Modelling Lectal Coherence: The Case of Swabian German

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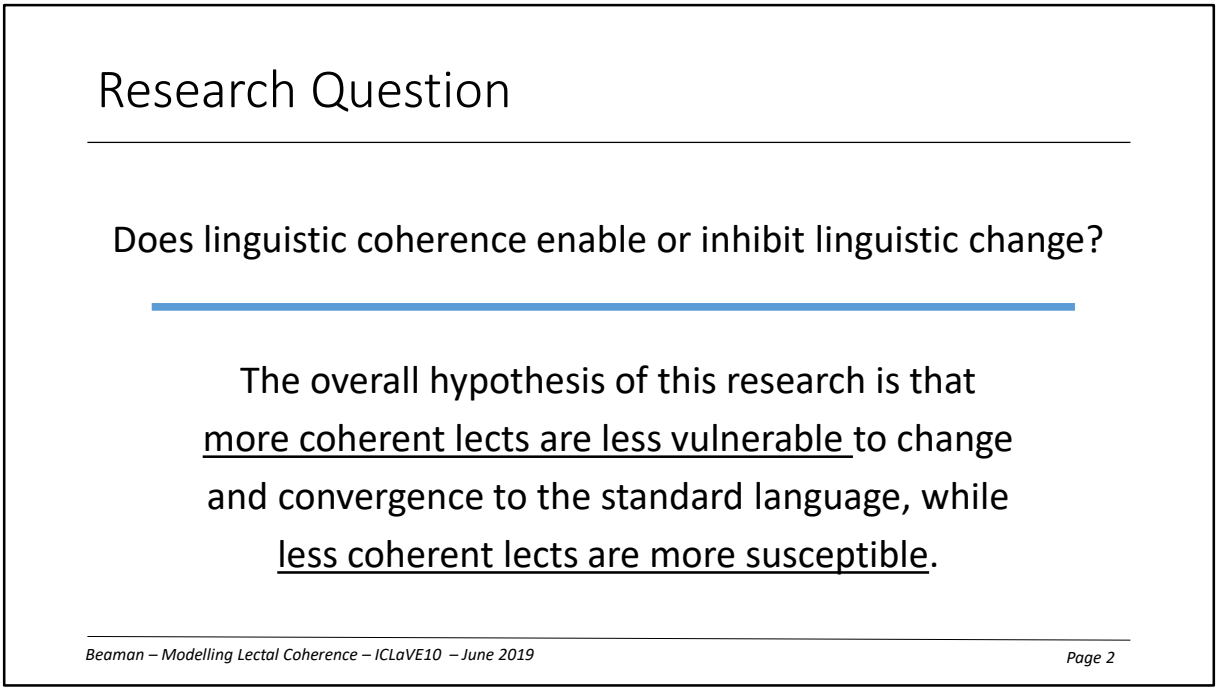
Fifty years ago, Weinreich, Labov, and Herzog observed: “idiolects do not provide the basis for self-contained or internally consistent grammars,” rather it is the grammar of the speech community, governed by social factors, which reflects regularity and coherence and where linguistic change occurs. Chambers (1997) claimed: “the more you aggregate data for a sociolinguistically significant change, the more coherent it becomes." According to Guy & Hinskens (2016), the concept of orderly heterogeneity implies: “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...”

This paper presents an exploratory model for evaluating lectal coherence based on lattice theory. A lattice is an abstract, mathematical construct that can be used to depict the orderly heterogeneity of a dialect-standard continuum and assess lectal coherence. Linguists have used lattices in phonology, syntax, and semantics, but not yet, to my knowledge, in sociolinguistics or variation studies.

1 min



The research question this paper explores is: does linguistic coherence enable or inhibit linguistic change?

[CLICK] The overall hypothesis of this research is:

more coherent lects are less vulnerable to change and convergence to the standard language,

while less coherent lects are more susceptible.

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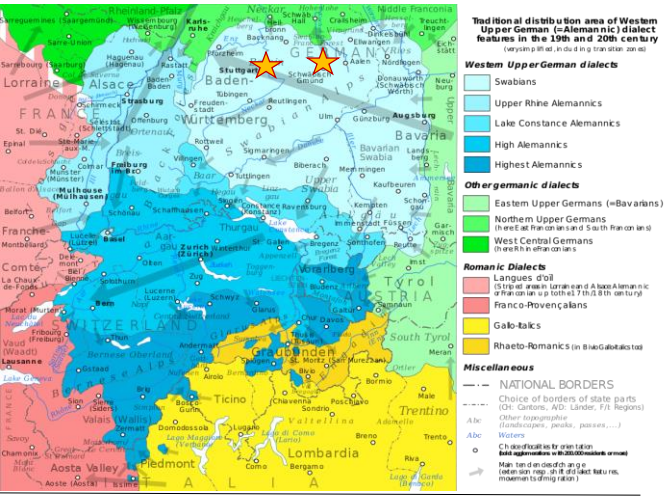
Swabian

Swabian or **Schwäbisch** is a High German dialect, belonging to the Alemannic family, spoken by just over 800,000 people.

Two communities:

- Stuttgart area
- Schwäbisch Gmünd



This research investigates the use of **Swabian** or **Schwäbisch**, a High German dialect belonging to the Alemannic family, which is spoken by just over 800,000 people or one percent of the German population.

[CLICK] Two communities have been selected for this research:

-- the large international city of Stuttgart and its surrounding suburbs and
-- the mid-sized town of Schwäbisch Gmünd and its surrounding rural villages.

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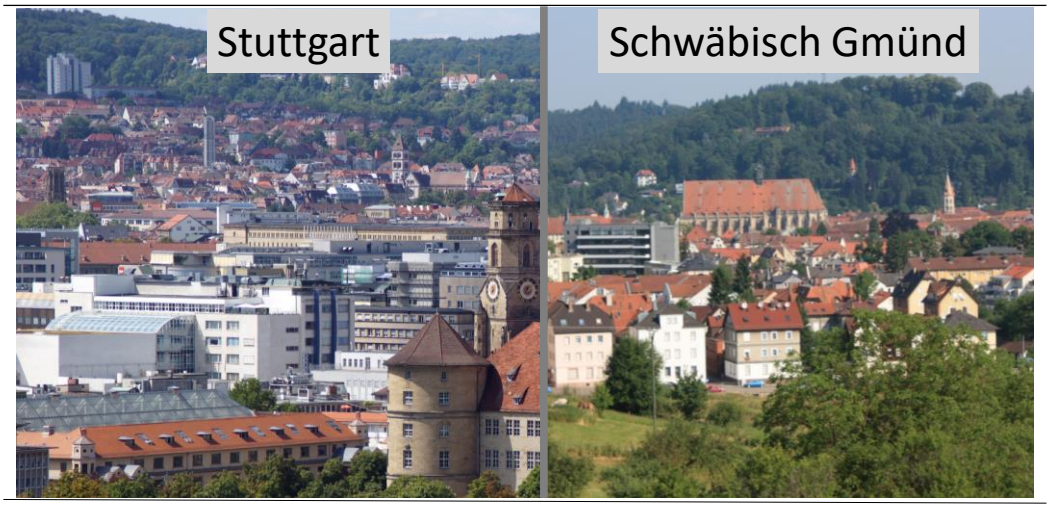
Two Speech Communities



Stuttgart is the heart of Swabia. It is a large urban area with over one million inhabitants and is home to many well-known global firms, such as Daimler-Mercedes-Benz, Porsche, Bosch, and Siemens.

[CLICK] Schwäbisch Gmünd lies 100 kilometers 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.

-- 2 mins

Swabian: Loved or Loathed

wenn i Urschwâbe hör, also die mã gar ned versteht, des denkt mã immer, des isch e Fremdsprache ja, … muss mã halt manchmal de Kopf schüttle, aber so find i des … kôi schlimme Sprach … i find e Dialekt isch nie schlecht

'if I hear really old-Swabian, that you can't even understand, then you always think, that's a foreign language, yeah, … sometimes you just have to shake your head, but I don't think it's a bad language … I think a dialect is never bad.'

(Bertha 1982)

meine Kinder schämen sich sogar heutzutage Schwäbisch, also die verbinden Schwäbisch mit irgendwas, was sie nicht möchten…. dieser dörfliche Zusammenhalt stoßen die eher ab.

'nowadays my children are actually ashamed of Swabian, well they associate Swabian with something they don't like…. they reject this village solidarity'

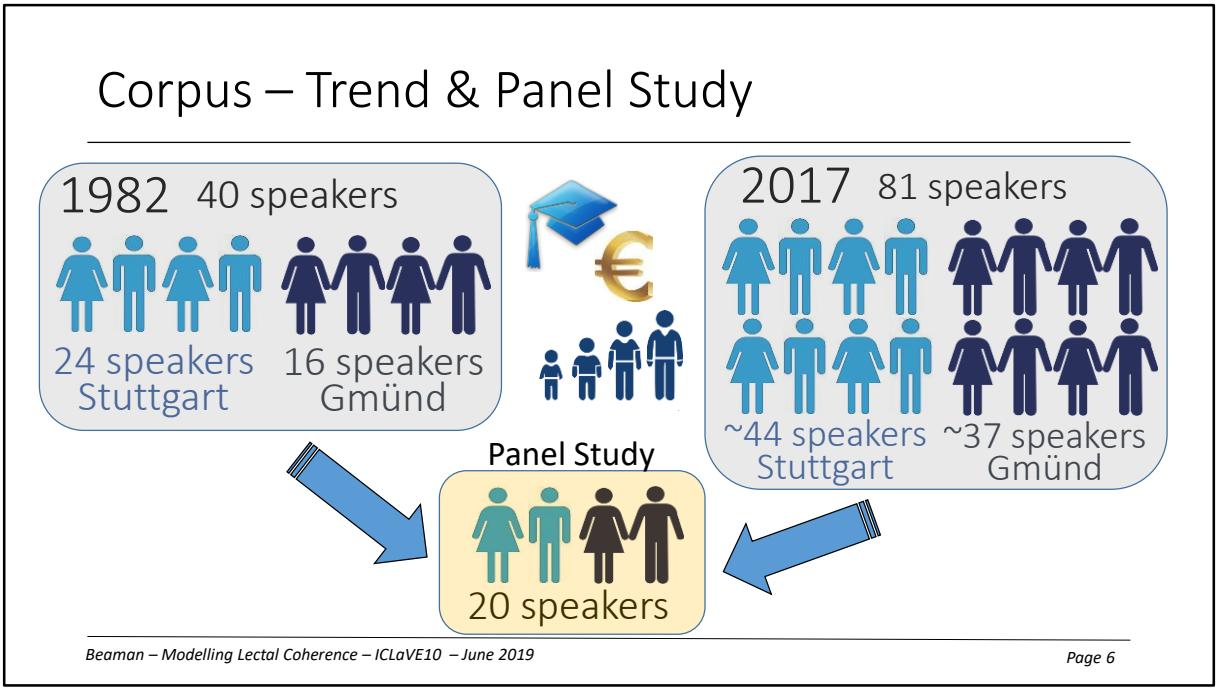
(Helmut 2017)

Attitudes toward Swabian vary: it is either loved or loathed. It is highly stigmatized by some and adored by others, as these two quotations from native Swabians show:

[CLICK] Bertha in 1982, said: 'if I hear really old-Swabian, that you can't even understand, then you always think, that's a foreign language, yeah, … sometimes you have to shake your head, but I don't think it's a bad language … I think a dialect is never bad.'

[CLICK] Helmut in 2017, said: 'nowadays my children are actually ashamed of Swabian, well they associate Swabian with something they don't like…. they reject this village solidarity.'

-- 2 mins 45 secs



This research combines both a Trend Study and a Panel Study based on data collected from [CLICK] 40 speakers recorded when I was a Ph.D. student in 1982 – 24 in Stuttgart and 16 in Schwäbisch Gmünd, [CLICK] stratified for education, gender and age.

[CLICK] After a 35-year break, I have been collecting data from an additional 80-some speakers,

[CLICK] 20 from 1982 who have been re-interviewed and comprise the Panel Study.

The current paper reports on the Panel Study participants, which consists of 11 women and 9 men, 13 from Schwäbisch Gmünd and 7 from Stuttgart. 16 are in the same age group, in their 20's 1982 and 50's in 2017, and four in the next older group. All are of a similar socio-economic status, quasi upper middle class.

-- 3 mins 30 secs

Methods

- ***Sociolinguistic Interviews***
  - —Labovian-style, casual interview questions
  - —Same interview instrument & techniques used in 1982 and 2017
- ***Linguistic Variables***
  - —12 Swabian dialect features
- ***Social Predictors***
  - —Speech community
  - —Recording year
- ***Quantitative Analyses***
  - —Principal Components Analysis (PCA)
  - —Generalised Linear Models with Random Effects (GLMER)
  - —Pairwise comparisons with Suissa & Schuster Exact Test

[CLICK] The methods used in this study consist of semi-structured sociolinguistic interviews, conducted by native Swabian speakers with me in attendance in the role of friend-of-a-friend. To increase compatibility across years, the same survey instrument and interviewing techniques were used in both 1982 and 2017.

[CLICK] The dependent variables investigated in this study are 12 Swabian dialect features – explained on the next slide

[CLICK] Two social factors are considered in this analysis: speech community and recording year.

[CLICK] The quantitative analyses were conducted in R using principal components analysis, mixed linear regression models, and pairwise comparisons with Suissa & Schuster Exact tests.

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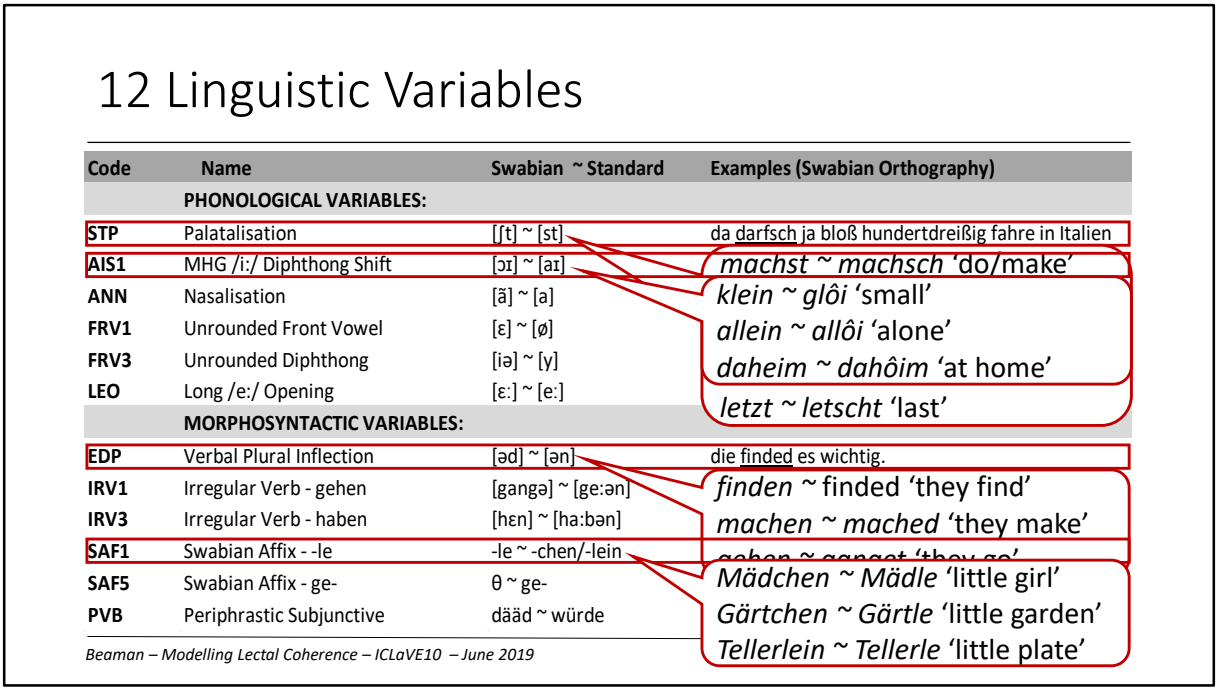

I've identified over 40 linguistic variables that I'm tracking in my Swabian corpus. For this current exploratory study, I've selected twelve – six phonological and six morphosyntactic – which are highly representative of the rich palette of features available to the Swabian speaker. All have been coded for a binary distinction between the dialect variant and the standard German variant. In the interest of time, I'll point out just a couple:

[CLICK] **Palatalization of /st/ in syllable-coda position** is a stereotypical feature of Swabian and the Alemannic dialects. It is common in the second person singular verb formation. For example, *machst* is pronounced as *machsch, gehst* as *gehsch*, *and darfst* as *darfsch*.

[CLICK] The diphthong in words with a **MHG /i:/** origin is rounded and lower in Swabian, so the standard forms *klein, allein, daheim* are pronounced as *glôi, allôi, dahôim* in Swabian.

[CLICK] The **present tenses plural verb inflection** is *-ed* in Swabian versus *-en* in standard German, so forms such as *sie finded, sie mached, sie ganged* vary with standard forms *sie finden, sie machen, sie gehen.*

[CLICK] The suffix to mark the **dimunitive form** in standard German is typically *-chen (*or the older version *-lein).* In Swabian, the ending *-le* is highly productive and highly stereotypical. So you get forms like *Mädle, Gärtle, Tellerle, Päckle,* and *Unterschiedle* for 'small difference'.

Over 50,000 tokens were extracted, 20,000 from 1982 and close to 30,000 from 2017, with an average of over 1,000 tokens per speaker in 1982 and over 1,400 tokens per speaker in 2017.

-- 6 mins

Variable Predictions by Year

Phonological Variables

Variable	Year	n	lodds	prob	diff	sig
STP	1982	4761	1.0209	73.5%	-14.8%	***
st~ʃt	2017	5716	0.3531	58.7%		
ANN	1982	2717	-0.3574	41.2%	-16.6%	***
an~ã	2017	3027	-1.1245	24.5%		
FRV3	1982	1747	-0.7085	33.0%	-15.6%	***
ɑɪ~ɔɪ	2017	2692	-1.5589	17.4%		
LEO	1982	1827	-0.7873	31.3%	-10.9%	***
e~æ	2017	3291	-1.3648	20.4%		
FRV1	1982	1365	-1.0740	25.5%	-13.1%	***
ø~e	2017	1401	-1.9615	12.3%		
AIS1	1982	3914	-1.5848	17.0%	-9.2%	***
aɪ~ɔɪ	2017	4975	-2.4723	7.8%		

Morphosyntactic Variables

Variable	Year	n	lodds	prob	diff	sig
EDP	1982	628	3.3772	96.7%	-37.3%	***
ən~əd	2017	954	0.3800	59.4%		
PVB	1982	122	0.7723	68.4%	-31.1%	***
'tun'	2017	181	-0.5178	37.3%		
IRV1	1982	266	0.7516	68.0%	-51.4%	***
gaŋə	2017	418	-1.6163	16.6%		
IRV3	1982	1022	0.2948	57.3%	-35.5%	***
hɛn	2017	1843	-1.2758	21.8%		
SAF1	1982	1707	-1.1095	24.8%	-12.9%	***
-lə	2017	2277	-1.9970	12.0%		
SAF5	1982	1638	-1.2181	22.8%	-11.1%	***
gə~ɸ	2017	2386	-2.0182	11.7%		

Looking at the results of a generalised linear regression model, this chart shows the change across the years for the 12 linguistic variables. The phonological variables are on the left and the morphosyntactic ones are on the right, sorted by decreasing probability of occurrence in 1982.

[CLICK] As can be seen, all variables under investigation show highly significant attrition across the years. We also see, with the exception of the [CLICK] two Swabian affixes ('-le' and 'ge-'), that the morphosyntactic variables have receded significantly more than the phonological ones.

Further investigation into the diminutive affix indicates that it may be more lexical than morphological, while dropping of the past participle prefix, may be more a case of phonological reduction than a true morphological effect.

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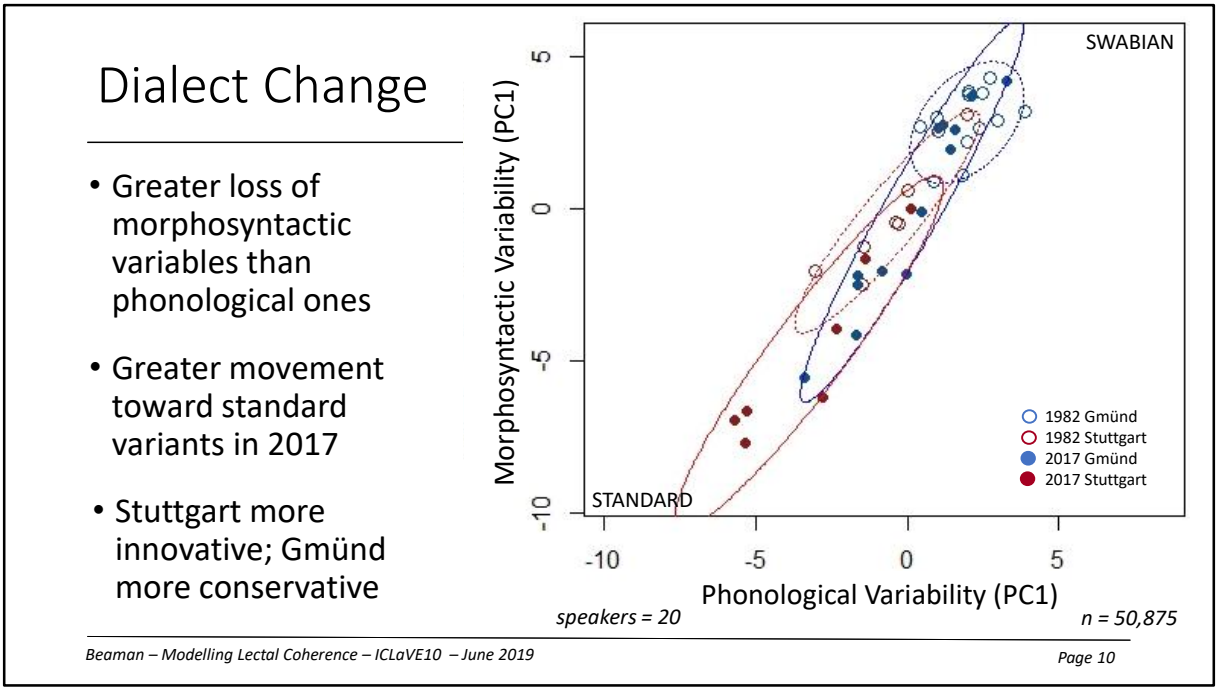


The first model I want to present uses principal components analysis to plot dialect usage for the individual speakers. [CLICK] PC1 for the phonological variables is plotted on the horizontal axis and PC1 for the morphosyntactic variables is on the vertical axis. The upper right corner approximates 100% usage of all dialect variants, while the lower left corner verges toward 100% usage of standard German variants.

[CLICK] The open circles show the dialect usage for the speakers in 1982, red for Stuttgart and blue for Schwäbisch Gmünd.

[CLICK] and solid dots show the speakers' dialect usage in 2017. With the exception of two speakers, all have experienced dialect attrition as can be seen by the movement down and to the left, [CLICK] indicating a high correlation between the phonological and morphosyntactic variables and showing greater loss of morphosyntactic variants over phonological ones.

[CLICK] The blue dotted ellipse encircles the speakers from Schwäbisch Gmünd in 1982. It's been drawn to show two standard deviations from the mean of the group. The small, compact nature of this ellipse indicates there was considerable homogeneity among the speakers in 1982 – a tight-knit community – at least with regards to the use of these dialect variants.

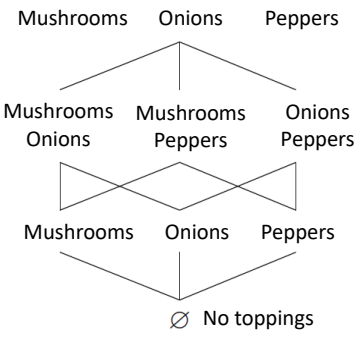
[CLICK] The red dotted ellipse encircles all the Stuttgart speakers in 1982. The Stuttgart variety shows a stronger tendency toward the standard variants than that of Schwäbisch Gmünd.

[CLICK] The solid blue ellipse encircles the speakers in Schwäbisch Gmünd in 2017, and [CLICK] the solid red ellipse shows the speakers in Stuttgart in 2017. [CLICK] [CLICK] The larger and longer shapes of the 2017 ellipses indicate that the Swabian dialect has moved closer to the standard language in 2017 than it was in 1982.

This brings up the question and the focus of this talk: how well do these lects cohere? And how we can assess the level of coherence and its impact on language change?

-- 8 mins

Introducing the Lattice



Adapted from Daniel Harbour (2014)

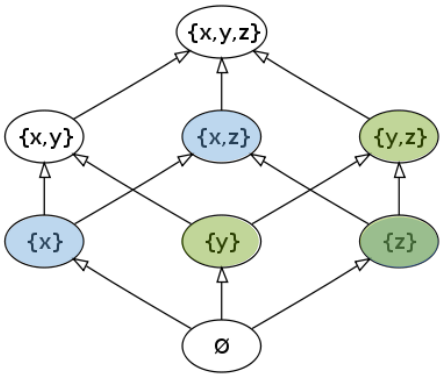
To answer this, I'd like to introduce a lattice.

[CLICK] This pizza illustrates the concept of a lattice in which there are any number of subsets of variable toppings you can have.

[CLICK] In this example, there are mushrooms, onions, and peppers, which of course you can have in any combination or alone. And of course, you can have a pizza with no toppings, like a dialect speaker who chooses to speak only standard German at school.

9 mins

Lattice Theory



Lattice of subsets, shown as Hasse Diagram

- An abstract structure showing hierarchical or implicational relationships between pairs of variables
- Consists of a partially ordered set in which every two elements have a least upper bound (JOIN) and a greatest lower bound (MEET)

(Partee et al. 1993)

A lattice is an abstract structure based on the ORDER THEORY of mathematics that uses binary relations to examine the hierarchical or implicational relationships within a given set of elements. A LATTICE generalizes the data from a straight line (such as, x implies y implies z) to a multi-dimensional picture, depicted by a Hasse diagram.

The lattice consists of PARTIALLY ORDERED SETS, called POSETS, in which every two elements have a least upper bound, called a JOIN, and a greatest lower bound, called a MEET. The relationship between the variables is one of inclusion. [CLICK] For any two elements, you can go up the lattice to find an element that includes both (the JOIN) or [CLICK] go down the lattice to find an element that includes both (the MEET).

Lattices exhibit the principle of DUALITY, which means that 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.

-- 10 mins

Posets and Pairwise Comparisons

Angela 1982

	AIS1	ANN	EDP1	FRV1	FRV3	IRV1	IRV3	LEO	PVB	SAF1	SAF5	STP
AIS1	0	0	1	0	0	1	0	0	0	1	0	1
ANN	0	0	1	1	1	1	0	0	0	1	0	1
EDP1	0	0	0	0	0	0	0	0	0	0	0	0
FRV1	0	0	1	0	0	0	0	0	0	1	0	0
FRV3	0	0	1	0	0	0	0	0	0	1	0	1
IRV1	0	0	0	0	0	0	0	0	0	0	0	0
IRV3	0	0	1	0	0	0	0	0	0	1	0	1
LEO	0	0	1	0	0	1	0	0	0	1	0	1
PVB	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
SAF5	0	0	1	1	1	1	0	0	0	1	0	1
STP	0	0	0	0	0	0	0	0	0	0	0	0

Angela 1982 SORTED Rank = 28

	ANN	SAF5	AIS1	LEO	IRV3	FRV3	FRV1	PVB	IRV1	STP	EDP1	SAF1
ANN	0	0	0	0	0	1	1	0	1	1	1	1
SAF5	0	0	0	0	0	1	1	0	1	1	1	1
AIS1	0	0	0	0	0	0	0	0	1	1	1	1
LEO	0	0	0	0	0	0	0	0	1	1	1	1
IRV3	0	0	0	0	0	0	0	0	0	1	1	1
FRV3	0	0	0	0	0	0	0	0	0	1	1	1
FRV1	0	0	0	0	0	0	0	0	0	0	1	1
PVB	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
STP	0	0	0	0	0	0	0	0	0	0	0	0
EDP1	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

LEGEND: 0 = non-significant pair; 1 = significant pair
Suissa & Shuster (1985) Exact test (p<.05) with Holm-Bonferroni correction

The first step in developing a Lectal Lattice is to create POST HOC PAIRWISE COMPARISONS for the linguistic variables, arranged in two-by-two contingency tables.

[CLICK] In this example POSET for Angela in 1982, you see the 12 linguistic variables (AIS1 through STP) which generate a POSET of 144 pairs of variables.

Using the Suissa & Shuster Exact test, each pair of variables is tested to determine the significant differences in frequency. When a statistical difference is found – that is, when the variable in the row is lower than the variable in the column -- maintaining the implicational order – that pair is assigned a 1. [CLICK] If there is no statistical difference for that pair, it is a assigned a 0.

In a POSET every pair of variables need not be related significantly for the pattern to be valid. This allows for uncertainties or inadequacies or unknowns in the dataset, which of course is common with sociolinguistic data.

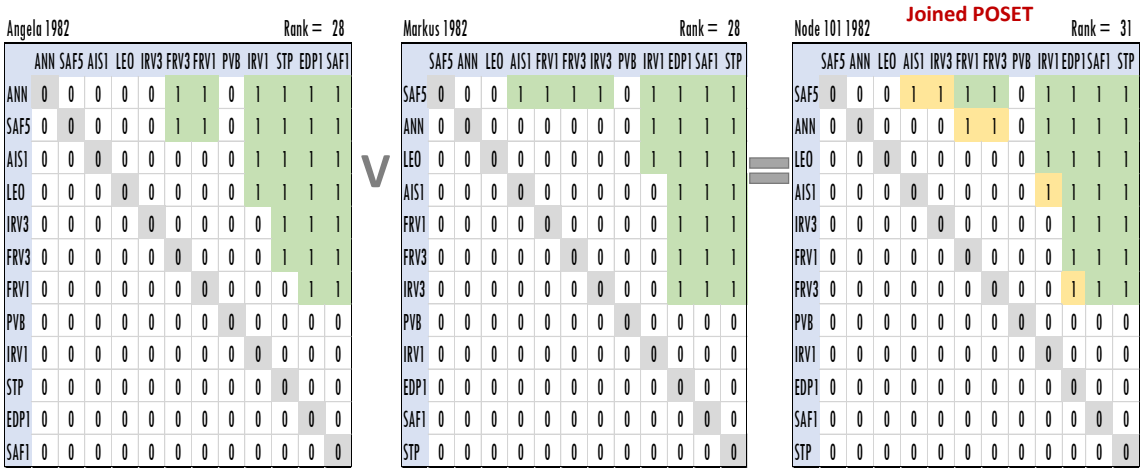
[CLICK] The variable POSET is then sorted first by significant pairs and then according to the frequency of the dialect variant, so that we end up with a sorted POSET such as this one on the right.

All POSETS are ranked by summing the significant PAIRWISE COMPARISONS. In this example, Angela in 1982 has a rank of 28 because there are 28 significant pairwise comparisons.

RANK allows us to calculate the DISTANCE between two different lects, that is, the number of pairs that would have to change in order for two lects to be a perfect match.

-- 11 mins 30 secs

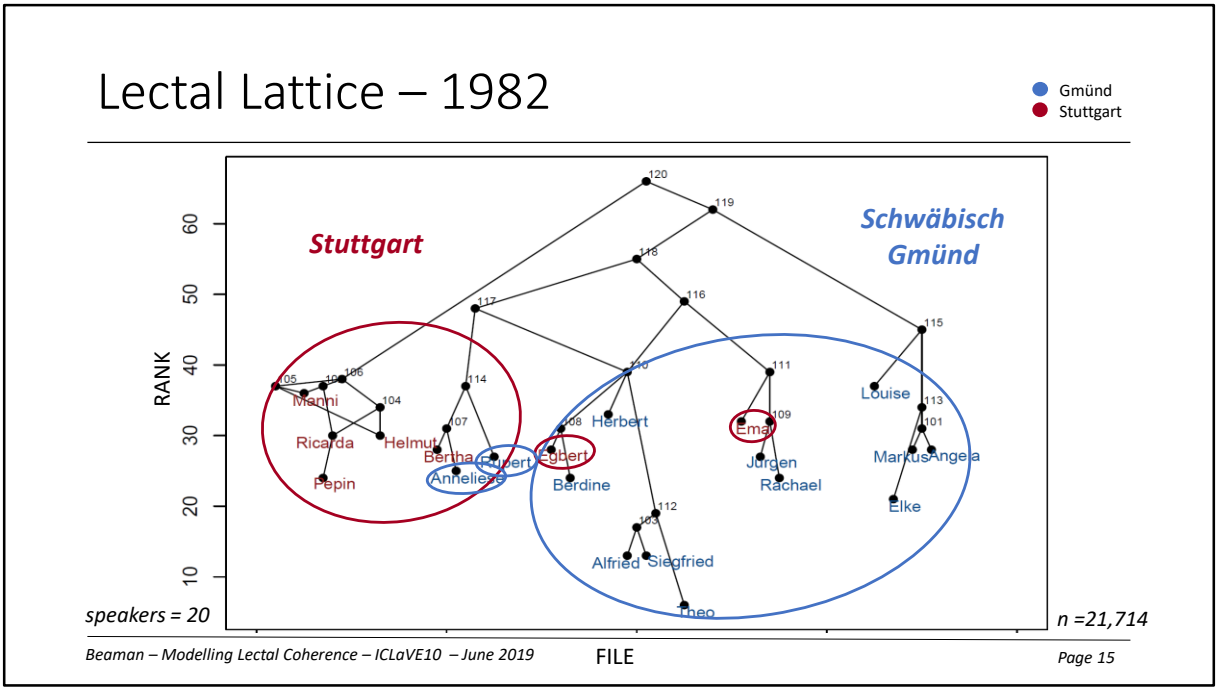
Joining Neighbours



Next, neighbouring POSETS, those that are most similar, are joined: that is, all neighbours that lie at the same minimum DISTANCE are joined one by one. In this example, we join Angela's POSET with Markus' POSET, and we get a new POSET, which will becomes a node in the lattice. In this example, there are seven joined pairs, highlighted in yellow, which is the mathematical DISTANCE between the two lects. The RANK in the lattice for this newly joined POSET is 31.

To build the lattice, all POSETS are connected with their nearest neighbours and JOINED into larger groups. It's POSETS within POSETS – or "turtles all the way down" – and UP, of course, to maintain the DUALITY of the lattice.

-- 12 mins



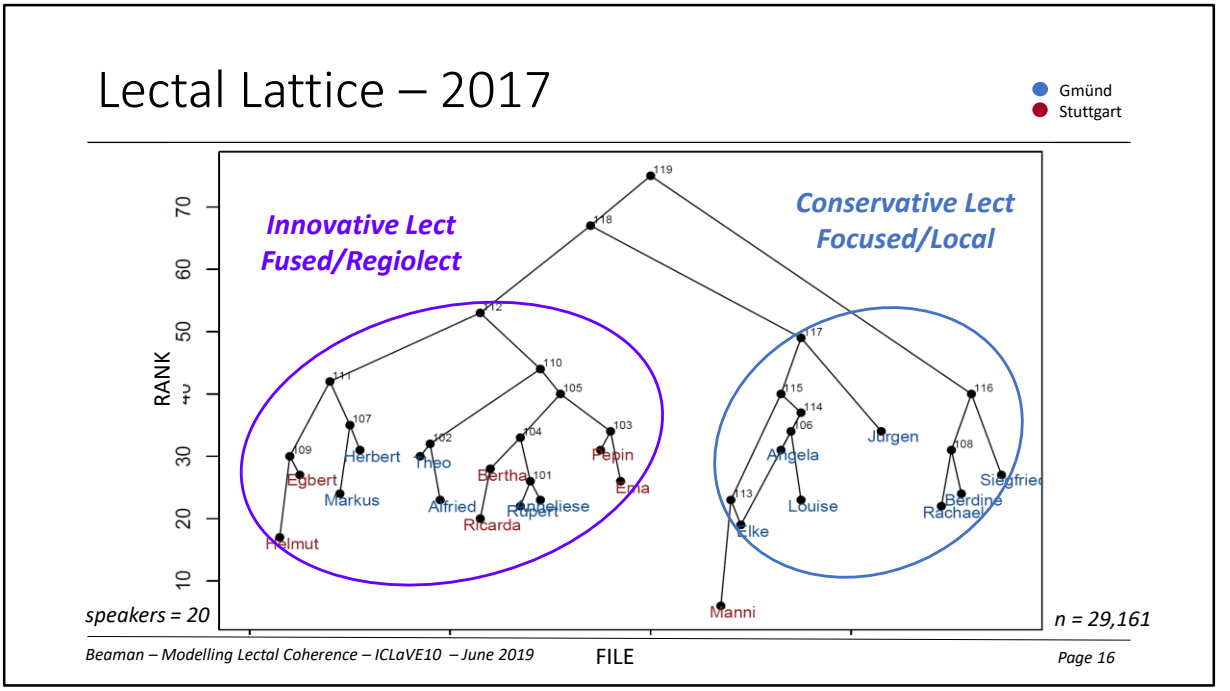
Here's the Lectal Lattice for the 20 speakers in 1982. The vertical axis represents the RANK -- the hierarchical distance between lects. The horizontal axis represents the FILE -- the left-to-right right line-up of the individual lects which has been determined based on the first principal component.

The lattice was created with standard R functions, such as *plot*, *points*, *lines* and *text*. It is technically a SUB-LATTICE because it doesn't show all of the points in the LATTICE, rather only the significant ones. It is also a SEMI-LATTICE because it depicts only the JOINS or the upward trajectory. This SUB-SEMI-LATTICE greatly simplifies the visualisation by eliminating redundant and irrelevant information.

It is important to point out that each point in the Lectal Lattice represents a lect. The points for each speaker's idiolect form the foundation of the lattice. These are labelled with the speakers' names, red for Stuttgart and blue for Schwäbisch Gmünd. All points above the idiolects represent different groups of similar speakers, such as a dialect, a sociolect, a regiolect, or perhaps a certain style or register.

[CLICK] We can see that the speakers from Schwäbisch Gmünd form a fairly coherent lect, [CLICK] as well as the speakers from Stuttgart, with only a few exceptions or outliers.

-- 13 mins

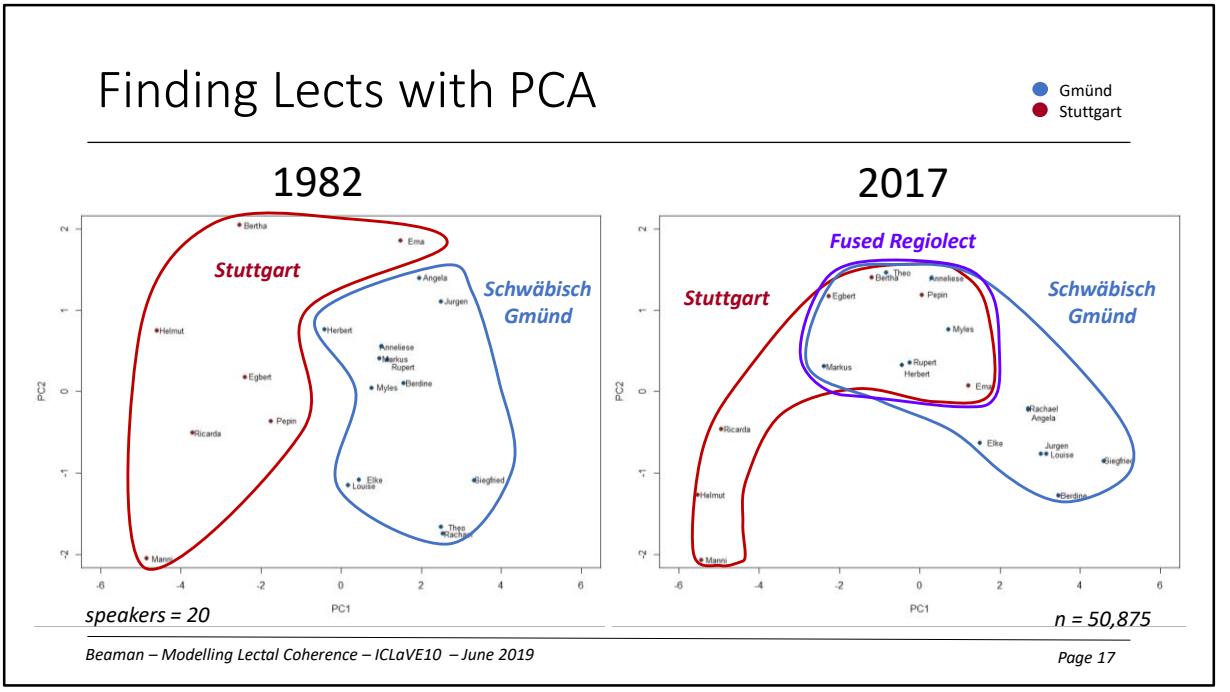


And here's the Lectal Lattice for the 20 panel speakers in 2017. [CLICK] We see some preservation of the conservative lect in Schwäbisch Gmünd, but [CLICK] we now see a very different picture on the left. Over the 35-year timespan of this study, some speakers from Schwäbisch Gmünd have "fused" with the speakers from Stuttgart, creating a supralocal lect – a regiolect – a lect that is not necessarily geographically situated, but rather one that is sociolinguistically closer to the standard language.

This finding provides support that the Swabian dialect is changing from a geographical / horizontal variety to a sociolectal / vertical variety – the result of levelling due to the extensive social and demographic changes occurring in German society.

Still, we can see that half of the Schwäbisch Gmünd speakers have retained their conservative dialect features over the years. Some of my other research has shown that this is largely influenced by notions of 'dialect identity' and 'lectal focusing' and on indices of Swabian Orientation – but that's another topic beyond the scope of talk.

-- 14 mins



I'd like to compare the lattice with principal components analysis, which has similarly been used by some sociolinguists as a heuristic for grouping speakers based solely on their linguistic behaviour. PCA reduces the dimensionality of multivariate data to two or three principal components that can be visualised graphically.

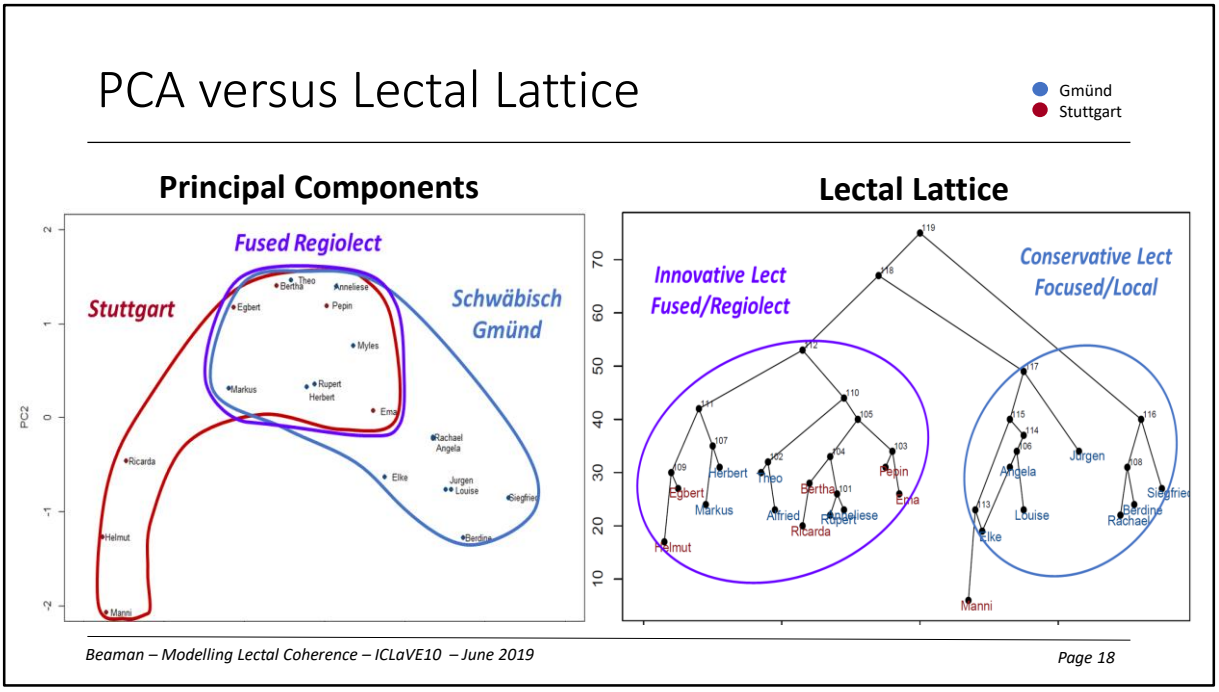
[CLICK] Here's the results of the PCA for the 20 panel speakers in 1982. PC1 is shown on the horizonal axis, and PC2 on the vertical axis, which together account for 62% of the variation.

By eye-balling the data, you can see two quite distinct lects, [CLICK] Stuttgart in red and [CLICK] Schwäbisch Gmünd in blue.

[CLICK] Here is the PCA for the 20 panel speakers in 2017. Together PC1 and PC2 account for 82% of the variation. Again, by eye-balling the graphic, it's possible to delineate the different groups: [CLICK] Stuttgart in red and [CLICK] Schwäbisch Gmünd in blue.

And we can also see the fusing of the lects [CLICK] here in the middle, encircled in purple.

15 mins



Both PCA and the Lectal Lattice are linear models that show significant groupings of speakers based on linguistic factors alone, albeit using different methods. However, with the graphical display of the Lectal Lattice, it's easier to see what the relationships are without running multiple levels of PCA.

Another main difference between PCA and the Lattice 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 based on both the frequencies and the order of the variables.

However, one of the most promising aspects of the Lectal Lattice, which differentiates it from other models, is the potential to measure the implicational coherence of each lect and/or groups of lects. Let me explain.

-- 16 mins

Measuring Implicational Coherence (IC)

Node 120 1982 IC = 82% Rank = 66

	AIS1	SAF5	ANN	LEO	FRV1	FRV3	PVB	IRV1	IRV3	STP	SAF1	EDP1
AIS1	0	1	1	1	1	1	1	1	1	1	1	1
SAF5	1	0	1	1	1	1	1	1	1	1	1	1
ANN	0	1	0	1	1	1	1	1	1	1	1	1
LEO	0	0	1	0	1	1	1	1	1	1	1	1
FRV1	0	0	1	0	0	0	0	1	1	1	1	1
FRV3	0	0	1	0	0	0	0	1	1	1	1	1
PVB	0	0	0	0	0	0	0	0	1	1	1	1
IRV1	0	0	0	0	0	0	0	0	1	1	1	1
IRV3	0	0	0	0	0	0	0	0	0	1	1	1
STP	0	0	0	0	0	0	0	0	1	0	0	1
SAF1	0	0	0	0	0	0	0	0	0	0	0	0
EDP1	0	0	0	0	0	0	0	0	0	0	0	0

Formula for Implicational Coherence:

$$IC = \frac{\sum_{i=1}^{n} x_i^{\omega} - \sum_{i=1}^{n} x_i^{\beta}}{\sum_{i=1}^{n} x^i} \qquad .82 = \frac{60 - 6}{66}$$

Implicational Scale for Swabian in 1982:

AIS1 < SAF5 < ANN < LEO < { FRV1, FRV3 } < { PVB, IRV1 } < IRV3 < EDP1;

AIS1 > SAF5 > { ANN, FRV1, FRV3 } > STP

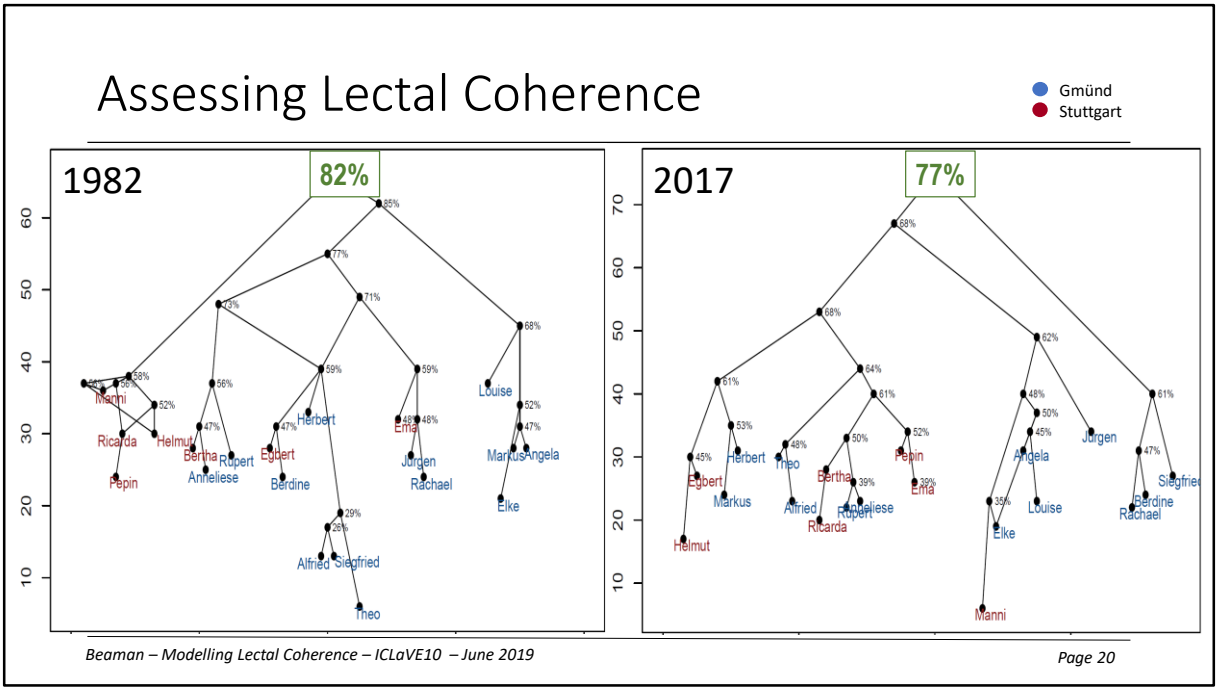
This POSET is the topmost node in the 1982 lattice. The implicational pattern signifies a coherent lect, 82%, with only six contradictions or deviants, exposed by the 1's below the diagonal.

[CLICK] An implicational scale can be drawn for any POSET, which shows the pattern for the lect using traditional notation, both the main pattern and the deviant pattern.

The notion of implicational coherence provides a way to quantitatively assess the level of coherence in any given lect. [CLICK] This is done by summing the 1's above the diagonal and subtracting the 1's below the diagonal (the deviants) and then dividing by the total number of significant pairs above the diagonal.

In short, the Lectal Lattice is based on implicational patterns that are derived from the ordering between variables, yet it also considers the frequency of the variables in deriving the order. Hence, it is not as strict as implicational scaling because it allows for variation in the variable pairings by factoring in the effect of deviants rather than ignoring them.

-- 16 mins 30 secs



Here are the two lattices for 1982 and 2017, showing the implicational coherence for the two samples. In 1982 the Swabian speakers showed a coherence of 82% and in 2017 the same speakers show coherence of 77% -- not a statistically significant difference. However, it's interesting to note out that all of the nodes in the 2017 lattice show lower coherence than in the 1982 lattice.

This provides support for the widely accepted assumption that communities behaves in parallel, reflecting regularity and coherence.

-- 17 mins 15 secs

Limitations and Opportunities for Future Work

- Variables with very high or very low token counts
- Differing numbers of speakers with each pairing/pattern
- Additional social predictors, e.g., age, gender, identity, etc.
- Larger more diverse dataset
- Broader set of variables

This has been an exploratory investigation of coherence using a different mathematical construct than has traditionally been applied to a dialect-standard continuum. There are some limitations with this initial prototype which offer opportunities for improvement:

- [CLICK] The current calculation doesn't account for variables with very high or very low tokens count – of the 12 variables in the study, none are highly skewed like that, but this situation needs to be taken into consideration in other datasets
- [CLICK] There is no consideration given to differing numbers of speakers with each pairing / implicational pattern -- all pairwise comparisons are treated equally which may be inflating the coherence numbers. The solution may be to weight the calculation based on the number of speakers exhibiting each pattern.
- [CLICK] Need to incorporate additional social predictors, e.g., age, gender, identity, etc.
- [CLICK] Need to apply the lattice to a larger more diverse dataset and [CLICK] to a broader set of variables

And undoubtedly many more!

-- 18 mins 45 secs

Lectal Modelling with a Lattice

- Offers greater explanatory value than principal components analysis by depicting the patterns of significant relationships between variables
- Depicts a multidimensional diagram with hierarchical ordering and implicational relations between variables based on significant pairwise comparisons
- Provides an independent method for calculating the relative coherence of different socially relevant lects
- Supports WLH (1968) that coherence or "orderly heterogeneity" is found in the grammar of the speech community
- Provides a method to test the hypothesis of this study that less coherent lects are more likely to change, providing insight into the actuation of change

The Lectal Lattice offers several benefits over other approaches in identifying dialect groups and measuring lectal coherence.

[CLICK] First, it provides greater explanatory value than principal components by depicting the patterns of significant relationships between variables.

[CLICK] Second, rather than an implicational scale portraying a linear chain, the Lectal Lattice is multidimensional, showing the hierarchical ordering and implicational relations between variables based on significant pairwise comparisons. This allows us to associate similar and dissimilar idiolects and find logical groupings of lects, all on a single graph.

[CLICK] Third, it provides an independent metric for calculating the relative coherence of different socially relevant lects.

[CLICK] Fourth, the lattice supports Weinreich, Labov, and Herzog that coherence or "orderly heterogeneity" is found in the aggregate grammar of the speech community rather than the individual.

[CLICK] Finally, the Lectal Lattice provides a method to test the hypothesis of this investigation that less coherent lects are more vulnerable and likely to change, potentially providing insight into the actuation of linguistic change.

Thank you! I look forward to your feedback.

-- 19 mins

an important point - -maybe expand a little, to make it perfectly clear? i.e. remind us which of the lects were less coherent and have changed more

Thank you

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