherent lects less susceptible to change and, conversely, are less coherent lects more vulnerable to change. The posets in the lattice provide a technique for quantitatively assessing the level of coherence in any given lect by calculating the number of significant pairwise comparisons that follow the implicational pattern. Implicational coherence (IC) is calculated by summing the 1's above the diagonal (i.e., significant pairs based on Suissa and Shuster (1985) Exact test ($p < .05$) using the Holm-Bonferroni method), subtracting the 1's below the diagonal (those deviating from the pattern), and then dividing by the total number of significant pairs in the poset. The following formula describes the calculation for implicational coherence:

$$IC = \frac{\sum_{i=1}^{n} x_i^{\omega} - \sum_{i=1}^{n} x_i^{\beta}}{\sum_{i=1}^{n} x^i}$$

Figure 7-25 through Figure 7-27 provide the IC percentages for each node in the lattice. To illustrate the IC calculation, Figure 7-28 presents the posets for two nodes in the 1982 Lectal Lattice (Figure 7-25): node 116 primarily comprises Schwäbisch Gmünd speakers, and node 118 largely represents Stuttgart speakers. In calculating the IC for node 116, there are 139 significant pairwise comparisons above the diagonal and 3 below, generating an IC of 54% ((139-3) / 253 = .538). The poset for node 118 reveals only one deviant, rendering an IC of 62% ((158-1) / 253 = .621). A two-tailed Student's t-distribution shows the difference in coherence between these two lects to be marginally significant ($p < .07$; $n = 253$). However, a holistic and meaningful analysis of coherence must take into account the resounding influence of factors such as Swabian orientation, variable type (Swabian or regional), among others, as this investigation has shown.

Node 116 IC = 54% Rank = 142

	FRV4	AIS1	FRV2	LEO	AIS2	FRV1	FRV3	STPI	ANN	SFV	IRV3	SAF5	STPV	STPO	PVB	STP6	IRV2	SAF3	IRV1	SAF1E	EDP	NEG	DAS
FRV4		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AIS1	0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FRV2	0	0		0	0	1	0	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1
LEO	0	0	0		1	0	0	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1
AIS2	0	0	0	0		0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	1	1	1
FRV1	0	0	0	0	0		0	0	0	1	1	1	1	1	0	1	0	0	0	0	1	1	1
FRV3	0	0	0	0	0	0		0	0	0	1	1	1	1	0	1	0	0	1	0	1	1	1
STPI	0	0	0	0	0	0	0		0	1	1	1	1	1	0	1	0	0	0	0	1	1	1
ANN	0	0	0	0	0	0	1	0		0	1	1	1	1	0	1	0	0	0	0	1	1	1
SFV	0	0	0	0	0	0	0	0	0		1	0	0	0	0	1	0	0	0	1	1	1	1
IRV3	0	0	0	0	0	0	0	0	0	0		1	0	1	0	1	0	0	0	0	1	1	1
SAF5	0	0	0	0	0	0	0	0	0	0	1		0	0	0	1	0	0	0	0	1	1	1
STPV	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	0	0	1	1	1
STPO	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	1	1
PVB	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	1
STP6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	1
IRV2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
SAF3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
IRV1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
SAF1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
EDP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
NEG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
DAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Node 118 IC = 62% Rank = 159

	FRV4	AIS1	AIS2	FRV3	FRV2	FRV1	STPV	LEO	SFV	ANN	IRV1	IRV3	PVB	SAF5	EDP	IRV2	STPO	STPI	SAF3	SAF1E	NEG	DAS	STP6
FRV4		1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
AIS1	0		0	0	0	0	1	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1
AIS2	0	0		0	0	0	1	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1
FRV3	0	0	0		0	0	1	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1
FRV2	0	0	0	0		0	1	0	1	1	0	0	0	1	1	0	1	1	0	1	1	1	1
FRV1	0	0	0	0	0		1	0	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1
STPV	0	0	0	0	0	1		0	0	0	1	0	0	1	1	1	1	1	0	1	1	1	1
LEO	0	0	0	0	0	0	0		0	1	0	1	0	1	1	0	1	1	0	1	1	1	1
SFV	0	0	0	0	0	0	0	0		0	0	1	0	1	1	0	0	1	0	1	1	1	1
ANN	0	0	0	0	0	0	0	0	0		0	1	0	1	1	0	0	1	0	1	1	1	1
IRV1	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	1	1	0	1	1	1	1
IRV3	0	0	0	0	0	0	0	0	0	0	0		0	1	1	0	0	1	0	1	1	1	1
PVB	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	1	1	0	1	1	1	1
SAF5	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	1	0	1	1	1	1
EDP	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	1	1	1
IRV2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	1	1	1
STPO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	1	1	1
STPI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	1	1
SAF3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	1
SAF1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
NEG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
DAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
STP6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Figure 7-28. POSETS for Two Distinguishing Lects in 1982 Panel Study

At the core of this research is the question of whether lectal coherence enables or inhibits linguistic change. The claim of HYPOTHESIS 3, that more coherent lects are more resistant to change while less coherent lects are more prone to change, can be investigated by comparing implicational coherence (IC) percentages and dialect density indices (DDI) across lects. To test this hypothesis, Figure 7-29 depicts Lectal Lattices for the panel study for the 12 Swabian variables, broken out by community and recording year. In 1982, Schwabisch Gmünd shows a DDI of 61.2% (Table 7-1) and an IC of 80% (Figure 7-29), while Stuttgart shows a DDI of 47.9% and an IC of 59%. By 2017 dialect density has declined 7.5% more in Stuttgart (from 47.9% to 26.6%) than in Schwäbisch Gmünd (from 61.2% to 47.4%), providing support for the hypothesis that the less coherent variety of Stuttgart is more susceptible to change than the more coherent variety of Schwäbisch Gmünd. The supposition underlying this premise is that strong coherence binds linguistic variables together making them more resistant to outside influences (e.g., “change-from-above”), much like the strong social ties in closed social networks which resist outside innovation (Milroy 1987). Additional analyses are definitely needed to test the validity of the Lectal Lattice further; however, this methodological construct offers a potential new approach for evaluating lectal coherence, dialect density, and language change.

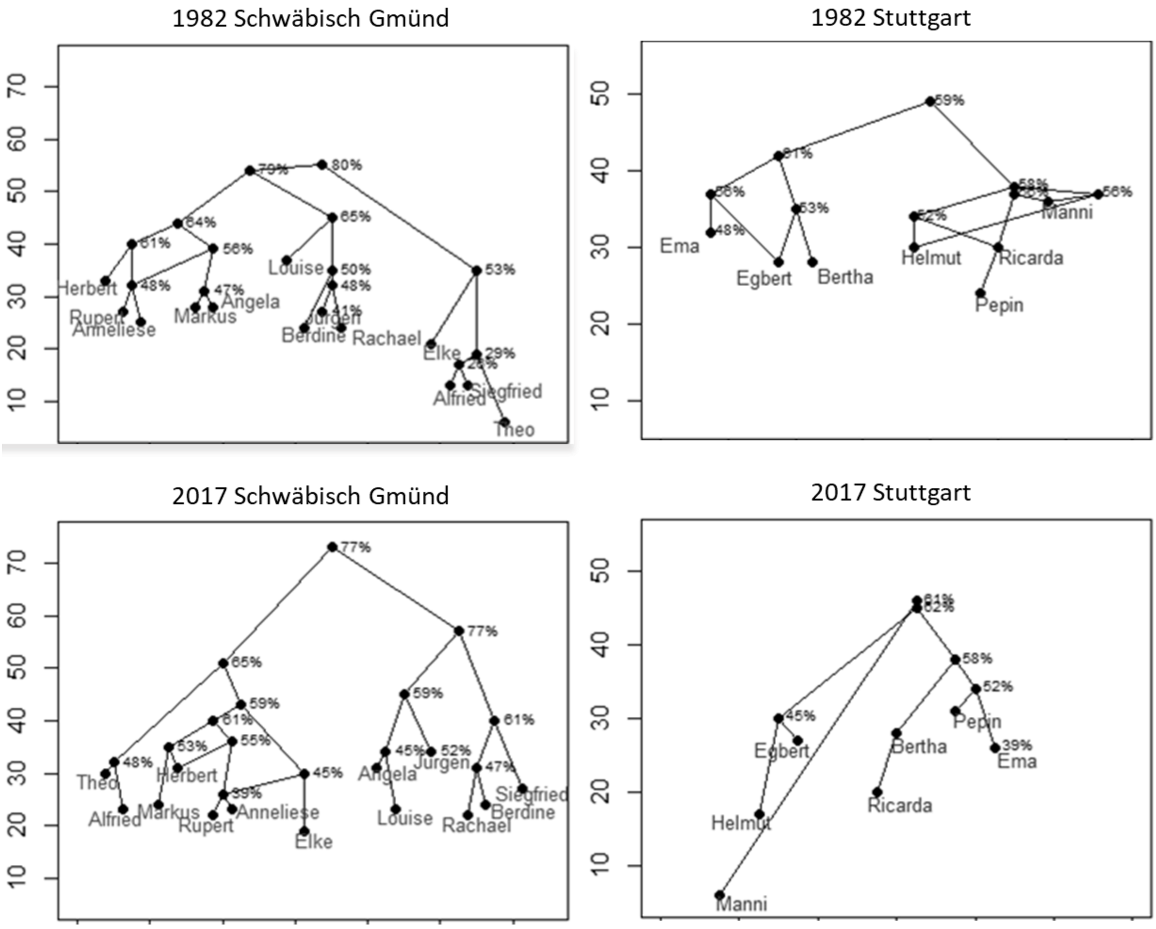


Figure 7-29. Lectal Lattice for 12 Swabian Features in Real-Time – Panel Study

Finally, in correlating the IC indices and the PCA coefficients across the nodes in the 1982 and 2017 panel study, PC1 yields an R^2 of .117, while IC shows a R^2 of .396, demonstrating that implicational coherence does a better job of explaining the variance in the data. According to Cohen (1992), r-squared values greater than .26 indicate a high effect size. Moreover, the majority of the variance is explained by the lectal RANK (the vertical axis in the Lectal Lattice) rather than the FILE (the horizontal axis) (RANK: $R^2 = .538$; FILE: $R^2 = .073$), indicating that pairwise comparisons (represented by the RANK) provide an improved explanation of the relationships between the variables than principal components (represented by the FILE).

7.4.4.5. Theoretical implications

Early in the variationist paradigm, Fasold (1970) argued that the combination of frequency analysis and implicational scaling leads to more revealing insights than either approach does individually (Fasold 1970:562). The Lectal Lattice advances Fasold's claim by exploring a method for combining statistically significant differences in the proportion of dialect use with implicational scaling techniques to measure the levels of coherence in differing lects. By measuring levels of implicational coherence, the Lectal Lattice provides an approach for predicting which lects may be more susceptible to change and which may be more impervious.

The Lectal Lattice offers several benefits over other approaches for identifying lects and assessing coherence. First, it provides greater explanatory value over principal components by exposing the significant relationships between variables based on pairwise comparisons. Second, rather than a single linear chain, such as with an implicational scale, the Lectal Lattice is multidimensional, rendering a single visualisation that unveils the logical groupings and hierarchical ordering of similar lects. Third, lattice methodology with its variable posets offers an independent statistical method for calculating and the level of coherence of individual lects. Fourth, the Lectal Lattice offers a technique for investigating the premise that less coherent lects are more vulnerable to change by comparing coherence levels across lects and assessing how they change over time. Finally, lattice theory supports Weinreich, Labov, and Herzog's (1968) contention that coherence or "orderly heterogeneity" is found in the aggregate grammar of the speech community rather than in the individual, reinforcing the widely-held premise that individuals in a community behave in parallel, reflecting regularity and coherence.

7.4.4.6. Limitations and future opportunities

This section introduced a new, exploratory model as a potential means for measuring, visualising, and comparing coherence across lects; however, as with all new approaches, it is not without limitations. Future refinement of the Lectal Lattice must consider the following:

1. Structure and shape of the graphs: the structure and shape of the Lectal Lattice, particularly for the horizontal axis (based on PC1), is somewhat arbitrary. Future refinement should consider a method for comparing the generated graphs to an MDS

(multidimensional scaling) analysis to enhance the structure and provide greater visualisation of the differences between lects.

2. Proportion of idiolects sharing the same pattern: currently the Lectal Lattice is built from significant patterns that occur in at least one idiolect in the lect, meaning that all pairwise comparisons are treated equally. Future development should take into account the frequency of occurrence of each pattern, i.e., the proportion of speakers with the same pattern, and weight the calculation of rank and implicational coherence based on the number of speakers exhibiting each pattern.
3. Variables with very low or very high token counts: the current implementation does not account for variables with very high or very low token counts. While none of the variables in the current study is skewed in this way, this situation needs to be considered when expanding the Lectal Lattice to other datasets.
4. Additional intra- and extralinguistic predictors: the current study has considered only recording year, community, and variable type as factors impacting lectal coherence. Additional social predictors, such as speakers' age and Swabian orientation, as well as sociolinguistic predictors, such as variable stigma, salience, and status, should be incorporated into the model to uncover more nuanced aspects of lectal coherence.
5. Larger dataset: a common problem with sociolinguistic data is the small token count making it difficult to conduct rigorous tests of statistical significance. An opportunity for the future is to test the concept of the Lectal Lattice against more extensive and more complex datasets to assess its explanatory power and determine its robustness.

7.5. Discussion

This investigation in coherence in Swabian has probed four different methods for analysing the orderly heterogeneity of sociolects: (1) covariation or correlational analysis, (2) multivariate analysis with interaction effects, (3) principal component analysis with variable weightings, and (4) lattice theory with pairwise comparisons and implicational scaling. As the results from these analyses show, there is no silver bullet for assessing sociolinguistic coherence. Each of these methods has unveiled disparate aspects of a highly complex, multifaceted, and nuanced phenomenon. Covariation and correlational analyses reveal how tightly coupled individual variables may be, and hence, whether they are more or less likely to move in unison. Mixed-effects regression models identify which intra- and extralinguistic constraints influence coherence, either strengthening or breaking down the relationships. Principal components analyses offer a multivariate approach using orthogonal linear transformation to expose the underlying relationships between the variables, thereby illuminating the ones carrying more weight. Finally, pairwise comparisons with implicational scaling can be utilised to construct a model that visually illustrates how close (or distant) individuals lects are with one another – for both individual idiolects as well as for groups of lects that may form a local dialect, regiolect, sociolect, register, or other coherent linguistic variety.

In the covariation analysis of four Swabian sociolects separated by place and time, greater coherence is seen in varieties closer to the standard language, supporting the premise that consistency and prestige promote less variation and greater convergence to the standard language (Woo, Gadanidis, and Nagy, submitted). Concerning the core hypothesis of this chapter, however, the results of the covariation analysis are inconclusive: while the variety with the weakest coherence, Schwäbisch Gmünd 1982 ($\overline{x}$ = .302, DDI change = 13.8%), has levelled considerably in real-time, it has levelled somewhat less than the variety with the greatest coherence, Stuttgart 2017 ($\overline{x}$ = .543; DDI change = 21.3%), although this difference is not statistically significant. In addition, no significant differences in covariation were evident in apparent-time: younger and older speakers demonstrate similar levels of coherence, as measured by correlation means (all groups are reasonably coherent, close to $\overline{x}$ = .500). These findings suggest a reformulation of HYPOTHESIS 3: how coherent must a lect be in order to be resistant to change? And concomitantly, what level of (in)coherence is necessary to instigate change?

As with all sociolinguistic analyses, there are multiple factors at play. The multivariate analysis investigated seven sociolinguistic factors and found five to be strong predictors of coherence: community membership (Stuttgart), recording year (2017), variable type (Swabian), variable stage (changing), and level of stigmatisation (low). Most significant is the interaction between the Swabian-specific variables and those undergoing change (i.e., higher levels of attrition) with lower levels of stigmatisation (hence, below the level of consciousness). Perhaps, as Guy (2013, 2014) has suggested, the more highly stigmatised features, which are more perceptually salient, are reserved for identity formation, style indexicalities, and stance-taking. Guy’s holistic notion resolves the disconnect between the concept of a speech community, which promotes collective coherence, and the notion of speaker agency, which advocates individual choice, providing support for his proposal that the sets of variables that covary belong to the community, while those that do not belong to the individual (Guy 2014, 2020).

The results of the multivariate analysis demonstrate several strong interaction effects influencing the level of covariation across variables. First, confirming Cheshire (2003), Sharma (2005), and others, speakers are more likely to avoid nonstandard morphosyntactic variables than phonological ones, as nonstandard morphosyntax is more strongly associated with lower levels of education. Second, the Swabian-specific features cohere more tightly than the regional features, a fact which can be explained by their common sociohistorical background and by speakers’ desires to project a shared sense of identity (Tamminga 2019). Third, because Stuttgart in 1982 exhibits a high level of covariation with the variables undergoing change, it is likely that convergence toward the standard language was already in progress 35 years ago. By 2017 the results show that Schwäbisch Gmünd is following Stuttgart’s lead in converging toward the regional standard. Fourth, high-stigma variables are under the greatest attrition: many have entirely died out or significantly receded over the timeframe of this study, particularly in Stuttgart. Appendix A.3 documents a number of Swabian variables in the current corpus with extremely low token counts, primarily found only in the 1982 recordings due to their significant attrition over the years. Finally, the lack of a community and time distinction for the variables currently undergoing change exposes a collective sense of social motivation for convergence toward the standard language (Tamminga 2019, Woo, Gadanidis, and Nagy, submitted).

The findings of the principal components analysis reveal that linguistic variables cluster based on their sociohistorical and etymological origin. This study patently shows that the type of variable, whether Swabian or regional, has an overarching effect on the level of coherence within lects. The Swabian dialect is a conservative variety with a long tradition of evoking sundry and opposing images such as “inventive”, “hard-working” and “thrifty” but also “backward”, “uneducated” and “miserly”. Hence, it is not surprising that speakers would react differently to traditional Swabian-specific features than with regional ones entering the dialect from other varieties of German. The stigma associated with the traditional Swabian-specific variables has increased over time concomitant with rising levels of education and individuals’ aspirations to improve their social standing over the parents’ generation, stimulating a reduction in dialect density and thereby a strengthening in coherence through convergence to the standard language.

The Lectal Lattice offers an innovative, albeit still exploratory, approach for depicting and measuring sociolectal coherence by establishing an implicational coherence metric to assess how vulnerable any given lect is to change. The initial findings suggest that lectal coherence has a pivotal role to play in language change; however, the factors are nuanced and multifarious. The preliminary results show that the tighter coherence of the Swabian-only variables in Schwäbisch Gmünd has a constraining effect on change while the looser coherence in Stuttgart has an accelerating impact. Further tests must be conducted to validate the efficacy of this tool.

In sum, coherence is a matter of relativity and degree, not absoluteness (Tomaschek, Hendrix, and Baayen 2018). The relative level of coherence for the four sociolects has changed over time with both Schwäbisch Gmünd and Stuttgart becoming “more coherent” in 2017 than they were in 1982 as Swabian has converged toward the standard language. During the course of change, coherence is reduced as some variables naturally spread faster than others; however, as variables converge, coherence increases. This process leads to the speculation that in the ensuing years, as Swabian continues to converge toward the standard language and as more of the changing variables stabilise, coherence will continue to strengthen. However, what will happen when new changes not targeted toward the standard language occur? As the Roman scholar Marcus Terentius Varro (116-27 BC) observed, *consuetudo loquendi est in motu,* ‘the vernacular is always in motion’ (translated by Taylor 1975). As some variables stabilise, others begin to change, keeping sociolinguists constantly on the move in search of the cognitive coherence of sociolects.

7.6. Summary

This chapter has explored four different approaches to the study of sociolectal coherence: (1) correlational analyses to expose the relationships between variables; (2) multivariate analysis of correlation coefficients to establish the significant factors affecting the correlations between variables; (3) principal components analysis to investigate variable clustering and those carrying the most coherence weight; and, (4) pairwise comparisons combined with implicational analysis and lattice theory to identify lects and sub-lects that are more similar and more coherent. The findings confirm Guy's (2013) assertion that sociolectal coherence is indeed more nuanced and multidimensional than previously assumed.

The citation at the beginning of this chapter offers a thought-provoking parallel for the study of coherence. In 2017, Schwäbisch Gmünd Klaus explained a time during his military service as a young man, when he left Swabia for the first time and was stationed in northern Germany. He was trying to communicate with his *Plattdeutsch* 'Low German' speaking superior:

(45) *Klaus (2017)*

er hat wirklich Schwierigkêite khet	he really had trouble
mi zu verstehe …	to understand me
wenn du des wirklich	when you actually
zum erschte Mâl so heersch	hear it for the first time
dann stehsch du dann	then you stand there
wie der Ochs vor der Apothek	like the ox in front of the pharmacy

[S042-17-I-1-Klaus-00:45:25]

The expression, *wie der Ochs vor der Apothek* 'like the ox in front of the pharmacy', is actually a combination of two different German sayings: *ein Ochs vorm Berg stehen* 'an Ox standing before a mountain [meaning dumb or helpless with no idea what to do next]' and *ein Pferd vor der Apotheke kotzen sehen* 'seeing a horse puking in front of the pharmacy [meaning to experience something very unusual]'. In German, as the saying goes, the ox stands perplexed in front of the mountain, and the horse gets sick in front of the pharmacy; yet it appears that Klaus experienced both feelings concurrently and fused the two expressions into one. Having spent all his life in Swabia, he likely felt both helpless like the ox, not knowing what to do to get his superior to understand him, as well as surprised like seeing a sick horse at the pharmacy, never having experienced such a situation before. While it is likely that he simply mixed up these two common German sayings, this example illustrates that speakers combine variants in innovative and unique ways to convey new and personal meanings yet retain coherence in expression. Klaus felt both mystified and surprised, like an ox in front of the pharmacy, just as I feel, both confounded and contemplative, investigating the concept of coherence.

Chapter 8. Thirty-five years of variation and change

Hochdeutsch … des isch nur Kopf kôine Seele drin
'Standard German … it's only a head without a soul'
– Willard 2017

8.1. Introduction

There is a dearth of variationist sociolinguistic studies in varieties of German, particularly longitudinal perspectives of the dialect-standard language contact situation. Thus, the first aim of this research has been to conduct a variationist sociolinguistic study of Swabian, an understudied variety of German, with the goal of expanding the inventory of German sociolinguistic and social dialectological research. The findings reveal that most variables are undergoing change, some have moved to completion, others are actively in the process of change, and yet others have developed an indexical status in which nonstandard variants are imbued with social meaning, conveying notions of personal identity and local belonging.

The second goal of this thesis has been to carry out an in-depth evaluation of the compatibility and complementarity of real-time and apparent-time analyses through a combined panel and trend study. Such joint studies provide the opportunity to cross-validate and triangulate the findings across multiple subgroups and shed greater light on the nature, rate, and dispersion of linguistic change. The addition of a lifespan component to a conventional trend study aids in blending the qualitative and ethnographic perspective into the traditional quantitative variationist paradigm, thereby providing enhanced insight into the factors influencing both longitudinal lifespan and community change.

The third goal of this research effort has been to explore the concept of sociolectal coherence and its role in shaping the systematic and predictable linguistic patterns that govern variation and advance or constrain language change. Sociolinguists have explored the notion of coherence with numerous variables, using various methods, and across diverse language varieties, yet none have found the holy grail that explains the origin and motivation behind all variation and change. This study shows that by modelling a larger number of variables, across different levels of the grammar, viewed through multiple time-slices, both real and apparent, the more "coherent" the variety becomes and the more explanatory power the model bears (Meyerhoff and Klaere 2017:42).

The sections in this concluding chapter summarise the key findings from this investigation of Swabian (Section 8.2), the empirical contributions offered to the field (Section 8.3), the methodological developments probed throughout the study (Section 8.4), and the theoretical innovations explored in the analysis of longitudinal language variation and change (Section 8.5). I conclude by proposing additional opportunities for future research (Section 8.6).

8.2. Key Findings

The key findings from this investigation are organised following the three themes underpinning this research (see Section 1.2): the changing Swabian dialect situation (Section 8.2.1), the comparability and compatibility of a combined panel and trend study (Section 8.2.2), and the role of sociolectal coherence in language variation and change (Section 8.2.3).

8.2.1. Swabian Dialect Landscape

This investigation demonstrates overwhelming confirmation of HYPOTHESIS 1 of this thesis, which claims that Swabian, as with many nonstandard varieties across the globe, is undergoing massive dialect levelling and convergence to the standard language, compelling nonstandard variants to retreat into smaller and more focussed domains of usage. Swabian prevails for speakers in a non-urban environment and with high orientation to their local community. It is essential for expressing indexicalities of social meaning and for signalling deep-rooted bonds with "home and hearth". Nevertheless, the domains of usage where Swabian is appropriate are shrinking as competing personas conveying "well-educated" and "successful" increasingly infringe on the spheres of language usage traditionally dominated by Swabian.

Supraregionalisation. Dialect levelling through processes of SUPRAREGIONALISATION is endemic in Swabian, with the variety in Schwäbisch Gmünd unmistakeably "adverging" toward and "fusing" with the higher status, regional variety in Stuttgart. As with other nonstandard varieties across the globe, traditional Swabian variants are succumbing to "linguistic variants with a wider socio-spatial currency" (Britain 2010:193). Expanding urbanisation, increased mobility, and growing numbers of immigrants, both from within and outside Germany, are bringing more diverse people together, hence, as Schwäbisch Gmünd speaker Belinda says, everyone has to "speak a little more standard German" so the new people can understand (see example (23)).

Urbanity versus rurality. The urban-rural divide is ever-present in modern Germany. Consistently throughout this investigation, the semi-rural town of Schwäbisch Gmünd and its surrounding suburbs exhibit higher levels of Swabian usage than the urban centre of Stuttgart, establishing that outlying communities are attracted to the prestigious urban centre where change generally begins, spreading to neighbouring towns in waves or cascades (Schmidt's (1872) *Wellentheorie* 'Wave Model', Trudgill's (1974) Gravity Model; Labov's (2003) Cascade Model). As Schwäbisch Gmünd swells in size and local prestige, dialect variants are levelling and merging with the regional standard variety already well-established in Stuttgart; hence, traditional dialect usage is being pushed even further into the countryside. Speakers often comment that the "true" dialect is only spoken in *die Schwäbischen Alp* 'the Swabian mountains'.

Education. The findings from this study demonstrate the increasing role of education in furthering prescriptivism and adherence to the German standard language ideology. A consequence of a more highly educated society is a more stratified society – the "educated" versus the "uneducated" – which can open or close doors to social and financial advancement.

Over the last 50 years, education in Germany has risen three-fold (individuals with *Abiturs* rose from 8% in 1970 to 25% in 2000 (Frietsch 2003:38)). In 1982, Swabian society was more egalitarian with respect to education which played no significant differentiating role in speakers' propensity to speak dialect. In both real- and apparent-time, as education levels have increased, dialect density has decreased, creating a more highly stratified and socially differentiated society (see Figure 3-10), which is reflected in speakers' choice of language variants.

Geographic mobility. While educational attainment was not a discerning factor in 1982, geographic mobility played a pertinent role. Speakers with higher levels of mobility, bringing them into more frequent contact with speakers of other linguistic varieties, show lower levels of dialect density. However, by 2017, the roles of education and mobility have reversed: the mobility effect has vanished, and education has usurped its place as a quintessential differentiating factor in dialect usage. The changing influence of residential mobility and higher education on dialect usage reflects the transformation that is occurring in Swabian society: geographical mobility has become ubiquitous, and education has become a conspicuous marker of social standing.

Identity and accommodation. This study initially sought to unravel the confounding influence of dialect identity and linguistic accommodation on speakers' choice of linguistic variants. However, in the absence of controlled psycholinguistic experiments, whether the linguistic choices people make are conscious and deliberate, as suggested with identity construction, or automatic and mechanical, as argued with linguistic accommodation, the underlying motivations are impossible to tease apart. I concur with Tuten's (2008:261) explanation that the two concepts are simultaneous and mutually dependent and with Hazen's (2017) claim that some, perhaps the more salient variables, may be appropriated for identity construction while others more readily react to automatic, structural patterns (cf. Guy (2014) "bricks and bricolage").

Indexicalities and social meaning. Swabian dialect identity construction reflects what Auer (2013) calls the "New Regionalism" in Germany in which speakers deploy a mix of features to index a regional identity, partially to counteract mounting nationalism, partially to signal Swabian belonging. High Swabian orientation is one of the strongest predictors of dialect density, more influential than all other factors investigated in this study, overpowering differences in community, recording year, age group, mobility and education. As a Swabian speaker, Helmut remarked that he feels like he should not speak dialect in public, yet he has an enduring, intrinsic "longing for it" (example (11)). Young educated speakers, such as Fabian, Patrizia, and Michaela, demonstrate that an emerging "Swabian renaissance" may be underway. They find Swabian to be *voll cool* 'totally cool' (examples (8) and (18)), as well as *niedlich*, *sympathisch, schön* 'cute, friendly, lovely' (example (9)). Modern Swabian is *net ultra-schwäbisch, etwas in der Mitte* 'not ultra-Swabian, [but] something in the middle', says Markus (example (17)), speaking Swabian *das i wêiß dass die mi verstehet* 'so that I know they understand me', echoes Marius (example

(19)). Young Swabians today can simultaneously convey a traditional local identity along with a modern, successful, supralocal identity by exploiting Swabian, regional and standard language features in novel ways to convey indexicalities of social meaning.

8.2.2. Real- and Apparent-time analyses

This research contributes to the growing literature of combined real- and apparent-time studies, confirming HYPOTHESIS 2 of this thesis that apparent-time change largely mirrors real-time change. While most panel research shows SPEAKER STABILITY to be the most common lifespan pattern (Sankoff 2006:114), few studies have been conducted in situations comparable to Swabia, which is undergoing massive dialect levelling and advergence to the standard language. Hence, in the current study, LIFESPAN CHANGE is the predominant pattern, with speakers across their lifetimes following the community trend, demonstrating WLH's (1968) premise that communal change is the aggregation of individual change.

Compatibility and complementarity of panel and trend studies. As with other combined panel and trend studies, the current investigation shows considerable consistency between the two investigative methods. The current panel study of 20 speakers is considered large by sociolinguistic panel study standards, thereby mostly avoiding the issue of low token counts which often plague panel research. The 40 real-time interviews with the panel participants and the 40 apparent-time interviews with the social twins proved to be highly compatible and provided contrasting data points for triangulating the results, producing greater overall validity.

Lifespan and communal change. The findings from this study concur with Sankoff (2006) and others that lifespan change largely follows communal change, although there are always individual patterns that diverge from the norm. People are malleable and change over time due to different life events (e.g., marriage, divorce, career change, relocation), and their identities, ideologies, and speech patterns change commensurately. In 1982, Louise was in her early 50's and in the unique situation of being the only woman on the board for the local theatre. Under the influence of the linguistic market and feeling the pressure to exhibit a more powerful persona, she used more standard variants in comparison to her cohorts, Rachael and Herbert, at the time. In her late 80's in 2017, Louise exemplifies RETROGRADE CHANGE, using more dialect variants than she did earlier, thereby exposing the long-tail of language change when late-stage individual change runs counter to ongoing communal change.

Critical-age hypothesis. This study has added substantial evidence to the growing body of research which casts doubt on the CRITICAL-AGE HYPOTHESIS by demonstrating that people can and do change their speech patterns over the course of their lifetimes. According to Sankoff (2006, 2019), the predominant individual pattern is LIFESPAN STABILITY; however, in volatile situations, such as the rampant dialect levelling underway in Swabia, it seems reasonable to assume that most members of the community would conform to the trend and "swim with the tide" rather than be subjected to ridicule and marginalisation.

Rate of change. HYPOTHESIS 2 claims that the direction of change is observable in the apparent-time analysis, and the speed of change is discernable in the real-time analysis. In the current study, the direction and rate of change in the real- and apparent-time analyses primarily reveal similar trends. Across their lifespan, the panel speakers' dialect density dropped 18.4% (from 56.8% in 1982 to 38.4% in 2017), and across the generations, the 2017 twin speakers' dialect density dropped 11.5% (from 44.6% for the older speakers to 33.1% for the younger speakers). It is important to remember that the real- and apparent-time analyses in this study both cover a 35-year time span so that the older speakers in the twin study are comparable in age to the panel speakers in 2017. A crucial aspect of this study is that real-time change has been more robust for the panel speakers (18.4% decline) than apparent-time change for the twin speakers (11.5% decline), likely because they started from a higher level of dialect density in 1982 and needed to "catch up". The most profound difference in the rate of change lies in the community, with Stuttgart transitioning more dramatically to the standard language (DDI 26.6% for 2017 panel speakers and 20.5% for younger twin study speakers), while the speakers from Schwäbisch Gmünd lag behind (DDI 47.4% for the 2017 panel speakers and 41.8% for the younger twin study speakers, see Table 4-3).

Societal change. The results from this investigation suggest that overwhelming societal change is occurring in Swabia. As previously mentioned, rising education, ubiquitous mobility, increasing immigration, and expanding urbanisation are creating more diffuse speech communities with "weaker ties" (Milroy & Milroy 1985), making them more vulnerable to dialect levelling and the emerging supraregionalised language variety. Concomitantly, communities on the outskirts, in Schwäbisch Gmünd and the *Schwäbischen Alp* 'Swabian mountains', are more "focussed", retaining stronger community ties and showing greater linguistic conformity and stability. Several speakers in the study call attention to the recency of this change, which appears to have predominately occurred throughout the last generation. Laura remarks that she speaks Swabian with her older brother but standard German with her younger brother who is ten years her junior (example (20)). Markus points out that, when they were younger, his children spoke "real" Swabian, but they have now entirely switched to standard German (example (22)). Michaela comments that, when she hears her parents speaking on home videos from when she was a baby, she does not even recognise them as her parents (example (25)). These examples and others demonstrate the overwhelming societal transformation and linguistic shift that has occurred in Swabia over the last 35 years.

8.2.3. Coherence and language change

This study has explored the orderly heterogeneity of sociolinguistic coherence, providing some support for HYPOTHESIS 3 of this investigation that "less coherent" lects are more vulnerable to change while "more coherent" lects are more resistant to change. The results from this investigation, however, are far from conclusive, leaving open many questions on the role of coherence in a comprehensive theory of linguistic change. The greatest mystery remains why some studies show high levels of coherence and others little to none. The findings concur with Guy (2013:63) that sociolectal coherence is more multidimensional than previously supposed (Guy 2013:63). Still, a few relevant findings from this investigation are worth noting.

Coherence is relative. This study demonstrates that coherence is a relative concept and may justly lie "in the eye of the beholder" (Gregersen and Pharao 2016:42). While variables may covary, show significant pairwise comparisons, be aligned in an implicational scale, or lie at similar distances in a lattice, coherence is defined as the aggregation of multiple variables and speakers into socially meaningful lects following systematic patterns of orderly heterogeneity. The elusive search for sociolectal coherence ultimately lies in how the concept is defined and what variables are considered. The polemic question of whether linguistic features are more like "bricks" or "bricolage" may be resolved in considering the nature of the variable in its relevant sociohistorical and sociolinguistic context. As this study, along with Paiva et al. (2020), Hazenberg (2017) and others, shows, individual variables react and evolve differently: some may be influenced by forces from above, others from below, while others may be recruited for identity construction projecting nuanced indexicalities of social meaning. Coherence may best be defined as the optimal mix of features for socially meaningful interaction (cf. Benor's (2010) "repertoire model"). Hence, the regional standard variety of Stuttgart is coherent in having variables that convey notions of prestige and success, while the more conservative variety of Schwäbisch Gmünd is coherent in using variables that project more traditional values of "home and hearth."

Coherence is multifaceted. In the search for models of orderly heterogeneity (WLH 1968), prior studies of coherence have utilised a collection of statistical methods ranging from correlational/covariation analysis, implicational scaling, principal components/constrained correspondence analysis, random forests, and other clustering techniques, and, as this study has explored, set and lattice theory. These different methods provide divergent views of coherence, leaving open questions of comparison across studies and of just "how" orderly and systematic a variety must be in order to be considered "coherent". Crucially, as this study decisively demonstrates, the nature of the variable is paramount, both its etymological and sociohistorical background, as well as its indexical status influencing its use in interaction. This investigation of 20 Swabian variables supports Sharma's (2005) claim that nonstandard usage is more multifaceted than standard usage as speakers tend to use nonstandard features in strategic ways to convey subtleties in social meaning, which may differ for each variable and in different contexts. Nonetheless, the findings show that Swabian-specific variables share common indexicalities and thus tend to change and covary in union (cf. Guy 2020). The role of variable stigmatisation adds another angle to the multifaceted aspect of sociolectal coherence, as high levels of stigma promote a shared social motivation across the community (Tamminga 2019) prompting greater convergence to the standard language.

Coherence is malleable. Overall, the findings show that real- and apparent-time studies do not necessarily move in lockstep with respect to coherence and that levels and patterns of coherence are malleable, influenced by a profusion of factors, which transform over time and space. The more conservative variety of Swabian spoken in Schwäbisch Gmünd in 1982 shows the highest dialect density and the lowest level of coherence, revealing the capricious and unpredictable effects of dialect mixture on orderly patterns of variation and change. Greater coherence is found in the supraregionalised variety of Stuttgart in 2017, supporting the premise that an external norm and prestige variety suppresses variation and promotes convergence to the standard language (Woo, Gadanidis, and Nagy, submitted). While the extensive dialect levelling transpiring in Swabia over the last 35-years may have brought greater linguistic coherence, this transformation has also resulted in less linguistic diversity and loss of the traditional, close-knit Swabian culture.

8.3. Empirical contributions

This investigation offers a number of empirical contributions to the understanding of sociolinguistic language variation and change in Swabian, specifically, and in German more broadly – language varieties that have received relatively little attention in variationist sociolinguistics or social dialectology.

German social dialectology. This effort demonstrates the value of a unified paradigm of social dialectology and variationist sociolinguistics. The united approach provides documentation of an under-researched variety of German accompanied by a longitudinal sociolinguistic analysis of language variation and change over a 35-year time span.

Pervasive dialect levelling in Swabia. As discussed throughout this thesis, this study has unveiled a dynamic situation of widespread dialect levelling in southwestern Germany. This research adds to the growing body of sociolinguistic studies in dialect contact situations, specifically in the context of two varieties of the same language.

Nature of the linguistic variable. This study underscores the importance of considering the nature of the linguistic variable when investigating language variation and change. Factors as diverse as variable type, grammatical level, stigma, evolutionary status, and lexical frequency influence the direction and speed of change. In line with other studies, the findings show that the etymology and language family of the variable is one of the strongest predictors: Swabian-specific features are undergoing more dramatic change and cohering more tightly than more widely used regional features. Additionally, morphosyntactic variables are receding faster than phonological variables, providing evidence for the premise that morphosyntactic variables are more “distinctive” and more sharply stratified, signalling lower levels of education, and hence retreat more quickly under pressure “from above.” Swabian speakers are avoiding all stigmatised variables, most of which are being wholly levelled out of the pool of variants in the supraregional variety. Some traditionally “stigmatised” variables, however, are being co-opted for identity work. Importantly, variables currently undergoing change exhibit higher levels of coherence than stable variables, supporting other findings that once a change is in progress, it continues to accelerate bringing other, potentially related, changes along. This phenomenon appears not to be differentiated by community or time, providing support for "shared social motivation for the change" (Tamminga 2019) across Swabia.

Lexical frequency. Much sociolinguistic research has disregarded the influence of lexical frequency on language change; however, the results of this study point to frequency as a critical factor in how change advances through the lexicon. Prior research has reported conflicting results concerning lexical frequency (see Section 3.7.3.5), which may be because frequency interacts with other factors, such as local orientation and salience. Since high-frequency words are more deeply entrenched in the lexicon, they may be less responsive to change; however, in interaction with Swabian orientation, high-frequency words, due to their greater salience, may be requisitioned as markers of identity, thereby making them more receptive to change.

Speaker sex. This study supports Auer's (personal communication) conviction that speaker sex plays no significant role in language change. Due to the strong influence of speaker sex in the English-speaking world, this factor was considered in every analysis and only thrown out when no significant effects were observed. Since speaker sex wields such a prevailing influence in many varieties around the world, its absence in Swabian is notable. With respect to language usage, Germany appears to be more egalitarian than many English-speaking countries, such as the US and the UK, for example, where women are generally considered to be the leaders of language change. Supporting the notion of a more egalitarian German society is the consideration of female participation in the political arena, for example. Germany has had a female *Bundeskanzlerin* 'Chancellor', Angela Merkel, for 15 years and shows 31.2% female representation in the *Bundestag* 'federal parliament', in comparison to 23.7% female representation in the US Congress. In Germany, women make up just over 70% of the workforce, 10 points higher than the OECD average, but still 8 points lower than men, and 23 points higher than in the US.[38] As more women move into the workforce in the US and around the world, taking on more and greater positions of power and prestige, it will be intriguing to examine the effects of this evolving societal change on language use.

[38] https://www.bundestag.de/abgeordnete/biografien/mdb_zahlen_19/frauen_maenner-529508; https://cawp.rutgers.edu/women-us-congress-2020; https://www.oecd.org/germany/Gender2017-DEU-en.pdf; https://www.bls.gov/spotlight/2016/a-look-at-the-future-of-the-us-labor-force-to-2060/home.htm; retrieved 13 October 2020.

8.4. Methodological contributions

The methodological and theoretical contributions of this work are diverse, but the primary contribution to the fields of sociolinguistics and dialectology is in the combined panel and trend study and the development of a multistage corpus of spontaneous spoken German.

Combined real- and apparent-time analysis. A key goal of this study has been to respond to Sankoff's (2018, 2019) call for additional combined panel and trend studies in order to compare and contrast the results of lifespan change and generational change and to examine the assumptions of the apparent-time hypothesis. The findings show that, overall, real-time change mirrors apparent-time change, validating that the apparent-time hypothesis serves as a valuable and useful proxy for real-time change, albeit shedding doubt on the critical-age hypothesis.

Multistage corpus. This research offers a methodological and empirical contribution to the fields of sociolinguistics and German dialectology by establishing a multistage corpus of spontaneously spoken Swabian, comprising 121 speakers, aged 18 to 88, covering 105 years, in three speech communities (Stuttgart, Schwäbisch Gmünd, and Tübingen), and across two recording periods (1982 and 2017). My intention for the future is to make this corpus (along with the Swabian-German Lexicon, see below) publicly available, offering a goldmine for researchers interested in intraspeaker lifespan and community change.

Swabian-German Lexicon (SGL). A by-product of this research effort has been the development of a 14,000-word German-Swabian Lexicon (SGL) which maps Swabian variants to standard German words, containing additional information such as word stem, lemma, MHG variant, and English translation, along with annotations for the linguistic variables under investigation and associated parts of speech (POA) (see Appendix H).

Statistical tools and indices. Methodologically, this study has employed a variety of statistical tools and indices to measure and evaluate the effects of linguistic variation and change, including principal components analysis, correlation analysis, linear regression analysis, generalised additive mixed models, and several new methodological constructs uniquely created for this study of Swabian: DDI (see Section 3.6.3), SOI (see Section 3.7.2.1), SMI (see Section 3.7.2.3), TEDS (see Section 5.3.5), IC (see Section 7.4.4.4), and the Lectal Lattice (see Section 7.4.4). This study has exemplified how different statistical techniques can expose both similar and divergent results, emphasising the importance of triangulating and replicating research findings.

Interviewer Effect. A foremost concern with multistage corpora is the unavoidable effect of different interviewers (cf. "Rutledge Effect" (Bailey and Tillery 1999)) which arises as an inevitable by-product when conducting studies over long time spans. Multiple interviewers, the GAP EFFECT (Cukor-Avila and Bailey 2017), as well as the biological aspects of ageing introduce style variation and capricious power dynamics into the interview which can make comparisons across periods problematic (see Table 3-4). For this reason, this study has incorporated interviewer name as a random effect in all statistical models to aid in neutralising this bias.

8.5. Theoretical contributions

It has been argued that sociolinguistics lacks a holistic theory of language variation and change – a theory distinct from, yet complementary to, general linguistic theory (Coupland 1998). While it is not the goal of this thesis to chase this holy grail, I hope that this research effort has made a small theoretical contribution in the following three critical areas.

Combined real- and apparent-time analysis of language variation and change. Throughout this investigation, each analysis has been viewed through both a real-time and apparent-time lens enabling triangulation of the findings and assessment of the compatibility of the outcomes. A combined panel and trend study approach joins two studies, linking intraspeaker lifespan change and interspeaker communal change into one holistic view of the language situation and providing greater insight into WLH's (1968) five fundamental problems of language change:

1. TRANSITION (the stages of change): the 21 linguistic variables selected for this 35-year investigation of Swabian are at various stages of change. Some variables are in the nascent or incipient stages of standardisation, others remain stable throughout the timeframe of this study, and others are well-advanced in their transition to the standard language almost to completion of the change (see Section 4.4.2).
2. CONSTRAINTS (the factors influencing change): this investigation divulges a plethora of social factors responsible for promoting (or retarding) change. Paramount are the competing forces of prestige (achieved through higher levels of education) and local identity (portrayed through speakers' Swabian orientation): the former propels linguistic variants toward the standard language, while the latter upholds the traditional conservative variants. This study shows how these constraints interact with a host of others, such as urbanity/rurality and the nature of the linguistic variable itself, to impel or impede linguistic change.
3. EMBEDDING (the social structure surrounding change): language exists in both the individual and in a social and communal structure, each of which exerts influence on the direction and progression of change. The shifting values in Swabian society over the last 35 years, in particular, the greater value placed on higher education and the emotional force associated with assertions of local identity, surround language use with opposing forces. Speakers may respond differently to these competing influences across their lifespan, depending on their individual situations. While most of the speakers in this study are moving with the communal trend toward the emerging regional standard, others prioritise different aspects of the social situation, depending on their own life trajectories, such as Louise's greater use of standard variants in mid-life and her retrograde change in later life.
4. EVALUATION (the perception of change as it spreads): stigmatisation and local orientation demonstrate that the emotional value speakers place on a linguistic

variable can accelerate or decelerate linguistic change. Those striving to portray higher status and prestige transition to more standard variants, such as Rupert, Markus, Ricarda, Helmut, and Manni at the peak of their professional careers; others choose to retain and assert their local identity and group membership and hence use more Swabian variants, such as Angela, Ema, Elke, Rachael, and Siegfried, who largely remain stable across their lifespans.

5. ACTUATION (the motivation of change): while the actual cause of linguistic change may remain forever elusive, this study points to reigning language ideologies which uphold the standard language as the pinnacle of prestige and success while speakers of nonstandard varieties are reviled as uneducated and backward, *der letschte Bauer ‘the last farmer’* (see Michaela, example (18)). Yet, the influence of dialect identity and Swabian orientation cannot be underestimated, which can exert sufficient pressure to redirect any constraint, even “turning it upside-down” (Auer 1997).

Predictors of language variation and change in situations of dialect contact. A fundamental question this research has sought to answer is which variables participate in language change and which remain stable and why. The findings concur with ample previous sociolinguistic work, pointing to the following factors as the primary influencers of change in Swabian:

1. Urbanity/rurality: primarily for reasons of prestige, linguistic change emanates from urban centres, spreading out to rural environments following the principles of the gravity and cascade models;
2. Education: higher levels of education favour conformance with standard language variants, resulting from prevalent standard language ideologies and inescapable teacher prescriptivism;
3. Variable type: variables of the same linguistic variety (i.e., same etymological and sociohistorical background) tend to cohere and change in unison, jointly projecting notions of local and personal identity and nuanced indexicalities of social meaning;
4. Variable status: once initiated, variables in the process of change are likely to continue to change, even picking up speed, much like Newton’s first law of motion: a feature at rest stays at rest and a feature in motion stays in motion;
5. Variable stigma: socially stigmatised and highly stereotypical variables are more likely to converge to the standard language as speakers actively seek to avoid ridicule or ostracisation which may result from their usage;
6. Variable salience: the effect of perceptual salience on language variation and change appears to be closely tied to stigma and lexical frequency, however, the results from this study are inconclusive, necessitating additional research;

7. Word frequency: change appears to favour low-frequency words first through processes of analogy while high-frequency words are more resistant to change due to the effects of entrenchment; however, frequency influences are mitigated and may be overturned by high levels of local orientation and identity formation; and,
8. Swabian orientation: notions of local orientation and Swabian identity appear to prevail over all other constraints with the ability to spur onward or reverse any linguistic change in its tracks.

Models of sociolectal coherence in explaining and predicting linguistic change. This investigation has explored many different methods and models for evaluating sociolectal coherence. Correlational analyses show that the more highly correlated lects are those in the later recording period and with younger speakers, lects that adhere more closely to the standard language. Mixed-effects regression modelling identifies variable type, status, and stigma as the most powerful constraints impacting coherence in Swabian. The PCA analyses show that the traditional Swabian variables, those with a common etymological origin, cohere more tightly, while the more broadly used regional variables reflect greater dispersion. Finally, implicational scaling, pairwise comparisons, and lattice theory introduce a new theoretical and methodological construct for evaluating, visualising, and measuring coherence across varieties and time periods. While additional research is obviously needed to continue to explore the gaps in our knowledge on how the concept of orderly heterogeneity (WLH 1968) fits within a comprehensive theory of linguistic change, the findings from this investigation show that the notion of sociolectal coherence has a vital role to play.

8.6. Opportunities for future research

As with most endeavours of this nature, with fixed time and space constraints, there are numerous areas where I was not able to dive as deeply or as broadly as I would have liked. The following lists some opportunities that I hope to pursue in my continued research.

Speed of change. While the results show that lifespan change generally follows the same trajectory as community change (disregarding situations of retrograde change, which can generally be explained through unique individual circumstances), what is less certain is the speed with which change is proceeding. With two timepoints, only conjecture is possible; thus, to fully address this issue, additional recording periods are needed. For the current investigation, a time-slice at the mid-point between 1982 and 2017 would have been ideal. However, since no viable technology for retroactive recording has yet been developed, two more realistic opportunities are to construct a sample of “social twins” from the Ruoff Swabian Archives from the 1950s and to conduct an additional round of interviews 10 to 15 years from now. This would provide four timepoints for comparison, yielding greater insight into the rate of change in Swabian (see Sankoff 2019).

Identity or accommodation. This thesis has not addressed the conundrum over whether speakers proactively select linguistic variants to index their personal identities or whether they automatically and somewhat unconsciously react to their interlocutor by accommodating their speech in interaction. There are fervent opinions on both sides of this debate. An experimentally-designed, combined socio- and psycholinguistic project could expose the underlying forces motivating individuals to adapt their language in interaction, thereby providing some steps toward resolving this dispute.

Stylistic variation. The current investigation has not taken account of stylistic variation which is unquestionably a major facet of language usage. One opportunity for future research is to compare the results from the sociolinguistic interviews with data from the reading/word list passages (more formal) and with speaker self-recordings and spontaneous conversations (less formal) to assess the role that style plays in the Swabian linguistic situation. One particular goal I have is to analyse a case study of the *Schnaihäsle Familie*, a core group of six speakers from Schwäbisch Gmünd from the same nuclear and extended family, for which I have both sociolinguistic interviews as well as hours of spontaneous, casual conversation drinking tea and sitting around the dinner table, in interaction with each other and with non-Swabians.

Role of salience. As discussed, the role of salience in language change remains ambiguous, and the results of the current investigation are similarly inconclusive. Salience appears to have had a significant impact on the panel speakers' use of dialect in real-time, and the apparent-time analysis points to a similar difference, although the effect size was not significant. Future studies should incorporate a perceptual and attitudinal component to investigate more explicitly the impact of variable salience (as well as the closely linked phenomenon of stigmatisation) on dialect variation and change.

Lexical-specific variation. Auer (personal communication) has pointed out that some linguistic variables may be highly lexical, such as the Swabian nasalisation of the prefix 'an' (ANN) and many of the irregular verb stems (IRV1 through IRV5). Future analyses could assess the impact of the frequency of specific lemmata on linguistic change.

Additional linguistic variables. Appendix A.3 provides a partial list of some of the traditional Swabian variables that have entirely or are close to entirely dying out of the language, such as the low back vowel [o ~ un] (ULO), the dative possessive (DAT), the double perfect construction (DPF), reversed modal verb order (MVO), among others. Such a study would shift the typical sociolinguistic variationist study, which has primarily focused on incoming, innovative variants, to an investigation of outgoing, conservative variants, potentially shedding light on how and why some variables recede and become obsolete while others persevere.

Additional communities. This study has investigated two communities, a large urban centre and a mid-sized, semi-rural town. I have collected 47 additional sociolinguistic interviews from the university town of Tübingen, as well as from many rural villages in the Central Swabian dialect area. Future analyses with additional communities can provide greater understanding of the urbanity/rurality distinction and the diffusion of change.

Additional speakers. While the current study of 80 speakers is not small for a sociolinguistic study, it becomes limited when subsetting the data into smaller groups, as encountered in Chapter 4 with older speakers in Stuttgart and in Chapter 5 with two communities, two diphthong variants, and five interaction effects. Incorporating the sociolinguistic interviews from 47 additional Swabian speakers would avoid some of the challenges encountered in the current analysis with insufficient token counts in some cells.

Online corpus of spoken Swabian. One of my first goals upon completion of this thesis is to make the Swabian corpus and Swabian-German Lexicon available online for other researchers. This effort entails fully anonymising the recordings and making them accessible online with time-aligned ELAN transcriptions and PRAAT textgrids.

Lectal Lattice. Section 7.4.4.6 lists several opportunities to pursue in validating the efficacy and pertinence of the Lectal Lattice and what role such a theoretical construct could have in a theory of sociolinguistic change.

8.7. Closing

In sum, this investigation has afforded the unique opportunity to conduct a combined real- and apparent-time sociolinguistic variationist analysis over a 35-year time span targeting an understudied and waning variety of German using a range of sophisticated statistical modelling techniques. Overall, the findings show that, with the interminable and intractable advance of the standard language, Swabian is in precipitous decline for speakers with higher levels of education and in the large urban centre of Stuttgart. Nevertheless, the dialect is still very much alive and well among speakers with high levels of Swabian orientation in the small and mid-sized towns surrounding Schwäbisch Gmünd. Moreover, specific Swabian features, imbued with deep social meaning, index an ardent and ageless supralocal identity, one which simultaneously projects a worldly, well-educated and accomplished persona, along with regional pride, local consciousness, and community belonging. As Willard so genuinely expressed, *Hochdeutsch des isch Tagesschaudeutsch, des isch kein Bauch dabêi, des isch nur Kopf kôine Seele drin* ‘Standard German is TV-news-hour-German, there’s no belly in it, it’s only a head without a soul’, bolstering Angela’s assertion that Swabian will always be *des beschde Daitsch wo es gib* ‘the best German there is’.

Appendices

Appendix A. Linguistic variables under investigation

Table A-1 lists the linguistic variables investigated in this study. Each variable is coded for: variety type (Swabian-specific (SWG), general Alemannic (ALM), or southwestern regional (REG)), salience (low or high), and stigma (low or high). See Section 3.7.3 for an explanation of these categories. A detailed description of each variable with examples follows.

Code	Variable Name	SWG~STD (Example)	Type	Salient	Stigma	Swabian Examples
PHONOLOGICAL VARIABLES:						
AIS1	**MHG /i:/ Diphthong [əi ~ ai]** SWG ~ STD: [əɪ] ~ [aɪ]	*Dêig ~ Teig* 'dough'	SWG	low	low	*da dued mã in den Zylinder obe der Dêig nei* 'then you put [it] into the cylinder above the dough'
AIS2	**MHG /ei/ Diphthong [ɔi ~ ai]** SWG ~ STD: [ɔɪ] ~ [aɪ]	*klôi ~ klein* 'not a'	SWG	high	high	*mã brauchd da kôi Flôisch dazue* 'you don't need any meat with it'
ANN	**Nasal 'a' before 'n' [ã ~ an]** SWG ~ STD: [ã] ~ [an]	*mã ~ man* 'one'	SWG	high	high	*mã kã es mit em normale [Mehl] mache* 'you can make it with a normal [flour]'
FRV1	**Unrounded Front Vowel [e: ~ ø:]** SWG ~ STD: [ɛ] ~ [ø]	*meeglich ~ möglich* 'possible'	SWG	low	low	*so guet wie meeglich probier es* 'as good as possible [I] try it'
FRV2	**Unrounded Diphthong [ai ~ ɔʏ]** SWG ~ STD: [aɪ] ~ [ɔɪ]	*Fraind ~ Freund* 'friend'	SWG	low	low	*bin gern auf Baim gestiege* '[I] liked to climb trees'
FRV3	**Unrounded Front Vowel [iə ~ ʏ:]** SWG ~ STD: [iə] ~ [y]	*Kiiche ~ Küche* 'kitchen'	SWG	low	low	*dann ist d Kieche explodiert* 'then the kitchen exploded'
FRV4	**MHG /uo/ Diphthong [uə ~ u:]** SWG ~ STD: [uə] ~ [u]	*muess ~ muss* 'must'	SWG	low	low	*nâ muess er sueche* 'then he has to look'
LEO	**Lower Long Vowel [ɛː ~ eː]** SWG ~ STD: [ɛː] ~ [eː]	*lääbe ~ leben* 'live'	REG	low	low	*dâ e baar Jâhr lääbe* 'live a few years there'
SFV	**Stop-Fricative Variation [ɪç ~ ɪk]** SWG ~ STD: [ɪk] ~ [ɪç]	*richtich ~ richtig* 'correct'	REG	low	low	*scho richtich, wo andersch verkaufe au* 'already right where others sell also'
STP	**Palatal Coda -st [ʃ ~ s]** SWG ~ STD: [ʃt] ~ [st]	*darfsch ~ darfst* 'allow'	ALM	high	low	*da darfsch ja bloß hundertdreißig fahre in Italien* 'then you're only allowed to drive 130 in Italy'
MORPHOSYNTACTIC VARIABLES:						
DAS	**Definite Neuter Article: des ~ das** SWG ~ STD: [dɛs] ~ [das]	*des ~ das* 'the'	REG	high	low	*kennsch des?* 'do you know that?'
EDP	**Plural Verb Inflection: -ed ~ -en** SWG ~ STD: [əd] ~ [ən]	*finded ~ finden* 'they find'	SWG	high	low	*die finded es wichtich* 'they think it important'
IRV1	**Irregular Verb: gange ~ gehen** SWG ~ STD: [gangə] ~ [geːən]	*gange ~ gehen* 'go'	SWG	high	high	*willsch du an Telefon gange* 'do you want to answer the telephone'
IRV2	**Irregular Verb: stande ~ stehen** SWG ~ STD: [ʃtandə] ~ [ʃteːən]	*stande ~ stehen* 'stand'	SWG	high	high	*lässt mã no e halb Stunde stande* 'you let [it] sit for a half hour'
IRV3	**Irregular Verb: hen ~ haben** SWG ~ STD: [hɛn] ~ [ha:bən]	*hen ~ haben* 'have'	SWG	low	low	*mr hen e aldes Haus khet* 'we have had an old house'
NEG	**Negative Marker: ned ~ nich(t)** SWG ~ STD: [nedə]/[ed] ~ [nɪçt]	*nedde/ed ~ nicht* 'not'	REG	high	low	*glaub mã et ge?* 'you don't believe [it] eh?'
PVB	**Periphrastic Subj: dääd ~ würde** SWG ~ STD: [dædə] ~ [vʏʁdə]	*däädе ~ würde* 'should'	REG	low	low	*es dääd beeinflusse* 'it should influence'
SAF1	**Swabian Affix: -le ~ -chen** SWG ~ STD: [lə] ~ [çən/laɪ̯n]	*Mädle ~ Mädchen* 'little girl'	ALM	high	low	*dass er en Mädle mâg un se ihn mâg* 'that he likes a girl and she likes him'
SAF3	**Swabian Affix: nââ- ~ hin-** SWG ~ STD: [nɔ] ~ [hɪn]	*nââkriegt ~ hinkriegt* 'carry something off'	SWG	low	high	*nâ verzählet se was se so im Gschäft erlebet* 'then they explain what they experienced at work'
SAF5	**Swabian Affix: Ø ~ ge-** SWG ~ STD: [θ] ~ [gə]	*[ge]baut ~ gebaut* 'built'	REG	low	low	*un hen hier e Haus [ge]baut* 'and they have built a house here'
REL	**Relative Marker: wo ~ dxx** SWG ~ STD: [vo] ~ [deːɐ̯/diː/das]	*wo ~ der/die/das/etc.* 'where' ~ 'that/who'	REG	high	high	*des beschde Daitsch wo [REL] es gib* 'the best German that there is'

Table A- 1. Summary of Linguistic Variables under Investigation

A.1. Phonological variables

Ten phonological variables have been selected for this study, chosen for their commonality (i.e., considered to be prototypical in the Swabian/Alemannic variety), variability (i.e., alternation between a dialect and standard variant), and productivity (i.e., sufficient number of tokens for analysis). A description of each variable follows, including a list of examples from the Swabian corpus, a dialect map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)*[39] (Klausmann 2018c, 2018a, 2018b) including a summary of the number of tokens and frequency of dialect use from the Swabian corpus along with a plot showing the change in the frequency of use across the two study types (panel and trend), two communities (Stuttgart and Schwäbisch Gmünd), and age groups.

AIS1 – MHG /ī/ Diphthong [əɪ ~ aɪ]

The modern standard German [aɪ] diphthong developed from the merger of two different MHG phonemes, /ī/ and /ei/.[40] Lemmata evolving from MHG /ī/ are typically realised as [əɪ] in Swabian and as [aɪ] in standard German (DiWA 2001:MapII/30; Frey 1975:33; Mihm 2000:2121; Russ 1990:346; Schwarz 2015:161-164; SNBW 2018:MapI/13.1; Spiekermann 2008:65). This variable is analysed in detail in Chapter 5. The following table provides some examples of [əɪ ~ aɪ] variation from the Swabian corpus.

MHG	STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
blībe	bleibe	[blaɪbə]	[bləɪbə]	blêib	stay
glīch	gleich	[glaɪç]	[gləɪç]	glêi	same
īn	ein (num)	[aɪn]	[əɪ]	êi	one (num)
mīn	mein (pro)	[maɪn]	[məɪ]	mêi	mine
rīten	reiten	[ʁaɪtn]	[ʁəɪdə]	rêide	ride (verb)
sīn	sein (verb)	[zaɪn]	[səɪ]	sêi	to be (inf)
wīn	Wein	[vaɪn]	[vəɪ]	Wêi	wine
wīʒ	weiß (adj)	[vaɪs]	[vəɪs]	wêiß	white (adj)
zīt	Zeit	[tsaɪt]	[tsəɪt]	Zêit	time

Table A- 2. AIS1 – MHG /ī/ Diphthong [əɪ ~ aɪ] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [əɪ] for the word *reiten* ‘to ride horseback’ (orange triangles) throughout southwestern Germany.

[39] I have added a star to each dialect map to indicate the location of Stuttgart (STG) and Schwäbisch Gmünd (GMD) for orientation purposes. All SNBW maps used with permission by Hubert Klausmann, Eberhard Karls Universität Tübingen, hubert.klausmann@uni-tuebingen.de. 16 February 2020.

[40] Etymological origins for all lemmata with the modern standard German diphthong [aɪ] were individually researched using the *Digitales Wörterbuch der deutschen Sprache* (DWDS 2020), published by the Berlin-Brandenburgischen Akademie der Wissenschaften (BBAW).

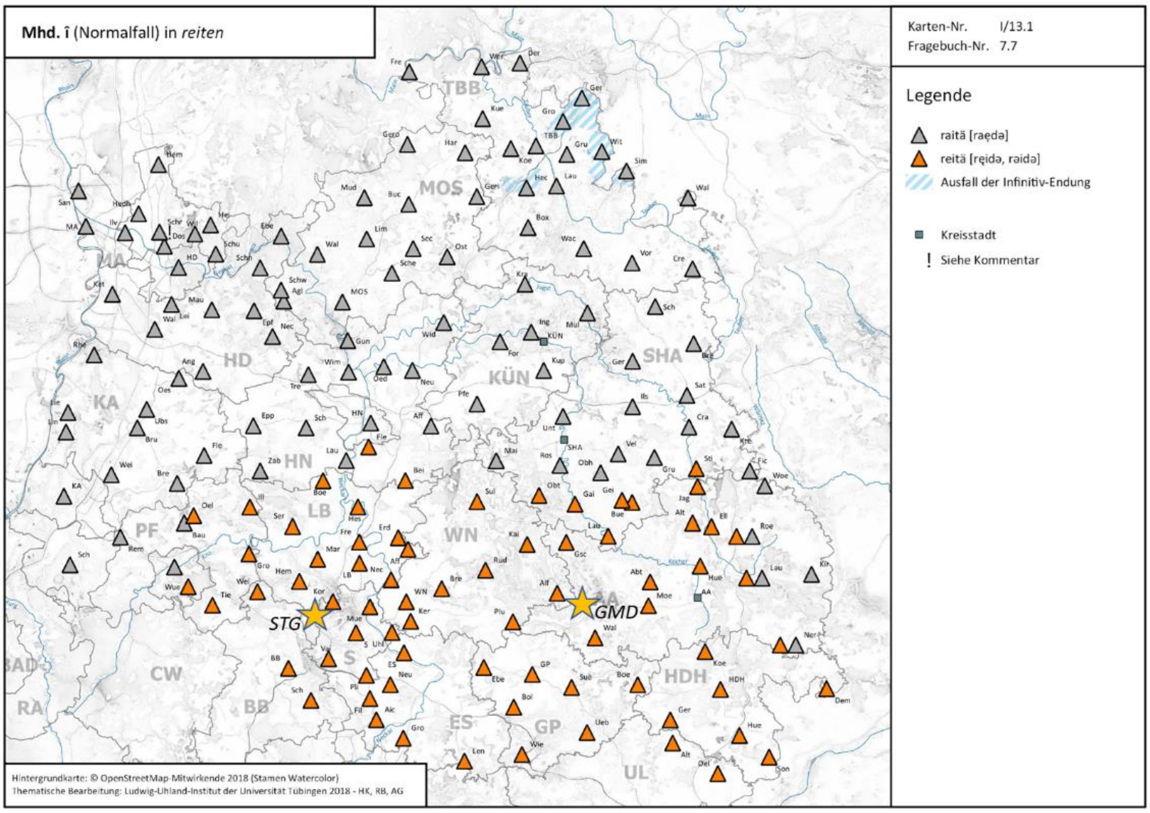


Figure A- 1. AIS1 – MHG /ī/ Diphthong [əɪ ~ aɪ] Map (SNBW 2018:29, Vol. 2)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
2722	**25.42**	3825	**13.96**	1652	**10.59**	2720	**13.57**	2405	**5.61**

Table A- 3. AIS1 – MHG /ī/ Diphthong [əɪ ~ aɪ] Mean Frequencies

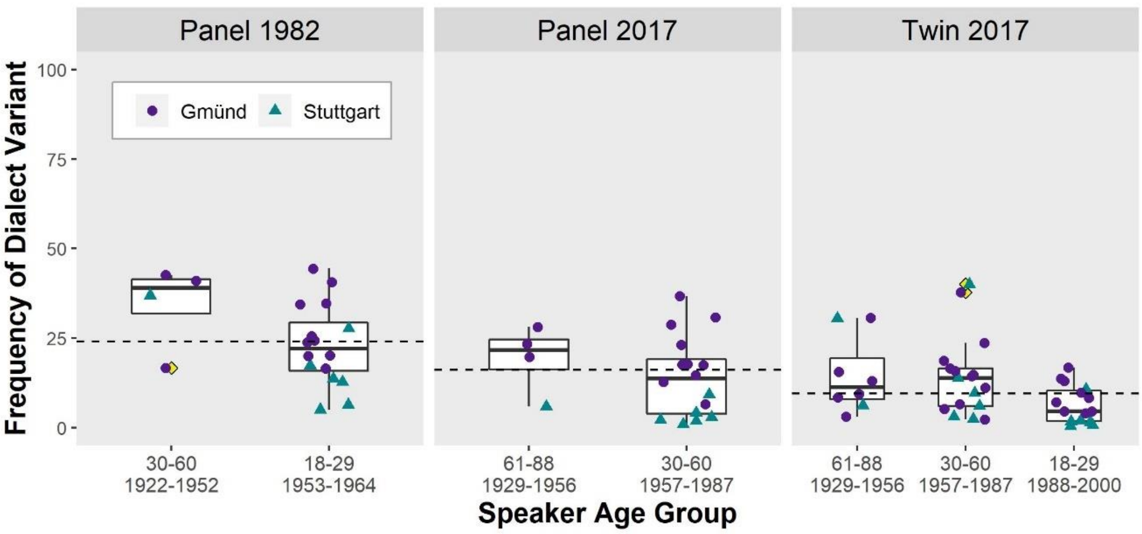


Figure A- 2. AIS1 – MHG /ī/ Diphthong [əɪ ~ aɪ] Change Across Time

Lemmata with the modern standard German [aɪ] diphthong that evolved from MHG /ei/ are typically realised as [ɔɪ] in Swabian versus [aɪ] in standard German (DiWA 2001:MapII/30; Frey 1975:33; Mihm 2000:2121; Schwarz 2015:161-165; Spiekermann 2008:65). This variable is analysed in detailed in Chapter 5. The following table provides some examples of [ɔɪ ~ aɪ] variation from the Swabian corpus.

MHG	STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
breit	Breit	[bʁaɪt]	[bʁɔɪd]	brôid	wide
vleisch	Fleisch	[flaɪʃ]	[flɔɪʃ]	Flôisch	meat
heiʐ	heiß	[hais]	[hɔɪs]	hôiß	call
ein	ein	[aɪn]	[ɔɪ]	ôi	a / an
klein	klein	[klaɪn]	[glɔɪ]	glôin	small
meinen	meine	[maɪnə]	[mɔɪn]	môin	think
teic	Teig	[taɪk]	[dɔɪg]	Dôig	dough
weiʒ	weiß	[vaɪs]	[vɔɪs]	wôiß	know

Table A- 4. AIS2 – MHG /ei/ Diphthong [ɔɪ ~ aɪ] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [ɔɪ] for the words *breit* 'wide' and *Geiß* 'goat' (red triangles) throughout Swabia.

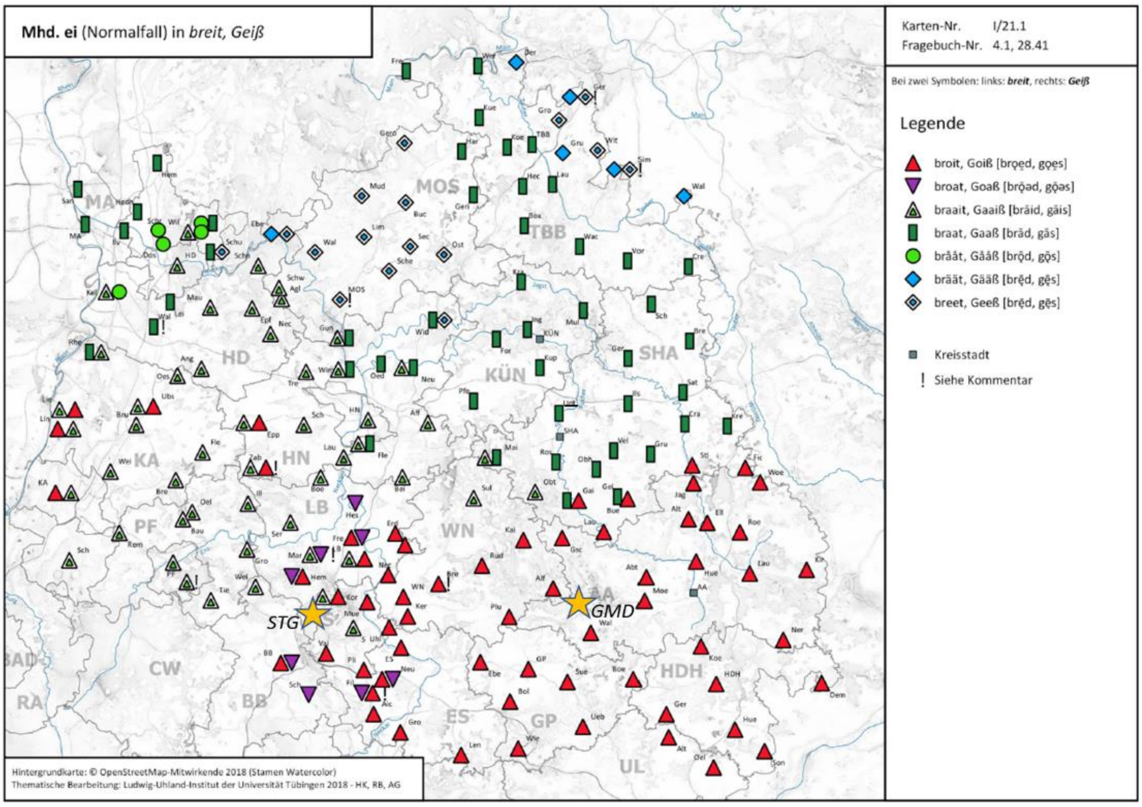


Figure A- 3. AIS2 – MHG /ei/ Diphthong [ɔɪ ~ aɪ] Map (SNBW 2018:48, Vol. 2)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
2331	**43.59**	3263	**19.64**	1268	**27.76**	2447	**27.67**	1863	**10.68**

Table A- 5. AIS2 – MHG /ei/ Diphthong [ɔɪ ~ aɪ] Mean Frequencies

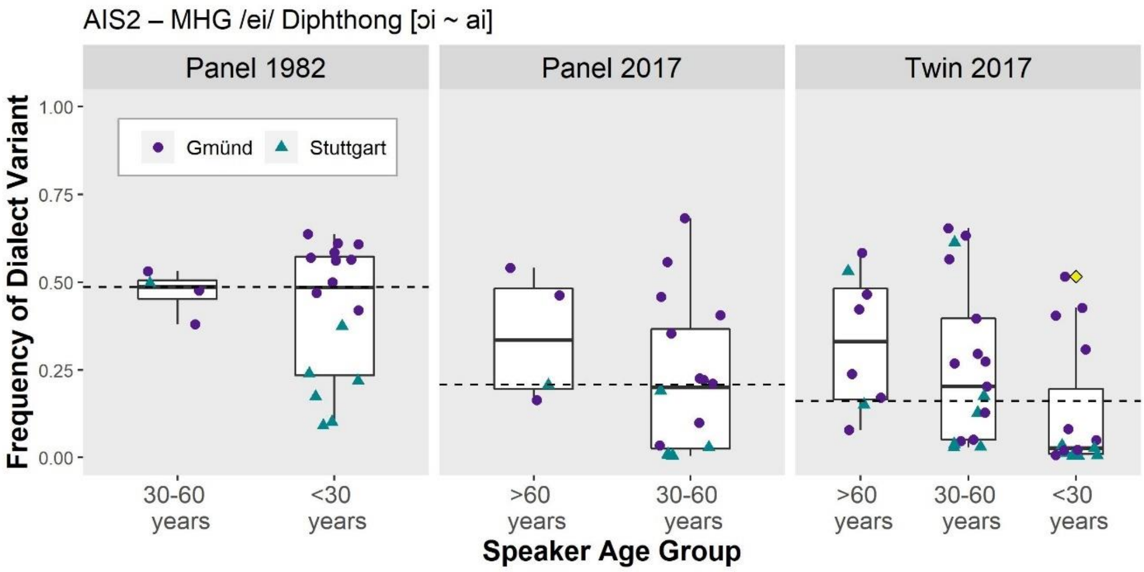


Figure A- 4. AIS2 – MHG /ei/ Diphthong [ɔɪ ~ aɪ] Change Across Time

ANN – Nasal ‘a’ before ‘n’ [ã ~ an]

Nasalisation of short, mid-vowels before [m], [n], and [ŋ] is a traditional feature of Swabian (DiWA 2001:Map II/1.52; Mihm 2000:2121). While it can occur with three phonemes /a, ɛ, o/, the current study focuses only on the nasalisation of [a] before a nasal consonant, as in [mã kã] *man kann* ‘one can’ in Swabian versus [man kan] in standard German. Frey (1975) does not mention nasalised vowels in his Stuttgart variety, but they appear to be common in many southern Swabian varieties (Vogt 1977) and in the area bordering Bavaria (Ibrom 1968).

Griffen (1992) points out that nasalisation lowers high vowels to a high-mid position and it raises low-mid vowels to a high-mid position. The overall impact of this double neutralisation effect in Swabian is that three vowel height levels are reduced to one, leading to ambiguities with a large number of vowel heights (Griffen 1992:11-13). Citing Ohala (1974) and others, Griffen explains that, despite the potential for semantic ambiguity, it is a basic phonological universal that nasality tends to suppress vowel height distinctions (Griffen 1992:13). Vogt (1977) reported a loss of nasalisation in the dialect of Deufringen, a small rural community southwest of Stuttgart which he studied in 1959-60. Thirty years later he found that [mã] *man* 'one' had been replaced by [man] and [ma]. Auer (personal communication) suspects that this variable may be highly lexicalised. The following table provides some examples from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
angehen	[ange:ən]	[ãgaŋə]	ãgange	be about
Bahnhof	[ba:nho:f]	[bã:ho:f]	Bãhof	train station
dran	[dran]	[drã]	drã	about
kann	[kan]	[kã]	kã	be able to
man	[man]	[mã]	mã	man
Weinanbau	[vainanbaʊ]	[vəɪãbaʊ]	Weinãbau	wine cultivation

Table A- 6. ANN – Nasal 'a' before 'n' [ã ~ an] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [ã] for the word *Mann* 'man' (black circles and rectangles) throughout Swabia.

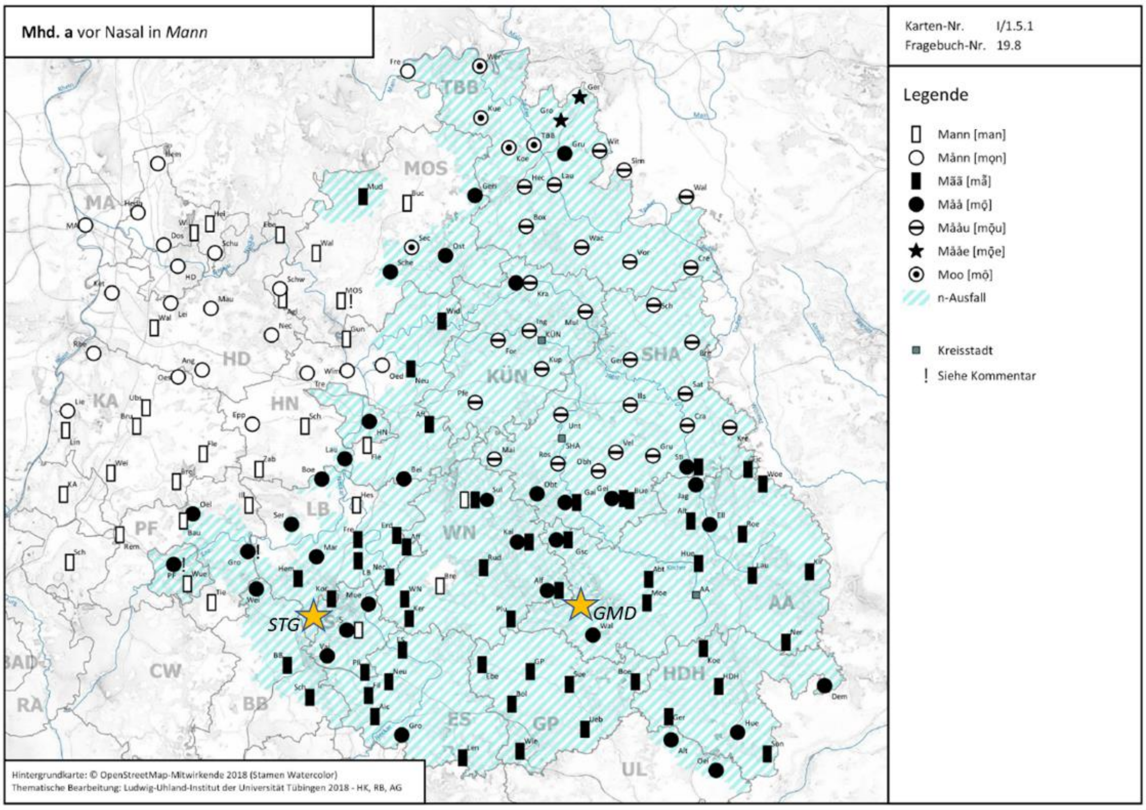


Figure A- 5. ANN – Nasal 'a' before 'n' [ã ~ an] Map (SNBW 2018:12, Vol. 1)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
2362	**54.57**	2681	**37.08**	1111	**38.70**	1866	**44.43**	1824	**36.18**

Table A- 7. ANN – Nasal 'a' before 'n' [ã ~ an] Mean Frequencies

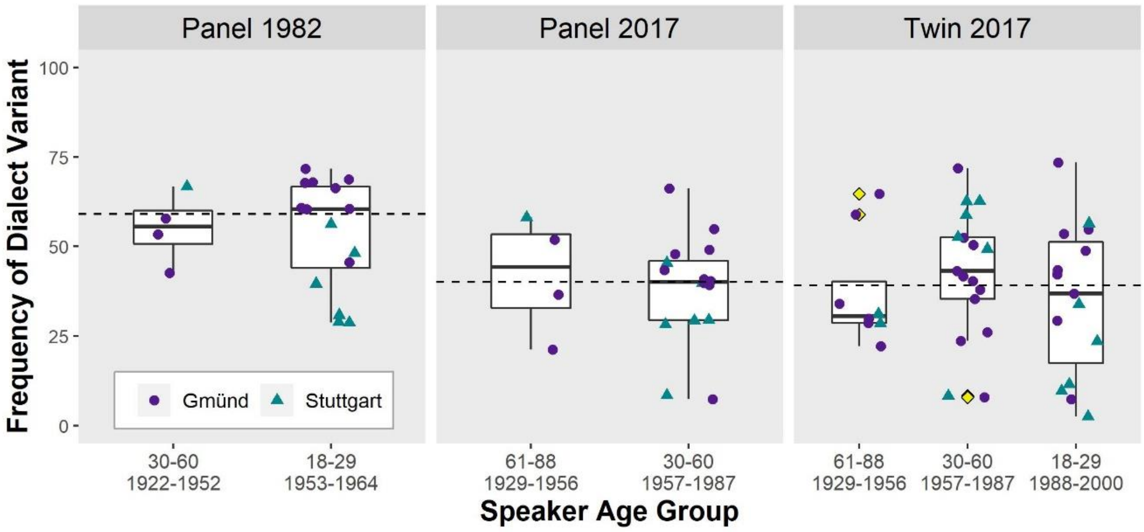


Figure A- 6. ANN – Nasal 'a' before 'n' [ã ~ an] Change Across Time

FRV1 – Unrounded Front Vowel [e: ~ ø:]

Swabian has an unrounded front vowel [e:] whereas the standard German variant is rounded [ø:] (Ammon and Loewer 1977:39). The table below provides some examples of [e: ~ ø:] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
böse	[bø:zə]	[be:s]	Bees	evil
hören	[hø:rən]	[he:rə]	heere	to hear
König	[kø:nɪk]	[ke:nɪg]	Keenig	king
möglich	[mø:klɪç]	[me:klɪg]	meeglich	possible
schön	[ʃø:n]	[ʃe:]	schee	pretty
Vögel	[fø:gəl]	[fe:gəl]	Veegel	birds

Table A- 8. FRV1 – Unrounded Front Vowel [e: ~ ø:] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [e:] for the word *Vögel* 'birds' (red rectangles) throughout Swabia.

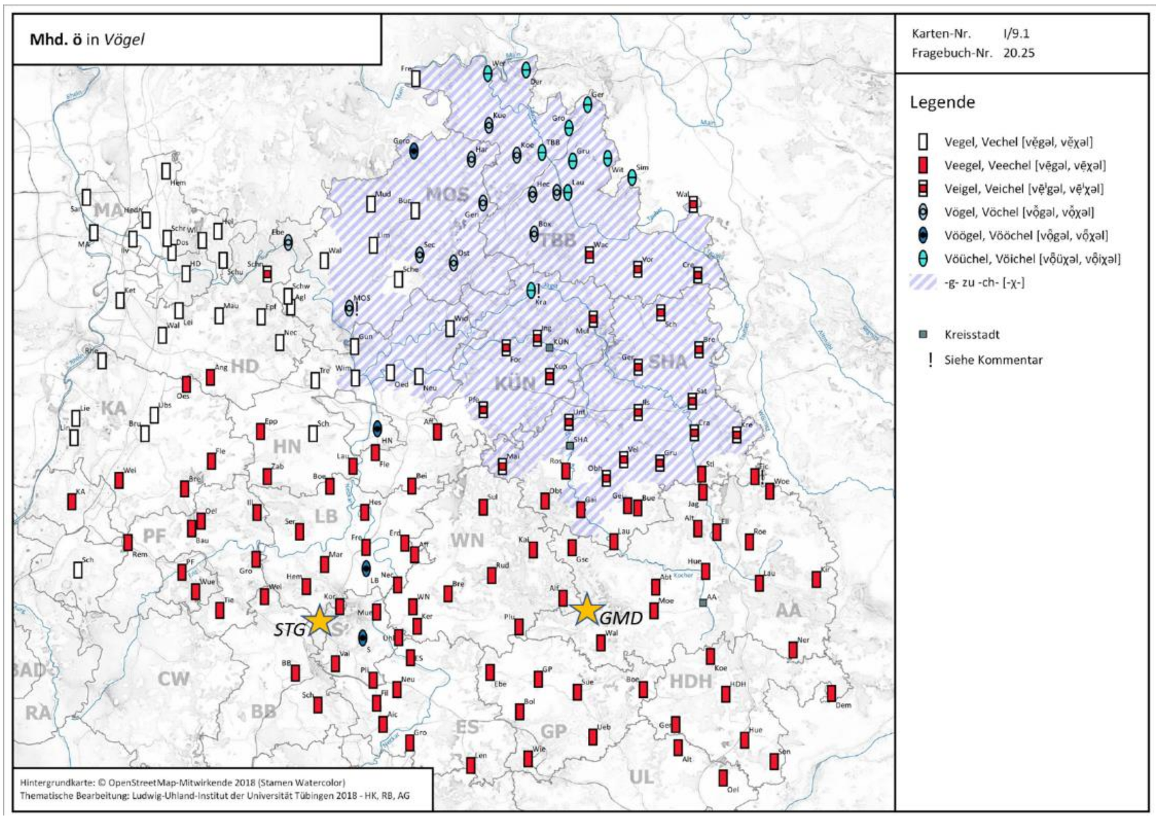


Figure A- 7. FRV1 – Unrounded Front Vowel [ɛː ~ øː] Map (SNBW 2018:73, Vol. 1)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
655	**46.56**	710	**22.25**	284	**25.00**	537	**24.21**	385	**9.09**

Table A- 9. FRV1 – Unrounded Front Vowel [eː ~ øː] Mean Frequencies

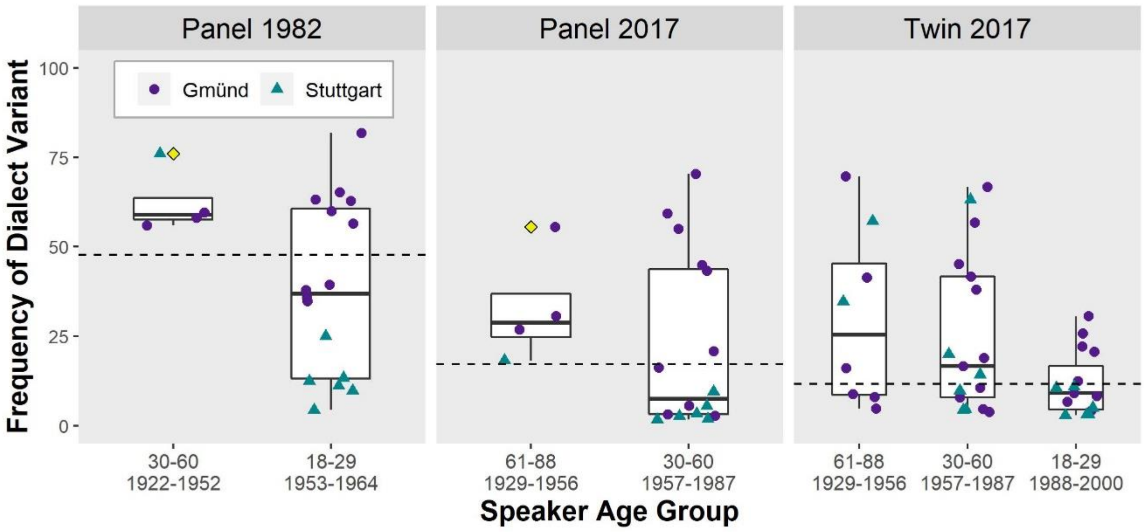


Figure A- 8. FRV1 – Unrounded Front Vowel [eː ~ øː] Change Across Time

Swabian has an unrounded diphthong [aɪ] whereas the standard German variant is rounded [ɔʏ] (Mihm 2000:2121). The following table provides some examples of [aɪ ~ ɔʏ] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
Bäume	[bɔʏmə]	[bəɪm]	Baim	trees
Deutsch	[dɔʏtʃ]	[dəɪtʃ]	Daitsch	German
Freund	[frɔʏnt]	[frəɪn]	Fraind	friends
Leute	[lɔʏtə]	[ləɪt]	Lait	people
Träume	[trɔʏmə]	[trəɪm]	Traim	dreams

Table A- 10. FRV2 – Unrounded Diphthong [aɪ ~ ɔʏ] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [aɪ] for the word *Bäume* 'trees' (grey triangles) throughout Swabia.

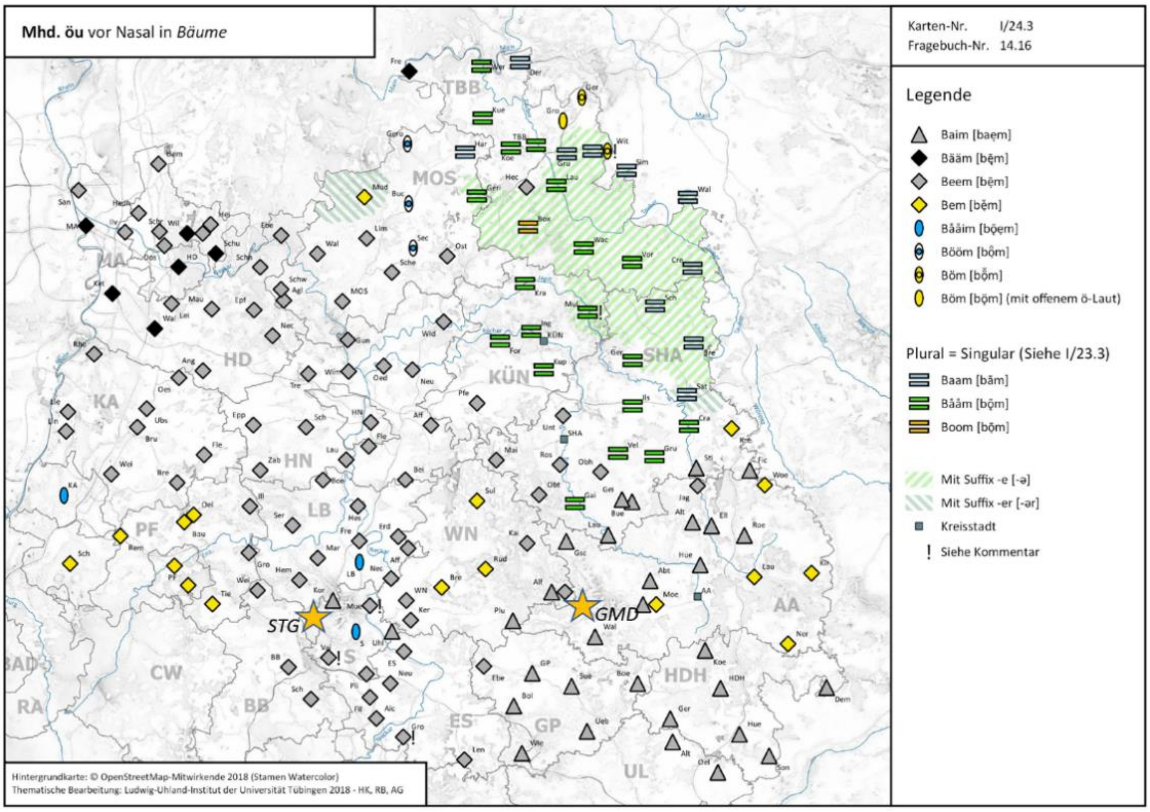


Figure A- 9. FRV2 – Unrounded Diphthong [aɪ ~ ɔʏ] Map (SNBW 2018:61, Vol. 2)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
672	**33.48**	853	**12.08**	341	**18.18**	593	**15.18**	526	**6.65**

Table A- 11. FRV2 – Unrounded Diphthong [aɪ ~ ɔʏ] Mean Frequencies

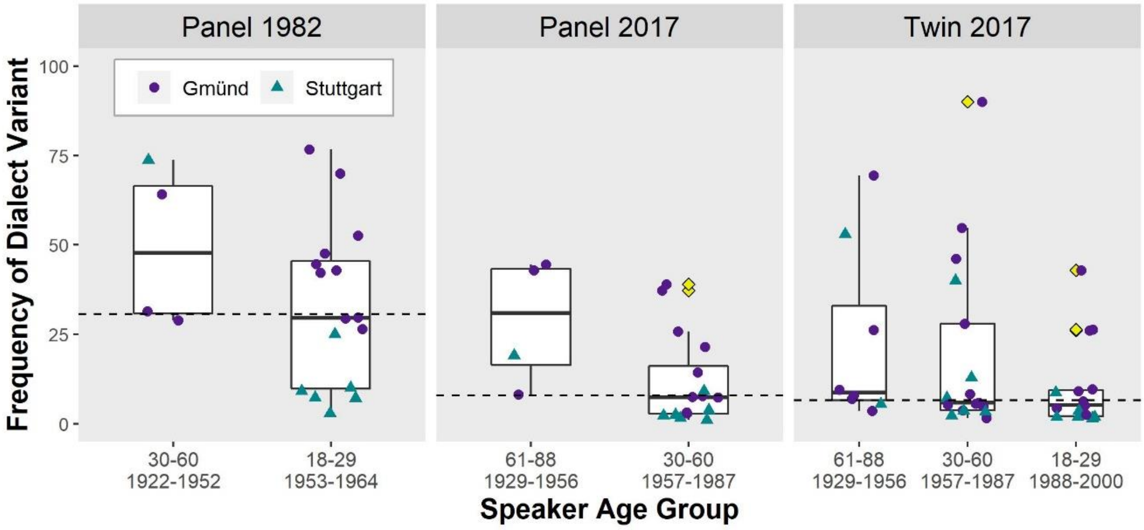


Figure A- 10. FRV2 – Unrounded Diphthong [aɪ ~ ɔʏ] Change Across Time

FRV3 – Unrounded Front Vowel [ɪə ~ ʏ:]

Swabian has an unrounded front vowel [ɪ] or a diphthongal variant [ɪə] whereas the standard German variant is rounded [ʏ:] (Mihm 2000:2121; Ammon and Loewer 1977:39). The following table provides some examples of [ɪə ~ ʏ:] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
Bücher	[bʏ:çər]	[bɪəçə]	Bieche	books
fühlen	[fʏ:lən]	[fɪəl]	fiehl	feel (verb)
Füße	[fʏ:sə]	[fɪəs]	Fieß	feet
Gemüse	[gəmy:zə]	[gəmɪəs]	Gemies	vegetables
Küche	[kʏ:ʃə]	[kɪəʃə]	Kiiche	kitchen
müde	[mʏ:də]	[mɪədə]	miede	tired
natürlich	[natʏ:ʁlɪç]	[natɪəʁlɪ]	nadierli	naturally

Table A- 12. FRV3 – Unrounded Front Vowel [ɪə ~ ʏ:] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [ɪə] for the words *Kühe* 'cows' and *Gemüse* 'vegetables' (red triangles) throughout Swabia.

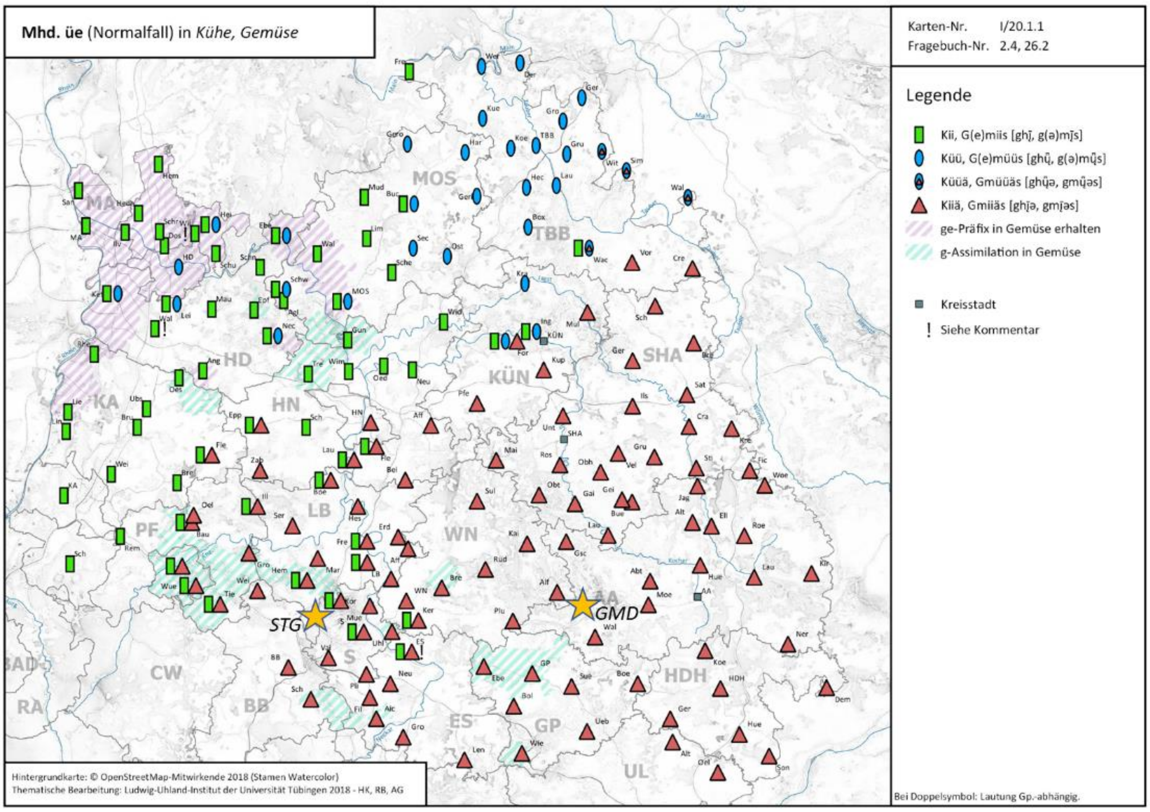


Figure A- 11. FRV3 – Unrounded Front Vowel [ɪə ~ ʏː] Map (SNBW 2018:46, Vol. 2)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
1268	**44.01**	1948	**25.21**	727	**20.08**	1430	**20.63**	1055	**6.35**

Table A- 13. FRV3 – Unrounded Front Vowel [ɪə ~ ʏː] Mean Frequencies

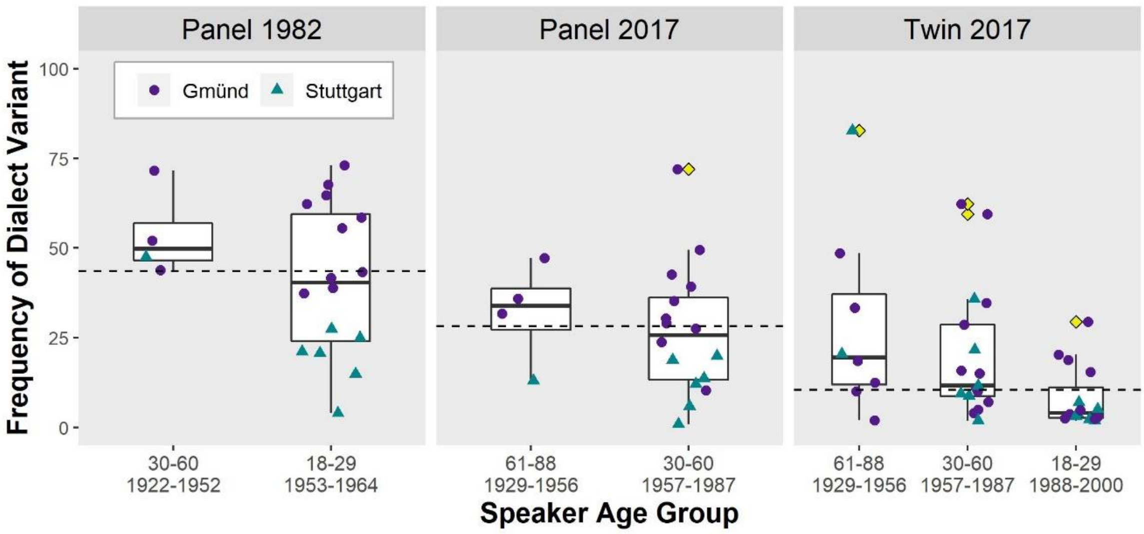


Figure A- 12. FRV3 – Unrounded Front Vowel [ɪə ~ ʏː] Change Across Time

For lemmata originating from MHG /uo/, Swabian has a diphthong [uə] whereas the standard German variant is a monophthong [uː]. The following table provides some examples of [uə ~ u] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
Bub	[buːp]	[buəb]	Bueb	boy
Fuß	[fuːs]	[fuəs]	Fueß	foot
gut	[gʌt]	[guət]	gued	good
muß	[mʊs]	[muəs]	mueß	must
suchen	[zuːxən]	[suəxə]	sueche	to seek

Table A- 14. FRV4 – MHG /uo/ Diphthong [uə ~ uː] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [uə] for the words *Kuh* ‘cow’, *Fuß* ‘foot’, and *Stuhl* ‘chair’ (red rectangles) throughout Swabia.

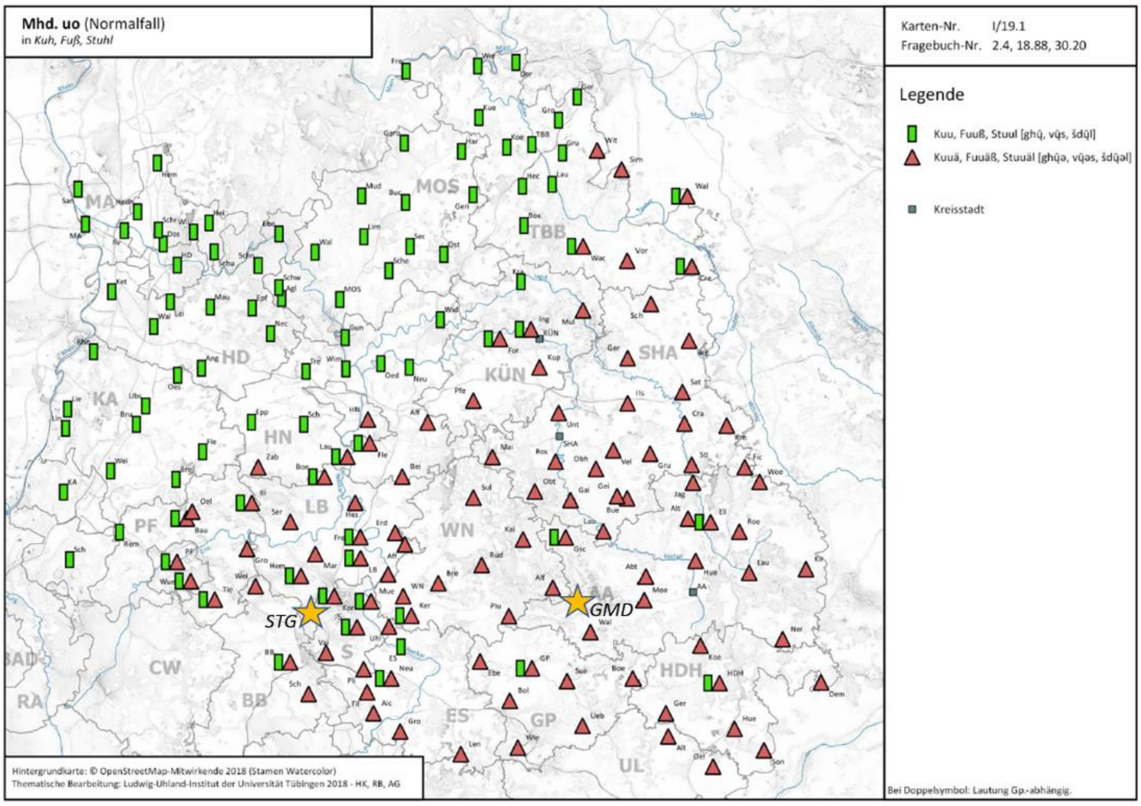


Figure A- 13. FRV4 – MHG /uo/ Diphthong [uə ~ u] Map (SNBW 2018:44, Vol. 2)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
1712	**18.57**	2226	**6.56**	881	**13.28**	1472	**7.81**	1218	**1.40**

Table A- 15. FRV4 – MHG /uo/ Diphthong [uə ~ u] Mean Frequencies

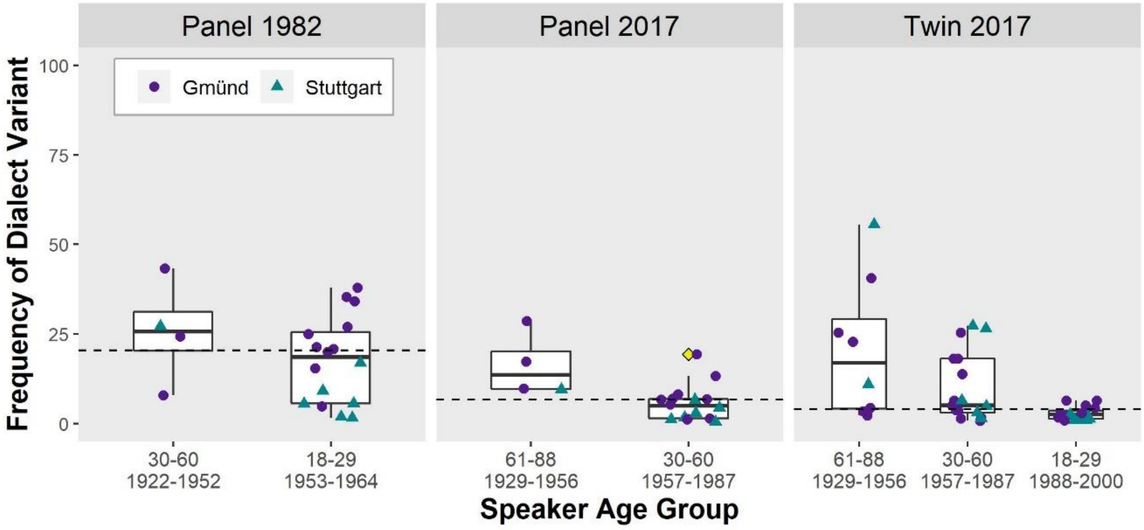


Figure A- 14. FRV4 – MHG /uo/ Diphthong [uə ~ u] Change Across Time

LEO – Lower Long Vowel [ɛ: ~ e:]

Swabian has a lower and more open long [ɛ:] vowel whereas the standard German variant is higher and more closed [e:] (Auer and Spiekermann 2011:168; Mihm 2000:2121; Spiekermann 2008:67; Russ 1990:346; Frey 1975:47; Ammon and Loewer 1977:45). The following table provides some examples of [ɛ: ~ e:] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
drehen	[dʁe:ən]	[dʁɛ:ən]	dräähe	turn
geben	[ge:bən]	[gɛ:bən]	gääbe	give
leben	[le:bən]	[lɛ:bən]	lääbe	live
Lehrer	[le:ʁɐ]	[lɛ:ʁɐ]	Läährer	teacher
lesen	[le:zən]	[lɛ:zən]	lääse	read
Mehl	[me:l]	[me:l]	Määhl	flour
sehen	[ze:ən]	[zɛ:ən]	säähe	see

Table A- 16. LEO – Lower Long Vowel [ɛ: ~ e:] Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows the usage of the dialect variant [ɛ:] for the word *Mehl* ‘flour’ (black circles) throughout Swabia.

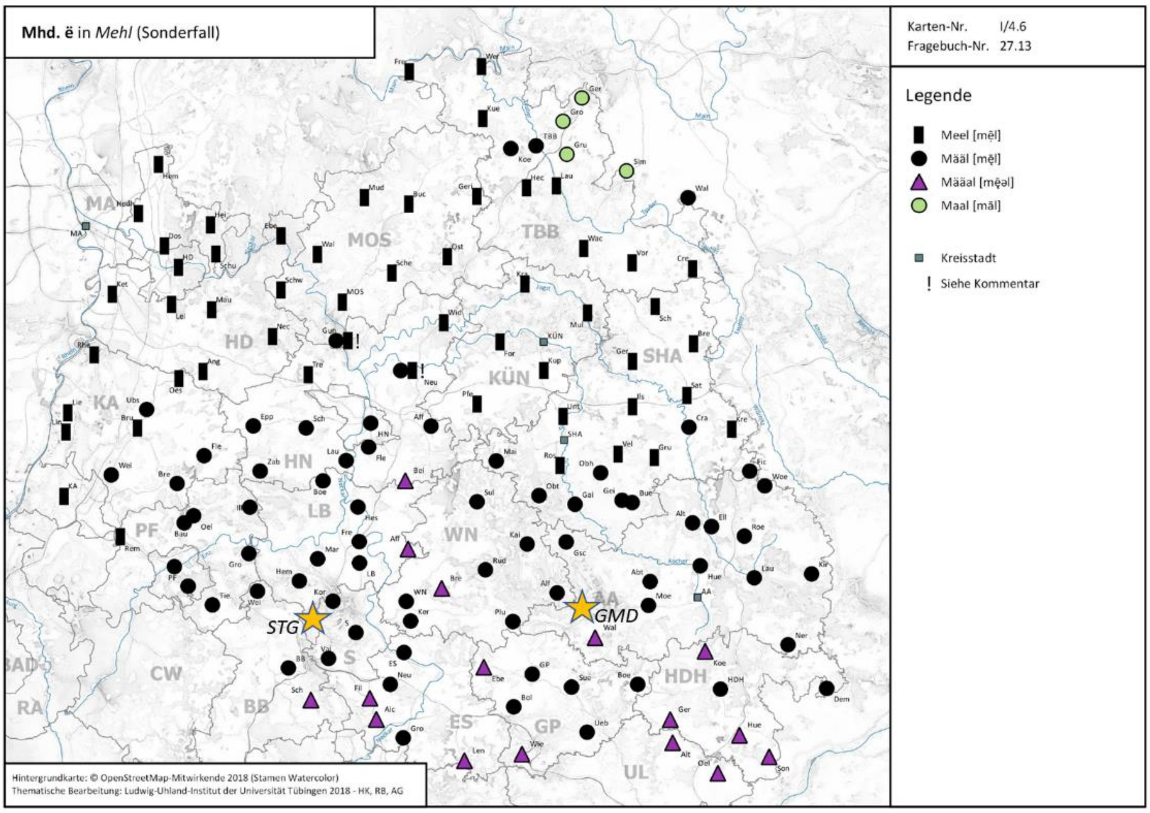


Figure A- 15. LEO – Lower Long Vowel [ɛː ~ eː] Map (SNBW 2018:39, Vol. 1)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
1205	**36.27**	2264	**20.58**	979	**14.50**	1735	**22.36**	1330	**10.83**

Table A- 17. LEO – Lower Long Vowel [ɛː ~ eː] Mean Frequencies

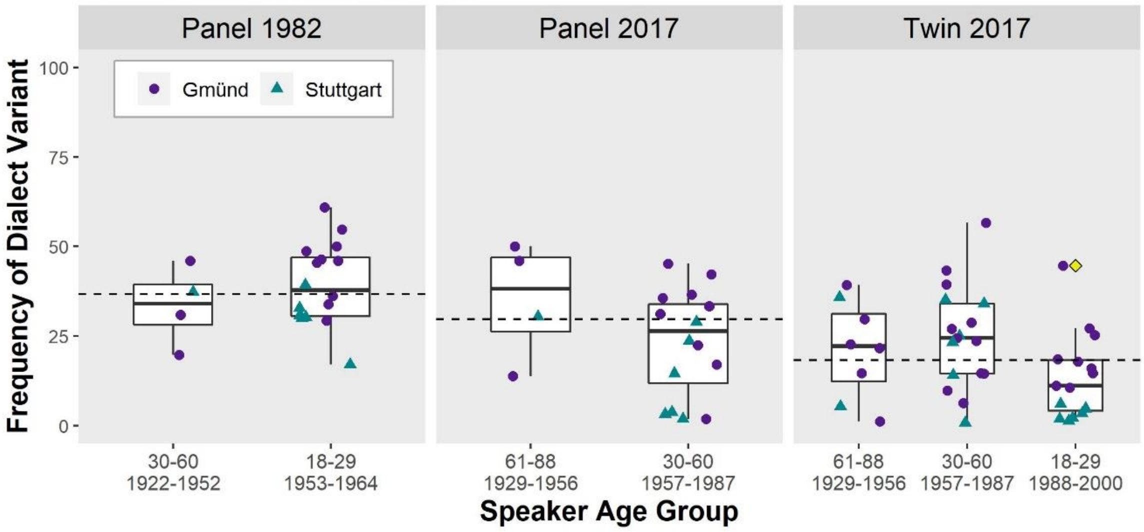


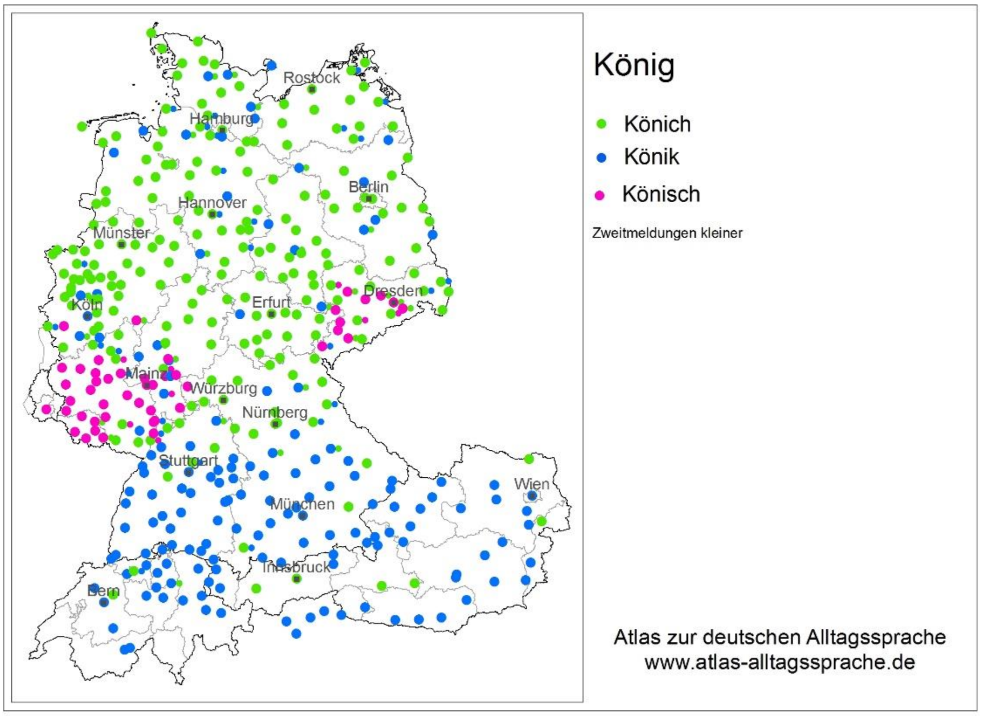
Figure A- 16. LEO – Lower Long Vowel [ɛː ~ eː] Change Across Time

Swabian and other southern German varieties differ from northern varieties by their variation between a stop [ɪk] (SWG) and a fricative [ɪç] (STD) typically in the suffix *-ig*, which changes a noun or verb into an adjective (Frey 1975:112; Herrgen 1986). The following table provides some examples of [ɪç ~ ɪk] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
bergich	bɛrkɪç	bɛrgɪg	bergig	hilly
eilich	aɪlɪç	aɪlɪg	eilig	hurried
geizich	gaɪtsɪç	gaɪtsɪg	geizig	selfish
häufich	hɔɪfɪç	hɔɪ̯fɪg	häufig	often
richtich	ʀɪçtɪç	ʀɪçtɪg	richtig	correct
wenich	veːnɪç	veːnɪg	wenig	a few

Table A- 18. SFV – Stop-Fricative Variation [ɪç ~ ɪk] Examples

The following map from the *Atlas zur deutschen Alltagssprache (AdA)*[41] shows the usage of the dialect variant [ɪk] for the word *König* 'king' (blue dots) throughout Swabia.



http://www.atlas-alltagssprache.de/runde-1/f14a-c/ (viewed 22-jan-2020)

Figure A- 17. SFV – Stop-Fricative Variation [ɪç ~ ɪk] Map (AdA 2003)

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41 All AdA maps used with permission granted by Stephan Elspaß and Robert Möller, Universität Salzburg, stephan.elpass@sgb.ac.at. 10 February 2020.

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
567	**55.73**	926	**45.90**	346	**36.42**	683	**48.17**	478	**46.86**

Table A- 19. SFV – Stop-Fricative Variation [ɪç ~ ɪk] Mean Frequencies

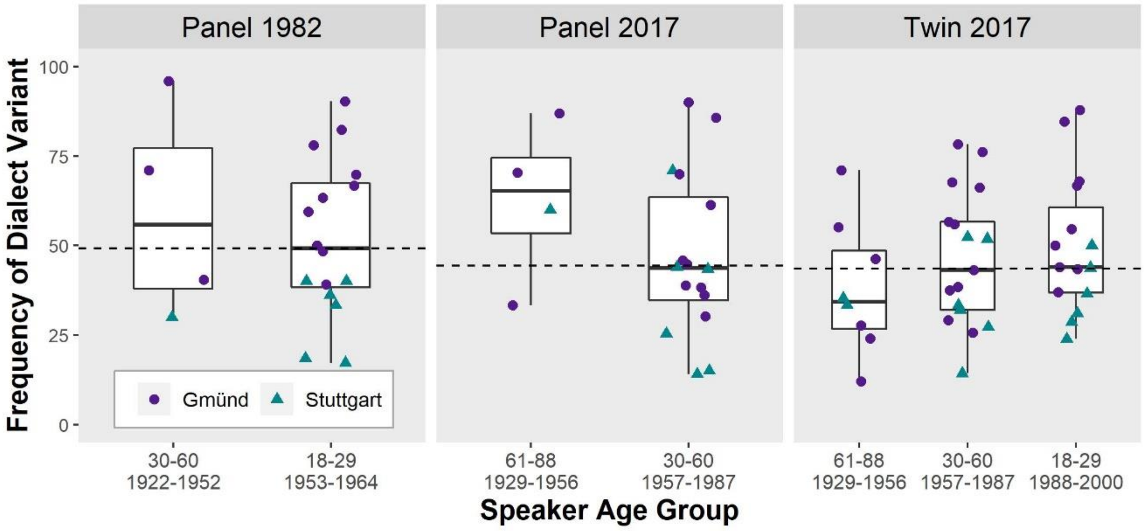


Figure A- 18. SFV – Stop-Fricative Variation [ɪç ~ ɪk] Change Across Time

STP – Palatal Coda -*st* [ʃt ~ st]

A stereotypical feature of the Alemannic dialect family is palatalisation of [s] before an obstruent, unless a morphological boundary intervenes. For example, the word *Fest* 'party' is pronounced [fɛst] in Standard German and *Fescht* [fɛʃt] in Alemannic and Swabian. Similarly, *am schlechtesten* 'the worst' is pronounced [ʃlɛxtɛstən] in Standard German and *am schlechschtesten* [ʃlɛxtɛʃtə] in Swabian (orthographically, *st* is written as *sch* in Swabian) (Auer and Spiekermann 2011:169; Frey 1975:29; Mihm 2000:2121; Spiekermann 2008:69). Note that palatalisation of [s] before [t] in morpheme initial position is a categorical feature of German, for example, *Stadt* 'city' [ʃtat] and *bestimmt* 'certain' [beʃtimt].

Palatal coda -*st* is widespread across all Alemannic dialects and is most salient in the second-person singular verb forms which generally end with the suffix -*st* (Auer 2020; Auer and Schwarz 2015). Spiekermann (2008:186) reports a 25% decline in palatalisation in Stuttgart over the last forty years, from 45% in 1961[42] to 20% in 2003[43].

[42] Spiekermann's 1961 data are drawn from the Pfeffer-Korpus (PFK), a collection of 398 interviews and narratives across 57 German-speaking states, assembled by Alan Pfeffer with the cooperation of high school teachers. Spiekermann selected 29 recordings, averaging six minutes each, for six cities in Baden-Württemberg, one of which was Stuttgart. Because the interviews were conducted by teachers, he considers them to constitute fairly formal style.
[43] Spiekermann's 2003 data are drawn from the Südwest-Standard-Korpus (SWS), a collection of

Auer's (2019) analysis of palatal coda -*st* targets six high-frequency verbs, he maintains that palatalisation is realised differently across word classes (e.g., nouns, adverbs) (personal communication). Thus, this variable has been split into four subgroups: (1) all verbs, (2) Auer's six high-frequency verbs, (3) extra-high-frequency verb *ist* 'is', and (4) other word classes. The following table provides some examples of [ʃ ~ s] variation from the Swabian corpus. Note that the final *t* can be voiced or reduced, which is not an object of study in the current investigation.

CATEGORY	STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
Verbs	machst	[maxst]	[maxʃ(t)]	machsch(t)	[you] make
	darfst	[darfst]	[darfʃ(t)]	darfsch(t)	[you] may
	kommst	[komst]	[komʃ(t)]	kommsch(t)	[you] come
	sagst	[zaːkst]	[zaːkʃ(t)]	sagsch(t)	[you] say
Six Verbs	bist	[bɪst]	[bɪʃ(t)]	bisch(t)	[you] are
(high	hast	[hast]	[haʃ(t)]	hasch(t)	[you] have
frequency)	kannst	[kanst]	[kanʃ(t)]	kannsch(t)	[you] can
	mußt	[mʊst]	[mʊʃ(t)]	mußch(t)	[you] must
	weißt	[vaɪst]	[vaɪʃ(t)]	weißch(t)	[you] know
	willst	[vɪlst]	[vɪlʃ(t)]	willsch(t)	[you] want
Verb 'ist'	ist	[ɪst / ɪs]	[ɪʃt / ɪʃ(t)]	isch	[he/she/it] is
	bist	[bɪst / bɪs]	[bɪʃt / bɪʃ(t)]	bisch	[you] are
Other	Angst	[æŋkst]	[æŋkʃ(t)]	Angsch(t)	fear
Words	coolst	[kuːlst]	[kuːlʃt(t)]	coolsch(t)	coolest
(non-verbs)	jüngste	[jʏŋstə]	[jʏŋʃtə]	jüngschte	youngest
	letzte	[lɛtstə]	[lɛtʃtə]	letzschte	last
	möglichst	[møːklɪçst]	[møːklɪçʃ(t)]	möglichsch(t)	most possible

Table A- 20. STP – Palatal Coda -st [ʃ ~ s] Examples

In 1980, I conducted a pilot study of palatalisation with one Swabian speaker during a dinner conversation with four other speakers (one other Swabian, one north German, and two American speakers of German). The analysis revealed two significant constraints: intralinguistically, a preceding high vowel, as in *du mußt* 'you should' [du muʃt] in Swabian versus [du must] in standard, was the first-order or most powerful constraint favouring palatalisation at .74, followed by non-anterior consonants favouring palatalisation at .72 (based on VARBRUL multivariate analysis (Cedergren and Sankoff 1974)). Extralinguistically, the relationship between the interlocutor and the listener had a highly significant effect: specifically, being a Schwab favoured palatalisation (.65) while not being a Schwab disfavoured (.35). Swabians simply speak more Swabian to other Swabians (Beaman 1980). The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows broad usage of palatal coda -*st* for the word *ist* 'is' (open squares) throughout southwestern Germany.

interviews with teachers across 11 cities in Baden-Württemberg assembled by the Albert-Ludwigs-Universität Freiburg between 2001 and 2003. Spiekermann's analysis covers five recordings in Stuttgart, averaging 20 minutes each. Because the informants were exclusively teachers, he considers them to constitute a fairly formal style.

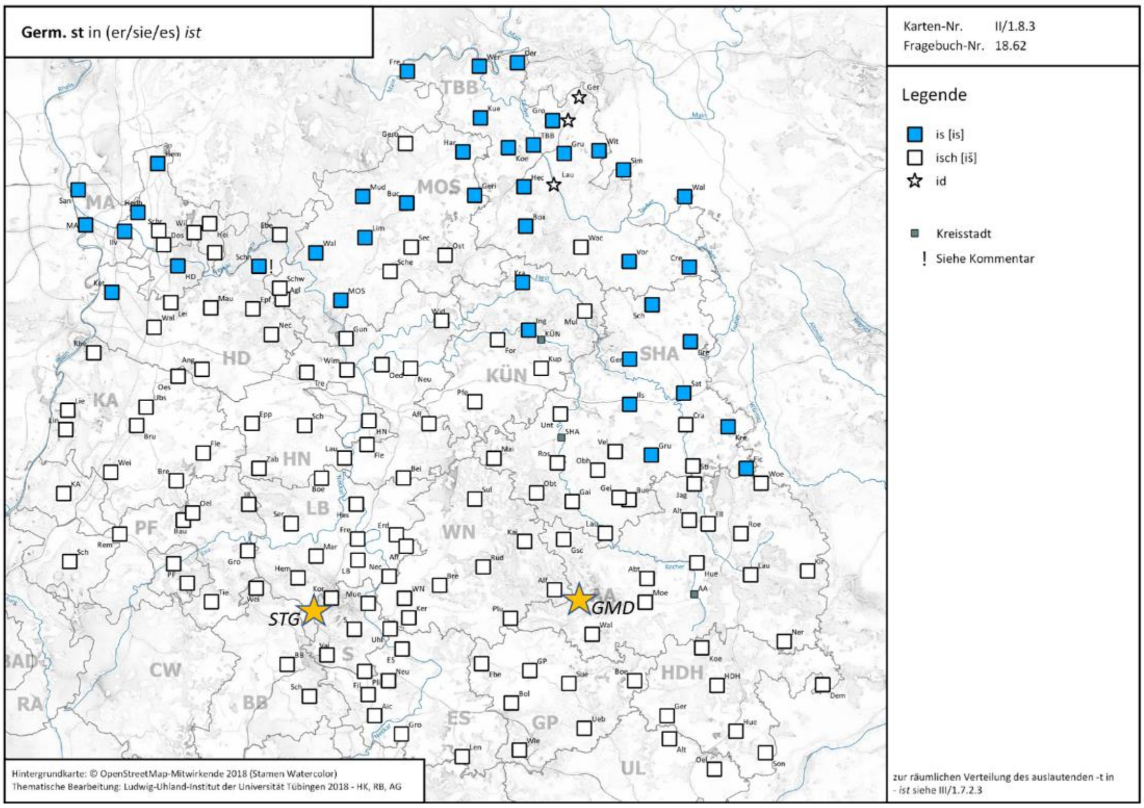


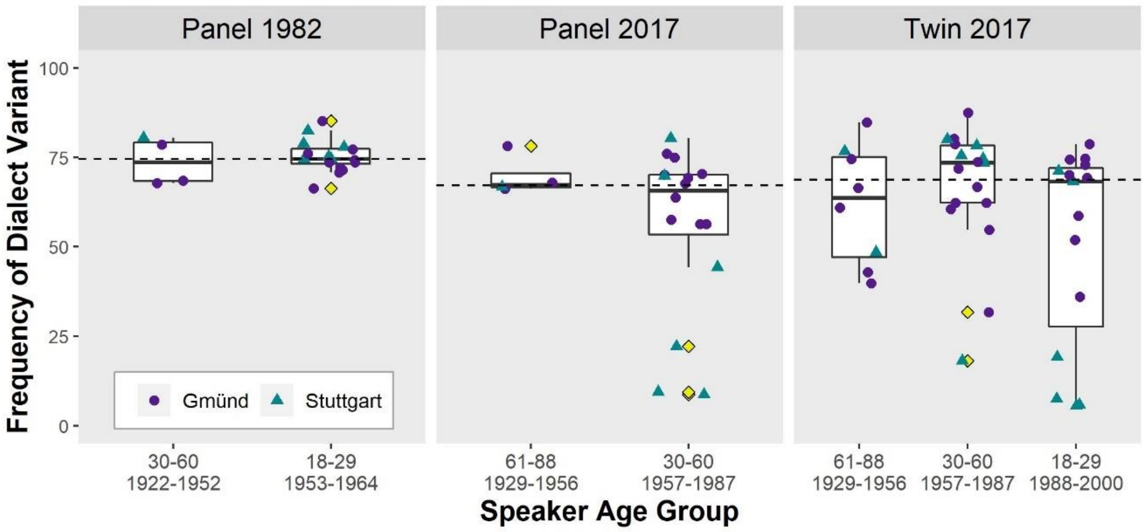
Figure A- 19. STP – Palatal Coda -st [ʃ ~ s] Map (SNBW 2018:86, Vol. 2)

The following table presents the frequencies statistics for palatal coda -*st* (STP) in the Swabian corpus across the two studies and 35 years.

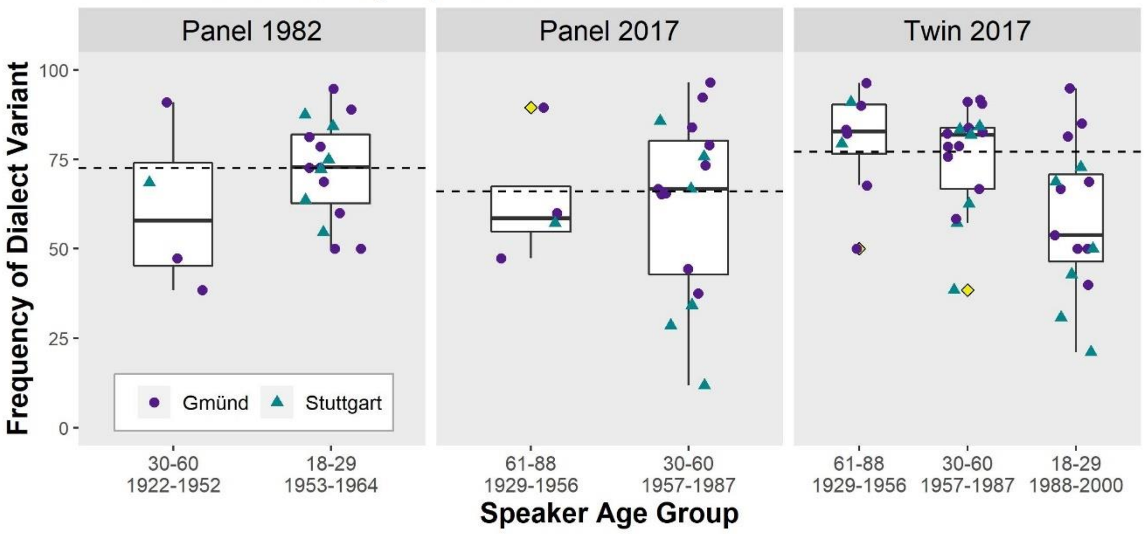
	Panel Study (n=20*2 speakers)				Trend Study (n=40 speakers)					
	1982		2017		Age Group 4		Age Group 5		Age Group 6	
	18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
	n	%	n	%	n	%	n	%	n	%
STPV Verbs	336	**75.89**	482	**70.95**	300	**86.00**	390	**82.82**	234	**68.80**
STPI 'ist/bist'	1675	**90.75**	2446	**71.30**	1235	**70.45**	1791	**81.85**	1508	**62.80**
STP6 Six Verbs	528	**60.23**	600	**50.17**	327	**68.81**	504	**61.90**	413	**25.42**
STPO Other	1369	**65.01**	1973	**39.79**	868	**37.33**	1430	**46.50**	1363	**38.66**
STPA TOTAL	3908	**76.33**	5501	**57.66**	2730	**61.43**	4115	**67.22**	3518	**49.46**

Table A- 21. STP – Palatal Coda -st [ʃ ~ s] Mean Frequencies

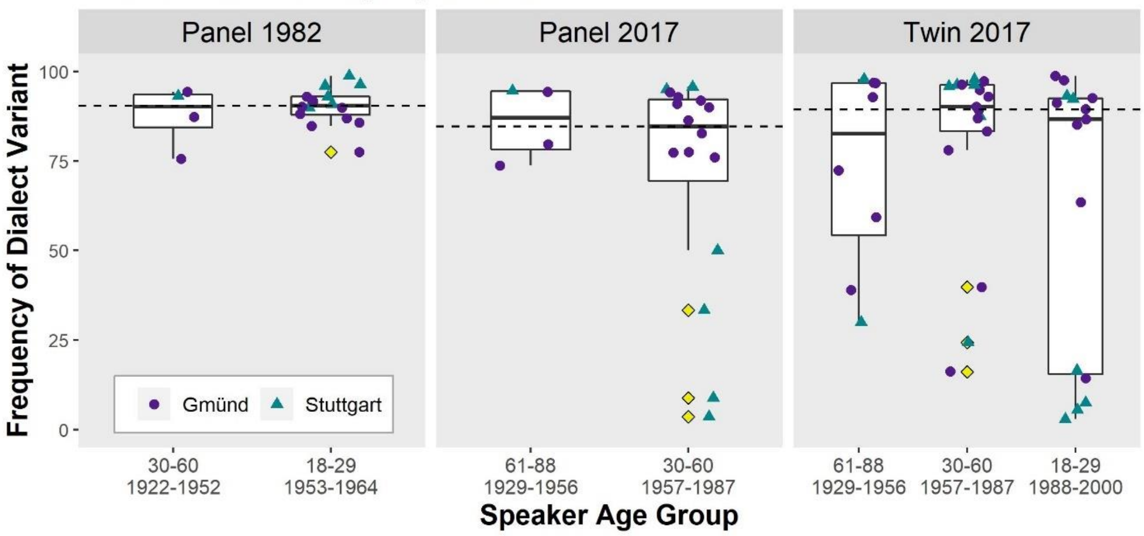
STPA – Palatal Coda -st [ʃ ~ s] - All forms



STPV – Palatal Coda -st [ʃ ~ s] - All Verbs



STPI – Palatal Coda -st [ʃ ~ s] - ist~isch



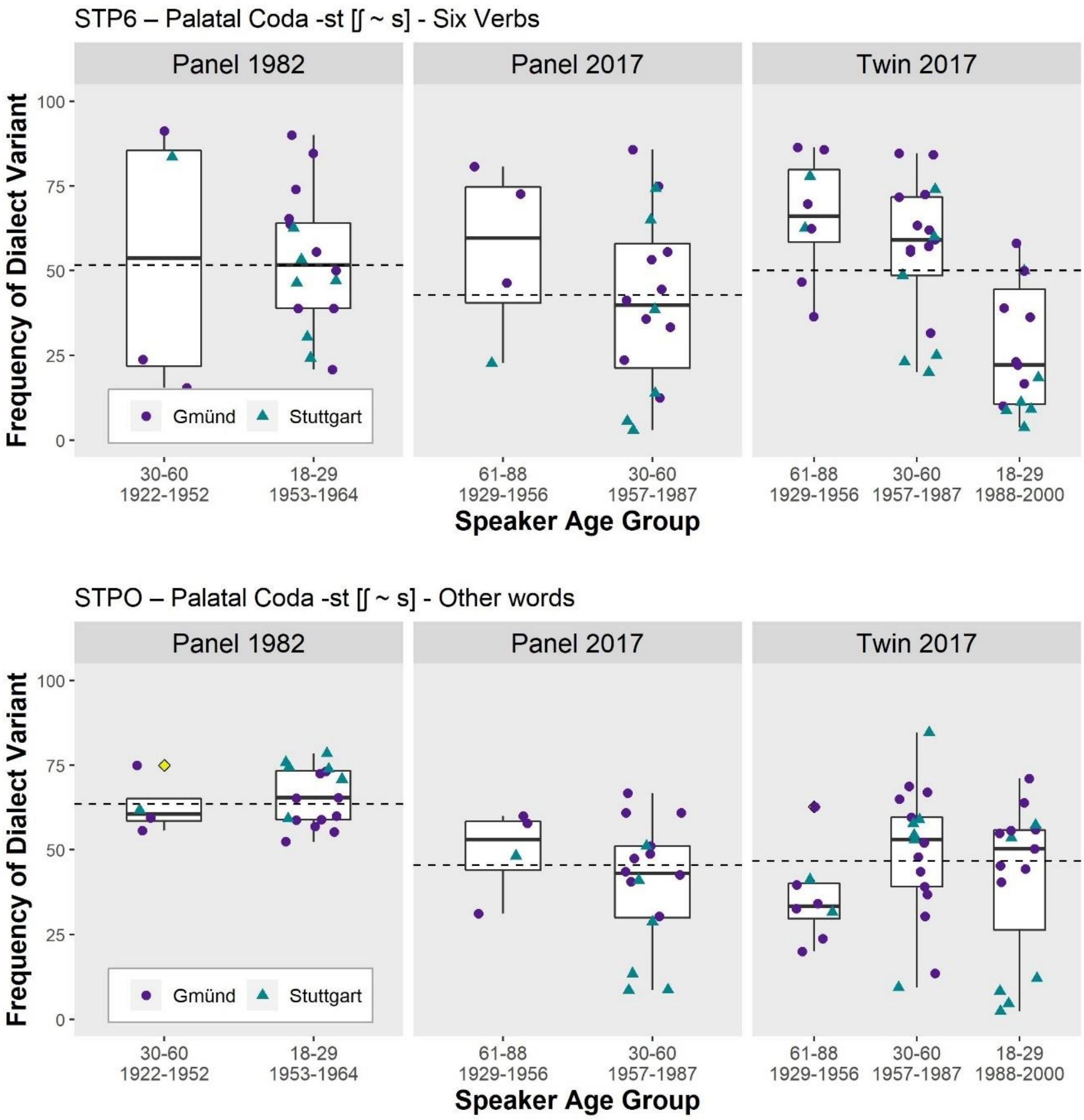
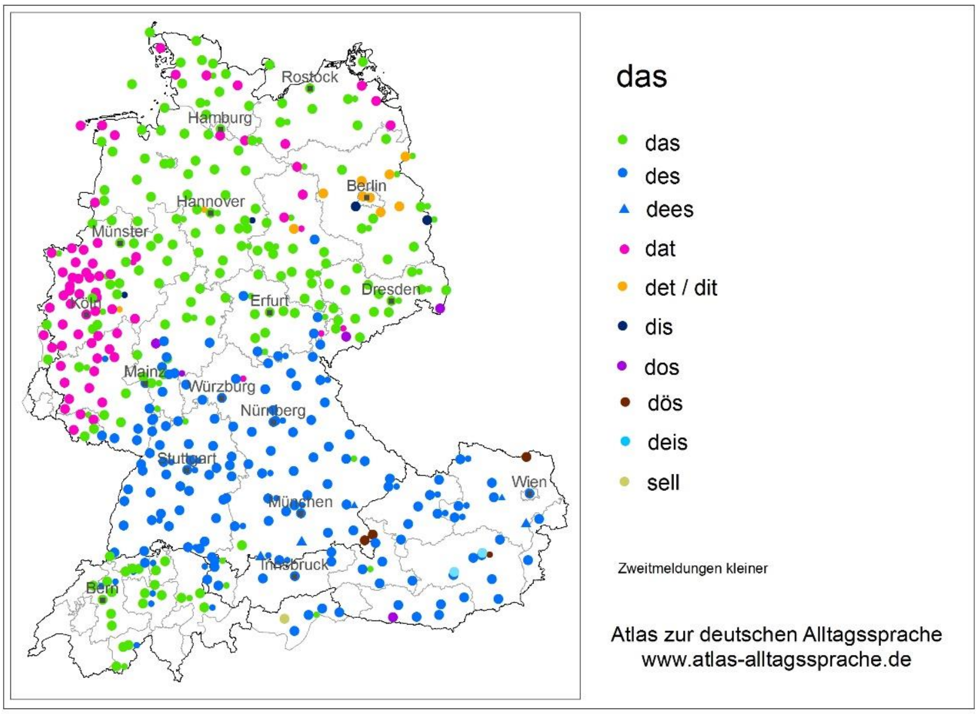


Figure A- 20. STP – Palatal Coda -st [ʃ ~ s] Change Across Time

A.2. MORPHOSYNTACTIC VARIABLES

Eleven morphosyntactic variables have been investigated in detail for this study, chosen for their commonality (i.e., considered to be prototypical in the Swabian/Alemannic variety), variability (i.e., alternation between a dialect and standard variant), and productivity (i.e., sufficient number of tokens for analysis). A description of each variable follows, including a list of examples from the Swabian corpus, a dialect map from the *Sprachatlas von Nord Baden-Württemberg* (Klausmann 2018c, 2018a, 2018b), if available, including a summary of the number of tokens and frequency of dialect use from the Swabian corpus along with a plot showing the change in the frequency of use across the two study types (panel and trend), two communities (Stuttgart and Schwäbisch Gmünd), and age groups.

A widespread dialectal variation throughout southern Germany is the definite neuter singular article *das* ‘the’ which is realised as *des* [dɛs] in the dialect versus *das* [das] in standard German. AdA remarks that the use of *des* is found in a geographical area similar to that of the negative marker *ned* (see NEG variable below). Spiekermann (2008:186) reports a 26% increase in the use of *des* in Stuttgart, from 44% in 1961 to 70% in 2003. It is worth noting that neither the relative pronoun *das* nor the complementiser *dass* are affected by this variation (Spiekermann 2008:75). The following map from the *Atlas zur deutschen Alltagssprache (AdA)* shows the usage of the dialect variant [dɛs] for the word *das* ‘the’ (blue dots) throughout Swabia.



http://www.atlas-alltagssprache.de/runde-2/f25a/ (viewed 22-jan-2022)

Figure A- 21. DAS – Definite Neuter Article ‘des’ ~ ‘das’ Map (AdA 2003)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
2066	**95.40**	3374	**93.72**	1657	**94.93**	2376	**95.16**	2078	**97.45**

Table A- 22. DAS – Definite Neuter Article ‘des’ ~ ‘das’ Mean Frequencies

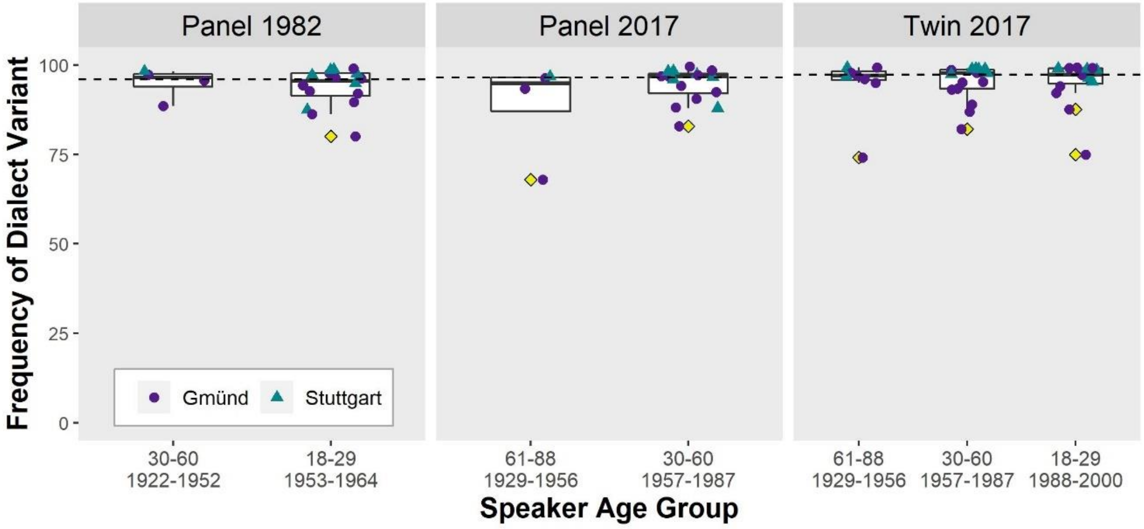


Figure A- 22. DAS – Definite Neuter Article 'des' ~ 'das' Change Across Time

EDP – Plural Verb Inflection: *-ed* ~ *-en*

One of the most common features of Swabian is the different inflection for plural verbs. In Swabian, all present tense plural verbs (all persons) take the ending *-ed* (pronounced as [-əd] or [-ət]) versus *-en* as in the standard language (Frey 1975:126-128; Vogt 1977). The following table provides some examples of *-ed* ~ *-en* variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
bringen	[briŋən]	[briŋət]	bringet	we/you bring
trinken	[triŋkən]	[driŋkət]	drinket	we/you drink
dürfen	[dʏrfən]	[dirfət]	diirfet	we/you should
essen	[ɛsən]	[ɛsət]	esset	we/you eat
machen	[ma:xən]	[ma:xət]	machet	we/you make
nehmen	[ne:mən]	[ne:mət]	nehmet	we/you take
verstecken	[ferʃtɛkən]	[ferʃtɛkət]	verstecket	we/you hide
zahlen	[tsa:lən]	[tsa:lət]	zahlet	we/you pay

Table A- 23. EDP – Plural Verb Inflection: -ed ~ -en Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of the plural verb inflection *-et* for the word *nehmen* 'we/you take' (red circles) throughout southwestern Germany.

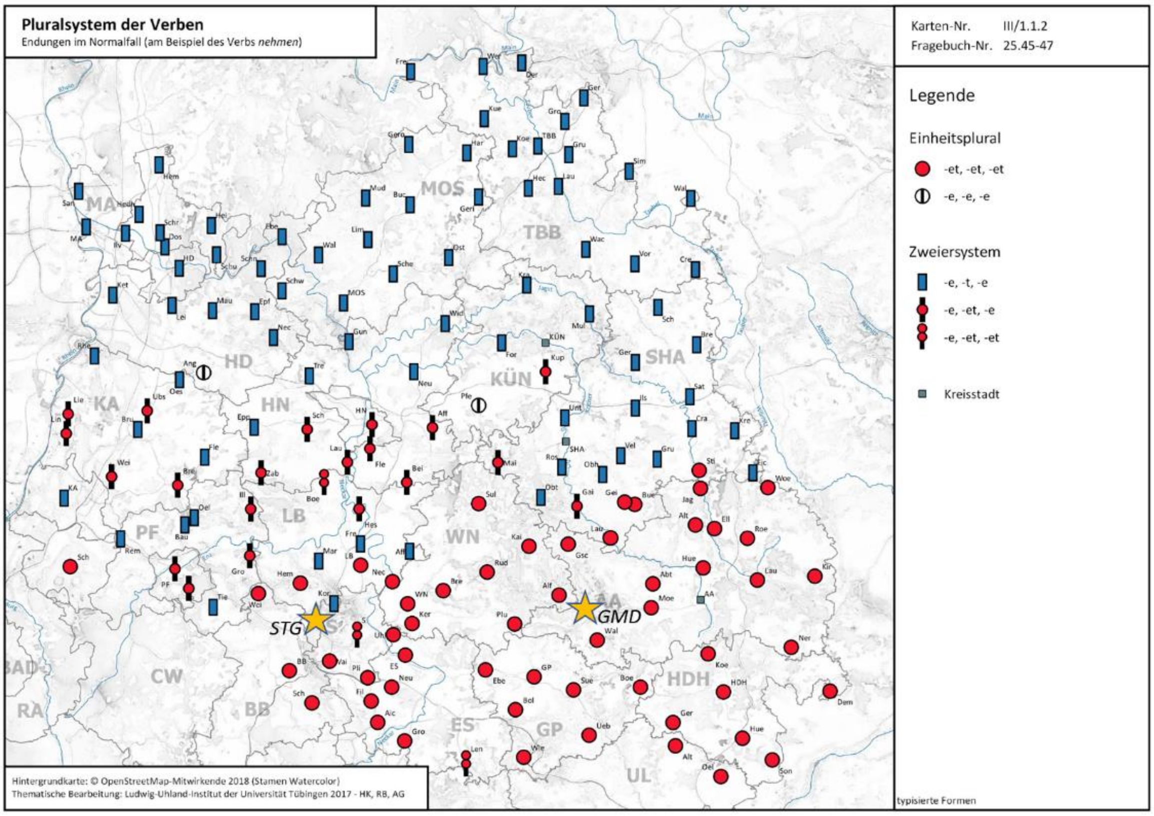


Figure A- 23. EDP – Plural Verb Inflection: -ed ~ -en Map (SNBW 2018:10, Vol. 3)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
902	**76.50**	2279	**29.27**	813	**38.01**	1479	**31.71**	1275	**21.10**

Table A- 24. EDP – Plural Verb Inflection: -ed ~ -en Mean Frequencies

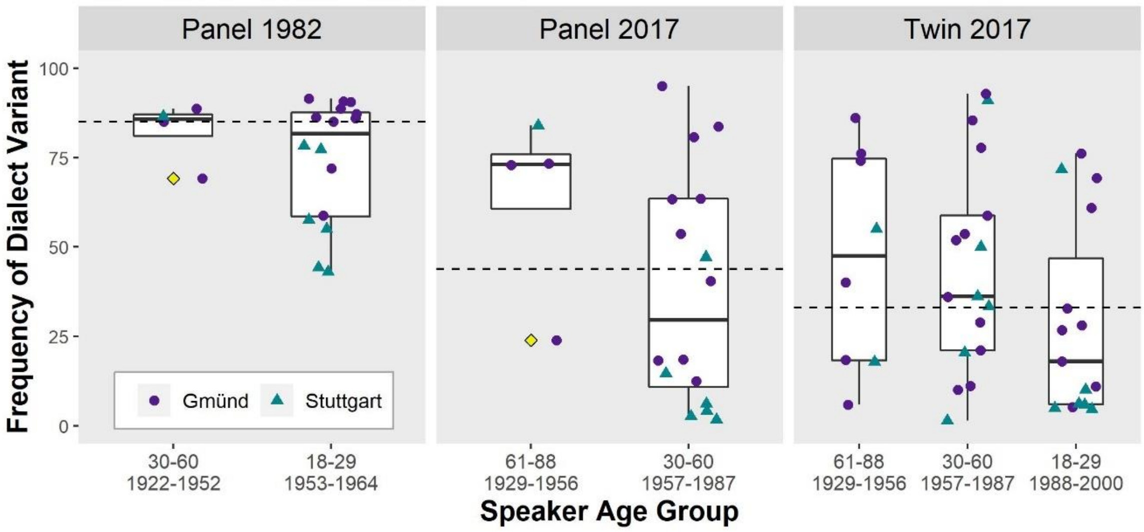


Figure A- 24. EDP – Plural Verb Inflection: -ed ~ -en Change Across Time

A distinctive and highly salient feature of Swabian is its use of a number of irregular (or strong) verb stems in the present tense versus standard German which uses strong stems of these verbs only in the preterite and past participle formations. One such Swabian irregular verb is *gehen* 'to go'. Specifically, *wir gehen* [vɪr ge:hən] 'we're going' is realised as *mr ganget* [mɪr gangət] in Swabian (Frey 1975:141). The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of dialect form *i gang* ich gehe 'I go' (red rectangles) throughout southwestern Germany.

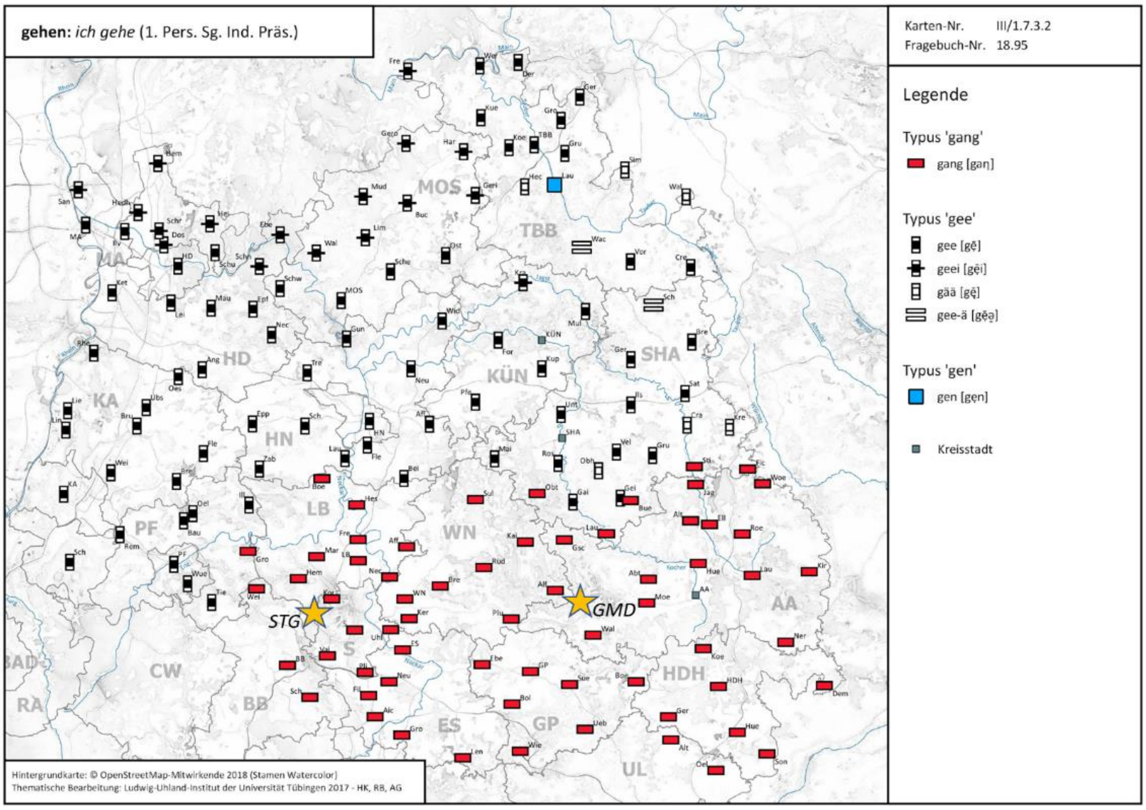


Figure A- 25. IRV1 – Irregular Verb: gange ~ gehen Map (SNBW 2018:51, Vol. 3)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
223	**72.20**	331	**33.84**	158	**40.51**	289	**37.02**	191	**26.18**

Table A- 25. IRV1 – Irregular Verb: gange ~ gehen Mean Frequencies

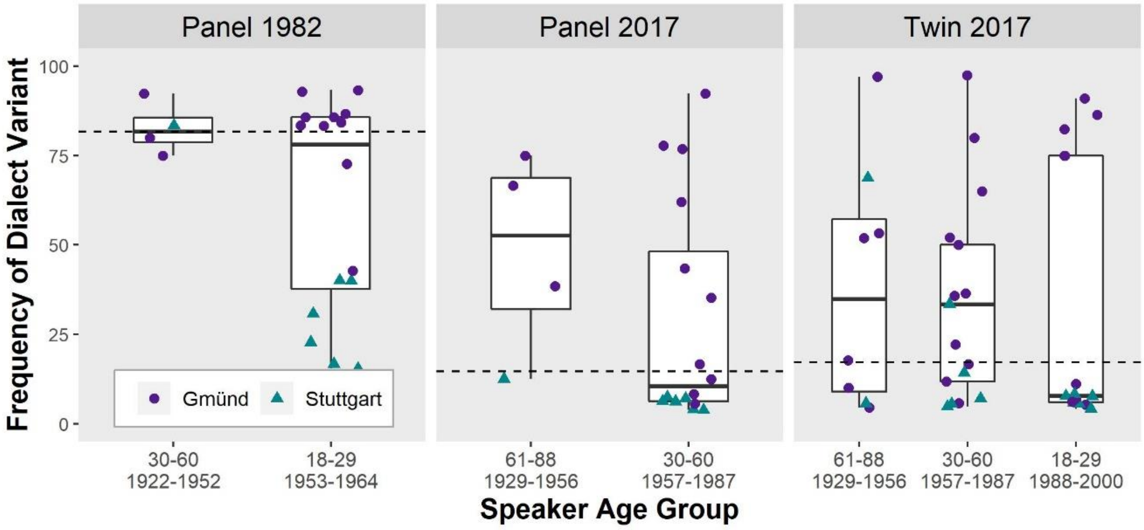


Figure A- 26. IRV1 – Irregular Verb: gange ~ gehen Change Across Time

IRV2 – Irregular Verb: *stande ~ stehen*

Another irregular Swabian verb that uses a strong stem in the present tense is *stehen* 'to stand', along with the related form, *verstehen* 'to understand', in contrast to standard German which uses strong stems only in the preterite and past participle forms. In Swabian these verbs are realised as *mr stande* 'we stand' and *mr verstande* 'we understand' versus *wir stehen* and *wir verstehen* in the standard language (Frey 1975:141). The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of dialect form *mr standet* wir stehen 'we stand' (red circles) throughout southwestern Germany.

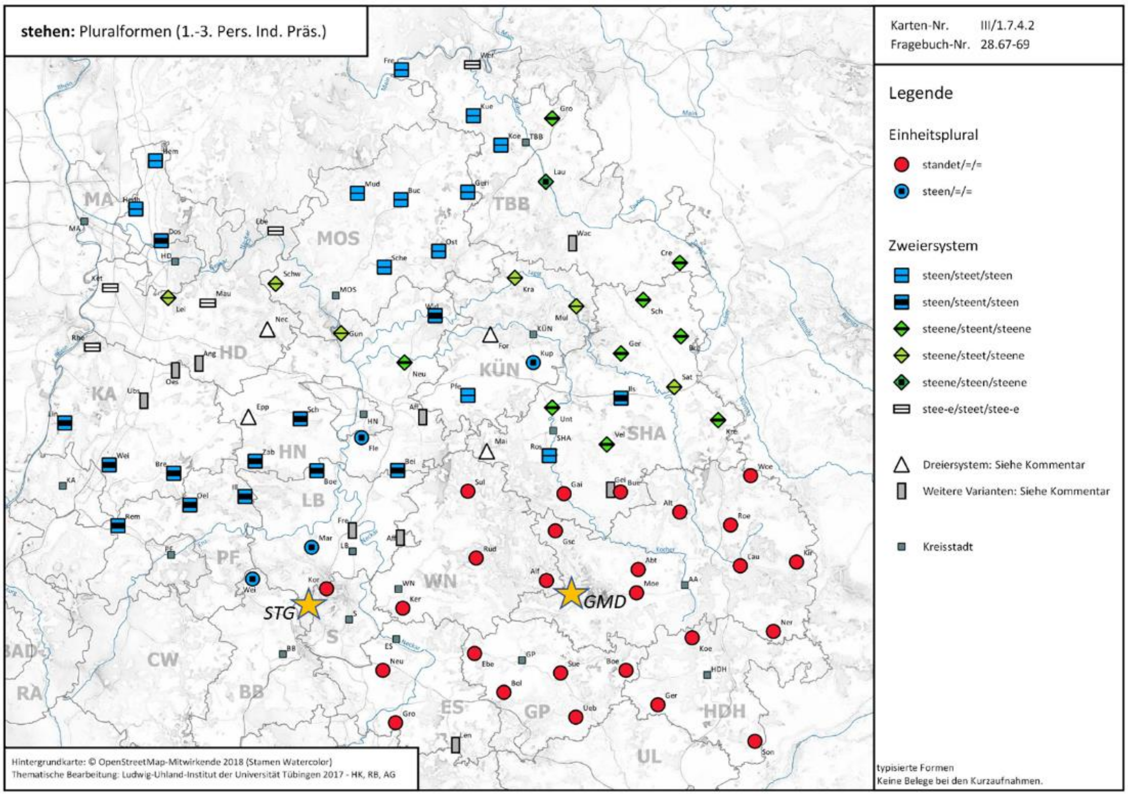


Figure A- 27. IRV2 – Irregular Verb: stande ~ stehen Map (SNBW 2018:58, Vol. 3)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
155	**67.74**	160	**43.12**	86	**27.91**	168	**34.52**	122	**33.61**

Table A- 26. IRV2 – Irregular Verb: stande ~ stehen Mean Frequencies

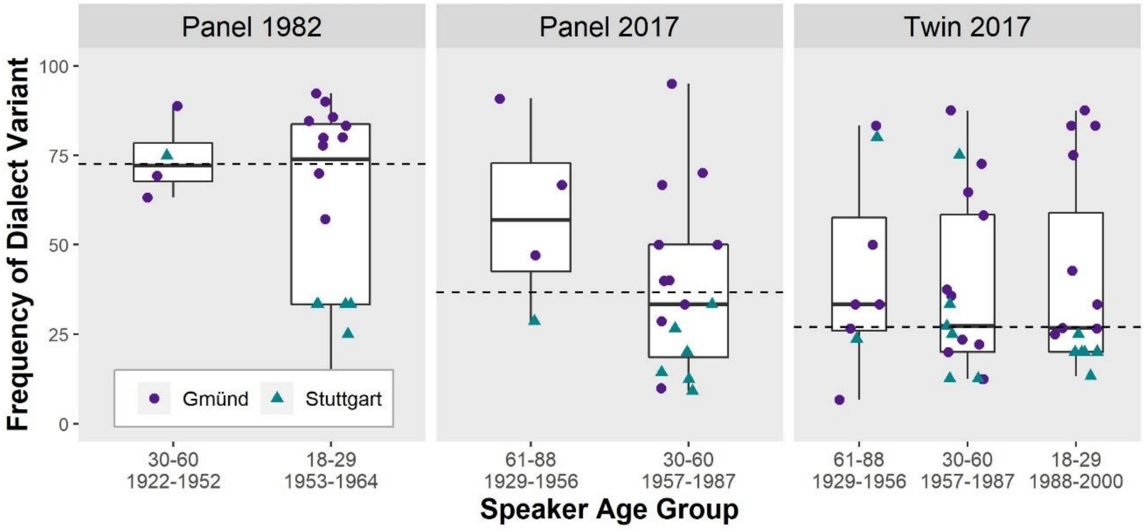


Figure A- 28. IRV2 – Irregular Verb: stande ~ stehen Change Across Time

IRV3 – Irregular Verb: *hen* ~ *haben*

A highly productive, yet less salient Swabian verb is the auxiliary *haben* 'to have', which is conjugated differently in Swabian versus standard German. The following table provides the paradigm for the present tense conjugation of *haben* (STD) and *hen* (SWG). The past participle of *haben* is also irregular in Swabian, with varying pronunciations depending on the Swabian fortis/lenis distinction, e.g., *ghet*, *ghed*, *khet*, or *khed* (SWG) versus *gehabt* (STD) 'had' (Frey 1975:142).

	STD singular	STD plural	SWG singular	SWG plural
1st	ich habe	wir haben	i han	mr hen (habed)
2nd	du hast	ihr habt	du hâsch	ihr hen (habed)
3rd	er/sie hat	sie haben	er/sie hâd	sie hen (habed)

Table A- 27. IRV3 – Irregular Verb: hen ~ haben Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of dialect form for the past participle of *haben* 'to have' *ghet* gehabt 'had' (red and yellow diamonds) throughout southwestern Germany.

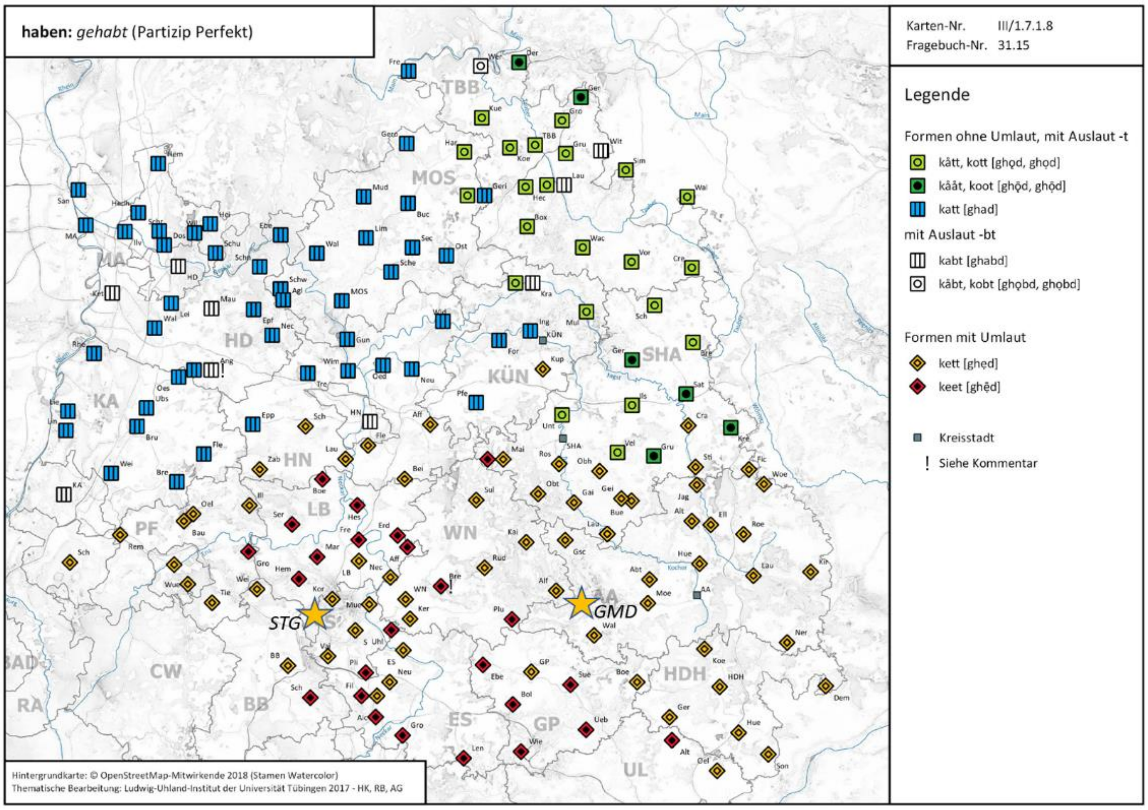


Figure A- 29. IRV3 – Irregular Verb: hen ~ haben Map (SNBW 2018:42, Vol. 3)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
1041	**65.51**	1825	**30.96**	1076	**62.45**	1471	**33.58**	835	**23.95**

Table A- 28. IRV3 – Irregular Verb: hen ~ haben Mean Frequencies

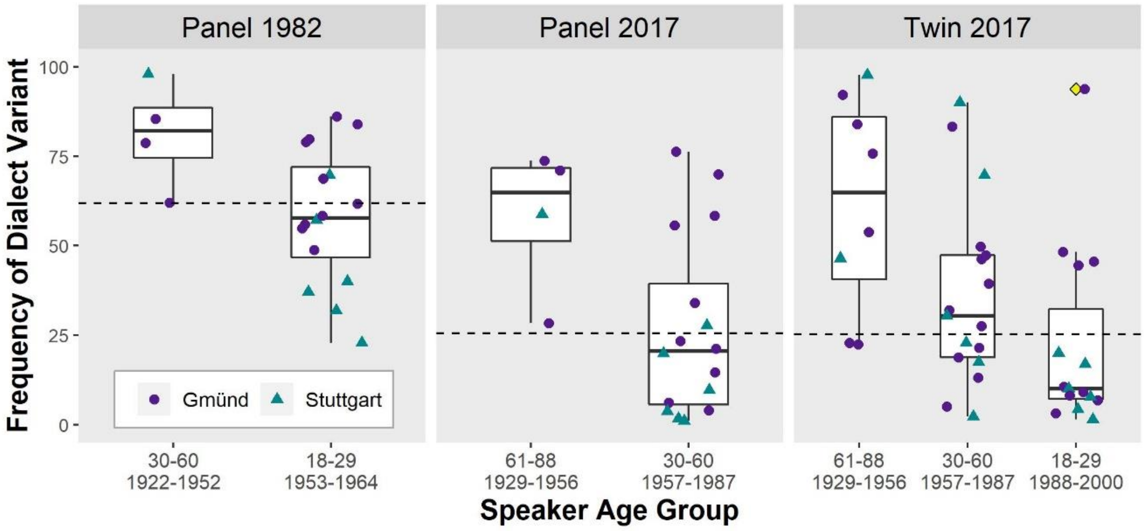


Figure A- 30. IRV3 – Irregular Verb: hen ~ haben Change Across Time

Another widespread dialectal form throughout southern Germany is in the use of the negative marker *nicht* ‘not’ which has a number of dialectal variants: *et, it, ed, net, ned, ette, itte, edde, nette, nitte, nedde, nidde,* etc. The *Atlas zur deutschen Alltagssprache* (AdA) denotes an isogloss south of Cologne (in the west) and Dresden (in the east), demarcating the standard form *nicht* to the north and *ned/nedde* to the south (AdA 2011:Question 25e, see Figure A- 31). The many dialectal variants are based largely on locality. For example, the *ned/nedde* variants are more common in Stuttgart (Spiekermann 2008:75), while the *ed/edde* variants are more common in Schwäbisch Gmünd (current study). All dialectal variants of the negative marker have been combined in the current analysis in order to compare them with the standard German variant *nicht*. The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows broad usage of dialect form for the dialect forms *ned(e), nid(e), ed(e),* and *it(e)* ‘not’ (open rectangles and red circles) throughout southwestern Germany.

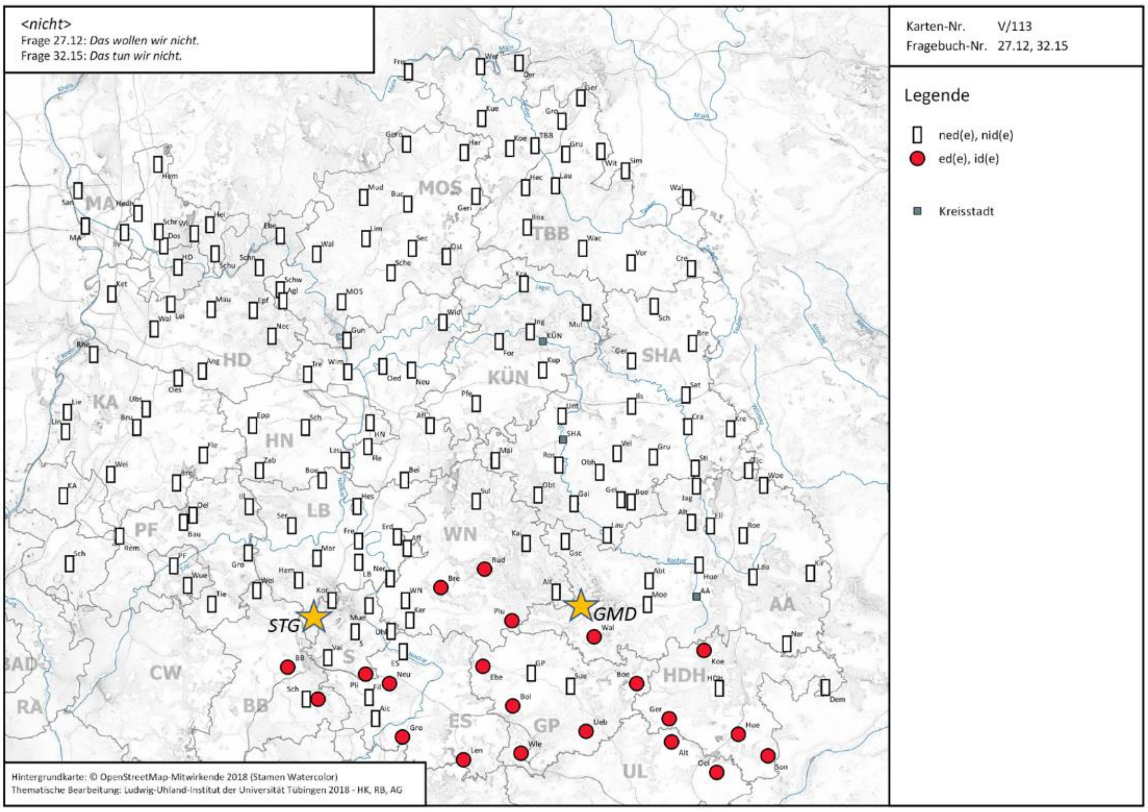


Figure A- 31. NEG – Negative Marker: ned ~ nich(t) Dialect Map (SNBW 2019:122, Vol. 5)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
1348	**95.10**	1902	**64.51**	752	**83.64**	1212	**76.07**	1288	**50.23**

Table A- 29. NEG – Negative Marker: ned ~ nich(t) Mean Frequencies

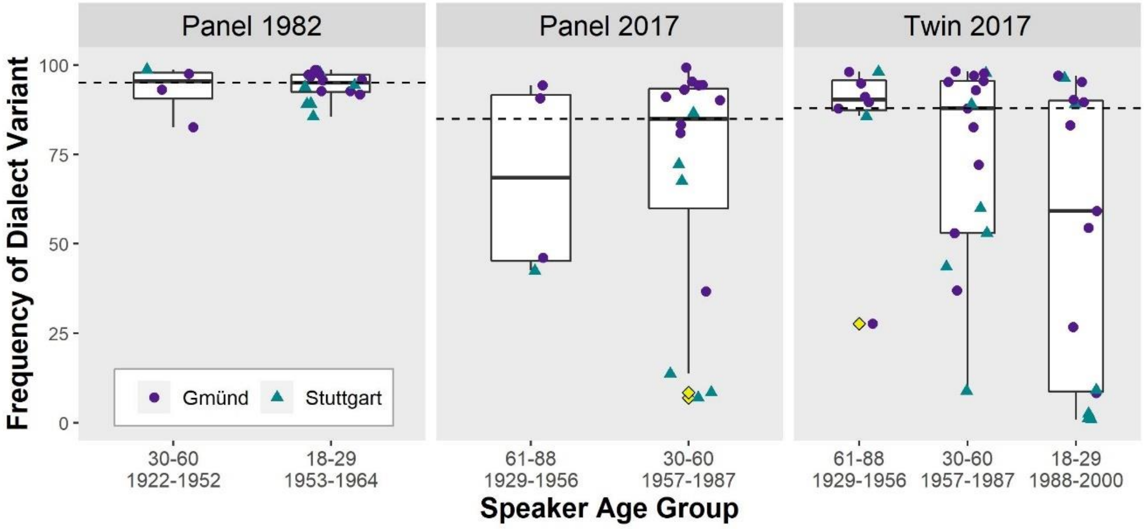
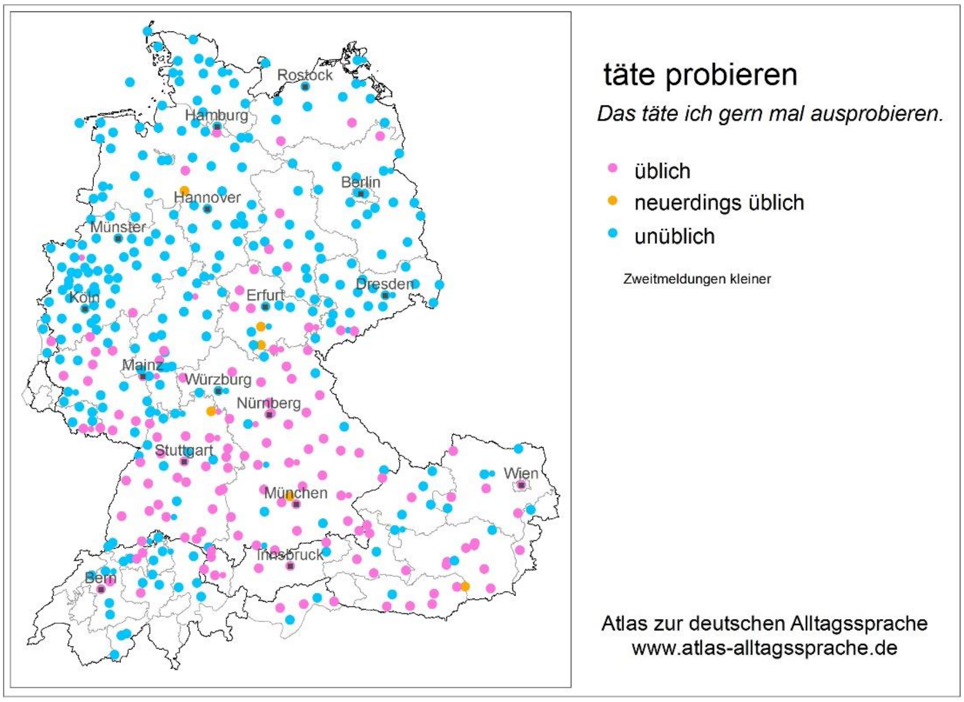


Figure A- 32. NEG – Negative Marker: ned ~ nich(t) Change Across Time

PVB – Periphrastic Subjunctive: *dääd ~ würde*

Swabian has a periphrastic verbal structure for the subjunctive mood using the verb *tun* 'to do' versus standard German which uses the verb *werden* 'to become'. Some examples are *er dääd lache* (SWG) versus *er würde lachen* (STD) 'he would laugh' (Frey 1975:146) and *es dääd beeinflusse* (SWG) versus *es würde beeinflussen* (STD) 'it would influence.' In his study of southwestern German dialects, Graf (1977:297) found that 92% (286) of subjunctive verbs were periphrastic forms. The following map from the *Atlas zur deutschen Alltagssprache (AdA)* shows the usage of the dialect variant *täte probieren* 'would try' (red dots) through southwest Germany.



http://www.atlas-alltagssprache.de/runde-2/f18c/ (viewed 22-jan-2020)

Figure A- 33. PVB – Periphrastic Subjunctive: dääd ~ würde Map (AdA 2003)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
126	**64.29**	166	**48.19**	53	**81.13**	126	**42.86**	155	**15.48**

Table A- 30. PVB – Periphrastic Subjunctive: dääd ~ würde Mean Frequencies

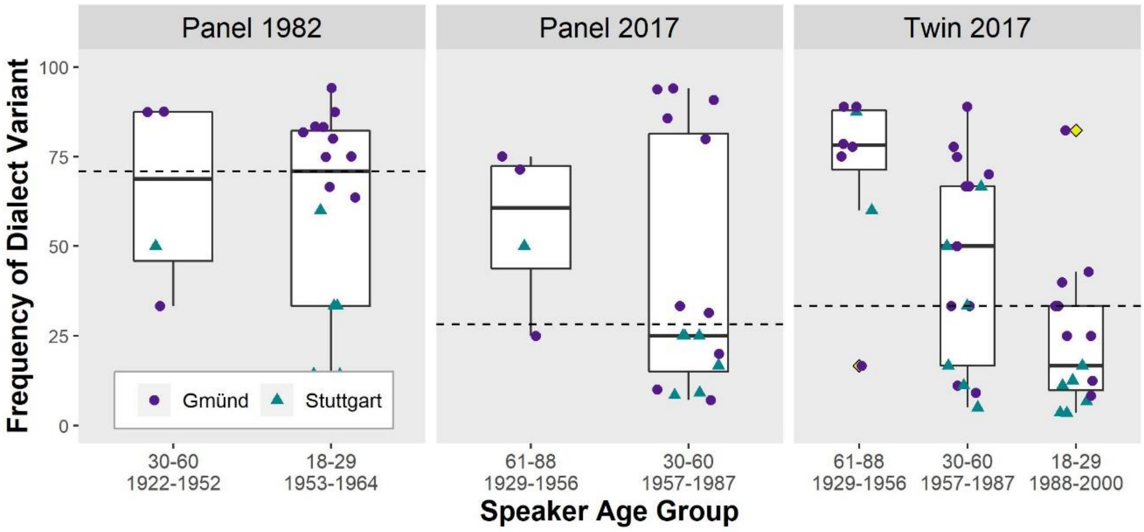


Figure A- 34. PVB – Periphrastic Subjunctive: dääd ~ würde Change Across Time

SAF1 – Swabian Affix: *-le* ~ *-chen*

Another distinguishing feature of Swabian is the different affixes that are used in forming words. Undoubtedly the most prototypical and salient Swabian affix is the suffix *-le* as opposed to the standard German *-chen* (or *-lein* which has mostly died out) which is used to create a diminutive form, such as in *Häusle* 'little house' in Swabian versus *Häuschen* in standard German and *bissle* 'little bit' in Swabian versus *bisschen* in standard German (Frey 1975:113-114). In Swabian, the diminutive affix is pronounced [lə] in the singular and [le] in the plural. Due to its extremely high frequency, Auer (2019) analyses the form *bissle* 'little bit' separately from other words with the diminutive *-le* suffix, a convention also followed in this research. He suspects that the standard variant *bisschen* is less salient as its derivation is no longer transparent (Auer 2019:4). The following table provides some examples of *-le* ~ *-chen/lein* variation from the Swabian corpus. The Swabian words are attested in the corpus; however, it is questionable whether a German speaker would ever use standard German equivalents such as *Autolein* or *Autochen* 'little car' or *Unterschiedchen* 'little difference'; more common would be *ein kleines Auto* 'a small car' and *ein kleiner Unterschied* 'a small different.'

STD(ortho)	SWG(ortho)	ENG
Autolein	Auedole	little car
Bächlein	Bächle	little river
Büblein	Buebele	little boy
bisschen	bissle	little bit
Häuschen	Haisle	little house
jetzt	jedsedle	now!
Mädchen	Mädle	little girl
Päckchen	Päckle	little package
Stückchen	Stiickle	little piece
Unterschiedchen	Unterschiedle	little decision

Table A- 31. SAF1 – Swabian Affix: -le Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows use of the dialect form -*le* (red and white boxes) throughout Swabia.

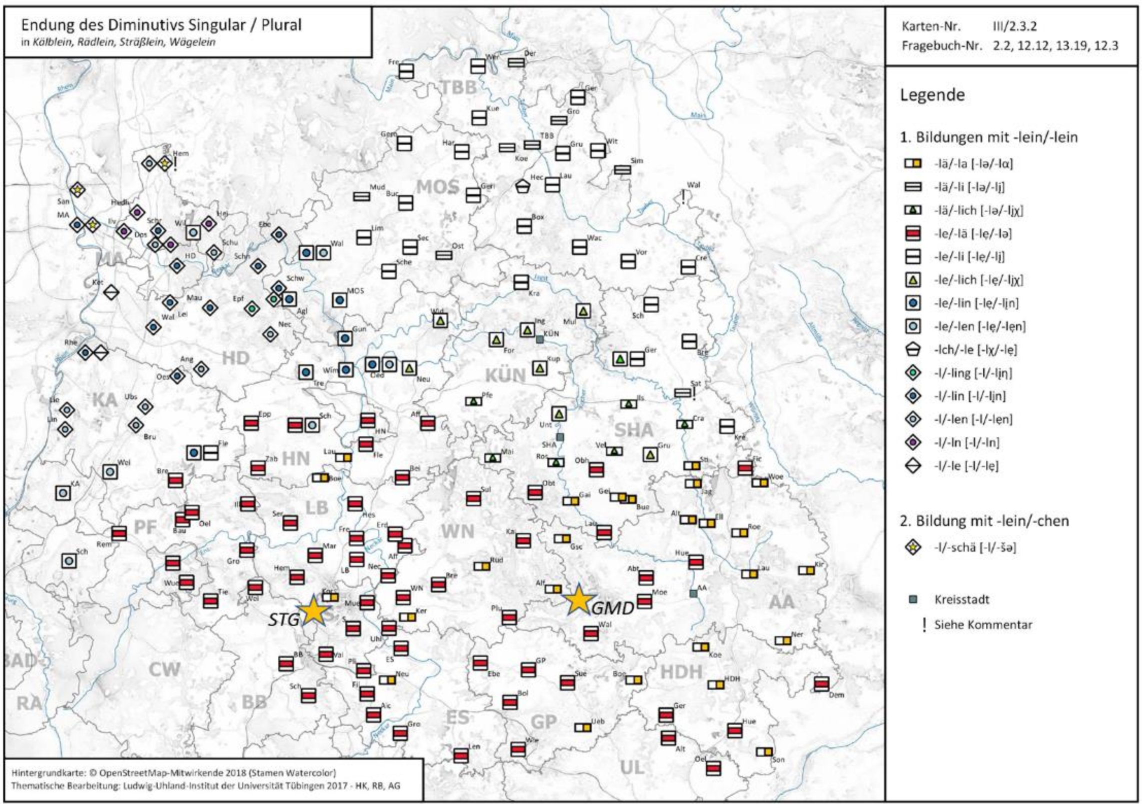


Figure A- 35. SAF1– Swabian Affix: -le Map (SNBW 2018:100, Vol. 3)

With a variable such as the -*le* diminutive affix, it is not particularly relevant to look at a binary distinction between the use of dialect -*le* and standard -*chen/-lein*, since Swabian speakers use the dialect variant -*le* considerably more frequently than standard German speakers would ever use -*chen/-lein.* Hence, this variable has been calculated as a “normed frequency” by dividing the actual frequency count of the variable by the total number of words in the corpus and multiplying by 100 to arrive at a normed score per 100 words (Levey 2001).

	Panel Study (n=20*2 speakers)				Trend Study (n=40 speakers)					
	1982		2017		Age Group 4		Age Group 5		Age Group 6	
	18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
	n	%	n	%	n	%	n	%	n	%
SAF1 *-le*	219	**26.08**	156	**12.76**	82	**15.09**	177	**20.15**	71	**9.75**
SAF1B *'bissle'*	210	**25.01**	219	**17.91**	70	**12.88**	195	**22.20**	150	**20.60**
SAF1A TOTAL	429	**51.09**	375	**30.67**	152	**27.97**	372	**42.36**	221	**30.35**

Table A- 32. SAF1A – Swabian Affix: -le and 'bissle' Frequency per 100 words

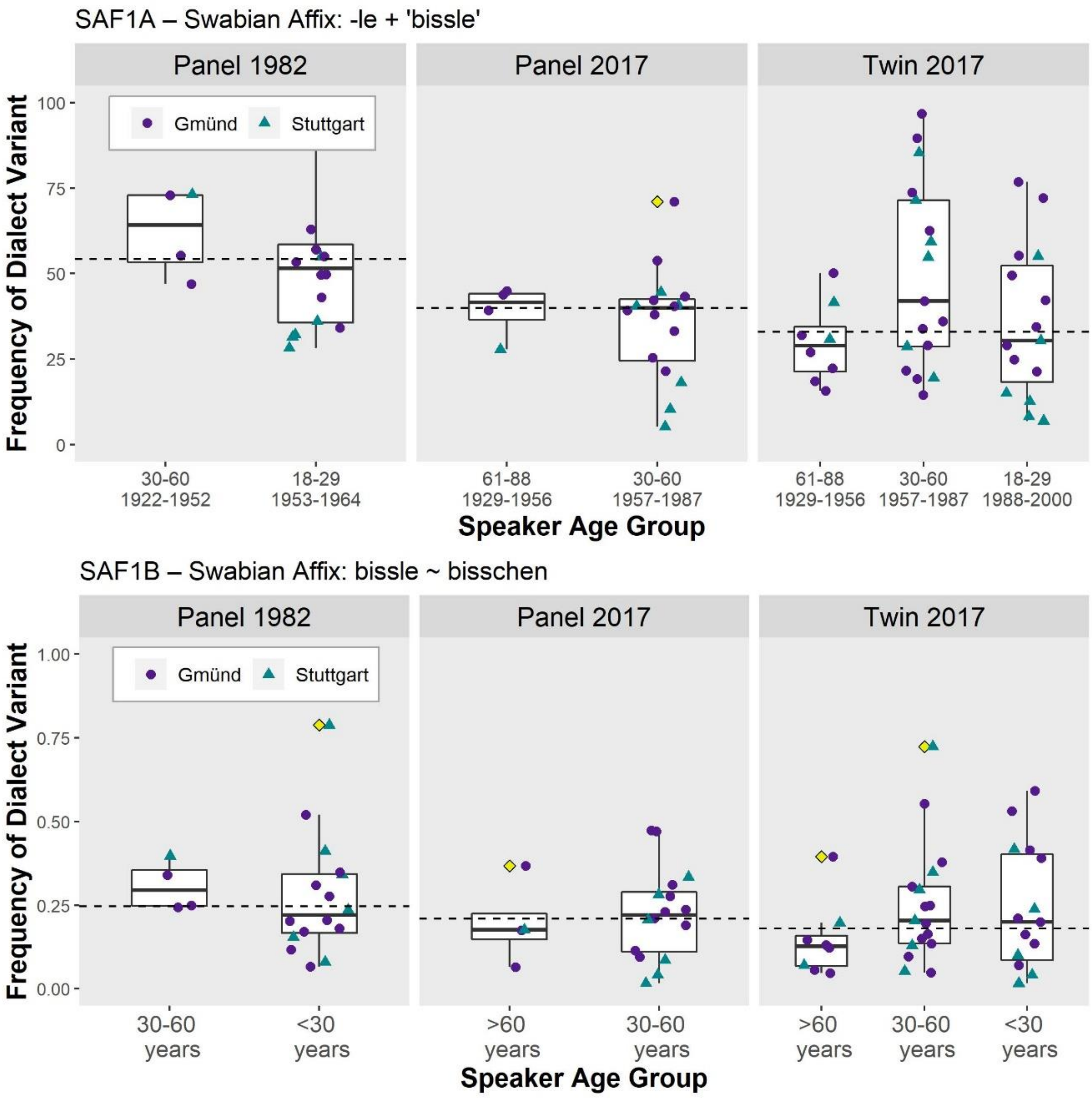


Figure A- 36. SAF1A – Swabian Affix: -le and 'bissle' Change Across Time

Swabian uses the prefix *nââ-* instead of *hin-*, which translates to many different prepositions in English, such as ‘in’, ‘to’, ‘at’, ‘away’, ‘about’, ‘down’, ‘there’, and others. The following table provides some examples of *nââ ~ hin* variation from the Swabian corpus.

STD(ortho)	SWG(ortho)	ENG
hinschauen	nââgucke	to look at
hinsetzen	nââhocke	to sit down
hinhören	nââheere	to listen to
hinkriegen	nââkriege	to wrangle / carry off
hingehen	nââgehe	To go in
hinlaufen	nââlaufe	to walk there
hinstehen	nââstande	to stand away

Table A- 33. SAF3 – Swabian Affix: -nââ ~ -hin Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of the dialect form -*nââ* (white rectangles) throughout Swabia.

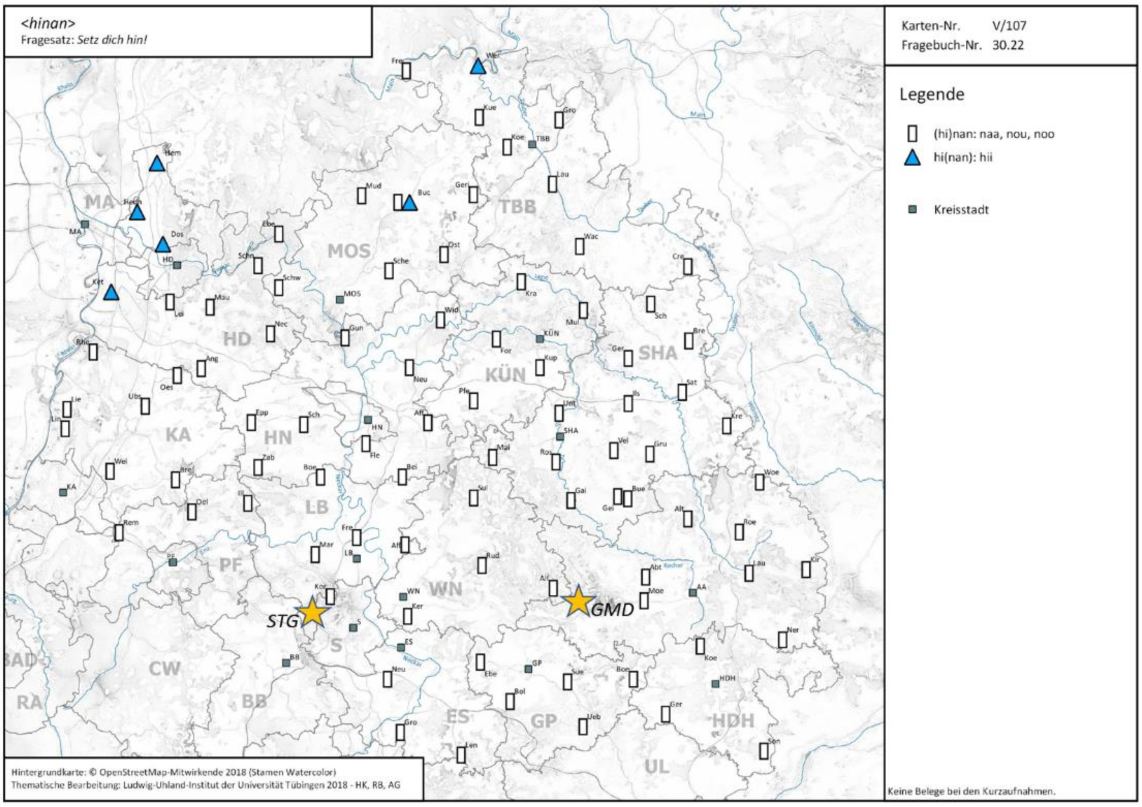


Figure A- 37. SAF3 – Swabian Affix: nââ- ~ hin- (SNBW 2019:116, Vol. 5)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
93	**80.65**	100	**26.00**	74	**60.81**	78	**41.03**	70	**24.29**

Table A- 34. SAF3 – Swabian Affix: nââ- ~ hin Mean Frequencies

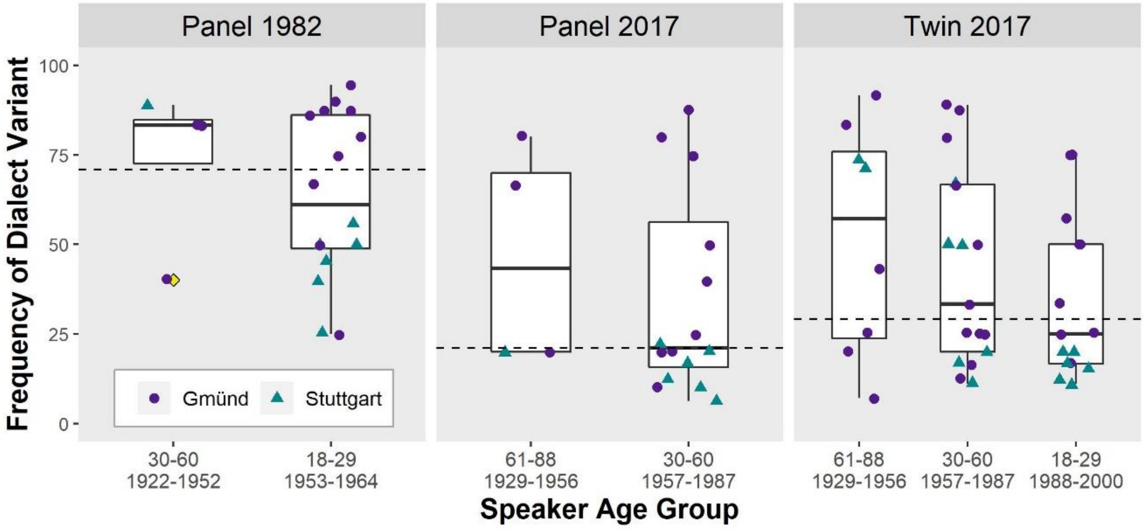


Figure A- 38. SAF3 – Swabian Affix: nâ̂- ~ hin Change Across Time

SAF5 – Swabian Affix: *Ø ~ ge-*

Swabian has only one past tense construction, the present perfect, which uses the auxiliary verbs *haben* 'to have' or *sein* 'to be' and the past participle of the verb, formed with the prefix *ge-*, for example, *er hat geschwäblt* 'he has spoken Swabian'. This construction is also used in standard German which also has imperfect tense. In Swabian, it is common to drop the past participle prefix *ge-*, which is highly productive in all environments, e.g., *er hat [ge]schwäblt* 'he has spoken Swabian', and most commonly following a stop, e.g., *er hat [ge]kriegt* 'he got it'. The following table provides some examples of *Ø ~ ge-* variation from the Swabian corpus. Note that [ge] is used to denote the absence of the prefix.

STD(ortho)	SWG(ortho)	ENG
abgebrannt	ab[ge]brannt	burned up
gedacht	[ge]denkt / [ge]dacht	thought
angefangen	an[ge]fange / ã[ge]fange	began
gesagt	[ge]sagt	said
gestanden	[ge]stande	stood
gewusst	[ge]wiisst / [ge]wusst	knew
umgezogen	um[ge]zoge	moved
zurückgekommen	zuriick[ge]komme	went back

Table A- 35. SAF5 – Swabian Affix: Ø ~ ge- Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows usage of the dialect form *baut* gebaut 'built' (yellow diamonds) throughout Swabia.

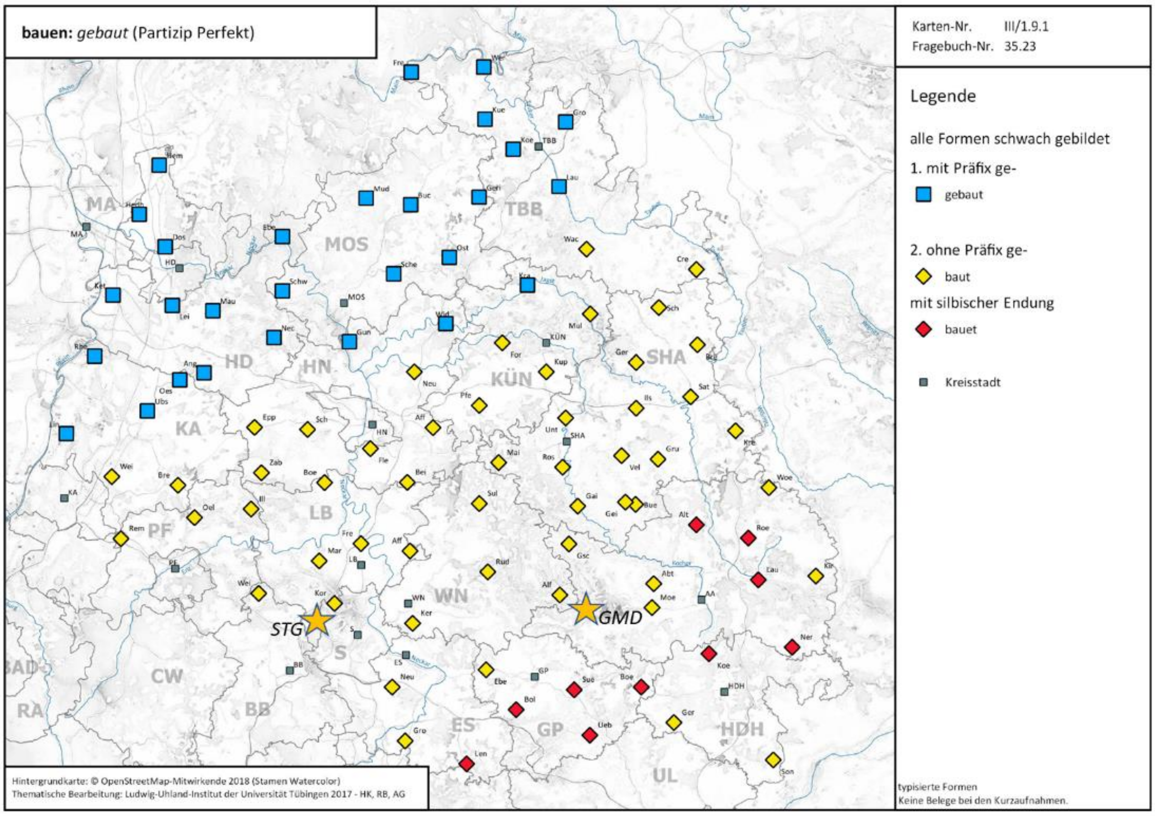


Figure A- 39. SAF5 – Swabian Affix: Ø ~ ge- Map (SNBW 2018:76, Vol. 3)

Panel Study (n=20*2 speakers)				Twin Study (n=40 speakers)					
1982		2017		Age Group 4		Age Group 5		Age Group 6	
18-60 years (1922-1964)		53-88 years (1922-1964)		61-88 years (1929-1956)		30-60 years (1957-1987)		18-29 years (1988-2000)	
n	%	n	%	n	%	n	%	n	%
553	**64.74**	1198	**31.22**	532	**54.32**	758	**41.82**	528	**39.58**

Table A- 36. SAF5 – Swabian Affix: Ø ~ ge- Mean Frequencies

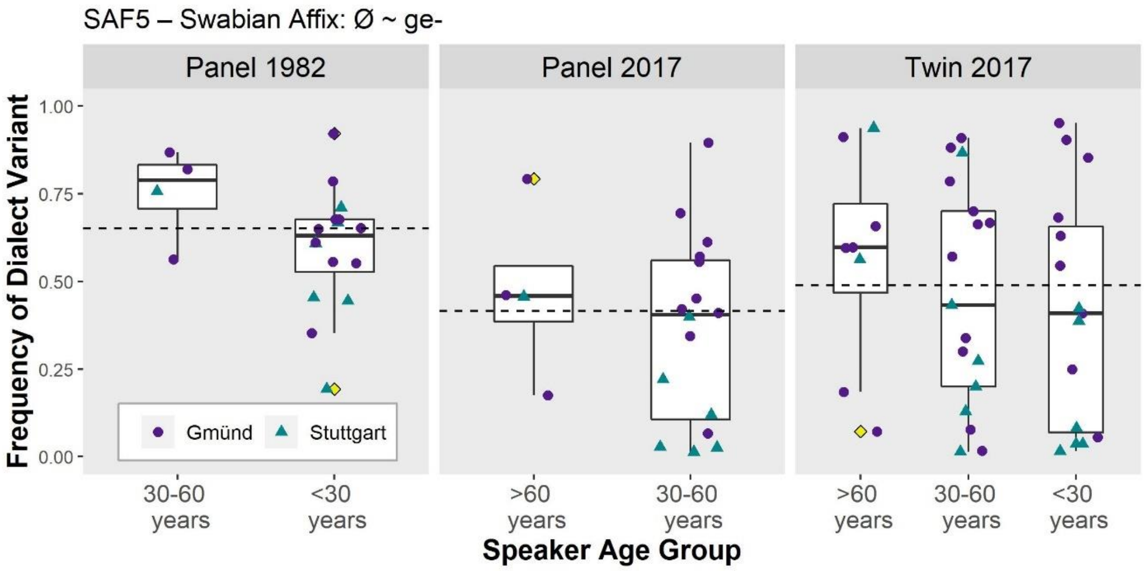


Figure A- 40. SAF5 – Swabian Affix: Ø ~ ge- Change Across Time

There has been considerable linguistic analysis of relative clauses in German, which are primarily formed using one of the *dxx* relative pronouns, e.g., *der*, *die*, *das*, *den*, *dem,* or one of the *wxx* pronouns primarily used in the written language, e.g., *welche, welcher, welchem*. However, little attention has been given to the nonstandard use of *wo* as a relative pronoun for non-place references. While not uniquely Swabian, use of *wo* as a relative marker is common in dialects across Germany. This variable is analysed in detailed in Chapter 6. The following table provides some examples of *wo ~ dxx* variation from the Swabian corpus.

SWG	STD	ENG
des beschde Daitsch, wo s gib	das beste Deutsch, das (NOM) es gib	the best German that there is
Lait, wo no kôi Schwäbisch verstandet	Leute, die (NOM) noch kein Schwäbisch verstehen	people who still don't understand Swabian
e Mädle, wo drogeabhängig war	ein Mädchen, das (NOM) drogenabhängig war	a young girl who was drug-addicted
Umstände, wo keiner was dafür konnt	Umstände, für die (ACC) keiner etwas konnte	circumstances that no one can do anything about
Sache, wo mã ned halte kã	Sache, die (ACC) man nicht halten kann	things that you can't deal with
e schlechter Mench, wo I ned leiden kã	ein schlechter Mensch, den (ACC) ich nicht leiden kann	a bad person whom I can't stand
sei Ôigeheit, wo i schee finde,	sein Eigenheit, die (ACC) ich schön finde	his characteristic that I find nice
wichtige Kollege, wo mã s Gfiehl han	wichtiger Kollege, mit dem (DAT) man das Gefühl hat	important colleague with whom you have a feeling
mein Kumpel, wo i hait morge zamme war	mein Kumpel, mit dem (DAT) ich heute morgen zusammen war	my buddy whom I was with this morgen
ene Region, wo s e bissle ruhiger isch	eine Region, in der es ein bisschen ruhiger ist	a region in which it is a little calmer

Table A- 37. REL – Relative Marker: wo ~ dxx Examples

The following map from the *Sprachatlas von Nord Baden-Württemberg (SNBW)* shows broad usage of the dialect form *wo* 'where' (yellow circles) versus standard German *als* 'as' in temporal relative clauses which is common throughout southern Germany.

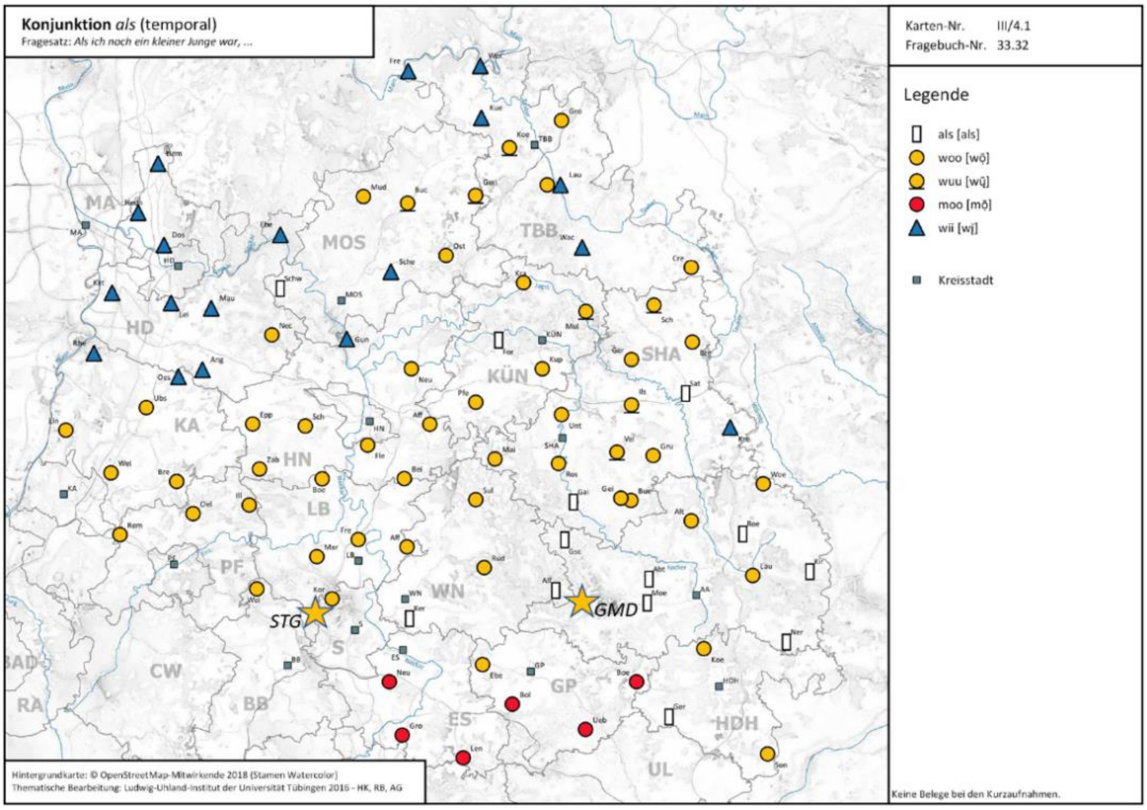
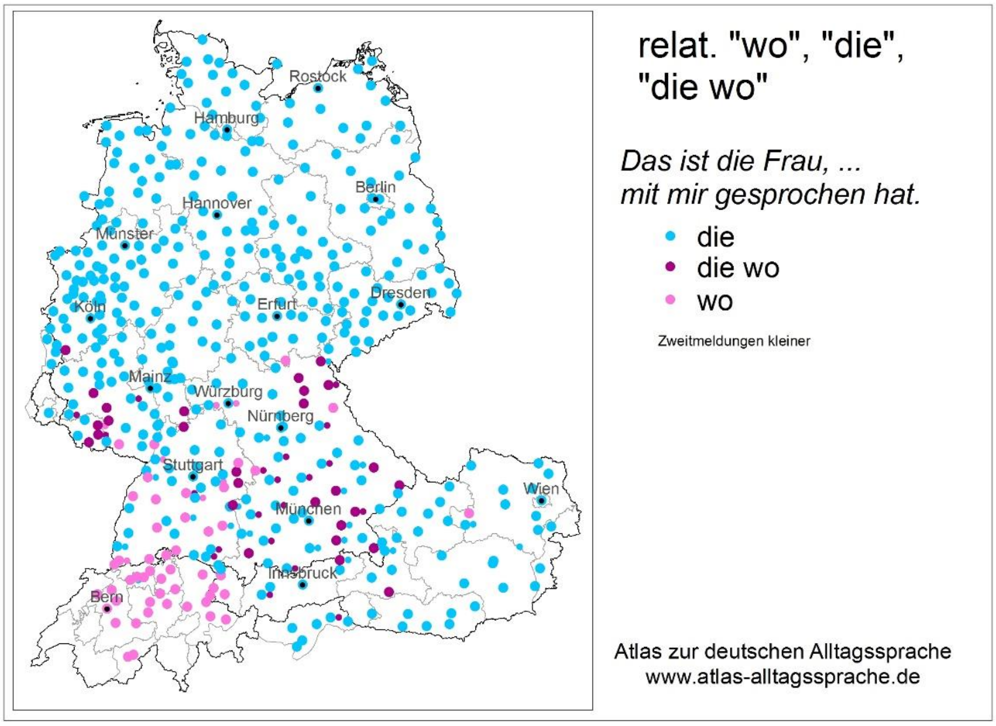


Figure A- 41. REL – Temporal Marker: wo ~ als Map (SNBW 2018:107, Vol. 3)

The following map from the *Atlas zur deutschen Alltagssprache (AdA)* shows the usage of the dialect variant *die wo* 'they who' (pink dots) throughout southwestern Germany.



http://www.atlas-alltagssprache.de/runde-7/f12c/ (viewed 22-jan-2020)

Figure A- 42. REL – Relative Marker: wo ~ dxx Map (AdA 2003)

A.3. Other variables

In addition to the Swabian/Alemannic variables described above, there are others, many of which are quite rare, and for that reason have not been investigated in this study. This section documents them for historical purposes and with the potential for future analyses.

DAT – Dative Possessive

The dative has replaced the genitive in all German dialects except the standard language, where it used primarily only in the written language or in formal spoken usage. Swabian uses a different dative construction to form the possessive than standard German. For example, the standard German construction *der Schlüssel von Anna* or *Anna Schlüssel* 'Anna's key' would be *der Anna ihr Schlüssel*, literally, 'of Anna her key'. The following table provides some examples of the variation in the dative possessive construction between Swabian and standard German.

SWG	STD	ENG
dem sei Vater isch Pfarrer	sein Vater ist Pfarrer	his father is pastor
holt dem sei Tochtr	er holt sein Tochter	he fetches his daughter
dem sein Haus	sein Haus	his house
dere ihre beschte Fraindin	ihre beste Freundin	her best friend
dene ihr Gruppe	ihre Gruppe	their group
dem sei freie Wille	sein freier Wille	his free will
dem sei Entscheidung	seine Entscheidung	his decision
derre ihr großes Thema	deren großes Thema	her big theme

Table A- 38. DAT – Dative Possessive Examples

DPF – Double Perfect

As in other Upper German dialects, there is no preterite form in Swabian, with the exception of the verb *sein* 'to be' and some modals, such as *wollen* 'to want'. The past perfect is used to describe all past indicative activities. However, there is a double perfect construction in the speech of some Swabian speakers, *ich habe das vergessen gehabt* (SWG) versus *ich habe das vergessen* (STD) 'I have forgotten that', which occurs fairly infrequently (0.12%) and only at the "lowest dialect levels" (Gersbach 1982:101-104). The following table provides some examples.

SWG	STD	ENG
hen se übertriebe khet	haben sie übertrieben	they have exaggerated
nachdem se des erfahre khet hen	nachdem sie das erfahren gehabt	after they have experienced it
wer hat no gwonne khet?	wer hat noch gewonnen?	who won still?
lang net gsproche ghet hen	lang nicht gesprochen	long time didn't talk
die hat s wirklich verstande han	die hat es wirklich verstanden	she had really understood it
nâ hab i d Hââr gwäscht ghet	dann habe ich die Haar gewaschen	then I have washed my hair
i hätt gern gwonne ghet	ich hätte gerne gewonnen	I would have liked to win
mr hen des vergäbe khet	wir haben das vergeben	we have forgiven it
der wo ihn erwischt hât hât	der ihn erwischt hat	he who has caught him

Table A- 39. DPF – Double Perfect Examples

DUR – Durative Aspect ‘tun’

Swabian has a periphrastic structure using the verb *tun* ‘to do/make’ to express the durative or the continuing nature of an action, such as in *sie tun essen* (SWG) versus *sie essen gerade* (STD) 'they are eating now' (Frey 1975:146) or *ich tue stricken* (SWG) versus *ich stricke regelmäßig* (STD) ‘I knit regularly’. The following table provides some examples of the durative construction from the Swabian corpus.

SWG	STD	ENG
tut mã se schabe	man schabt sie	you shave them
tut e bissle rumverdiene	[er] verdient ein bisschen herrum	[he] earns a little money around
lääse tu ich natiirlich viel	ich lese natürlich viel	I read naturally a lot
tu i jetzt au in so regalmäßig in Kletterhalle bouldern	ich bouldere jetzt auch regalmäßig in Kletterhalle	I climb now regularly in the climbing hall
wo hocke dusch	wo du rumsitzt	where you sit around
tusch jemand töte	du tötest jemand	you kill someone

Table A- 40. DUR – Durative Aspect 'tun' Examples

IPP – Irregular Past Participles

Swabian has a number of irregular past participles that are different from standard German. The following table provides some examples of the irregular past participle constructions from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
gebrannt	[gəbrant]	[(gə)bʀɛnt]	[ge]brennt	burned
gedacht	[gədɑxt]	[(gə)dɛŋk]	[ge]denkt	thought
gekannt	[gəkant]	[(gə)kɛnt]	[ge]kennt	knew
gelassen	[gəlasən]	[(gə)last]	[ge]lasst	left
gerannt	[gərant]	[(gə)rɛnt]	[ge]rennt	ran
gewäschen	[gəvæʃən]	[(gə)væʃt]	[ge]wäscht	washed

Table A- 41. IPP – Irregular Past Participles Examples

IRV4 – Irregular Verb: *welle ~ wollen*

Another irregular verb in Swabian is the use *welle* versus standard German *wollen* 'to want’. This verb form is very rare in the current Swabian corpus.

IRV5 – Irregular Verb: *doe ~ tun*

Another, less productive yet more salient, Swabian verb is *tun* ‘to do/make’ (Frey 1975:142). The standard and Swabian conjugations are shown in the following table. In addition, the infinitive, *doe*, and the subjunctive, *dääd*, are irregular forms in Swabian.

	STD singular	STD plural	SWG singular	SWG plural
1st	ich tue	wir tun	i due	mr dued (habed)
2nd	du tuest	ihr tut	du duesch	ihr duen (habed)
3rd	er/sie tut	sie tun	er/sie dued	sie duen (habed)

Table A- 42. IRV5 – Irregular Verb: 'doe' ~ 'tun' Examples

LEN – Lenition: [b, d, g ~ p, t, k]

Lenition or the voicing of the stops [p, b, k] to [b, d, g] is a typical feature of the regional southwestern variety of German. Sonorising lenition, which occurs particularly intervocalically, is usually considered assimilation to the surrounding linguistic environment, e.g., voicing to the vowel (Spiekermann 2008:70; Mihm 2000:2020; Frey 1975:27-28). For example, the standard German word *kaputt* 'broken' is realised a *gabut* in the dialect. The following table provides some examples of [b, d, g ~ p, t, k] variation from the Swabian corpus.

STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
Tausend	[taʊzənt]	[daʊzənd]	dausend	thousand
trinken	[tʁɪŋkən]	[dʁɪŋgə]	dringe	drink
kaputt	[kapʊt]	[gabʊt]	gabut	broken
kleine	[klɛɪnə]	[glɔɪnə]	glôine	small
halten	[haltən]	[haldə]	halde	hold
unter	[ʊntɐ]	[ʊndɐ]	under	under
Vater	[fɑːtər]	[fɑːdər]	Vader	father

Table A- 43. LEN – Lenition: [b, d, g ~ p, t, k] Examples

LXS – Swabian Lexical Items

There are a large number of traditional Swabian dialect words, although many are falling out of the modern dialect. A measure of the number of Swabian dialect words per 1,000 words of text was developed to assess the speakers' usage of traditional Swabian expressions. The following table provides some examples of Swabian lexical items from the current corpus.

CATEGORY	SWG	STD	ENG
Nouns	Ana	Großmutter	grandmother
	Ane	Großvater	grandfather
	Bebbele	kleiner Knäuel	small drops
	Grumbiere	Apfel	apple
	Mätz	Mädchen	girl
	Preschtling	Erdbeer	strawberry
	Viertele	Schoppen	quarter litre glass (of wine)
Verbs	bruddlen	meckeren	to complain
	heben	halten	to stop
	hocken	setzen	to sit/set
	keien	wegwerfen	to throw away
	schaffen	arbeiten	to work
	schlotzen	Glas Wein genießen	to enjoy a glass of wine
	schwätzen	reden	to speak
	verseckeln	ausschimpen	to scold/cuss out

CATEGORY	SWG	STD	ENG
Other	bache	möglich	possible
	dâhanne	da hinten	down there
	ebbes/äbbe	etwas	something
	fei	wirklich	really
	hanôi	niemals	never
	ra	herunter	there

Table A- 44. LXS – Swabian Lexical Items Examples

MVO – Modal Verb Order

Word order is very strict in standard German, yet some southern varieties have a different order for modals that occur at the end of a clause (e.g., *müssen* 'must', *wollen* 'want', *können* 'can', *sollen* 'shall', *lassen* 'let'). These verbs often occur in pairs at the end of a sentence (called an *Ersatzinfintiv* 'substitute infinitive'). For example, the standard German phrase, *er hat einen Apfel essen wollen* 'he wanted to eat an apple' would be *er hâd en Apfel welle esse* in Swabian. The infinitives *essen* and *wollen* occur in reversed order in the dialect (AdA 2011:Fr12d,Fr13a). While this variant appears to have completely disappeared in contemporary Swabian, there are still some German dialects where this variant occurs. The following table provides some examples of the variation in modal verb order from the Swabian corpus.

SWG	STD	ENG
ja hat mã s miesse hole	ja hat man es holen müssen	yeah you had to fetch it
des hât miesse sueche	das hat [man] suchen müssen	that you had to look for
s hat sich kenne freischlage	es hat sich freischlagen können	it could hit home free
weil sonscht hätt s keenne sei	weil sonst hätte es sein können	because then it could be
mã hat des nie so welle sei	man hat das nicht so sein wollen	you didn't want it to be
was hâsch du welle sage?	was hast du sagen wollen?	what did you want to say?
die hen s miesse sueche	die haben es suchen müssen	they had to seek it
da isch ôis hât miesse sueche	da ist einer, der hat suchen müssen	there is one had to seek
s hat sich kenne frêischlage	sie hat sich freischlagen können	it had to be able to catch
was hâsch du welle sage	was hast du sagen wollen	what did you want to say
ja hat mã s miesse hole	ja hat man es holen müssen	yea you had to fetch it
mr hen miesse damâl lache	wir haben da eimal lachen müssen	we had to laugh then
wo mr neisitze hat kenne	wo wir uns hinsetzen konnten	where were able to sit
wenn i han keenne läse	wenn ich lesen könnte	if I were able to read

Table A- 45. MVO – Model Verb Order Examples

PRO – Pronoun Drop

Swabian is a pro-drop language for subject of verbs in the first and second person singular, second person plural, and for direct objects (Bohnacker 2013; Rosenkvist 2018). The following table provides some examples of pronoun drop from the Swabian corpus. Note that the pronoun has been inserted in square brackets to indicate where it would have occurred in the utterance, e.g., [du], [ich].

SWG	STD	ENG
First-Person Singular		
[ich] weiss ned	ich weiss nicht	I don't know
[ich] gang manchmal gern nââ	Ich gehe manchmal gern hin	I like to go there sometimes
Second-Person Singular		
e Fescht, wo [du] hocke duesch	ein Fest, wo du hocken tuest	a party where you sit around
des musch [du] au halde	das muss du auch halten	you have to also hold it
Third-Person Singular		
lässt mã [ihn] e Wêile stande	lässt man ihn eine Weile stehen	you let it sit for a while

Table A- 46. PRO – Pronoun Drop Examples

SAF2 – Swabian Affix: *ver-* ~ *er-*

For some verbs, Swabian uses the prefix *ver-* versus the standard German forms of *er-* or *zer-* for a certain set of verbs (Frey 1975:105-106). The following table provides some examples of the *ver-* ~ *er-* variation from the Swabian corpus.

STD(ortho)	SWG(ortho)	ENG
erkälten	verkälte	to catch cold
erlesen	verlääse	to select
erschießen	verschieße	to shoot someone
erschaffen	verschaffe	to create
erwischen	verwische	to catch someone
erzählen	verzähle	to tell / narrate
erzwungen	verzwunge	to enforce
zerplatzen	verplatze	to burst

Table A- 47. SAF2 – Swabian Affix: ver- ~ er- Examples

SAF4 – Swabian Affix: *sau-* ~ *sehr*

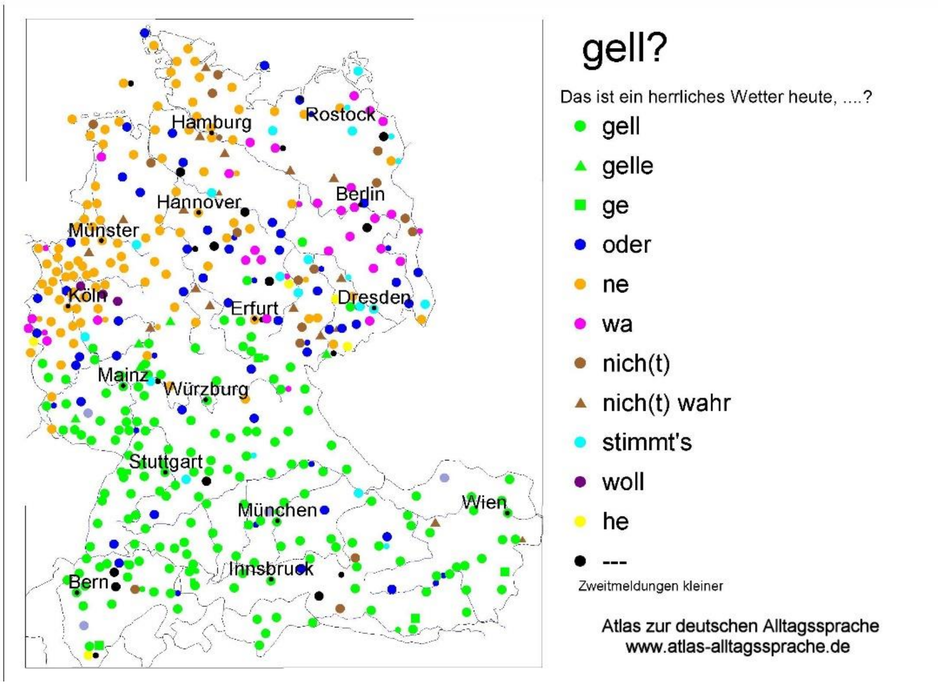
Swabian traditionally use the affix *sau* for *sehr* 'very' as an intensifier. This affix is no longer in widespread use; although some speakers use it more than others, perhaps as part of identity setting. The following table provides some examples from the Swabian corpus.

STD(ortho)	SWG(ortho)	ENG
sehr kalt	saukalt	very cold
sehr viel	saumässig	very much
sehr blöd	saubled	very silly
sehr dumm	saudumm	very dumb
sehr mässig	saumässig	very normal

Table A- 48. SAF4 – Swabian Affix: sau- ~ sehr Examples

UTF – Utterance Final Tags: *ge* ~ *gell* ~ *gelle* ~ *oder* ~ *ne*

Utterance final tags differ across Germany with *ge*, *gell*, and *gelle* being common in southern German varieties. Using *ja* as a UTF is also common in the transcripts. The following dialect map shows this distribution.



http://www.atlas-alltagssprache.de/runde-2/f19a-b/

Figure A- 43. UTF – Utterance Final Tag Map (AdA 2003)

ULO – Low Back Vowel [o ~ un]

In Swabian, in some words and in some contexts, the vowel [u] is lowered to [o]. This is common before [n], particularly with the prefix *un-* 'un-' as in *unmöglich* 'impossible', which is realised as *oomeeglich* in Swabian. There is also often an additional process of nasalisation in Swabian (Frey 1975:107-108). The following table provides some examples of [o ~ un] variation from the Swabian corpus. This variable has fallen out of use in the 2017 recordings.

CATEGORY	STD(ortho)	STD(IPA)	SWG(IPA)	SWG(ortho)	ENG
prefix 'un'	unbedingt	[ʊnbədɪŋkt]	[obədɪŋkt]	oobedingt	absolute
	Unfall	[ʊnfal]	[onfal]	Oofall	accident
	ungefähr	[ʊngəfɛːɐ]	[ogəfɛːɐ]	oogefähr	about
	ungern	[ʊngɛʁn]	[ogɛʁn]	oogern	reluctantly
	unheimlich	[ʊnhaimlix]	[ohaimlix]	ooheimlich	eerily
	Umwelt	[ʊmvɛlt]	[ovɛlt]	Oowelt	environment
other 'un'	gesund	[gəzʊnt]	[gəsond]	gesond	healthy
	Hund	[hʊnt]	[hod]	Hod	dog
	hundert	[hʊndɐt]	[hondɐd]	hondert	hundred
	und	[ʊnd]	[ond]	ond	and
	uns	[ʊns]	[os]	oos	us
	unser	[ʊnzɐ]	[osɐ]	oss(er)	ours
	unter	[ʊndɐ]	[ondɐ]	ooder	under
other 'o'	durch	[dʊɐx]	[doɐx]	dorch	through
	genug	[gənuːk]	[gənoːg]	gnog	enough

Table A- 49. ULO – Low Back Vowel [o ~ un] Examples

Appendix B. List of Swabian informants

Following is a list of all informants included in this investigation, the 20 Panel Study informants recorded in 1982 and 2017 (see Appendix B.1) and the 40 Trend Study informants recorded once in 2017 (see Appendix B.2), along with relevant socio-demographic characteristics.

B.1. Panel study informants

Year	Community	ID	Pseudonym	Current Residence	BirthYr	Age	Grp	Sex	Edu	Abi	CCI	SOI	ICI	SMI
1982	Stuttgart	S007	Egbert	Stuttgart	1958	24	3	M	5	Y	13	4.08	0.77	25
1982	Gmünd	S008	Rupert	Tübingen	1958	24	3	M	5	Y	13	4.08	0.88	39
1982	Gmünd	S010	Angela	Schwäbisch Gmünd	1964	18	3	W	5	Y	13	4.42	0.96	0
1982	Gmünd	S011	Herbert	Schwäbisch Gmünd	1931	51	2	M	4	N	12	4.25	0.62	14
1982	Gmünd	S012	Elke	Weiler in den Bergen	1960	22	3	W	3	N	13	4.00	1.00	0
1982	Gmünd	S013	Louise	Weiler in den Bergen	1929	54	2	W	3	N	10	4.17	1.00	0
1982	Gmünd	S014	Markus	Schwäbisch Gmünd	1960	22	3	M	5	Y	28	4.42	0.90	0
1982	Stuttgart	S015	Ricarda	Leonberg-Warmbronn	1964	18	3	W	5	Y	13	4.00	0.25	15
1982	Stuttgart	S016	Manni	Stuttgart	1958	24	3	M	5	Y	15	3.58	0.82	27
1982	Stuttgart	S018	Pepin	Feuerbach-Stuttgart	1957	26	3	M	5	Y	14	3.00	1.00	31
1982	Gmünd	S020	Alfried	Schwäbisch Gmünd	1959	23	3	M	5	Y	12	4.50	0.92	15
1982	Gmünd	S021	Siegfried	Schwäbisch Gmünd	1961	22	3	M	5	Y	12	4.00	1.00	0
1982	Gmünd	S022	Rachael	Schwäbisch Gmünd	1934	48	2	W	2	N	13	4.33	1.00	0
1982	Gmünd	S024	Theo	Schwäbisch Gmünd	1964	18	3	M	5	Y	12	3.75	1.00	0
1982	Gmünd	S026	Berdine	Schwäbisch Gmünd	1961	21	3	W	5	Y	13	3.58	1.00	17
1982	Gmünd	S027	Anneliese	Schwäbisch Gmünd	1960	22	3	W	5	Y	28	3.83	0.55	64
1982	Gmünd	S031	Jurgen	Schwäbisch Gmünd	1963	20	3	M	5	Y	13	3.50	0.88	0
1982	Stuttgart	S034	Bertha	Leonberg-Höfingen	1964	19	3	W	1	N	8	3.42	0.85	16
1982	Stuttgart	S036	Helmut	Renningen	1960	22	3	M	5	Y	13	3.58	0.50	25
1982	Stuttgart	S040	Ema	Leonberg-Warmbronn	1934	49	2	W	1	N	6	4.25	0.79	7
2017	Stuttgart	S007	Egbert	Leonberg-Warmbronn	1958	59	5	M	6	Y	14	3.67	0.23	23
2017	Gmünd	S008	Rupert	Tübingen	1958	58	5	M	7	Y	23	2.42	0.46	52
2017	Gmünd	S010	Angela	Iggingen	1964	53	5	W	7	Y	24	4.42	0.68	84
2017	Gmünd	S011	Herbert	Schwäbisch Gmünd	1931	85	4	M	4	N	13	4.42	0.63	9
2017	Gmünd	S012	Elke	Weiler in den Bergen	1960	57	5	W	4	N	14	4.42	0.77	0
2017	Gmünd	S013	Louise	Weiler in den Bergen	1929	88	4	W	2	N	8	3.83	0.96	0
2017	Gmünd	S014	Markus	Mutlangen	1960	57	5	M	6	Y	27	2.58	0.46	51
2017	Stuttgart	S015	Ricarda	Filderstadt	1964	53	5	W	5	Y	13	2.00	0.35	67
2017	Stuttgart	S016	Manni	Leonberg	1958	59	5	M	6	Y	16	2.67	0.54	17
2017	Stuttgart	S018	Pepin	Waldenbuch	1957	60	5	M	6	Y	16	3.75	0.79	46
2017	Gmünd	S020	Alfried	Schwäbisch Gmünd	1959	59	5	M	5	Y	13	4.17	1.00	37
2017	Gmünd	S021	Siegfried	Schwäbisch Gmünd-Bett	1961	57	5	M	5	Y	13	4.75	1.00	0
2017	Gmünd	S022	Rachael	Schwäbisch Gmünd	1934	83	4	W	2	N	7	4.08	1.00	0
2017	Gmünd	S024	Theo	Schwäbisch Gmünd	1964	54	5	M	6	Y	16	3.58	0.73	33
2017	Gmünd	S026	Berdine	Rheinbach	1961	57	5	W	5	Y	19	3.50	0.42	83
2017	Gmünd	S027	Anneliese	Urdorf, Schweiz	1960	57	5	W	7	Y	30	3.75	0.58	73
2017	Gmünd	S031	Jurgen	Hamburg	1963	55	5	M	6	Y	22	3.67	0.35	75
2017	Stuttgart	S034	Bertha	Weissach	1964	54	5	W	2	N	10	3.58	0.38	45
2017	Stuttgart	S036	Helmut	Lehrensteinsfeld	1960	57	5	M	6	Y	16	2.08	0.23	57
2017	Stuttgart	S040	Ema	Leonberg-Warmbronn	1934	83	4	W	1	N	6	4.42	0.78	5

Figure A- 44. List of Speakers – Panel Speakers

Legend: Grp=Age Group; Edu=Education; Abi=Abitur completed; CCI=Composite Class Index; SOI=Swabian Orientation Index; ICI=Interlocutor Choice Index; SMI=Speaker Mobility Index.

B.2. Twin study informants

Year	Community	ID	Pseudonym	Current Residence	BirthYr	Age	Grp	Sex	Edu	Abi	CCI	SOI	ICI	SMI
2017	Gmünd	S041	Karl	Iggingen	1998	19	6	M	5	Y	28	3.25	0.44	57
2017	Gmünd	S042	Klaus	Iggingen	1970	47	5	M	4	N	12	3.92	0.85	55
2017	Stuttgart	S047	Marta	Stuttgart	1930	87	4	W	1	N	6	4.00	1.00	45
2017	Stuttgart	S048	Gustav	Stuttgart	1957	60	5	M	5	Y	14	4.33	1.00	45
2017	Gmünd	S050	Paula	Spraitbach	1946	71	4	W	6	Y	27	3.67	0.85	62
2017	Gmünd	S051	Brand	Spraitbach	1946	71	4	M	6	Y	22	3.00	0.50	81
2017	Gmünd	S053	Belinda	Schwäbisch Gmünd	1951	66	4	W	1	N	7	4.17	0.73	0
2017	Gmünd	S054	Frank	Schwäbisch Gmünd	1940	77	4	M	3	N	13	4.00	0.50	7
2017	Gmünd	S055	Gesine	Schwäbisch Gmünd	1957	60	5	W	5	Y	11	4.17	0.50	39
2017	Gmünd	S056	Wilma	Schwäbisch Gmünd	1963	54	5	W	1	N	7	4.00	0.91	17
2017	Gmünd	S058	Anne	Spraitbach	1984	33	5	W	4	N	9	3.58	0.54	57
2017	Stuttgart	S059	Bernadette	Pforzheim	1964	53	5	W	4	N	9	4.33	0.62	45
2017	Stuttgart	S062	Selina	Leonberg-Warmbronn	1994	23	6	W	5	Y	25	3.50	0.50	48
2017	Gmünd	S063	Jarvis	Schwäbisch-Gmünd	1957	60	5	M	1	N	9	4.42	0.75	0
2017	Gmünd	S066	Willard	Schwäbisch Gmünd	1957	60	5	M	5	Y	14	4.33	0.96	49
2017	Gmünd	S071	Mel	Iggingen	2000	18	6	M	5	Y	25	4.25	0.63	14
2017	Gmünd	S072	Anatoly	Itapúa Paraguay	1960	58	5	M	4	N	14	4.17	0.58	69
2017	Gmünd	S074	Didrika	Rechberghausen	1958	60	5	W	5	Y	15	4.33	0.67	50
2017	Gmünd	S075	Ulrich	Rechberghausen	1958	60	5	M	5	Y	23	4.25	0.54	35
2017	Gmünd	S076	Marius	Heubach	1985	33	5	M	5	Y	17	4.17	0.92	66
2017	Gmünd	S077	Nikolaus	Bettringen	2000	18	6	M	5	Y	27	4.08	0.72	12
2017	Gmünd	S079	Isabelle	Rechberghausen	1941	76	4	W	1	N	7	4.25	0.81	37
2017	Stuttgart	S086	Sunhilde	Leonberg	1966	52	5	W	4	N	10	3.58	0.75	52
2017	Stuttgart	S087	Urs	Leonberg	1964	53	5	M	4	N	11	3.75	1.00	35
2017	Gmünd	S089	Moritz	Iggingen	1999	18	6	M	2	N	12	3.50	0.58	44
2017	Gmünd	S093	Maddalyn	Sulzau	1930	88	4	W	1	N	6	4.08	0.90	0
2017	Stuttgart	S094	Konni	Leonberg-Warmbronn	2000	18	6	M	5	Y	27	4.00	0.50	30
2017	Stuttgart	S095	Barrett	Leonberg-Warmbronn	1999	19	6	M	5	Y	28	3.92	0.44	0
2017	Stuttgart	S098	Poldi	Stuttgart	1992	26	6	M	5	Y	28	3.92	0.73	47
2017	Gmünd	S102	Ilyse	Zimmerbach/Durlangen	1994	24	6	W	4	N	11	3.33	0.77	11
2017	Gmünd	S103	Wendall	Zimmerbach/Durlangen	1960	58	5	M	4	N	10	4.42	0.96	20
2017	Stuttgart	S110	Robin	Stuttgart	1970	48	5	M	1	N	7	3.92	1.00	50
2017	Stuttgart	S111	Agatha	Stuttgart	1966	53	5	W	6	Y	16	3.75	0.67	36
2017	Stuttgart	S112	Nadga	Stuttgart	1997	21	6	W	2	N	16	3.25	0.04	28
2017	Gmünd	S114	Patrick	Bopfingen-Baldern	1996	23	6	M	5	Y	22	3.33	0.33	22
2017	Stuttgart	S119	Fabian	Stuttgart	1995	24	6	M	5	Y	27	4.00	0.46	46
2017	Gmünd	S120	Patrizia	Rottenburg	1997	22	6	W	5	Y	22	4.25	0.67	33
2017	Gmünd	S124	Laura	Schwäbisch Gmünd	1994	24	6	W	5	Y	21	3.92	0.46	68
2017	Gmünd	S126	Michaela	Lachingen-Machtolsheir	1991	28	6	W	5	Y	18	3.50	0.85	25
2017	Stuttgart	S127	Wilbur	Besigheim	1955	64	4	M	4	N	12	4.17	0.90	41

Figure A- 45. List of Speakers – Twin Study

Legend: Grp=Age Group; Edu=Education; Abi=Abitur completed; CCI=Composite Class Index; SOI=Swabian Orientation Index; ICI=Interlocutor Choice Index; SMI=Speaker Mobility Index.

Appendix C. List of Swabian transcripts

Following is a list of all the transcripts that were used in this investigation, including the date of the interview, the length, the interviewer name, interviewer closeness, the number of people in attendance, and whether the Principal Investigator was in attendance or not.

C.1. Panel study transcripts

Year	Community	Speaker ID	Speaker Name	Interview Date	Interview Length	Interview Location	Interviewer Name	Interviewer Closeness	Number of Attendees	PI Present
1982	Stuttgart	S007	Egbert	28-Jul-1982	49	Home	Karen82	yes	2	yes
1982	Gmünd	S008	Rupert	4-Aug-1982	47	Home	Karen82	yes	3	yes
1982	Gmünd	S010	Angela	5-Aug-1982	55	Home	Rupert	yes	3	yes
1982	Gmünd	S011	Herbert	5-Aug-1982	62	Home	Rupert	yes	3	yes
1982	Gmünd	S012	Elke	5-Aug-1982	57	Home	Rupert	yes	3	yes
1982	Gmünd	S013	Louise	5-Aug-1982	62	Home	Rupert	yes	3	yes
1982	Gmünd	S014	Markus	9-Aug-1982	58	Home	Rupert	yes	3	yes
1982	Stuttgart	S015	Ricarda	30-Aug-1982	53	Home	Egbert	yes	2	no
1982	Stuttgart	S016	Manni	30-Aug-1982	60	Home	Egbert	yes	2	no
1982	Stuttgart	S018	Pepin	22-Sep-1982	60	Home	Egbert	yes	2	no
1982	Gmünd	S020	Alfried	14-Oct-1982	45	Home	Rupert	yes	3	yes
1982	Gmünd	S021	Siegfried	14-Oct-1982	50	Home	Rupert	yes	3	yes
1982	Gmünd	S022	Rachael	14-Oct-1982	60	Home	Rupert	yes	3	yes
1982	Gmünd	S024	Theo	15-Oct-1982	36	Home	Rupert	yes	3	yes
1982	Gmünd	S026	Berdine	14-Oct-1982	60	Home	Rupert	yes	3	yes
1982	Gmünd	S027	Anneliese	14-Oct-1982	60	Bar	Rupert	yes	2	no
1982	Gmünd	S031	Jurgen	19-Oct-1982	60	Home	Rupert	yes	3	yes
1982	Stuttgart	S034	Bertha	1-Nov-1982	39	Home	Egbert	yes	2	no
1982	Stuttgart	S036	Helmut	2-Nov-1982	42	Home	Egbert	yes	2	no
1982	Stuttgart	S040	Ema	2-Nov-1982	60	Home	Egbert	yes	2	no
2017	Stuttgart	S007	Egbert	21-May-2017	63	Home	Jutta	no	3	yes
2017	Gmünd	S008	Rupert	28-Apr-2017	82	Home	Karen17	no	2	yes
2017	Gmünd	S010	Angela	29-Apr-2017	74	Home	Karl	yes	3	yes
2017	Gmünd	S011	Herbert	29-Apr-2017	92	Home	Karl	yes	3	yes
2017	Gmünd	S012	Elke	15-Jun-2017	136	Home	Karl	no	6	yes
2017	Gmünd	S013	Louise	15-Jun-2017	w/S012	Home	Karl	no	6	yes
2017	Gmünd	S014	Markus	23-Jun-2017	56	Home	Karl	no	3	yes
2017	Stuttgart	S015	Ricarda	19-Nov-2017	67	Home	Jutta	no	3	yes
2017	Stuttgart	S016	Manni	19-Nov-2017	73	Home	Karl	no	3	yes
2017	Stuttgart	S018	Pepin	24-Jun-2017	91	Home	Jutta	no	3	yes
2017	Gmünd	S020	Alfried	24-Apr-2018	73	Home	Karl	no	4	yes
2017	Gmünd	S021	Siegfried	5-Apr-2018	60	Home	Karl	no	3	yes
2017	Gmünd	S022	Rachael	24-Apr-2018	73	Home	Karl	no	4	yes
2017	Gmünd	S024	Theo	5-Apr-2018	46	Home	Karl	no	3	yes
2017	Gmünd	S026	Berdine	12-Mar-2018	65	Home	Karl	yes	3	yes
2017	Gmünd	S027	Anneliese	17-May-2017	37	Phone	Karl	no	2	no
2017	Gmünd	S031	Jurgen	24-Mar-2018	52	Church	Karl	yes	3	yes
2017	Stuttgart	S034	Bertha	9-Dec-2017	90	Home	Jutta	no	3	yes
2017	Stuttgart	S036	Helmut	26-Nov-2017	116	Home	Jutta	no	5	yes
2017	Stuttgart	S040	Ema	21-May-2017	60	Home	Jutta	no	3	yes

Figure A- 46. List of Transcripts – Panel Study

C.2. Twin study transcripts

Year	Community	Speaker ID	Speaker Name	Interview Date	Interview Length	Interview Location	Interviewer Name	Interviewer Closeness	Number of Attendees	PI Present
2017	Gmünd	S041	Karl	29-Apr-2017	58	Home	Karen17	no	2	yes
2017	Gmünd	S042	Klaus	29-Apr-2017	61	Home	Karl	yes	3	yes
2017	Stuttgart	S047	Marta	27-Sep-2017	54	Home	Jutta	yes	2	no
2017	Stuttgart	S048	Gustav	27-Sep-2017	35	Home	Jutta	yes	2	no
2017	Gmünd	S050	Paula	18-Jun-2017	156	Home	Karl	no	5	yes
2017	Gmünd	S051	Brand	18-Jun-2017	w/S051	Home	Karl	no	5	yes
2017	Gmünd	S053	Belinda	19-Jun-2017	w/S052	Home	Karl	no	3	yes
2017	Gmünd	S054	Frank	19-Jun-2017	78	Home	Karl	no	3	yes
2017	Gmünd	S055	Gesine	19-Jun-2017	w/S054	Home	Karl	no	3	yes
2017	Gmünd	S056	Wilma	27-Jun-2017	138	Home	Karl	yes	5	yes
2017	Gmünd	S058	Miriam	27-Jun-2017	w/S056	Home	Karl	yes	5	yes
2017	Stuttgart	S059	Bernadette	10-Jun-2017	37	Home	Bernard	yes	3	no
2017	Stuttgart	S062	Selina	2-Jul-2017	60	Home	Karen17	no	2	yes
2017	Gmünd	S063	Jarvis	29-Oct-2017	70	Home	Karl	yes	3	yes
2017	Gmünd	S066	Willard	16-Dec-2017	69	Home	Karl	no	5	yes
2017	Gmünd	S071	Mel	9-Mar-2018	30	Home	Karl	yes	2	no
2017	Gmünd	S072	Anatoly	14-Mar-2018	74	Home	Karl	yes	2	no
2017	Gmünd	S074	Didrika	3-Apr-2018	90	Bar	Karl	no	5	yes
2017	Gmünd	S075	Ulrich	3-Apr-2018	w/S074	Bar	Karl	no	5	yes
2017	Gmünd	S076	Marius	4-Apr-2018	74	Home	Karl	yes	3	yes
2017	Gmünd	S077	Nikolaus	16-Apr-2018	62	Home	Karl	no	2	no
2017	Gmünd	S079	Isabelle	19-Apr-2018	101	Home	Karl	no	4	yes
2017	Stuttgart	S086	Sunhilde	27-Apr-2018	79	Home	Selina	yes	3	no
2017	Stuttgart	S087	Urs	28-Apr-2018	w/S086	Home	Selina	yes	3	no
2017	Gmünd	S089	Moritz	22-Apr-2018	60	Home	Karl	yes	2	no
2017	Gmünd	S093	Maddalyn	4-May-2018	92	Home	Joachim	no	4	yes
2017	Stuttgart	S094	Konni	4-May-2018	91	Home	Selina	yes	3	no
2017	Stuttgart	S095	Barrett	4-May-2018	w/S095	Home	Selina	yes	3	no
2017	Stuttgart	S098	Poldi	13-May-2018	40	Home	Selina	yes	3	no
2017	Gmünd	S102	Ilyse	3-Jun-2018	42	Home	Karl	yes	2	no
2017	Gmünd	S103	Wendall	3-Jun-2018	77	Home	Karl	yes	2	no
2017	Gmünd	S110	Robin	23-Mar-2019	100	Home	Selina	yes	2	no
2017	Stuttgart	S111	Agatha	7-Apr-2019	66	Home	Selina	yes	3	no
2017	Stuttgart	S112	Nadga	7-Apr-2019	w/S111	Home	Selina	yes	3	no
2017	Gmünd	S114	Patrick	15-Apr-2019	30	School	Karl	no	2	no
2017	Stuttgart	S119	Fabian	26-Apr-2019	61	School	Jutta	no	2	no
2017	Gmünd	S120	Patrizia	30-Apr-2019	72	School	Jutta	no	2	no
2017	Gmünd	S124	Laura	2-May-2019	100	School	none	yes	3	no
2017	Gmünd	S126	Michaela	2-May-2019	w/S124	School	none	yes	3	no
2017	Stuttgart	S127	Wilbur	4-May-2019	202	Home	Jutta	no	3	yes

Figure A- 47. List of Transcripts – Twin Study

Appendix D. Interview documents

Two interview documents were used in this investigation: the Sociolinguistic Interview Template (Appendix D.1) outlines the questions that the interviewers asked of the informants during the interview; and, the Demographics Questionnaire (Appendix D.5) was completed by the informant by hand (paper and pencil) at the end of the interview. Copies of these templates, translated into English, follow.

D.1. Sociolinguistic interview

A. PERSONAL BACKGROUND

1. Where were you born?
   How long did you live there?
   Where else have you lived?
   Have you lived outside of Swabia?
   Where? For how long?

2. Where were your parents born?
   Your grandparents?
   Your spouse/partner?

3. Where did you go to school?
   What did you study?
   What degree did you achieve?

4. FOR ADULTS:
   What do you do?
   What types of jobs have you had?
   Your spouse?

5. FOR STUDENTS:
   What do you want to do when you finish?
   What would be your ideal job?

B. GAMES AND LEISURE

1. What games did you play as a child?
   Do you know the game 'hide-and-seek'?
   Do you know how to play it? 'Blind cow'?
   Are there specific rules?
   What other games did you play as a child?

2. Do you like to read?
   What do you read?
   What's your favourite book?
   What is it about?

3. Do you go the movies?
   What is your favourite film? What is it about?
   What is the last film you saw? What is it about?

4. Have you travelled a lot to other countries?
   Which ones? How long were you there?

5. Do you play sports? Which ones?
   Are you on a team? Do you win a lot?

6. Do you know any children's rhymes?
   For example, ‘Eeney, meeney, miney, mo.’
   Which ones do you know?

7. As a child, did you have a favourite toy?
   What was it? What did you play?

C. NEIGHBORHOOD AND COMMUNITY

1. How long have you lived in this town?
   Has it changed much during your lifetime?

2. What kinds of activities are there to do here?
   Is there a neighbourhood place or pub where people like to go and hang out?
   Do people just drop in to visit?

3. What do you like best about this neighbourhood? The least?

4. Did anything really big ever happen around here? Like a big fire? Or a house burned down?

5. Have you ever had a fight with anyone? Maybe witnessed a fight by others?
   What was it about? What happened?
   Who started the fight? Who won?

6. What was the most embarrassing thing that ever happened to you?
   What did you learn from the experience?

D. IDEALS AND GOALS

1. What is common sense?
   Can you give me an example?
   Does everyone have it? How do you get it?
   Does it come with age? Are you born with it?
   Did you ever meet someone with a lot of common sense? With no common sense?

2. What is the difference between common sense and intelligence?
   Can you give me an example?

3. What is a successful person?
   What is a good person?
   What is a bad person?

4. Do you have a great dream?
   For example: sailing around the world?

5. If you had three wishes, what would they be?

E. PERSONAL BELIEFS

1. Are you religious?
   Which church do you go to?
   Do you actively participate in church activities?
   Which ones? How often?

2. Are you superstitious?
   What does it mean to be superstitious?
   Do you believe in ghosts?

3. Have you ever had any supernatural experiences?
   Have you heard of someone else having a supernatural experience?

4. Is superstition tied to religion?

5. Do you think people are less religious nowadays?

6. Do you remember your dreams? Do you think dreams mean anything?
   Have you ever had a dream that meant something? Can you tell me about it?

F. CULTURE AND HOMELAND

1. Do you know how to make *Spätzle* ‘Swabian egg noodles’? How?
   Maultaschen ‘Swabian ravioli’? How? *Most* ‘apple wine’? How?

2. Do you know what a *Hocketse* ‘local festival’ is?
   Do you like to go? What do you do there?
   Are there a lot in your home town?

3. Do you know what *Gogen-Witze* ‘vintner jokes’ are?
   Do you know any?

4. Do you know *Häberle* und *Pfleiderer*?
   Can you tell me one of their stories?

5. What sort of local festivals are there?
   Do you often go? What do you do there?
   What was the last one you went to?

6. Are there special Swabian events here?
   Do you like to go to them?

G. IDENTITY

1. What is a 'real Swabian’?
   Does he/she have to speak Swabian?

2. Are you a real Swabian?
   What does being Swabian mean to you?
   What is the difference between Swabians and Bavarians or Hessens?

3. What do you think of Swabia? Your town?
   What is unique about your town?
   What do you like about it? Not like?
   How have things changed over the years?

4. Do you know a lot of people who are not Swabian? Do you speak Swabian with them? What do they think of the Swabian dialect?

5. Do you have any immigrants or refugees here? Has much changed in the town due to their arrival?

H. LANGUAGE

1. What was the first language that you learned? Do you speak other languages? Which?

2. What do you think about Swabian? Is it 'good' or 'bad' German?

3. Are there any specific Swabian features? Which ones are common?

4. Are there different Swabian dialects? How many types? What's different about them?

5. Do you speak differently with family, friends, or people at work/school?

6. Do you think your language has changed over time? Do you speak differently from your parents? Do kids talk differently these days than when you were a kid?

7. Is it hard to find a job if you speak Swabian? Would it be difficult in Munich? In Hamburg?

8. Do you think it is odd when a Swabian speaks standard German? Why or why not?

9. When you travel north do people have trouble understanding you? Do you then try to change how you talk?

D.2. Reading passage

Here is the beginning of a story. I would like you to read it aloud.
Afterwards I will ask you what happens next in this story.

The first five minutes from one of three Grimm's fairy tales are provided to the informant:

(1) *Froschkönig* 'The Frog King'
https://www.grimmstories.com/de/grimm_maerchen/der_froschkonig_oder_der_eiserne_heinrich
(2) *Der Wolf und die sieben jungen Geißlein* 'The Wolf and the Seven Little Goats'
https://www.grimmstories.com/de/grimm_maerchen/der_wolf_und_die_sieben_jungen_geisslein
(3) *Dornröschen* 'Sleeping Beauty'
https://www.grimmstories.com/de/grimm_maerchen/dornroschen

1. Do you know what happens next in this fairy tale? Can you tell me?
2. Is there a moral to this story? What is it?

D.3. Word list

Finger ‘finger’	*Flüge* ‘flight’	*Biene* ‘bee’
Hunger ‘hunger’	*immer* ‘always’	*Äpfel* ‘apples’
Apfel ‘apple’	*Asche* ‘ashes’	*zum* ‘to the’
waschen ‘wash’	*Fett* ‘fat’	*Rettich* ‘radish’
Berg ‘mountain’	*schlecken* ‘lick’	*Bahn* ‘train’
essen ‘eat’	*rinnen* ‘flow’	*Straße* ‘street’
sterben ‘die’	*Nase* ‘nose’	*Nest* ‘nest’
Schwabe ‘Swabian’	*hat* ‘has’	*fasten* ‘fasting’
Abend ‘evening’	*bedrängen* ‘pressure’	*Paar* ‘pair’
Publikation ‘publication’	*weißer* ‘white’	*Ecke* ‘corner’
Rest ‘rest’	*Türme* ‘towers’	*rasten* ‘rest’
Leute ‘people’	*Badewanne* ‘bathtub’	*laufen* ‘walk’
Frage ‘question’	*Linde* ‘linden’	*meist* ‘most’
Haar ‘hair’	*Huhn* ‘chicken’	*Türe* ‘doors’
Kinder ‘children’	*alle* ‘all’	*Gast* ‘guest’

D.4. Minimal pairs

Flüge ‘flights’	*Fliege* ‘flies’	*Söhne* ‘sons’	*Sehne* ‘tendon’
können ‘can’	*kennen* ‘know’	*Türe* ‘doors’	*Tiere* ‘animals’
vermissen ‘miss’	*vermessen* ‘measure’	*Weite* ‘width’	*Weide* ‘meadow’
küssen ‘kiss’	*Kissen* ‘pillow’	*rasten* ‘rest’	*fasten* ‘fast’
Linde ‘linden’	*Lende* ‘loin’	*heißer* ‘hot’	*heiser* ‘hoarse’
Mund ‘mouth’	*Mond* ‘moon’	*Tusche* ‘ink’	*Dusche* ‘shower’
Paar ‘pair’	*bar* ‘cash’	*schwimmen* ‘swim’	*schwemmen* ‘sluice’
Tank ‘tank’	*Dank* ‘thanks’	*Gast* ‘guest’	*fast* ‘fasting’
Oper ‘opera’	*Ober* ‘waiter’	*Leber* ‘liver’	*Leder* ‘leather’
beide ‘both’	*Beute* ‘prey’	*Rum* ‘rum’	*Rom* ‘Rome’
Weiser ‘manner’	*weißer* ‘white’	*Meister* ‘master’	*Geister* ‘spirit’
Rest ‘rest’	*Nest* ‘nest’	*Züge* ‘trains’	*Ziege* ‘goat’
lügen ‘lie’	*liegen* ‘lie down’	*fragen* ‘ask’	*tragen* ‘carry’
Höfe ‘farmyards’	*Hefe* ‘yeast	*Körbe* ‘baskets’	*Kerbe* ‘nicks’
sinken ‘sink’	*senken* ‘drop’	*verbünden* ‘federate’	*verbinden* ‘link’
packen ‘pack’	*backen* ‘bake’	*heiter* ‘cheerful’	*heute* ‘today’
Feuer ‘fire’	*feiern* ‘party’	*Ofen* ‘oven’	*oben* ‘above’
Kreide ‘chalk’	*Kreuze* ‘cross’	*Magen* ‘stomach’	*sagen* ‘say’

D.5. Socio-demographic questionnaire

Demographic Questionnaire

Swabian in Everyday Communication

All of the information will be held in complete confidence and be used only for statistical purposes. All of the names will be changed and all of your data will be completely anonymized. All information will be handled in accordance with the provisions of the European Data Protection Act 1998.

1. PERSONAL DATA: *(Please complete)*

Full Name	Occupation	Gender

Birthdate (mm/yyyy)	Birthplace	Marital Status

2. RESIDENCE: *(Please complete)*

Street Name	City / Town / Neighborhood	For How Long?

Other places where you have lived and for how long (for more than two years):

	Street Name	City / Town / Neighborhood	For How Long?
1)			
2)			
3)			
4)			
5)			

3. WORKPLACE: *(Please complete)*

Organization	City / Town / Neighborhood	For How Long?

Other places where have you worked and for how long (for more than two years):

	Organization	City / Town / Neighborhood	For How Long?
1)			
2)			
3)			
4)			
5)			

4. EDUCATION:

	City / Town / Neighborhood	(Please complete) Apprentice / Subject / Focus	Degree (yes/no)?	What Year?
Elementary School:				
Middle School:				
Upper School:				
Professional School:				
Technical School:				
High School:				
Technical College:				
University:				
Other:				

5. PARENTS:

(Please complete)

	Birthplace	Major Residence	Occupation	Highest School	Degree?	Speak Swabian?
Father:						
Mother:						

6. LANGUAGE:

(please check)

	Yes	A Little	No
Do you speak Swabian?			
Do you speak Standard German?			

Do you speak Swabian or Standard German with:

(please check)

	Swabian	Both	Standard German	Other
Your parents?				
Your brothers and sisters?				
Your relatives?				
Your husband/wife/girlfriend/boyfriend?				
Your friends?				
Your neighbors who are older?				
Your neighbors who are younger?				
Your work colleagues?				
Your boss?				
Your clients?				
People you don't know well?				
People in a train/bus?				
Your teachers/professors?				

Appendix E. Transcription guidelines and conventions

This document contains the procedures that were followed in using ELAN to transcribe the recordings. According to Nagy and Meyerhoff (2015:1), ELAN "allows for transcription, extracting, coding, preparation for statistical analysis, calculation of some basic frequency statistics, and creation of a concordance all within one program.... Seamless connection between recording, transcript and coding of dependent and independent variables improves consistency, efficiency, utility, reliability and the accountability of our coding to the original recording."

E.1. Transcription philosophy

Speech is produced with different physical and cognitive constraints than writing. In addition, the grammar of spoken language is not the same as the grammar of written language in all respects. Thus, all transcriptions of spoken language require an interpretation in some way (cf. 'Transcription is Theory' (Ochs 1979). In transcription work, it is important, to guard against being overly influenced by the knowledge of written language and not interpret things in terms of any pre-existing ideas that might stem from intuitional conventions or formal training in the written language. At the same time, it is critical to stay close enough to the written language to ensure that the transcript is easily readable. Hence, all transcribers were counselled to maintain a balance between being true to the phonetics of the word and ensuring ease of typing and reading.

E.2. ELAN transcription conventions

All transcriptions have been done in ELAN tool using a standardised ELAN template. All transcripts were extracted from ELAN, automatically coded for the linguistic variables (see Appendix A), based on entries in the bespoke Swabian-German Lexicon (see Appendix H), and loaded into R (see Appendix G) for further analysis. ELAN has various modes of usage. For this project, only Segmentation and Transcription Mode have been used. Annotations have been handled automatically in the ELAN-to-R Extraction Process (see Appendix G).

ELAN Segmentation:

Segmentation consists of splitting up the WAV file into individual units or utterances for analysis. These units, called segments in ELAN, were created using ELAN's Segmentation Mode. Ideally, segments have been created between one and three seconds long, ideally at natural breaks or pauses that the speaker makes and not broken in the middle of a word. The following is example extract of well-segmented transcript:

Mutterles und Vaterless han i gespielt.
da isch praktisch wie e --- wie e Familie.
da dued mã so wie, wenn mã Familie wär.

aber natiirlich empfiehlt si scho, dass d Frau
e Mutter macht, und wenn bloß ôi Frau dabêi wär,
isch dann ... ist d automatisch Mutter.

ELAN Transcription:

Transcripts were created using ELAN's Transcription Mode, using separate transcription tiers for each speaker. Each transcript has three transcription tiers defined:

1. SWG – Swabian, for the informant, transcribed using the Swabian defined orthography (see Appendix F),
2. ITW – Interviewer, for the person asking the questions of the informants, transcribed using standard German orthography, and
3. NOI – Noise, notes indicating extraneous sounds, such as laughter, phone ringing, someone entering the room, general comments from the transcribers.

Swabian Transcription Tier (SWG)

Swabian Orthography: Swabian transcriptions followed the standard orthographic conventions created for this project (see Appendix F). The SWG tier has not been intended to provide a full phonetic transcription. The objective has been to keep a reasonable balance between two goals: (1) detailed enough to indicate significant information for linguistic analyses, such differences in Standard-Swabian variants being studied in this investigation, such as [st] ~ [sch] and [eɪ] ~ [ôɪ] and (2) simple enough to enable relatively easy transcription and to assure a readable transcript. Hence all letters and symbols used in the transcripts are those found on the International English keyboard.

Standard German Orthography: In cases where there is no relevant difference between the Swabian and standard pronunciation (that is, it is not a variable being investigated in the current study), Standard German orthography has been used. For example, a word such as *spielen* 'play' is not transcribed as *schpielen* to indicate initial palatalisation of [sp], as this is Standard German pronunciation. In ambiguous cases, standard German orthographic conventions have been used.

Phonetic Transcription Conventions

Voiced/Voiceless Consonants: Swabian lacks the voiced-voiceless distinction with the stops/plosives /p/, /t/, and /k/, which are generally voiced /b/, / d/, and /g/ (unless influenced by the preceding or following segment). Often, in Swabian, these stops are half-voiced making it difficult to hear the difference. Transcribers were instructed to transcribe words as they were heard, e.g., *gut* 'good' as *gued* or *guet*, *tut* ‘do’ as *dued* or *tuet,* and *trinken* 'drink' *drinke* or *trinke*.

Neutral Schwa Vowel: The schwa [ə] sound, a mid-central vowel, generally represents reduction, neutralisation or an unstressed sound. For ease of typing and reading of the transcript, the schwa is transcribed as 'e', e.g., *gued* gut 'good', *muess* muss 'must', *gange* gehen 'go', *schwätze* reden 'talk', and *mached* machen 'go'.

Back Mid-central Vowel: For ease of typing and reading, the [ɔ] and [ɔɪ] sounds have been transcribed as [â] and [ôi], respectively, as in words like *hâd* hat 'has', *Sprââch* Sprache 'language' and *glôinr* kleiner 'smaller'.

Rounded/Unrounded Vowels: Swabian lacks the rounded vowels /ö/ and /ü/ and the rounded diphthong /eu/; the Swabian variants have been transcribed as /ee/, /ii/, and /ai/, respectively, for example, *schee* schön 'pretty', *zriick* zurück 'back', *iibr* über 'over', *miesse* müss 'have to', *Fraind* Freund 'friend'.

Short and Long Vowels: Short vowels have been transcribed with one letter, while long vowels have been transcribed by doubling the letter, such as in *Waage* Wagen 'wagon' and *Sprââch* Sprache 'language'. For words, such as *zehn* 'ten', *geht* 'go', and *Bahn* 'train', Standard German orthography uses an 'h' to indicate the long vowel and for ease of reading this has been retained. That is to say, *zehn*, *geht*, and *Bahn* have not been transcribed as *zeen*, *gâât*, and *Baan*, but rather as *zehn*, *geht* or *gâhd*, and *Bahn* or *Bã*.

Long Open /e/: Swabian has a broader long /e/ sound than does standard German, which has been transcribed /ää/, for example *lääse* lesen 'to read' and *gewää* gewesen 'been'.

Capitalisation

Following standard German written conventions, all nouns and only nouns have been capitalised in transcripts. Thus, it follows that the formal personal pronouns *Sie* 'you', *Ihr* 'your', and *Ihnen* 'yours' have not been capitalised in the transcripts as is standard in written German.

Quotation Marks

Titles of films, books, songs, famous people, special expressions or nonsense words have been indicated within double quotation marks, for example:

"Die Ehe der Maria Braun"
"Gene Kelly"
"Halli Hallo"
"ratz fatz"
"ruck zuck"

Citations that a speaker references when telling a story for example, she said she wasn't going to the store, are not put inside quotation marks.

Punctuation

Commas: Phrases or clauses have been marked with a comma to indicate what is interpreted to be the end of a clause or intonational unit. These may be either main clauses, subordinate clauses, or appositive clauses. With the exception of appositives, clauses generally contain a verb.

Question Marks: Words or phrases spoken with what is interpreted to be rising intonation have been followed with a question mark (?).

Exclamation Points: Words or phrases spoken with what is interpreted to be an utterance of surprise or emphasis have been followed by an exclamation point (!).

Apostrophes: Apostrophes, which are typical in written language, such as in *gib's* gibt es 'there is' or in *geht's* geht es 'there goes' are not used. These utterances have been transcribed as *gib s* and *geht s.*

Numbers: Numbers have been spelled out and transcribed as they are spoken, for example, *ôi zwêi drêi* ein zwei drei 'one two three' and not written as numerals.

Abbreviations: When the speaker has spelled out a word, the letters have been hyphenated in lower case, for example, *p-f-e-r-d* 'h-o-r-s-e'. When the speaker uses an abbreviation or brand name which is said with letters, then the letters have been written in upper case with dashes, for example, I-B-M for IBM.

Noise, Context and Comments: Contextual information has been added in the Noise tier if it is deemed relevant to the understanding of the interaction, for example,

*Nachbarn ist angekomme*n 'neighbour has arrived'
Handyanruf 'mobile phone call'
Hund bellen 'dog barking'

Back channel indicators, extraneous noises, and relevant commentary have been transcribed in the Noise Tier for example,

lachen 'Laughter'
atmen 'Breathing'
husten 'Coughing'
gähnen 'Yawning'
singen 'Singing'
klingeln 'Ringing'
Tür öffen 'Door opening'

Utterances spoken in a particular mode (fast, soft, whispered, etc.) which are notably different from the speaker's normal speaking style have been indicated accordingly in the Noise/Comment tier. Also, when the speaker has responded to someone other than the interviewer, this information has been noted in the Noise/Comment tier.

Discourse Markers: Discourse markers have been transcribed exactly as heard. For example, tja, aha, mhm, ja, ge, gell, ach.

Filler Sounds: Filler sounds have been preceded and followed with a – (hyphen), for example, -uh-, -eh-, -um-

Pauses: Three dots (...) have been used to indicate pauses. For longer pauses, two sets of three dots (... ...) have been used. A space always occurs before and after each set of three dots.

Repetitions: Repetitions of words and phrases, self-interruptions false starts, and word fragments have been transcribed as accurately as possible and indicated with three dashes (---) between the repeated or partial utterance, for example, *mr hen* --- *mr hen, wenn mr* --- *wenn mr, von* --- *von* --- *von*. Only the last word in a string of repetitions has been used in the analysis.

<u>False Starts:</u> Broken words have also been indicated with three dashes (---), but the dashes have been joined immediately with the word that was broken before it, for example, *scheid*--- *scheidet, Gege*--- *Gegete*. Broken words have been excluded from analysis.

<u>Transcriber Comments and Questions</u>. Questions and comments that the transcriber had about a particular utterance have been entered in the Noise/Comments tier and prefaced with three question marks (???). Questions that the transcriber had about the transcription of a particular sound have been prefaced with a single question mark, for example: ?*glôinr*, to indicate further acoustic analysis is necessary.

<u>Unintelligibility</u>: Words or expressions that cannot be understood or reliably transcribed have been indicated with three question marks (???) to signal that a part of the transcript cannot be understood and therefore is to be ignored. Wherever two or more conversational threads emerge which are too difficult to transcribe, as a general rule only the main thread of conversation has been transcribed. The threads which are not transcribed have been treated like a contextual event and are indicated such in the Noise/Comments tier.

E.3. TRANSCRIPT STORAGE AND SECURITY

<u>File Naming Standards</u>

All transcription files have been named in the following format;

Sxxx-yy-z-n-abcd, where:

xxx is the Speaker's unique ID number, e.g., 001, 042.
yy is the year of the recording, i.e., 82 or 17.
z is the type of interview:
- I = Individual sociolinguistic interview (Interviewee track)
- J = Individual Sociolinguistic interview (Interviewer track)
- N = Social network interview
- G = Group ethnographic interview
- S = Spontaneous conversation
- R = Self-recording

n is a sequential number, starting with one, to be used if there is more than one recording for this speaker and this type, such as with the 1982 recordings which are broken into two parts, 1 and 2 for the two sides of the cassette recording.
abcd is the first name (pseudonym) of the speakers.

For example,

S008-82-I-1-Rupert	Speaker 008, from 1982, individual interview, recording 1, Rupert
S008-17-R-2-Rupert	Speaker 008, from 2017, self-recording, number 1, Rupert
S041-17-N-1-Karl	Speaker 041, from 2017, social network interview, recording 1, Karl

When interviews were done in groups, one ELAN transcript was created and separate tiers for each speaker were added. A full list of the transcripts can be found in Appendix C).

Transcript Storage

All WAV and ELAN files are kept on a secured, encrypted Google Drive for permanent storage and to protect against inadvertent data loss. When working on a file, the file is “checked out”, so to speak, by indicating the transcriber's name and the words *in-Arbeit* 'in progress' in the Online Transcription Log. Once the transcription has been completed, the log is updated with the word *fertig* ‘finished’ which signals that that transcription is ready for further processing.

Anonymisation

A guiding principle of this project is sensitivity to the appropriate extent of anonymisation in order to protect the identities of the participants and the environment. All speakers have been assigned a unique speaker ID (a sequential number) and a pseudonym (that matches their self-reported gender). A master list of pseudonyms is maintained by the Principal Investigator and stored under lock and key in the Office of the Secretary for the Quantitative Linguistics Department at the University of Tübingen. Personal names and locations with personal identifying information, such as a person’s name and birthplace, have been transcribed in curly brackets {}, and are programmatically deleted during the anonymisation process, for example, {Rupert}, {Böblingen}.

Appendix F. Swabian orthographic conventions

This appendix provides examples of orthographic conventions adopted for the Swabian transcriptions, sorted alphabetically (vowels and consonants) by the Swabian phonetic symbol (SWG-Phone). These conventions were developed from a broad synthesis of the literature (Frey 1975; Klausmann 2014; Ruoff 1983; Russ 1990). Following convention, the IPA is shown in [square brackets], the orthographic transcription in *italics*, and the English translation in ‘single quotes.’

SWG Phone	**SWG Grapheme**	**SWG Example**	**STD Phone**	**STD Example**	**MHG Phone**	**MHG Example**
VOWELS:						
[a:]	aa (ah)	[ʃtʁaːfə] *Strafe* 'penalty'	[a:]	[ʃtʁaːfə] *Strafe* 'penalty'	a	strāfen *Strafe* 'penalty'
[a]	a	[kald] *kald* 'cold'	[a]	[kalt] *kalt* 'cold'	a	kalt *kalt* 'cold'
[ã]	ã	[kã] *kã* 'can'	[a]	[kan] *kann* 'can'	u	kunnen *können* 'able to'
[aɪ]	ai	[haɪt] *hait* 'today'	[ɔɪ]	[hɔɪtə] *heute* 'today'	iu	hiute *heute* 'today'
[aʊ]	au	[fʁaʊ] *Frau* 'woman'	[aʊ]	[fʁaʊ] *Frau* 'woman'	ou	vrouwe *Frau* 'woman'
[ɔ:]	ââ (ah)	[ʃpʁɔːx] *Sprââch* 'language'	[a:]	[ʃpʁaːxə] *Sprache* 'language'	ā	sprāche *Sprache* 'language'
[ɔ]	â	[hɔd] *hâd* 'has'	[a]	[hat] *hat* 'has'	ā	hān *hat* 'has'
[ɔɪ]	ôi	[glɔɪn] *glôin* 'small'	[aɪ]	[klaɪn] *klein* 'small'	ei	klein *klein* 'small'
[e:]	ee	[ʃee] *schee* 'pretty'	[ø:]	[ʃøːn] *schön* 'pretty'	œ	schœne *schön* 'pretty'
[e:]	ee (eh)	[se:] *See* 'lake'	[e:]	[ze:] *See* 'lake'	ē	sē *See* 'lake'
[ə]	e	[en] *en* 'one'	[aɪ]	[aɪn] *ein* 'one'	ei	ein *ein* 'one'
[ə]	u	[fəm] *vum* 'of'	[ɔ]	[fɔn] *von* 'of'	o	von *von* 'of'
[eə]	ee (eh)	[dseə] *zeehn* 'ten'	[e:]	[tse:n] zehn 'ten'	ē	zēn *zehn* 'ten'
[əɪ]	êi	[dsəɪt] *Zêit* 'time'	[aɪ]	[tsaɪt] *Zeit* 'time'	ī	zīt *Zeit* 'time'
[əɪ]	êi	[həis] *hêiß* 'called'	[aɪ]	[haɪs] *heiß* 'called'	ei	heiʒ *heiß* 'called'
[əu]	eu	[səu] *Seu* 'pig'	[aʊ]	[zaʊ] *Sau* 'pig'	u:	suu *Sau* 'pig'
[ɛ:]	ää	[lɛ:be] *lääbe* 'live'	[e:]	[leːbn] *leben* 'live'	e	leben *leben* 'live'
[ɛ]	e	[ebə] *ebe* 'even'	[e:]	[e:bən] *eben* 'even'	e	eben *eben* 'even'
[i:]	i	[bi:nə] *Biene* 'bee'	[i:]	[bi:nə] *Biene* 'bee'	i	bine *Biene* 'bee'
[i:]	ii (ie)	[gri:n] *griin* 'green'	[y:]	[gryːn] *grün* 'green'	üe	grüene *grün* 'green'
[ɪ]	i	[sɪn] *sin* 'are'	[ɪ]	[zɪnt] *sind* 'are'	ī	sīn *sind* 'are'
[iə]	ii (ie)	[iəbə] *iibr* 'over'	[ʏ:]	[ʏ:bə] *über* 'over'	ü	über *über* 'over'
[iə]	ii (ie)	[miəsd] *miesste* 'must'	[ʏ]	[mʏstə] *'müsste* 'must'	ü	müeʒen *müssen* 'must'
[o:]	oo (oh)	[ʃo] *scho* 'already'	[o:]	[ʃo:n] *schon* 'already'	ō	schōn *schon* 'already'
[u:]	u	[duː] *du* 'you'	[u:]	[duː] *du* 'you'	ū	dū *du* 'you'
[u]	u	[uf] u*ff* 'on'	[aʊ]	[aʊf] *auf* 'on'	ū	ūf *auf* 'on'
[uə]	ue	[guəd] *gued* 'good'	[u:]	[gu:t] *gut* 'good'	uo	guot *gut* 'good'
CONSONANTS:						
[b]	b	[bassd] *bassd* 'pass'	[p]	[pasən] *passen* 'pass'	p	gepassen *passen* 'pass'
[bf]	bf	[bfʊnd] Pfund 'pound'	[pf]	[pfʊnt] Pfund 'pound'	pf	pfunt Pfund 'pound'
[ç]	ch	[ɪ] *i* 'I'	[ç]	[ɪç] *ich* 'I'	ch	ich *ich* 'I'
[d]	d	[dʁɪŋkə] d*rinke* 'drink'	[t]	[tʁɪŋkn] *trinken* 'drink'	t	trinken *trinken* 'drink'
[ds]	ds	[dsəɪt] *Zêit* 'time'	[ts]	[tsaɪ̯t] *Zeit* 'time'	z	zīt *Zeit* 'time'
[f]	f	[fɪndə] *finde* 'find'	[f]	[fɪndn] *finden* 'find'	f	finden *finden* 'find'
[g]	g	[guəd] *gued* 'good'	[g]	[gu:t] *gut* 'good'	g	guot *gut* 'good'
[h]	h	[hɔd] *hâd* 'has'	[h]	[hat] *hat* 'has'	h	hān *hat* 'has'
[j]	j	[ja] *ja* 'yes'	[j]	[ja] *ja* 'yes'	j	jaa *ja* 'yes'
[k]	k	[kɛnəd] *kenned* 'know'	[k]	[kɛnən] *kennen* 'know'	k	kennen *kennen* 'know'
[l]	l	[laŋə] *lange* 'long'	[l]	[laŋə] *lange* 'long'	l	lange *lange* 'long'
[m]	m	[məɪ] *mei* 'my'	[m]	[maɪn] *mein* 'my'	m	miin 'mein'
[n]	n	[kɛnəd] *kenned* 'know'	[n]	[kɛnən] *kennen* 'know'	n	kennen *kennen* 'know'
[ŋ]	ng (n)	[dʁɪŋkə] d*rinke* 'drink'	[ŋ]	[tʁɪŋkn] *trinken* 'drink'	ng (n)	trinken *trinken* 'drink'
[p]	b	[ab] *ab* 'down'	[p]	[ap] *ab* 'down'	b	ab *ab* 'down'
[ʀ]~[ʁ]	r	[ʀoːd] *rot* 'red'	[ʀ]	[ʀoːt] *rot* 'red'	r	root *rot* 'red'
[s]	s	[so] *so* 'so'	[z]	[zo:] *so* 'so'	s	soo *so* 'so'
[s]	s	[esse] *essen* 'eat'	[s]	[ɛsən] *essen* 'eat'	ʒ	ëʒʒen *essen* 'eat'
[ʃ]	sch	[ʃafə] *schaffe* 'work'	[ʃ]	[ʃafən] *schaffen* 'work'	sch	schaffen *schaffen* 'work'
[t]	t	[hɔd] *hâd* 'has'	[t]	[hat] *hat* 'has'	t	hān *hat* 'has'
[v]	w	[vi:] *wie* 'how'	[v]	[vi:] *wie* 'how'	w	wie *wie* 'how'
[x]	ch	[ʃpʁɔːx] *Sprââch* 'language'	[x]	[ʃpʁaːxə] *Sprache* 'language'	ch	sprāche *Sprache* 'language'

Appendix G. ELAN-to-R (E2R) extraction process

This appendix describes the ELAN-to-R (E2R) process for extracting the transcripts from ELAN and processing them for statistical analysis in R. All ELAN transcripts are stored on a secured, encrypted Google drive, and access is provided to the project team through a userid and password. Figure A- 48 presents a graphical overview of the steps involved in the E2R process.[44] Each step is described in detail in the following sections.

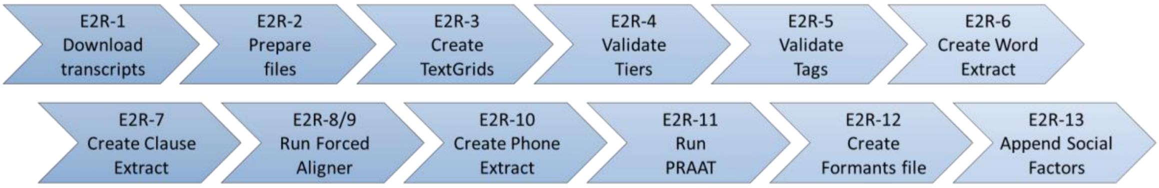


Figure A- 48. ELAN-to-R (E2R) Extraction Process

G.1. ELAN TRANSCRIPT PROCESSING

Script: E2R-1 Download transcripts: GDownload.py

Prerequisites: Google account; drive API; download credentials; corresponding libraries.

Inputs: path of the download directory; path to the ELAN directories; path to the WAV directories; speaker demographic files

Processing: The script downloads all ELAN transcripts from the Google drive directories, 1982_slx_interviews_elan and 2017_slx_interviews_elan. On the first run (the ELAN and WAV directories are empty): it reads the trans_id in the speaker files into a list and searches and downloads all files from the Google Drive into the download directory. Files with multiple speaker names do not have a matching trans_id and so must be downloaded and moved to the download directory manually. After the first run (the ELAN and WAV directories are no longer empty): the script searches the Google Drive with the file names and compares the last modified date and time of the local file with the file on the Google Drive. If the file has changed, a new copy is downloaded to the appropriate ELAN or WAV directory.

Script: E2R-2 Prepare files: select_move_file.py

Processing: This script matches the downloaded files with the speaker trans_id and moves the ELAN and WAV files to the corresponding directories for processing.

Outputs: Updated ELAN transcription files (format:.eaf) and WAV audio files

[44] I wish to extend my deepest appreciation to Zhuge Gao from the University of Tübingen who developed the Python scripts for the E2R process, and painstakingly and repeatedly ran and re-ran the extracts on demand, as continual updates were made to the ELAN transcripts and to the SGL lexicon.

(format:.wav) downloaded into one of five directories: panel_elan/1982, panel_elan/2017, panel_wav, trend_elan, trend_wav, twin_elan, twin_wav and manual.

G.2. TextGrid creation

Script: E2R-3 Create TextGrids: Eaf2TextGrid.py

Prerequisites: pympi installation

Inputs: path of ELAN directory; path of TextGrid directory; name of the ELAN tier that will be kept in the TextGrid.

Processing: The script reads each ELAN file and uses the pympi library to select the correct tiers and create TextGrids. For files with multiple speakers, the TextGrids must be created manually, changing the tier name and removing the additional speaker names and numbers.

Outputs: TextGrid files in TextGrid directory (format:.TextGrid) in four TextGrid directories: panel_tg/1982, panel_tg/2017, trend_tg, twin_tg

G.3. Tier validation

Script: E2R-4 Validate tiers: check_tiers.py

Inputs: path of TextGrid directory

Processing: The script reads each TextGrid and iterates across the tiers to find the SWG tier (containing the Swabian transcript) to validate that the file is ready for processing. If there are no SWG tiers in the TextGrid, the file and tier names are output for manual error handling. Additional speaker names in the tier name must be removed by opening the TextGrid in a text editor and making the correction manually. The tier validation program is re-run to check that no further changes are required. Only the actual sociolinguistic interview text is processed, meaning that the reading passage, word games (from 1982 only), and word lists are skipped. The program first checks for proper pairing of the skip-text-tags, such as [BEGIN-READING], [END-READING], [BEGIN-WORD-LISTS], [END-WORD-LISTS], [BEGIN-WORD-GAMES], and [END-WORD-GAMES]. There are two skipping methods: (i) skip_by_tag: if a [BEGIN] is detected, all the words between the [BEGIN] tag and its corresponding [END] tag are skipped; (ii) skip_word_list: if there is no [BEGIN] tag, the script searches for sections to skip by matching word sequences in the transcript hat match the first and last ten words of the reading passage and the word lists.

Outputs: Validated TextGrid files in TextGrid directory; error correction file

G.4. Tag validation

Script: E2R-5 Validate tags: tg_inspect.py

Inputs: path of TextGrid directory

Processing Considerations: The script reads each TextGrid and validates that all tags (manual annotations in the ELAN files) are correct. It checks for tags that are letters surrounded by square brackets, such as [REL], [ANT], [PRO], for correctly paired [BEGIN] and [END] tags, and that all tags are valid. If not, the TextGrid name and the invalid tags are output for manual error handling. The tags can be corrected by opening the TextGrid in any text editor and making the changes manually. The ELAN files are also updated to correct the error at its source. The program is then rerun to validate that all tags are correct and no further changes are needed.

Outputs: Validated TextGrid files in TextGrid directory; error correction file

G.5. WORD EXTRACT PROCESSING

Script: E2R-6 Create words extract: words_extract.py

Prerequisite: stanford-corenlp installation to handle POS (part of speech) tagging.

Inputs: processing date; extract type; path of SGL table (Swabian-German Lexicon, see Appendix H); path of output directory; path of TextGrid

Processing: The script creates the words extract, which is used to calculate the frequency of dialect versus standard variants for each of the variables under investigation. If the SGL table (lexicon) has been updated, the program first checks for an invalid variable code (var_code) in the word_vars column. Additionally, it calculates four new columns for word frequency counts: word_stem_freq, word_lemma_freq, word_standard_freq, word_variant_freq. The updated SGL table is output as a new CSV file which is used in creating the extracts. Invalid var_codes are omitted in the new SGL table and output to a separate file for manual error handling. The script reads the TextGrids, retaining the file name and the text annotations from the SWG tier, and exercises the same skip-text-tags process described in Section G.3. The text is tokenised, and one row is inserted for each word in the transcript, filtering out all non-words (e.g., filler words surrounded by hyphens (-mhm- -ah- -uh- etc.), punctuation marks such as commas, periods, question marks, etc., interruptions and partial words (---, br---, etc.), and pauses (…)). Each Swabian word (SWG_word) is checked to see if it exists in the SGL table. If a match is found, its var_code and POS_tag are attached to the word, referred to as VAR-tagging and POS-tagging, respectively. If no match is found, the var_code is left blank, and only the POS_tag is attached to the word. POS_tags are derived using the Stanford Log-linear Part-Of-Speech Tagger (Toutanova et al. 2003).

Outputs: One extract for each sample type, named with the extract type and processing date: SWG_panel_words, SWG_twin_words, and SWG_trend_words. Each word extract contains 35 columns and over 200,000 rows. Figure A- 49 provides a partial view of a word extract, including some of the social information which is appended in script E2R-13.

File_ID	Word_SWG	var_code	Word_German	POS_tag	dem_yr	spk_com	spk_id	spk_name	spk_twin	spk_sex	spk_age
S007-82-I-1-Egbert	und	ULO2s	und	KON	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	soll		soll	VMFIN	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	i	PROs	ich	PPER	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	au		auch	APPR	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	jetzt	STPOs	jetzt	PIDAT	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	mit		mit	APPR	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	aufnehme	LEOs	aufnehm	VVFIN	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	die	DADs	die	ART	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	Einleidung	AIS2s	Einleitung	NN	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	au		auch	APPR	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	aufnehme	LEOs	aufnehm	VVFIN	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	ja		ja	PTKANT	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	okee		okee	XY	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	was		was	PWS	1982	Stuttgart	S007	Egbert	S095	M	24
S007-82-I-1-Egbert	hem	IRV3d	haben	VAFIN	1982	Stuttgart	S007	Egbert	S095	M	24

Figure A- 49. Sample word extract for R statistical analysis

G.6. Clause extract processing

<u>Script</u>: E2R-7 Create clause extracts: clauses_extract.py (and clauses_rel_extract.py)

<u>Processing</u>: The script builds the clause extract file, creating one row for each clause in the transcript, which is used in the statistical analysis of morphosyntactic variation. The clause extract is created in a manner similar to the word extract except that all filler words, symbols, and punctuation marks are retained. Punctuation marks (e.g., periods, commas, explanation points, question marks) are used to designate separate clauses (i.e., a spoken utterance). All segments are VAR-tagged and POS-tagged using the same methods and tools as in the words extract. The var_codes and POS_tags are merged onto each row. An asterisk (*) is used as a placeholder for words without var_codes and for uninformative POS_tags. For the clause extract, there is no tokenisation or filter. For the clauses_rel extract, only the clauses which contain the tags [REL] or [ANT] are extracted.

<u>Outputs</u>: One clause_extract for each sample type, named with the extract type and processing date: SWG_panel_clauses, SWG_twin_clauses, and SWG_trend_clauses. Each clause extract contains 114 columns and roughly 30,000 rows. Figure A- 50 provides partial view of the format of the clause extract, demonstrating the output of the VAR-tagging and POS-tagging processes.

File_ID	SWG	VAR	POS
S007-82-I-1-Egbert	-mhm- -mhm- -mhm- .	* * * *	* * * $.
S007-82-I-1-Egbert	und soll --- soll i au jetzt mit aufnehme ?	ULO2s * * * PROs STPOs * LEOs *	KON VMFIN APPR VMFIN PPER APPR PIDAT APPR VVFIN $.
S007-82-I-1-Egbert	die Einleidung au aufnehme ?	DADs AIS2s LEOs *	ART NN APPR VVFIN $.
S007-82-I-1-Egbert	-hm- -mhm- -mhm- -mhm- -mhm- -mhm- -mhm- ja ... ok	* * * * * * * * * *	* * * * * * * PTKANT * XY $.
S007-82-I-1-Egbert	-mhm- -mhm- -mhm- -hm- .	* * * * *	* * * * $.
S007-82-I-1-Egbert	was hem mr gspielt ?	* IRV3d SAF5s *	PWS VAFIN PPER VVPP $.
S007-82-I-1-Egbert	Fange -gs- hem mr gspielt .	* * IRV3d SAF5s *	NN * VAFIN PPER VVPP $.
S007-82-I-1-Egbert	und Verstegge .	ULO2s *	KON NN $.
S007-82-I-1-Egbert	-aha- -mmh- ja ,	* * *	* * PTKANT $,
S007-82-I-1-Egbert	denn ... einr muss sich d Auge zu halde ,	* * AIS2s FRV4s * * FRV4s * *	ADV * ART VMFIN PRF ART NN PTKZU XY $,
S007-82-I-1-Egbert	oder muss --- muss irgendwo gege enm Baum sich ste	* FRV4s * FRV4s * LEOs * * * * *	KON VMFIN APPR VMFIN ADV ADV XY NN PRF VVFIN $,

Figure A- 50. Sample clause extract for R statistical analysis

G.7. Aligner processing

Script: E2R-8 Split files: split.py

Prerequisite: pydub for manipulating WAV audio files and cutting them according to the time stamps in the TextGrids

Inputs: path to directory which contains the TextGrid and WAV files

Processing: The script splits the TextGrid and WAV files in preparation for running the Forced Aligner. It first looks for matching TextGrid and WAV files. For every TextGrid interval, it writes the interval text to a TXT file, TextGridName_Number.txt, and cuts out the corresponding WAV audio, TextGridName_Number.wav, using the interval xmin and xmax time stamps. If the text is empty, the TXT and WAV files are saved in an empty folder; otherwise, they are saved in none_empty_SPEAKERTYPE folder. Note: for the next step, for processing efficiency, it is best to load all the files on the Tübingen Suebi server, using the UNIX command scp, for example:

scp /local/path/to/the/target/directory yourusername@suebi.sfs.uni-tuebingen.de:~/SWG/target/directory/on/server

Outputs: TXT and WAV files (format: .txt, .wav) in directories: none_empty_panel, none_empty_trend, none_empty_twin.

Script: E2R-9 Run Aligner: SWG_run_aligner.R

Prerequisite: R, Aligner, htk (on the Suebi server)

Inputs: path to the none_empty directories (working directory), path to the output directories (NEWFOLDER), path to the intermediate aligner files (ALIGNFOLDER), TRANSFOLDER, path to the output folder (GRIDFOLDER).

Processing: The script generates time-aligned audios file based on the orthographic ELAN transcriptions, using the Kaldi ASR toolkit (Kaldi 2020) for speech recognition as its underlying technology. The script sets the working directory to the none_empty folder. The file names are read into a list, and for each file name, all punctuation is removed and replaced with the special characters. The Forced Aligner aligns the cleaned text with the audio on two levels: segment and word. The segment level aligns phones within the words, and the information is stored in the intermediate Aligner files. The script reads in the intermediate files and writes the phones, words and time stamps into a TextGrid.

Outputs: TextGrids and WAV audio files (format: .TextGrid, .wav) in the done_panel, done_trend, done_twin directories.

G.8. Phone extract processing

Script: E2R-10: Create phone extract: phone_extract.py

Inputs:

Processing: The phone extracts are created in a manner similar to the word extracts except that each phone is separated onto a single row, a file format used for statistical phonetic analysis.

The script reads in the Forced Aligner output TextGrids and the original TXT files and outputs one phone/segment for each row, including the start time and end time of the phone, the word that contains the phone, and the start time and end time for the word. Words are VAR-tagged and POS-tagged as in the other extracts. Four additional columns are added: previous_seg, following_seg, previous_word, and following_word.

<u>Outputs</u>: One phone extract for each sample type, named with the extract type and processing date: SWG_panel_phones, SWG_twin_phones, and SWG_trend_phones. Each phone extract contains 108 columns and roughly 900,000 rows. Figure A- 51 provides a partial view of the phone extract, showing the word and segment start and end times, previous and following word and segment, var_code and POS_tag.

trans_id	word_start	word_end_	word_SWG	previous_word	following_word	seg_r	seg_start_	seg_end_t	segment_SWG	previous_seg	following_seg	var_code	POS_tag
S007-82-I-1-Egbert_81	08:24:00	10:33:36	<P>	#	eimal	1	08:24:00	10:33:36	_p:_	#	ai		NE
S007-82-I-1-Egbert_81	10:33:36	19:26:24	eimal	#	s	1	10:33:36	13:26:24	ai	#	m	AIS2s	ADV
S007-82-I-1-Egbert_81	10:33:36	19:26:24	eimal	#	s	2	13:26:24	15:21:36	m	ai	a:	AIS2s	ADV
S007-82-I-1-Egbert_81	10:33:36	19:26:24	eimal	#	s	3	15:21:36	18:43:12	a:	m	l	AIS2s	ADV
S007-82-I-1-Egbert_81	10:33:36	19:26:24	eimal	#	s	4	18:43:12	19:26:24	l	a:	s	AIS2s	ADV
S007-82-I-1-Egbert_81	19:26:24	23:16:48	s	eimal	eimal	1	19:26:24	23:16:48	s	l	ai		PPER
S007-82-I-1-Egbert_81	23:16:48	07:26:24	eimal	s	so	1	23:16:48	03:07:12	ai	s	m	AIS2s	ADV
S007-82-I-1-Egbert_81	23:16:48	07:26:24	eimal	s	so	2	03:07:12	04:48:00	m	ai	a:	AIS2s	ADV
S007-82-I-1-Egbert_81	23:16:48	07:26:24	eimal	s	so	3	04:48:00	06:43:12	a:	m	l	AIS2s	ADV
S007-82-I-1-Egbert_81	23:16:48	07:26:24	eimal	s	so	4	06:43:12	07:26:24	l	a:	z	AIS2s	ADV
S007-82-I-1-Egbert_81	07:26:24	15:36:00	so	eimal	#	1	07:26:24	11:02:24	z	l	o:		ADV
S007-82-I-1-Egbert_81	07:26:24	15:36:00	so	eimal	#	2	11:02:24	15:36:00	o:	z	#		ADV
S007-82-I-1-Egbert_81	15:36:00	18:48:58	<P>	so	#	1	15:36:00	18:48:58	_p:_	o:	#		NE
S007-82-I-1-Egbert_83	00:00:00	12:14:24	<NOISE>	#	#	1	00:00:00	12:14:24	_NOISE_	#	#		NE
S007-82-I-1-Egbert_83	12:14:24	19:26:24	<P>	#	mit	1	12:14:24	19:26:24	_p:_	#	m		NE
S007-82-I-1-Egbert_83	19:26:24	23:31:12	mit	#	eim	1	19:26:24	21:07:12	m	#	ɪ		APPR
S007-82-I-1-Egbert_83	19:26:24	23:31:12	mit	#	eim	2	21:07:12	21:50:24	ɪ	m	t		APPR
S007-82-I-1-Egbert_83	19:26:24	23:31:12	mit	#	eim	3	21:50:24	23:31:12	t	ɪ	ai		APPR
S007-82-I-1-Egbert_83	23:31:12	06:57:36	eim	mit	Bein	1	23:31:12	04:19:12	ai	t	m	AIS2s	ART
S007-82-I-1-Egbert_83	23:31:12	06:57:36	eim	mit	Bein	2	04:19:12	06:57:36	m	ai	b	AIS2s	ART
S007-82-I-1-Egbert_83	06:57:36	16:04:48	Bein	eim	und	1	06:57:36	08:24:00	b	m	ai	AIS2s	NN
S007-82-I-1-Egbert_83	06:57:36	16:04:48	Bein	eim	und	2	08:24:00	13:26:24	ai	b	n	AIS2s	NN
S007-82-I-1-Egbert_83	06:57:36	16:04:48	Bein	eim	und	3	13:26:24	16:04:48	n	ai	ʊ	AIS2s	NN

Figure A- 51. Sample phone extract for R statistical analysis

G.9. FORMANT EXTRACT PROCESSING

<u>Script</u>: E2R-11 Run PRAAT: Praat_extract_formants.praat

<u>Inputs</u>: Aligner output files; path to the directory where the WAV audio files are located; output path

<u>Processing</u>: The script reads the Aligner output and processes the WAV files in preparation for creating the formants extracts.

<u>Script</u>: E2R-12 Create formant extract: formant_extract.py

<u>Inputs</u>: processing date; extract type; path of SGL table; path of output directory; path to the TextGrid directories; path to the WAV directories.

<u>Processing</u>: The formants extracts are created in a manner similar to the phones extracts except that frequency measurements are separated into individual rows, a file format used for statistical acoustic analysis. The script reads the phones extract, selects all rows which contain the variable in question (currently, only the AIS1 and AIS2 variables are investigated), and writes the data into formant_raw CSV file for further processing. All the formant files are read into a dictionary with the filename as key. For each row in the formant_raw file, the relevant formant

time, F1, and F2 are retrieved using the file name and the segment start and end time. Segment duration and word duration are created by subtracting the segment start_time from end_time column. Normalised time is calculated to start from 0 and end at 1 by: (1) getting the number of rows of each segment or word interval (same start and end time); (2) dividing 1 by the number of rows to get the length of the step; and (3) calculating the normalised time for each line within the interval as step_length * line_num. Zeroed end time is the time from the formant minus the start time, that is, the difference between the current time and the start time of the file.

<u>Outputs</u>: One formant extract for each sample type, named with the extract type and processing date: SWG_panel_formants, SWG_twin_formants, and SWG_trend_formants. Each formant extract contains 118 columns and roughly 2 million rows. Figure A- 52 provides a partial view of the formant extract, showing the F1 and F2 frequencies, zeroed time, normalised time, word duration, etc.

trans_id	time	F1Hz	F2Hz	zeroed_word	normalized_time	word_start_	word_end_	word_duration	word_SWG	seg_	AR_start_	zeroed_time	normalized_time	seg_start_	seg_end_
S031-17-I-1-Jurgen_1	1.650505	836.717	2220.336	0.000505	0	1.65	3.60601	1.95601	weit	1	TRUE	0	0	1.65	1.7
S031-17-I-1-Jurgen_1	1.653005	1116.096	2323.297	0.003005	0.0013	1.65	3.60601	1.95601	weit	1	FALSE	0.0025	0.001285347	1.65	1.7
S031-17-I-1-Jurgen_1	1.655505	1019.309	2274.89	0.005505	0.0026	1.65	3.60601	1.95601	weit	1	FALSE	0.005	0.002570694	1.65	1.7
S031-17-I-1-Jurgen_1	1.658005	1095.319	2013.385	0.008005	0.0039	1.65	3.60601	1.95601	weit	1	FALSE	0.0075	0.003856041	1.65	1.7
S031-17-I-1-Jurgen_1	1.660505	989.566	1820.641	0.010505	0.0051	1.65	3.60601	1.95601	weit	1	FALSE	0.01	0.005141388	1.65	1.7
S031-17-I-1-Jurgen_1	1.663005	1001.726	1760.217	0.013005	0.0064	1.65	3.60601	1.95601	weit	1	FALSE	0.0125	0.006426735	1.65	1.7
S031-17-I-1-Jurgen_1	1.665505	919.534	1974.217	0.015505	0.0077	1.65	3.60601	1.95601	weit	1	FALSE	0.015	0.007712082	1.65	1.7
S031-17-I-1-Jurgen_1	1.668005	820.076	2170.074	0.018005	0.009	1.65	3.60601	1.95601	weit	1	FALSE	0.0175	0.008997429	1.65	1.7
S031-17-I-1-Jurgen_1	1.670505	606.604	1951.853	0.020505	0.0103	1.65	3.60601	1.95601	weit	1	FALSE	0.02	0.010282776	1.65	1.7
S031-17-I-1-Jurgen_1	1.673005	1582.68	2337.4	0.023005	0.0116	1.65	3.60601	1.95601	weit	1	FALSE	0.0225	0.011568123	1.65	1.7
S031-17-I-1-Jurgen_1	1.675505	1646.695	2197.139	0.025505	0.0129	1.65	3.60601	1.95601	weit	1	FALSE	0.025	0.01285347	1.65	1.7
S031-17-I-1-Jurgen_1	1.678005	479.156	1179.526	0.028005	0.0141	1.65	3.60601	1.95601	weit	1	FALSE	0.0275	0.014138817	1.65	1.7
S031-17-I-1-Jurgen_1	1.680505	438.014	1285.816	0.030505	0.0154	1.65	3.60601	1.95601	weit	1	FALSE	0.03	0.015424165	1.65	1.7
S031-17-I-1-Jurgen_1	1.683005	423.559	1513.133	0.033005	0.0167	1.65	3.60601	1.95601	weit	1	FALSE	0.0325	0.016709512	1.65	1.7
S031-17-I-1-Jurgen_1	1.685505	369.671	1395.754	0.035505	0.018	1.65	3.60601	1.95601	weit	1	FALSE	0.035	0.017994859	1.65	1.7
S031-17-I-1-Jurgen_1	1.688005	489.025	1406.98	0.038005	0.0193	1.65	3.60601	1.95601	weit	1	FALSE	0.0375	0.019280206	1.65	1.7
S031-17-I-1-Jurgen_1	1.690505	454.28	1283.62	0.040505	0.0206	1.65	3.60601	1.95601	weit	1	FALSE	0.04	0.020565553	1.65	1.7
S031-17-I-1-Jurgen_1	1.693005	327.664	1569.712	0.043005	0.0219	1.65	3.60601	1.95601	weit	1	FALSE	0.0425	0.0218509	1.65	1.7
S031-17-I-1-Jurgen_1	1.695505	475.438	1423.007	0.045505	0.0231	1.65	3.60601	1.95601	weit	1	FALSE	0.045	0.023136247	1.65	1.7
S031-17-I-1-Jurgen_1	1.698005	455.605	1262.301	0.048005	0.0244	1.65	3.60601	1.95601	weit	1	FALSE	0.0475	0.024421594	1.65	1.7
S031-17-I-1-Jurgen_1	1.700505	491.45	1191.087	0.050505	0.0257	1.65	3.60601	1.95601	weit	2	FALSE	0.05	0.025706941	1.7	3.55
S031-17-I-1-Jurgen_1	1.703005	427.717	1124.273	0.053005	0.027	1.65	3.60601	1.95601	weit	2	FALSE	0.0525	0.026992288	1.7	3.55
S031-17-I-1-Jurgen_1	1.705505	410.625	1139.707	0.055505	0.0283	1.65	3.60601	1.95601	weit	2	FALSE	0.055	0.028277635	1.7	3.55

Figure A- 52. Sample formant extract for R statistical analysis

G.10. SPEAKER SOCIAL INFORMATION

<u>Script</u>: E2R-13 Append Social information: add_social_info_to_csv.py

<u>Input</u>: path to extract, path to speaker file, extract type

<u>Processing considerations</u>: The script appends the speakers' social factors from the socio-demographics questionnaire (see Appendix D.5) onto the end of each row in the extract files to prepare them for statistical processing in R. The extract and speaker file are read into dataframes and the two files are merged using the trans_id columns.

<u>Output</u>: extract with social information (format:.csv).

Appendix H. Swabian-German Lexicon (SGL)

The Swabian-German Lexicon (SGL) contains over 14,000 variants from the Swabian corpus containing at least one of the linguistic variables under investigation. Following are three short excerpts from the lexicon provided here for exemplary purposes.

word_stem	word_lemma	word_standard	word_variant	word_vars	word_english	POS_tag	word_MHG	word_stem_	word_lemma	word_stand	word_varia
heim	daheim	daheim	daheim	AIS2s	at-home	ADJD	heim	363	159	159	76
heim	daheim	daheim	dahêim	AIS2d	at-home	ADJD	heim	363	159	159	4
heim	daheim	daheim	dahôim	AIS2d	at-home	ADJD	heim	363	159	159	79
heim	Heim	heim	heim	AIS2s	home	NN	heim	363	93	93	50
heim	Heim	heim	hêim	AIS2d	home	NN	heim	363	93	93	4
heim	Heim	heim	hôim	AIS2d	home	FM	heim	363	93	93	39
heim	unheimlich	unheim*	oheim*	ULO1d AIS2s	scary	ADJD	heim	363	111	13	12
heim	unheimlich	unheim*	ooheim*	ULO1d AIS2s	scary	ADJD	heim	363	111	13	1
heim	unheimlich	unheimli*	unheimli*	ULO1s AIS2s	scary	ADJD	heim	363	111	98	95
heim	unheimlich	unheimli*	unhêimli*	ULO1s AIS2d	scary	ADJD	heim	363	111	98	1
heim	unheimlich	unheimli*	unhôimli*	ULO1s AIS2d	scary	ADJD	heim	363	111	98	2
heirat	einheiraten	eingeheiratet	ein[ge]heir*	AIS1s AIS2s SAF5d	married-into	VVPP	ein, hīrāt	81	1	1	0
heirat	einheiraten	eingeheiratet	eingeheir*	AIS2s SAF5s AIS1s	married-into	VVPP	ein, hīrāt	81	1	1	1
heirat	heirat	heirat*	heirad*	AIS1s	marry	VVFIN	hīrāt	81	1	28	1
heirat	Heirat	heirat*	hêirad*	AIS1d	marry	VVFIN	hīrāt	81	27	28	0
heirat	Heirat	heirat*	heirat*	AIS1s	marry	VVFIN	hīrāt	81	27	28	25
heirat	Heirat	heirat*	hêirat*	AIS1d	marry	VVFIN	hīrāt	81	27	28	2
heirat	heiraten	geheiratet	[ge]heirat*	AIS1s SAF5d	married	VVPP	hīrāt	81	27	27	0
heirat	heiraten	geheiratet	geheirat*	SAF5s AIS1s	married	VVPP	hīrāt	81	27	27	27
heirat	verheiraten	verheir*	verheir*	AIS1s	get-married	VVFIN	hīrāt	81	25	23	22
heirat	verheiraten	verheir*	verhêir*	AIS1d	get-married	VVFIN	hīrāt	81	25	23	1
heirat	verheiraten	verheirat*	vrheirad*	AIS1s	get-married	VVFIN	hīrāt	81	25	2	0
heirat	verheiraten	verheirat*	vrhêirad*	AIS1d	get-married	VVFIN	hīrāt	81	25	2	0
heirat	verheiraten	verheirat*	vrheirat*	AIS1s	get-married	VVFIN	hīrāt	81	25	2	2
heirat	verheiraten	verheirat*	vrhêirat*	AIS1d	get-married	VVFIN	hīrāt	81	25	2	0
heiß	heißen	gehießen	[ge]heiß*	AIS2s SAF5d	called	VVPP	heiʒen	907	907	119	0
heiß	heißen	gehießen	[ge]hôiß*	AIS2d SAF5d	called	VVPP	heiʒen	907	907	119	0
heiß	heißen	gehießen	geheiß*	AIS2s SAF5s	called	VVPP	heiʒen	907	907	119	26
heiß	heißen	gehießen	gehôiß*	SAF5s AIS2d	called	VVPP	heiʒen	907	907	119	33
heiß	heißen	gehießen	gheiß*	AIS2s SAF5s	called	VVPP	heiʒen	907	907	119	22
heiß	heißen	gehießen	ghêiß*	SAF5s AIS2d	called	VVPP	heiʒen	907	907	119	5
heiß	heißen	gehießen	ghôiß*	SAF5s AIS2d	called	VVPP	heiʒen	907	907	119	33
heiß	heißen	heiß	heiß	AIS2s	call	VVFIN	heiʒen	907	907	171	137
heiß	heißen	heiß	heiss	AIS2s	call	VVFIN	heiʒen	907	907	171	0
heiß	heißen	heiß	hêiß	AIS2d	call	VVFIN	heiʒen	907	907	171	5
heiß	heißen	heiß	hôiß	AIS2d	call	VVFIN	heiʒen	907	907	171	29
heiß	heißen	heiße	heiße	AIS2s	call	VVFIN	heiʒen	907	907	32	23
heiß	heißen	heiße	heisse	AIS2s	call	VVFIN	heiʒen	907	907	32	0
heiß	heißen	heiße	hêiße	AIS2d	call	VVFIN	heiʒen	907	907	32	3
heiß	heißen	heiße	hôiße	AIS2d	call	VVFIN	heiʒen	907	907	32	6
heiß	heißen	heißen	heißed	EDPd AIS2s	call	VVFIN	heiʒen	907	907	29	0

leicht	leicht	leichtest*	lôichtest*	AIS1d STPOs	lightest	ADJD	līht(e)	1122	69	1	0
leicht	Leicht	leich*	Lôich*	AIS1d STPOs	light	NN	līht(e)	1122	18	70	2
leicht	Leicht	Leich*	Leich*	STPOd AIS1s	light	NN	līht(e)	1122	18	16	11
leicht	Leicht	Leich*	Lêich*	AIS1d STPOs	light	NN	līht(e)	1122	18	16	5
leicht	vielleicht	viellei*	vielei*	AIS1s	perhaps	ADV	līht(e)	1122	1035	1035	5
leicht	vielleicht	viellei*	vielêi*	AIS1d	perhaps	ADV	līht(e)	1122	1035	1035	0
leicht	vielleicht	viellei*	viellei*	AIS1s	perhaps	ADV	līht(e)	1122	1035	1035	914
leicht	vielleicht	viellei*	viellêi*	AIS1d	perhaps	ADV	līht(e)	1122	1035	1035	111
leicht	vielleicht	viellei*	viellôi*	AIS1d	perhaps	ADV	līht(e)	1122	1035	1035	5
leid	beleidigen	beleidigst*	beleidigsch*	STPVd AIS1s	insult	VVFIN	līden	89	0	0	0
leid	beleidigen	beleidigst*	beleidigst*	STPVs AIS1s	insult	VVFIN	līden	89	0	0	0
leid	erleiden	erlei*	erlei*	AIS1s	suffer	VVFIN	līden	89	6	6	2
leid	erleiden	erlei*	erlêi*	AIS1d	suffer	VVFIN	līden	89	6	6	4
leid	Leiden	Leiden	Leide	AIS1s	suffer	NN	līden	89	1	1	1
leid	Leiden	Leiden	Lêide	AIS1d	suffer	NN	līden	89	1	1	0
leid	Leiden	Leiden	Leiden	AIS1s	suffer	NN	līden	89	1	1	0
leid	Leiden	Leiden	Lêiden	AIS1d	suffer	NN	līden	89	1	1	0
leid	leider	leider	leider	AIS1s	sorry	ADV	līden	89	81	81	78
leid	leider	leider	lêider	AIS1d	sorry	ADV	līden	89	81	81	3
leid	leidig	leidig*	leidich*	SFVs AIS1s	exasperating	ADJD	līden	89	0	0	0
leid	leidig	leidig*	leidig*	SFVd AIS1s	exasperating	ADJD	līden	89	0	0	0
leid	mitleidig	mitleidig*	mitleidich*	SFVs AIS1s	sympathetic	ADJD	līden	89	1	1	0
leid	mitleidig	mitleidig*	mitleidig*	SFVd AIS1s	sympathetic	ADJD	līden	89	1	1	1

reim	Kinderreim	Kinderreimchen	Kinderreimchen	SAF1s AIS1s	childrens-rhyme	NN	rīm	10	1	1	0
reim	Kinderreim	Kinderreimchen	Kinderreimle	SAF1d AIS1s	childrens-rhyme	NN	rīm	10	1	1	1
reim	Lieblingsreim	Lieblingsreim	Lieblingsreim	AIS1s	favorite-rhyme	NN	rīm	10	1	1	1
reim	Lieblingsreim	Lieblingsreim	Lieblingsrêim	AIS1d	favorite-rhyme	NN	rīm	10	1	1	0
reim	Reim	Reim	Reim	AIS1s	rhyme	NN	rīm	10	8	8	8
reim	Reim	Reim	Rêim	AIS1d	rhyme	NN	rīm	10	8	8	0
rein	rein	rein	rein	AIS2s	pure	ADV	rein(e)	190	190	342	513
rein	rein	rein	rêin	AIS2d	pure	ADV	rein(e)	190	190	342	0
rein	rein	rein	rôin	AIS2d	pure	ADV	rein(e)	190	190	342	0
rein	rein	reine	reine	AIS2s	pure	ADV	rein(e)	190	190	10	10
rein	rein	reine	rêine	AIS2d	pure	ADV	rein(e)	190	190	10	0
rein	rein	reine	rôine	AIS2d	pure	ADV	rein(e)	190	190	10	0
rein	rein	reines	reines	AIS2s	pure	ADV	rein(e)	190	190	9	9
rein	rein	reines	rêines	AIS2d	pure	ADV	rein(e)	190	190	9	0
rein	rein	reines	rôines	AIS2d	pure	ADV	rein(e)	190	190	9	0
reis	Reise	Reise	Reise	AIS2s	trip	NN	reis(e)	91	35	35	35
reis	Reise	Reise	Rêise	AIS2d	trip	NN	reis(e)	91	35	35	0
reis	Reise	Reise	Rôise	AIS2d	trip	NN	reis(e)	91	35	35	0

Figure A- 53. Sample Swabian-German Lexicon (SGL)

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