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# A High Definition Study of Syntactic Lifespan Change

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## **Abstract**

We examine variable use of Stylistic Fronting (SF) in Icelandic in thousands of parliament speeches given by parliament member Steingrímur J. Sigfússon between 1990-2013. This reveals a fine-grained diachronic picture of individual-specific lifespan change. We split the data by year and thus the time resolution of the study is 23 as opposed to a time resolution of 2-3 as is currently common practice in lifespan studies. We argue that a high time resolution is critical for studies of this type as well as a focus on qualitative detail when interpreting quantitative findings.

# A High Definition Study of Syntactic Lifespan Change

Lilja Björk Stefánsdóttir and Anton Karl Ingason\*

## 1 Introduction

In recent years, studies of language variation and change have increasingly paid attention to linguistic change across the lifespan of an individual. This is interesting because it is widely believed that a critical period for language acquisition constrains the malleability of linguistic abilities (Lenneberg 1967) and, empirically, the organization of language is indeed rather stable in the adult brain. It is therefore important to improve our understanding of what can change in the language of adults and how. Most current studies on lifespan change have a limited time resolution, typically looking at only 2–3 periods in the speaker’s life. We argue that an improved time resolution is critical for studies of this type as well as a focus on qualitative detail when interpreting quantitative findings.

(1) **Main point:**

While community-wide usage evolution is often regular and gradual, individual lifespan change responds rapidly to idiosyncratic sociolinguistic pressures – demanding a high-definition approach.

In our study, we examine variable use of Stylistic Fronting (SF) in Icelandic in thousands of parliament speeches given by parliament member Steingrímur J. Sigfússon between 1990-2013. This reveals a fine-grained diachronic picture. We split the data by year and thus the time resolution of the study is 23 as opposed to a time resolution of 2–3 as is currently common practice.

Stylistic Fronting (SF) is an optional movement process, found in Icelandic, of a word or a phrase into a phonological subject gap and it is associated with formal style (Maling 1980). The contrast between (2), without SF, and (3), with SF, illustrates the optionality. The relative clause has a subject gap and thus SF can apply and move the non-finite **main verb** in front of the finite **auxiliary**.

(2) Bækur [CP sem eru lesnar til skemmtunar] eru bestar.  
books [CP that **are read** for entertainment] are best  
‘Books that are read for entertainment are the best ones.’

(3) Bækur [CP sem lesnar eru til skemmtunar] eru bestar.  
books [CP that **read are** for entertainment] are best  
‘Books that are read for entertainment are the best ones.’

The evolution of SF use in Sigfússon’s parliament speeches from 1990-2013 is shown in Figure 1. Between the ages of 35-50, his use of SF gradually declines but then it increases to a peak that coincides with Sigfússon’s rise to prominent leadership roles in Icelandic politics. Finally, SF use goes back to its previous low rate as Sigfússon steps down from those roles.

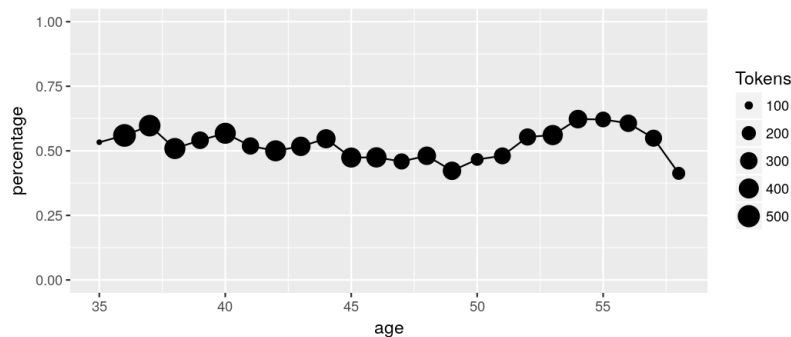


Figure 1: Rate of stylistic fronting in Sigfússon’s speeches.

\*We would like to thank Gillian Sankoff and Laurel MacKenzie for helpful comments, as well as the audiences at PLC 41, the Icelandic Humanities Conference 2017, and the U. of Iceland Linguistics Lunch.

The paper is organized as follows. In Section 2, we discuss some background on social meaning in the context of linguistic variation and change across the lifespan. Section 3 describes the variable and methodology and Section 4 presents the evolution of Sigfússon's SF usage over time and how this evolution is connected to developments in his political career. Section 5 concludes.

## 2 Social Meaning and Linguistic Variation and Change across the Lifespan

In this section, we put our study in the context of previous research on the topic and clarify our use of terminology on the matter. Our use of important terms may in some cases differ from at least some other uses in the literature but in that case this section should facilitate an understanding of our discussion below.

Social meaning shapes linguistic performance. The effects of social meaning can vary in the simplicity/complexity of the conceptual distinctions that it tracks. A basic case involves traditional style-shift (Labov 1972) in which a speaker's ability to distinguish formal and informal language gives rise to a one-dimensional scale where the probability of using a formal variant correlates positively with the attention the speaker pays to her language. Here, formal refers to approximating a community standard of proper language whereas informal refers, roughly, to approximating common properties of the vernacular. We acknowledge that the formal/informal distinction deserves a more nuanced discussion but this description will suffice for now. We view Labov's notion of attention-paid-to-speech as a special case of a more general notion of importance-of-language. Traditional style-shift is then a situational manifestation of importance-of-language, a reaction to the present surroundings that can be updated at moment's notice as a conversation unfolds. In addition to its situational effects, the importance of language for a person also gives rise to long term effects that are sometimes analyzed in terms of the so-called Linguistic Marketplace (Sankoff and Laberge 1978). Thus, the importance of language for a speaker at a certain point in her life, as shaped by her personal and professional experience over the years, also correlates positively with the rate at which formal variants surface in her speech. The Linguistic Marketplace explains why a teacher might use formal linguistic variants more frequently than an office worker whose perceived linguistic responsibilities are more limited.

Social meaning can also appear as more complex reactions to the perceived social roles of the speaker and her addressee. The speaker can situationally adapt her speech to the current audience and in that case the resulting effect can be analyzed in terms of so-called audience/referee design (Bell 1984, 2001). The outcome of such effects needs to track social roles which are multi-dimensional and conceptually more complex than simply tracking the level of importance-of-language. Furthermore, effects that track complex social roles can also be long term effects. The place of the individual within society and social networks, due to accumulated experiences, at a given point in life, also shapes her linguistic performance (Eckert 1989, 2001).

Our brief typology of interactions between social meaning and linguistic performance is summarized in Table 1. Although we will not dwell on the issue, we acknowledge that the boundaries between the cells are not always clear. We focus on the one-dimensional long term cell in the table because we believe this type of an explanation is the most appropriate one for our main findings.

	<b>Situational</b> (moment-to-moment)	<b>Long term</b> (evolves over years)
<b>One-dimensional</b> (importance)	Attention-paid-to-speech (Labov 1972)	Linguistic Marketplace (Sankoff & Laberge 1978)
<b>Multi-dimensional</b> (social roles)	Audience/Referee design (Bell 1984, 2001)	Social identity; group membership (Eckert 1989, 2001)

Table 1: Ways in which social meaning shapes linguistic performance.

In our study, we relate developments in individual lifespan change to a changed status in the Linguistic Marketplace. Let us now contrast individual lifespan change with other types of change.

Diachronic change over generations is the traditional focus of historical syntax and although such change is not about the lifespan of individuals it offers a useful comparison with our study because of the systematicity that is attested in such changes in the literature. The trajectories of syntactic change can span several generations, or even centuries, and mechanical (or at least systematic) forces yield S-shaped curves that are as mathematically neat as we can hope for (Kroch 1989). In fact, the effects are so systematic that assuming a mathematical S-curve is a reasonable default assumption about the nature of the empirical phenomenon.

Change across the lifespan of an individual is sometimes regular and gradual, but, as we will elaborate on, not always. We will use the terms age grading and community-specific lifespan change to distinguish cases where regular lifespan change takes place within a stable vs. changing community. Furthermore, we use the term individual-specific lifespan change for changes that are not in a systematic relationship with the community, but rather events in the life of an individual.

- (4) a. **Age grading:** Patterns in linguistic performance associated with certain age groups within stable communities. Relatively systematic generalizations over communities.  
*Shape:* Somewhat regular and predictable.
- b. **Community-specific lifespan change:** Groups within a community systematically adjust their performance relative to ongoing change in the community.  
*Shape:* Somewhat regular; participation in the change vs. retrograde change.
- c. **Individual-specific lifespan change:** Rapid reactions of individuals to idiosyncratic events. Explanations demand a high level of both quantitative and qualitative depth.  
*Shape:* Chaotic and unpredictable.

The types in (4) all involve changes throughout the lifespan of an individual but they differ in whether the community is changing and whether they are community-specific or individual-specific. It is a central point of our paper to argue that studies of individual-specific lifespan change, in the sense given above, require research methods that yield a fine-grained time resolution because otherwise important information will be lost. Consider the study by Sankoff & Wagner (2006) on periphrastic futures in Montréal French. This is one of the most important studies on morphosyntactic change over the lifespan, but the time resolution is only 2 readings per individual (1971 and '84). The study does offer clear insights into community-specific lifespan change because there is a clear tendency for the individuals in the study to readjust their performance in a similar manner as they grow older. However, a more fine-grained time resolution, coupled with enhanced qualitative depth, can tell us more about the development of specific individuals over time. Table 2 expands on this point.

Researcher(s)	Study	Time resolution
Sankoff and Blondeau (2007)	Language change across the lifespan /r/ in Montréal French	2 (/3)
Douglas-Cowie (1978)	Linguistic code-switching in a Northern-Irish village	2
Kwon (2014)	Vowel change across Noam Chomsky's lifespan	2
Sankoff and Wagner (2006)	Age grading in retrograde movement The inflected future in Montréal-French	2
MacKenzie (forthcoming)	Frequency effects over the lifespan: A case study of Attenborough's r's	2
Rickford and Price (2013)	Girlz II Women: Age-grading, language change and stylistic variation	2
Harrington (2006)	An acousting analysis of 'happy-tensing' in the Queen's Christmas broadcasts	2
Sankoff (2004)	Adolecents, young adults and the critical period: two case studies from 'Seven Up'	5
Arnaud (1998)	The development of the progressive in 19th century English: A quantitative survey	5–11

Table 2: Time resolution in studies on lifespan change.

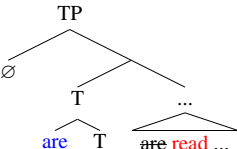
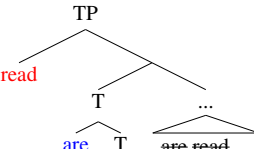
As the table illustrates, most of the current studies on lifespan change look at only two periods. In some cases this means that the data are from two distinct years but in other cases a few years are combined into one period for a contrast between two periods. A notable exception to that is found in Sankoff's (2004) study on the participants of the film series known as "7 and Up" where the same speaker is studied at five seven year intervals between the ages of 7 to 35. However, that study focuses on phonological variables (like several of the ones mentioned in Table 2) and therefore it does not reveal the dynamics of how syntactic variables evolve in people's lives. The study by Arnaud (1998) is in some ways similar to the present one in how it tracks the evolution of the progressive for a set of letter writers, but it nevertheless leaves room for enhanced detail. For example, Arnaud's study is exclusively based on written text and its quantitative findings are not based on a well-defined envelope of variation but rather a more coarse density measure. Furthermore, the data are grouped into 5 year periods and this yields a maximum of 11 readings per speaker. Therefore, we believe that there is much to be learned from our present study which looks at a **continuous year-by-year account** of a syntactic variable that spans 23 years in a corpus that is (mostly; see discussion below) derived from transcriptions of spoken language, thus having a time resolution of 23 in the sense of Table 2. Before presenting the main findings, we will describe the SF variable and our methodology.

### 3 Stylistic Fronting Variable and Methodology

Stylistic Fronting (SF) is an optional movement in Icelandic of a syntactic head (/word) or a phrase to the front of a clause that has a phonological subject gap (Maling 1980).<sup>1</sup> An example of SF is given in (5), where the non-finite main verb *lesnar* 'read' is moved in front of a finite auxiliary *eru* 'are' in a relative clause where the grammatical subject has been extracted.

- (5) ... [CP *sem lesnar eru lesnar* til skemmtunar] eru bestar.  
 ... [CP that **read are read** for entertainment] are best  
 '... that are read for entertainment are the best ones.'

SF has no effect on truth-conditional meaning and its only clear meaning component is a sociolinguistic one; the movement is associated with formal style. SF is found in both main clauses and subordinate clauses, as long as the subject is not phonologically overt. The phonological subject gap condition holds for relative clauses with extracted subjects as in (5) and impersonal main clauses where there is no overt subject. Although full phrases can be stylistically fronted, we only focus on the canonical case here where a non-finite main verb is fronted. The trees in (6) illustrate the structural contrast involved.

- (6) a. Without SF:  b. With SF: 

Although most previous work on SF comes from theoretical syntax, a study by Wood (2011) looked quantitatively at various factors that condition the use of SF, although social conditioning was not considered. Some of the factors studied by Wood are controlled for in our study by limiting the scope of the study to the following word orders involving the complementizer *sem* that introduces Icelandic relative clauses (e.g., by excluding frontable elements other than non-finite main verbs):

- (7) a. *sem* - **finite auxiliary** - **non-finite main verb**  
 b. *sem* - **non-finite main verb** - **finite auxiliary**

This does not include all cases of SF but allows us to extract a well-defined envelope of variation with high accuracy (where SF application and non-application are accounted for). We used a Python

<sup>1</sup>We will only discuss its main properties here; for further details on the syntax of SF, see Jónsson (1991); Holmberg (2006); Ingason and Wood (2017).

script to match actual relevant cases in our corpus and we checked the reliability of the automatic coding manually. All 100 examples that we checked were correctly annotated.

The data in the study come from the Icelandic parliament speeches of Steingrímur J. Sigfússon. We used publicly available transcriptions and audio+video recordings from 23 continuous years of his political career (1990-2013). While it would be ideal for a study of lifespan change to carry out repeated sociolinguistic interviews with the same speaker for several years, this is too time consuming to be a realistic methodology in most cases. Note that even lifespan studies that use publicly available recordings often focus on just 2–3 time periods because the transcription work is time consuming. Our data does admittedly not come from sociolinguistic interviews, but it still reflects relatively natural speech and we are able to collect an abundance of tokens to analyze.

Our analysis mixes quantitative and qualitative methods. We collected 8005 tokens of the SF variable from corpus and coded each example for SF application (SF vs. unused opportunity to use SF), the speaker's age, and the type of speech (prepared vs. response). The reliability of the transcription was checked manually by watching the video recording for 80 tokens. This process revealed two transcription errors that falsely introduced SF in its absence, an error rate of 2.5%. We interviewed the speaker (see more below) who informed us that he does not generally read from paper when giving speeches in the parliament, but rather speaks freely, even when they are the prepared category. We confirmed this using the video recordings where he only looked down at the podium in 16 out of 80 speeches that we checked. This happened more frequently in prepared speeches, but the minority of tokens in both categories involved looking at the podium.

In addition to the quantitative aspect of our study, we carried out a qualitative interview with our research subject, at his office at the Icelandic parliament on 2 March 2017. We used the interview to gain a deeper understanding of how the speaker's political history shapes his linguistic performance. The information we gained from interview was furthermore augmented by a side-by-side investigation of Sigfússon's SF use and Icelandic political history in general. Important findings from the interview will be introduced into the discussion as we present the main findings, which are the topic of the following section.

#### 4 Evolution of Steingrímur Sigfússon's SF usage

In this section, we examine Sigfússon's rate of SF use between the years of 1990-2013. Before zooming in on conceptually important periods, the overall development, shown in Figure 1 and repeated below as Figure 2, already allows for certain important observations.

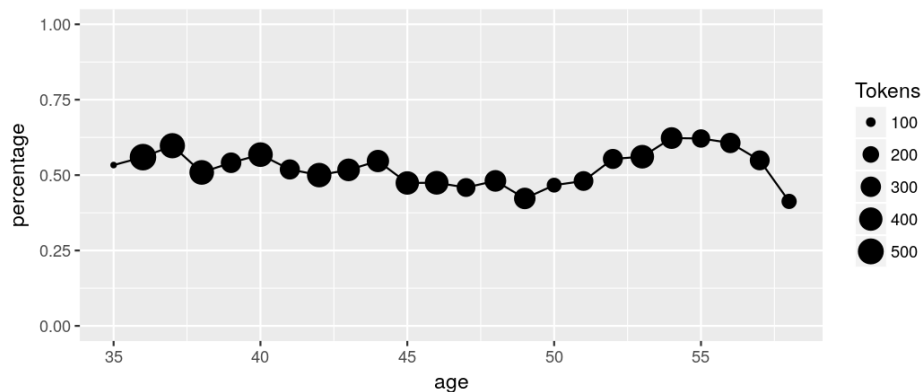


Figure 2: Rate of stylistic fronting in Sigfússon's speeches.

First, there is no one simple S-shaped curve but rather a series of periods where different patterns of change are found. The amount of data that is spread over the period (8005 tokens) as well as the magnitude of the changes means that this is unlikely to be a deviation from an S-curve due to

chance. Note that although the development has its ups and downs that need to be explained, there is a clear continuity in the evolution of SF use throughout the years. The use of SF in the speeches ranges from 41% to 62% and it can change quite rapidly from period to period. It is also useful to think about the overall evolution in this graph in the context of lifespan studies that are based on a time resolution of 2 periods. A lot of information would be lost if we only had the first and the last year as opposed splitting the data up by 23 continuous years.

It should be noted that our data do not include the first few years of Sigfússon's being a member of the parliament, before 1990. There are practical reasons for this that involve limitations of the data we used. We hope to be able to expand our empirical range in future work but in any case our discussion below will make it clear which kinds of factors we expect to play a role during this omitted period.

Let us zoom in on parts of the graph, focusing first on the period between 1990-2006 where we find a slow gradual decline in Sigfússon's use of Stylistic Fronting.

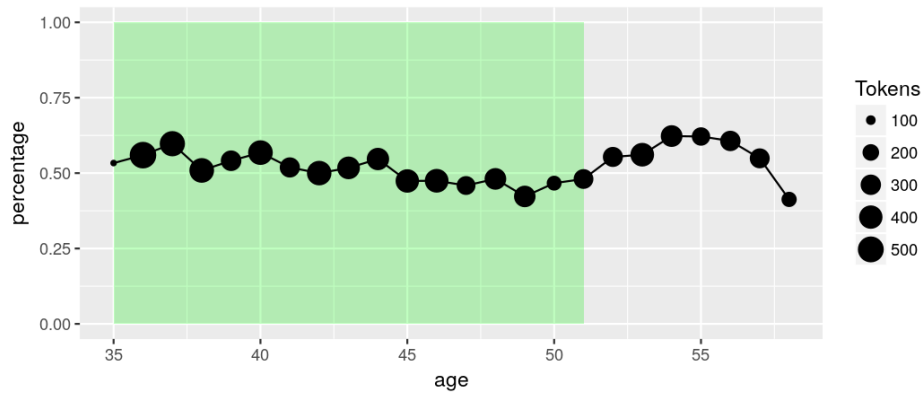


Figure 2: Linguistic retrenchment between 1990-2006.

We analyze this period in his political life in terms of a linguistic retrenchment (cf. Chambers 2003). His status in the Linguistic Marketplace changes as he grows older. Over the years, he becomes more confident and experiences less external pressure to prove that he belongs in the parliament.

In our interview with Sigfússon, we asked him if he had experienced becoming more relaxed about being in the role of a parliament member as he gained more experience in the job. He was under the impression that this was clearly the case:<sup>2</sup>

“Yes, there is no doubt about that.”

(S.J. Sigfússon; from our interview on 2 March, 2017)

He further commented that he suspected the fastest changes of this sort to have been in his first years in the parliament. Because we have not been able to analyze the first years of his parliament career yet, we cannot establish at this point whether this was indeed the case, but we plan to look into the matter in future work.

After the 2007 election, the right wing Independence Party and the Social Democratic Party formed a coalition government. Sigfússon's Left-Green Movement received more votes in the election than it had ever received since its founding in 1999 and transformed from a small and somewhat marginal party into the biggest opposition party. Importantly, the other main opposition party at the time, The Progressive Party, found itself in a weak position after suffering a major loss in the election. In our interview, Sigfússon commented on the state of the Progressive Party in this period:

<sup>2</sup>For all quotes from the interview, it should be emphasized that they are our translations from Icelandic and selected in order to facilitate an appropriate interpretation of the facts in the context of sociolinguistic theory. Political issues were discussed in the interview because the research subject is a politician but our presentation of selected pieces from the interview here is not appropriate for a political analysis of any sort.



“They were looking rather shamefaced at the time.”  
(S.J. Sigfússon; from our interview on 2 March, 2017)

This is important because it means that Sigfússon effectively became the leader of the minority in the Icelandic parliament. Due to the fact that there is no official position of minority leader in the Icelandic political system, Sigfússon was somewhat hesitant to refer to himself with that title when we brought it up with him, but he confirmed that he experienced increased responsibilities:

“I felt like I had greater responsibilities. At least, I had a bigger role than before.”  
(S.J. Sigfússon; from our interview on 2 March, 2017)

In 2007, Sigfússon became a frequent commentator in the Icelandic media, warning that an economic disaster was looming. In our interview with him, he spoke about his worries at the time:

“At that point I had become very worried that the [economic] balance was deteriorating and that we were about to be derailed. I received a lot of attention in discussions about the economy [and my message came across as] some kind of a general response to the government and its economic policies.”  
(S.J. Sigfússon; from our interview on 2 March, 2017)

In 2007, Sigfússon’s message became a kind of a general response to the government and its economic policies. The concern he expressed about the prospects of the economy would soon turn out to be legitimate because the Icelandic economy would soon face serious difficulties.

“They should have listened to me back then.”  
(S.J. Sigfússon; from our interview on 2 March, 2017)

For our purpose, the important message to be taken from this discussion is that becoming the unofficial leader of the minority in the parliament raised Sigfússon’s status in the Linguistic Marketplace and this is reflected in Figure 3 which shows his increased use of Stylistic Fronting between the years 2006-2007.

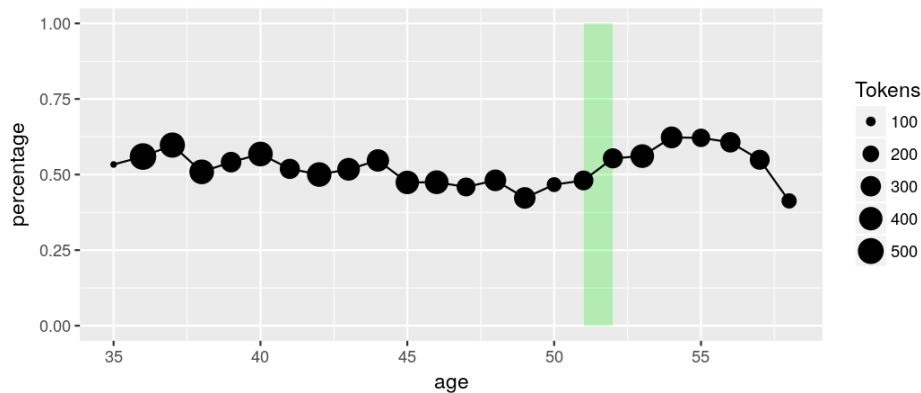


Figure 3: Linguistic Market Value rises as Sigfússon becomes minority leader.

This transition is the greatest rise in the use of Stylistic Fronting between years in the study and we believe that an analysis in terms of a status change in the Linguistic Marketplace is well motivated due to the special circumstances in the speaker’s career. His party had received more support in the election than ever before and Sigfússon himself became the (unofficial) minority leader. This is the analysis that we will adopt and thus we think of this as a one-dimensional long term effect where increased importance-of-language triggers a rise in the use of formal variants over time. However, it is important to acknowledge that this is a case where a more complex multi-dimensional analysis

might also be appropriate in which the multi-dimensional conceptual target is a type of a social role, i.e., the role of a political leader (cf. Eckert 1989). Identifying with a leadership role is a complex fact about an individual, but it is also one that is plausibly associated with the use of formal variants like Stylistic Fronting. While a simple importance-of-language analysis and a more nuanced social role analysis might be seen as competing proposals, they are in fact not mutually exclusive as both types of forces can be at play in the life of one speaker. For now, however, we will proceed by assuming the simplest analysis that is available to us, i.e., that the evolving rate of SF is a reaction to the Linguistic Marketplace.

Following the bankruptcy of Lehman Brothers in the fall of 2008, the entire Icelandic banking system collapsed. Street demonstrations followed, the government lost its majority, and Sigfússon eventually found himself as the minister of finance in an economy fighting for its life. As minister of finance, Sigfússon was a key figure of the Icelandic side of a legal dispute between Iceland and the UK over savings accounts in the collapsed Icelandic banking system which had been marketed to British customers in the period leading up to the collapse of the banks. During this time, Sigfússon would give live interviews on BBC news, arguing the Icelandic point of view, before a conclusion was reached by an international court. The claim made on the Icelandic government by the UK at the time was close to \$10.000 per every living Icelander.<sup>3</sup> For the purpose of our study, the point to be taken from this discussion is that Sigfússon's words carried a lot of weight at the time. The responsibilities he had were also reflected in other tasks that characterized his time as finance minister during an economic crisis. He commented on those tasks in the interview:

“The tasks that I had to undertake were really difficult and many of the proposals I put forth were terrible [...] gory budget cuts and tax increases [...] but you just had to do it because there was nothing else that could be done.”

(S.J. Sigfússon; from our interview on 2 March, 2017)

During this time, Sigfússon's status in the Linguistic Marketplace peaked and so did his use of Stylistic Fronting as shown in Figure 4.

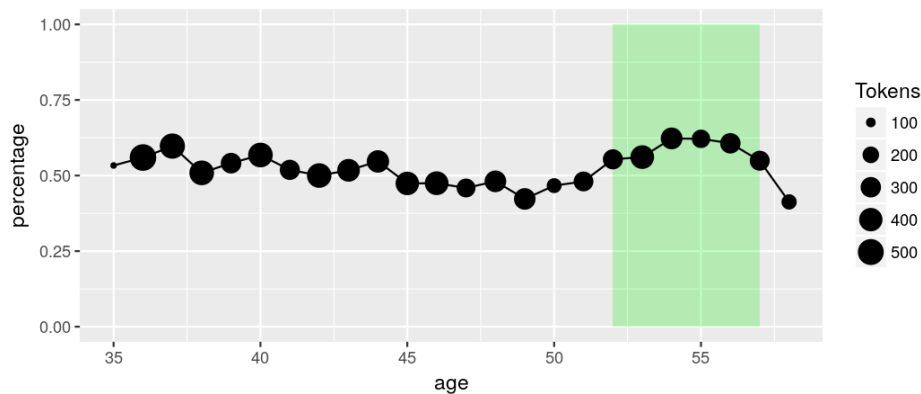


Figure 4: Maximum Linguistic Market Value as finance minister during an economic crisis.

The graph shows that the rate of SF use is highest when Sigfússon is responsible for the Icelandic economy in the aftermath of the 2008 economic collapse. This is to be expected because Sigfússon's linguistic market value is extremely high in this period under any reasonable way of measuring it.

In the 2013 election, the left wing government lost its majority and Sigfússon stepped down as minister of finance and as the leader of his party. He returned to being a normal parliament member and others took over those roles. His comments on the period reflect a significant change:

<sup>3</sup>The exact amount was under debate and it fluctuated in reports in the media at the time. The point here, of course, is not to give a precise analysis of the legal situation, but rather to draw attention to the fact that Sigfússon was in a position of great responsibility that affected his status in the Linguistic Marketplace.

“... I had had enough in the sense that my first thought was simply that it was time for me to take a break, get some rest, breathe and recover.”

(S.J. Sigfússon; from our interview on 2 March, 2017)

Sigfússon remained active in Icelandic politics after the 2013 election but he was no longer in the center of the political spotlight. We analyze the sharp decrease in SF use that is highlighted in Figure 5 as a result of this important change in the speaker’s life.

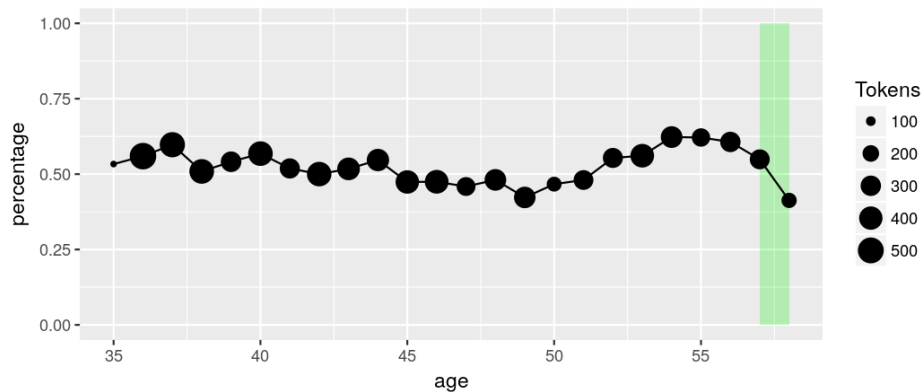


Figure 5: SF use declines as Sigfússon steps down from his 2006-12 leadership roles.

The change from 2012-13 is the sharpest decline between years that is found in our corpus and this is consistent with the view that Sigfússon experiences less pressure from the Linguistic Marketplace after he has stepped down as finance minister and leader of his party. While he is still a member of the parliament, he has passed on the torch in terms of the leadership roles that shaped his usage in the period of 2006-2012.

## 5 Conclusion

To conclude, our findings show that studies on individual lifespan change should emphasize a high time resolution due to the ways in which individual speakers can rapidly change their linguistic performance in response to idiosyncratic events in their lives. It has been suggested in previous studies that were limited to a time resolution of 2 that aiming for a higher resolution (in our terminology) might be beneficial for longitudinal studies of linguistic change (e.g., Rickford and Price 2013:172) and our results offer clear support for that view. Our main point is repeated below:

(8) **Main point:**

While community-wide usage evolution is often regular and gradual, individual lifespan change responds rapidly to idiosyncratic sociolinguistic pressures – demanding a high-definition approach.

It is important to note that attention to qualitative detail is important when interpreting such high-definition findings. We would like to emphasize that our method is not a replacement for sociolinguistic interviews. Different approaches are appropriate for different kinds of research questions. In this case, we really need a lot of data from one speaker and in that case it is a reasonable strategy to gather relevant tokens from publicly available transcriptions of parliament speeches.

In terms of the big picture, this kind of research, particularly when contrasted with the tantalizingly systematic S-shaped curves of historical syntax, highlights that in some ways individuals can be more complicated than communities. An individual like Sigfússon can all of a sudden find himself in roles which have a dramatic effect on the importance of language in his life even if the forces that shape his personal path through the Linguistic Marketplace are unimportant for linguistic performance in the community as a whole.

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