Intra- and Interspeaker Repetitiveness in Locative Variation

Aini Li
University of Pennsylvania

Meredith Tamminga
University of Pennsylvania

Intra- and Interspeaker Repetitiveness in Locative Variation

Abstract

A long research line in quantitative sociolinguistics has been aimed at understanding how persistence, the tendency for people to repeat a linguistic variant they have just used, influences language variation and change. Previous studies have variously attributed variant repetitiveness to priming in the psycholinguistic sense, socially-motivated style-shifting, or interspeaker accommodation, implying that intraspeaker persistence and interspeaker convergence are potentially different phenomena. This study reports both interspeaker convergence and intraspeaker persistence in a morphological variable that has been recently documented in the Chengdu dialect of Mandarin, a variety which is subject to language contact with standard Mandarin. We compare the relationship between repetitiveness within and across speakers. Results from mixed-effect logistic regression show that there is a persistence effect within speakers and a convergence effect across speakers; however the size of the effect varies according to different meaning contexts. Findings further shed light on the understanding of language change from psycholinguistic perspectives.

Intra- and Interspeaker Repetitiveness in Locative Variation

Aini Li and Meredith Tamminga*

1 Introduction

In sociolinguistic variation, it has been observed that speakers tend to repeat the use of a linguistic variant they have recently used. We refer to this tendency in general as **persistence**, a term intended to avoid presupposing an analysis of the source of the repetitiveness. A long line of research in quantitative sociolinguistics has been aimed at understanding how persistence influences sociolinguistic variation in conversational speech. In one of the first such studies, which investigated several pronominal variables in Quebec French, Sankoff and Laberge (1978) find that speakers are more likely to switch pronominal variants if two consecutive occurrences of the variable are more temporally distant than if the consecutive occurrences are close together. Additional studies of pronominal alternations, especially pro-drop in Spanish, contribute further evidence for persistence in natural speech (Travis 2007, Travis and Cacoullos 2012, Cameron 1992, Cameron and Flores-Ferrán 2004). In two other early studies by Poplack (1980, 1984), she finds a similar sequential dependency in /s/-deletion in Puerto Rican Spanish: a token of the variable is likely to have /s/ retained if the preceding token also exhibited retention, whereas /s/ is likely to be deleted if the previous occurrence of /s/ was deleted. Weiner and Labov (1983) document persistence in the syntactic alternation between generalized actives and agentless passive constructions in English. More recently, Gries (2005) finds persistence in the English dative alternation and particle placement, while Szmrecsanyi (2006) documents persistence in each of five different English variables: comparison strategy choice, genitive choice, future marker choice, verb particle placement and complementation strategy. Note that persistence has also been documented for phonological variables (Tamminga 2016, Clark 2014, 2018).

These persistence studies have most often attributed within-speaker persistence to **priming**, in the psycholinguistic sense of heightened activation after exposure and therefore preferential retrieval for subsequent use (Szmrecsanyi 2006, Tamminga 2016, Pickering and Garrod 2017). In particular, discussions of persistence in sociolinguistic variation often point to the experimental psycholinguistic literature on **structural priming** (e.g., Bock 1986; see Pickering and Ferreira 2008 for a recent review). Pickering and Branigan define structural priming as "the phenomenon whereby the act of processing an utterance with a particular form facilitates processing a subsequent utterance with the same or a related form" (1999:136). The properties of structural priming show parallels with the properties of sociolinguistic persistence: for example, lexical overlap between prime and target has been shown to increase the tendency toward variant repetition in both experimental structural priming (e.g. Hartsuiker et al. 2008) and corpus-based intraspeaker persistence (Szmrecsanyi 2006, Tamminga 2016, Clark 2018). Szmrecsanyi (2006) finds that the size of the priming effect gets boosted when prime and target token share more linguistic substance; Clark (2018) similarly finds that shared phonological content (such as phonetic variants with the same voicing) make the persistence effect in /t/-flapping stronger and slower to decay. These properties further motivate the argument that persistence arises as a result of priming.

However, there are also some ways in which the corpus-based studies of persistence discussed above and experimental studies of structural priming diverge. One notable methodological difference is that the former have focused on whether speakers repeat *their own* previous linguistic choices, whereas the latter typically involve participants being primed by input from some other source (a sentence spoken by a model talker or presented orthographically) before making a production choice in an experiment. While it is entirely plausible that speakers' own previous productions may serve as primes for their future speech, this methodological difference does raise the question of whether speakers are also primed by their interlocutor's use of sociolinguistic variation during conversational speech. There is an extensive literature about scenarios when speakers reuse linguis-

*Thanks to our speakers from Chengdu for their time and participation, to the members of the Language Variation and Cognition Lab and the Embick Lab at Penn for their comments and feedback, and to PLC 44 committee and PWPL editors for making this happen during these extraordinary times.

tic forms that they just heard from other speakers (see e.g. Auer and Hinskens 2005), which we will call **convergence** (without intending to imply a particular analysis, parallel to our use of the term *persistence*). However, these studies are typically framed as being about interspeaker **accommodation**, in the sense of Communication Accommodation Theory (see Giles 2016 for a recent overview). On this view, speakers adjust their language to align with their interlocutors in order to enhance social solidarity and facilitate communication. In other words, convergence is seen as being motivated by speakers' social and interactional goals, rather than being an automatic consequence of the linguistic processing system (as on the priming account). This possible social motivation for interspeaker convergence has some similarities with the possibility that, in principle, intraspeaker persistence might arise not from priming, but from stylistic or discourse coherence.

The substantive issue that arises, then, is whether intraspeaker persistence is or is not the same phenomenon as interspeaker convergence. Can both of these types of repetitiveness be explained through the mechanism of priming, or are there additional factors at play in one or both cases? These are deep questions that have occupied many socio– and psycholinguists for decades; we will certainly not resolve them here. However, note that our current understanding of the empirical properties of intraspeaker persistence and interspeaker convergence is drawn from studies that may involve different kinds of variables, different sociointeractional contexts, and different individual speakers. As we tackle the interesting project of disentangling the evidence for different possible explanations of persistence and convergence, then, it might be particularly useful to have more empirical evidence comparing within-speaker and across-speaker repetitiveness in the same variable, in the same data, from the same set of speakers. Data from sociolinguistic interviews, especially in cases with more than one participant per interview, is reasonably well suited to this task, because we can extract and analyze both within- and across-speaker data using the same methods.

With this motivation, the current study reports both interspeaker convergence and intraspeaker persistence in sociolinguistic interview speech data on locative variation in the Chengdu dialect of Mandarin. In other words, we compare the relationship between repetitiveness within speakers and repetitiveness across speakers using an understudied variable in an understudied Mandarin dialect as a test case. Locative variation has only recently been documented in Chengdu Mandarin, a variety which is subject to language contact with standard Mandarin. Even though it is understudied, given its high frequency (for a morphological variable) and linguistic salience, it is a good variable to use for the purpose of our current analysis. Meanwhile, using data from an understudied language variety offers opportunities to bring new insights into our current understanding of the phenomenon cross-linguistically. In Section 2, we discuss the sociolinguistic situation of Chengdu Mandarin and describe the locative variation in more detail. In Section 3, we describe the conversational speech on which the study is based and explain how we extracted the data on locative variation. In Section 4, we present a mixed-effects logistic regression analysis of the inter- and intraspeaker data together. Finally, in Section 5, we briefly discuss our results, their limitations, and some promising future directions for this line of work.

2 The sociolinguistic variable

Standard Mandarin is known as the lingua franca widely spoken and written in modern China. It is defined as a mixed language (Thomason 2008: 255) as it takes "northern Mandarin as its basis, the Beijing Mandarin phonological system as its norm of pronounciation, and exemplary modern baihua ['vernacular'] literary language [as opposed to classical Chinese] as its norm of grammar"(Xiandai Hanyu Cidian 1983: 255). As a variety of Northern Mandarin dialect groups, Sichuanese, as well as Chengdu dialect bears more resemblance to standard Mandarin than southeastern Chinese varieties. But still, these two varieties are linguistically divergent in various aspects. Crucially, the national promotion of standard Chinese (Putonghua) has 'standardized' the vernacular Chengdu dialect, giving rise to contact-induced variation in the speech community of Chengdu. We showcase the use of locatives here to pave the way for a better understanding of contact-induced language variation and change under the Chinese context.

To express location or direction in Chinese, a preposition (before the noun) such as *zai*, meaning

'at, on, in' or a postposition (after the noun) such as locative particles *shang* (up) 'on top of', *xia* (down) 'under', *li* (in) 'inside of', *wai* (outside) 'outside of', to name just a few, are necessary linguistic devices. For instance, *zai-xuexiao* (at-school) means 'at the school' and *zhuozi-shang* (table-up) means 'on the table'. Cases where both the preposition *zai* and postpositional particles coexist, such as *zai-xuexiao-li* (in-school-inside) 'inside the school' and *zai-zhuozi-shang* (on-table-up) 'on the table' are also considered grammatical.

In terms of the locative particles (Sun 2006), they have been defined in various ways in previous descriptive literature: Chao (1965) call them place words; Li and Thompson (1981) understand them as postpositions; and Liu (1998) even defines them as clitics that can be attached to the end of a noun phrase. Crucially, on the one hand, they can exist as monomorphemic units. On the other hand, they are allowed to enter a morpheme complex by adding to themselves locative markers/suffixes such as *-tou*, *-mian*, *-bian*, *-fang*. Although our present study focuses on the alternation between *-tou* and *-mian*, there do exist other lexical items that are functionally equivalent. As a suffix, *-tou* has been categorized by Chao (1965) as: 1) A nominalizer when it appears after nouns (e.g., *shi-tou* (stone-head) 'stone'), verbs (e.g., *nian-tou* (read-head) 'thought, idea') as well as adjectives (e.g., *tian-tou* (sweet-head) 'profit, advantage'). On these occasions, the suffix *-tou* nominalizes the original nouns, verbs and adjectives, converting them all into their correspondent nouns; 2) A locative marker when *-tou* follows place words or localizers like *shang* (up) 'on top of', *xia* (down) 'under', *li* (in) 'inside of', *wai*(outside) 'outside' (Chao 1965). Similar to *-tou*, the suffix *-mian* also serves as a morpheme attachable to localizers to denote location in standard Mandarin.

In Chengdu Mandarin, when the suffix *-tou* functions as a locative marker, it bears some different grammatical properties, compared with its standard counterpart. There are two types of *-tou* in Chengdu: the categorical *-tou* (cases where only *-tou* can be used), and the non-categorical *-tou* (cases where *-tou* alternates with *-mian*). The categorical *-tou* can denote location by being directly attached to substantive nouns of location without the presence of locative particles. Words such as *wu-tou* (house-head) 'inside the room' or *xuexiao-tou* (school-head) 'inside the school' are frequently used among Chengdu speakers. More importantly, *-tou* in these cases consistently functions as an abbreviated form of *li-tou* (inside-head) 'inside'. It has been commonly observed that Chengdu speakers are inclined to add *-tou* directly to all kinds of place nouns, be it a mono-morphemic localizer or a localizer complex. Words such as *wu-tou* (house-head) 'inside a room' or *xuexiao-tou* (school-head) 'inside the school' are all abbreviated equivalents to their complete forms *wu li-tou* or *xuexiao li-tou* where *-tou* directly follows the localizer *li* (meter) 'inside'.

In standard Chinese, however, there is no categorical use of locative *-mian*. Expressions such as *wu-mian* (room-face) are not grammatically acceptable. When *-mian* serves as a locative marker, it has to be attached to localizers. Example words include *li-mian* (inside-face) 'inside', *wai-mian* (outside-face) 'outside' and more. Given the social status of standard Mandarin, these forms are more frequently used than their dialectal counterparts *li-tou* (inside-head) 'inside', *wai-tou* (outside-head) 'outside' in those public settings such as conference rooms, schools or over mass media.

Therefore, the alternation between the standard variant *-mian* and the local variant *-tou* only exists in cases of localizer-tou, as in *shang-tou* versus *shang-mian* to mean "on top of". Other than marking spatial meaning, *-tou* and *-mian* can also have a temporal meaning, as in *qian-tou/mian*, for "before" and *hou-tou/mian*, for "after". A more detailed comparison concerning the interchangeable use of locative markers between Chengdu dialect and standard Chinese is summarized as follows in Table 1. Note that bolded ones refer to cases where *-tou* and *-mian* bear both spatial and temporal meaning.

Based on these facts, we investigate the effects of naturally-occurring prior instances of variants with regard to both their forms and meanings on the probability of variant choice in the subsequent token. Given how pervasive intraspeaker persistence and interspeaker convergence have been reported in previous studies to exist in natural speech, we expect the locative variation to exhibit both a persistence effect within speakers and a convergence effect across speakers based on our conversational speech data. Moreover, we follow Szmrecsanyi (2006) and Clark (2018) in asking to what extent shared content might strengthen the persistence/convergence effect; in this case, we are particularly interested in whether shared *meaning* (temporal vs. spatial) might boost the persistence/convergence effects. With these goals in mind, we specifically aim to answer the following

Meaning	Chengdu dialect	standard Chinese
'on/above'	shang/kau-tou (up/tall-TOU)	shang-mian (up-MIAN)
'below'	xia-tou (down-TOU)	xia-mian (down-MIAN)
'front'	**qian-tou** (front-TOU)	**qian-mian** (front-MIAN)
'back'	**hou-tou** (behind-TOU)	**hou-mian** (behind-MIAN)
'inside'	li-tou (inside-TOU)	li-mian (inside-MIAN)
'outside'	wai-tou (outside-TOU)	wai-mian (outside-MIAN)

Table 1: Locative alternation in Chengdu dialect.

research questions:

1. Is there both a persistence effect within speakers and a convergence effect across speakers?
2. Are any potential persistence/convergence effects present in both same-meaning and different-meaning prime–target pairs?
3. Is any potential meaning-based differentiation of the persistence/convergence effects consistent across the inter- and intraspeaker contexts?

3 Data and methods

The data was drawn from 31 sociolinguistic interviews conducted in the summer of 2017. A total of 40 native speakers of Chengdu dialect participated in the study (Male 19; Female 21). All of them have been living in Chengdu since they were born and were contacted through a social network approach, i.e., the "friend of a friend" approach (Milroy 1980). Interviews were recorded using a digital voice recorder and each interview lasted at least one hour. Two female interviewers who are also native Chengdu speakers did all the interviews.

We made reference to both Labov (2006 [1966])'s model of elicitation and Briggs (1986)'s model of open-ended conversation for eliciting relevant data. After excluding irrelevant cases, in the end, a number of 1193 tokens were drawn for the purpose of the current analysis. All the tokens were coded auditorily for variant (*-tou, -mian*), meaning (spatial, temporal), and speaker. For each token, we then made reference to the immediately preceding token in the conversation, regardless of who produced that token, what variant was used, or what the meaning was, coding each token for the *previous* token's variant, meaning and speaker. Note that in this approach, most tokens serve as both "targets" and "primes." From this information, we coded the tokens for whether the speaker and meaning are the same or different as the previous token. The coding approach is illustrated in Table 2. Table 3 summarizes the number of tokens each cross-tabulation context.

Variant	Meaning	Speaker	Prev_speaker	Prev_variant	Prev_meaning	Same_speaker	Same_meaning
-mian	spatial	SP2	IV	*-mian*	spatial	no	yes
-tou	temporal	SP1	SP2	*-mian*	spatial	no	no
-tou	temporal	SP1	SP1	*-mian*	temporal	yes	yes

Table 2: Illustration of the coding scheme.

4 Results

Figure 1 visualizes the observed rate of *-mian* use in each of these contexts. We fit a mixed-effect logistic regression model using the `lme4` package (Bates et al. 2015) in the R statistical environment (R Core Team 2015) to predict the probability of getting the standard variant *-mian* in the current token, with previous token's variant, meaning match (same/different as the previous token) and

Same speaker	Same meaning	Previous token's variant	Count
no	no	*-tou*	66
no	no	*-mian*	45
no	yes	*-tou*	89
no	yes	*-mian*	78
yes	no	*-tou*	114
yes	no	*-mian*	141
yes	yes	*-tou*	278
yes	yes	*-mian*	354

Table 3: Summary of number of tokens for each context.

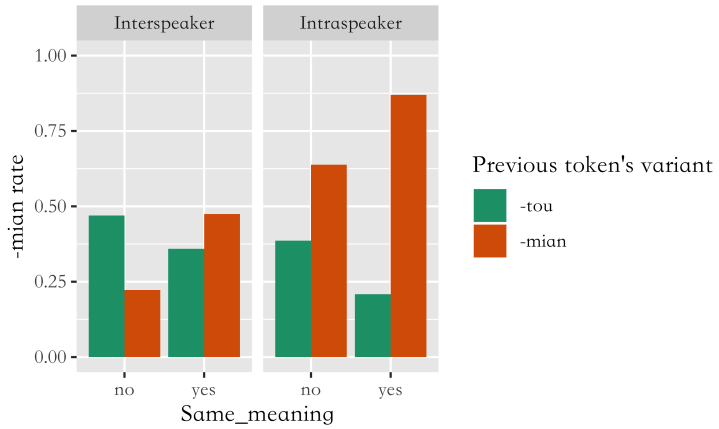

Figure 1: Observed *-mian* rates in inter- and intra-speaker context.

speaker match (same/different speaker) as fixed effects (all treatment-coded with variant *-tou*, same meaning, and different speaker as the reference level in a three-way interaction) and previous token's variant by individual speaker as a random slope to account for different baseline rates of variation and persistence magnitudes across speakers.

The results, as shown in Table 4, reveal that there is a main effect of PREVIOUS TOKEN'S VARIANT, suggesting that when speaker is different and in the same-meaning context, there is significant convergence effect when the previous token's variant is the same as the current one, i.e., both tokens use the variant *-mian* (β = 1.41, p = .00). No significant effect of DIFFERENT MEANING, i.e., meaning for *-tou*-primed tokens in the interspeaker context, is found (β = 0.57, p = .14). Conversely, there is no significant effect of SAME SPEAKER for *-tou*-primed tokens in the same meaning context (β = 0.02, p = .95). The interaction between PREVIOUS TOKEN'S VARIANT and DIFFERENT MEANING is significant (β = -1.92, p = .00), indicating that within the interspeaker scenario, the convergence effect in the different-meaning context is significantly different from the same-meaning context by triggering distinctively smaller amount of standard variant *-mian*. The interaction between PREVIOUS TOKEN'S VARIANT and SAME SPEAKER is not significant, which signals that in the different-meaning context, the persistence effect in the same-speaker context is not significantly different from the convergence effect in the different-speaker context (β = 0.57, p = .29). Moreover, the effect of same-meaning and same-speaker for *-tou*-primed tokens is not significantly different from different-meaning and different-speaker context. Lastly, the persistence effect in the same-meaning, same-speaker context is not significantly different from the convergence effect in the different-meaning and different-speaker context.

In short, we did find that there is an overall persistence effect within speakers and a convergence effect across speakers. The size of the effects differs according to whether the meaning context between the previous and the current token's variant is the same or not. However, the intra- and

	Estimate	Std.Error	z value	Pr(> |z|)
(Intercept)	-0.74	0.38	-1.97	0.05 *
Previous token's variant	1.41	0.45	3.16	0.00 **
Different meaning	0.57	0.39	1.47	0.14
Same speaker	0.02	0.34	0.07	0.95
Previous token's variant : Different meaning	-1.92	0.64	-3.00	0.00 **
Previous token's variant : Same speaker	0.57	0.51	1.07	0.29
Different meaning : Same speaker	0.14	0.48	0.29	0.77
Previous token's variant : Different meaning: Same speaker	-0.70	0.76	-0.92	0.36

Table 4: GLM results for *target variant* ∼ *previous token's variant*meaning*speaker + (previous token's variant variant | speaker).*

interspeaker patterns appear to be very similar in terms of the contexts where we do and do not find evidence for significant persistence/convergence.

Notably, this model configuration does not fully resolve all the possible comparisons. Crucially, it does not tell us, for the same-meaning predictor (yes or no), whether there is a persistence effect or a convergence effect in each subcontext or not. Therefore, we refit the same model with different reference levels multiple times to generate these tests we are interested in. The results suggest that the persistence effect and the convergence effect are bigger in the same-meaning context. In addition, no persistence or convergence effect is found in the different-meaning context for both interspeaker and intraspeaker scenarios.

The values for an average speaker is further predicted using the model output. Figure 2 presents the predicted values for an average speaker based on the statistical tests. Even though the size of the effects is bigger in the same-meaning context, the persistence effect and the convergence effect are not different in nature for within- and across-speaker cases.

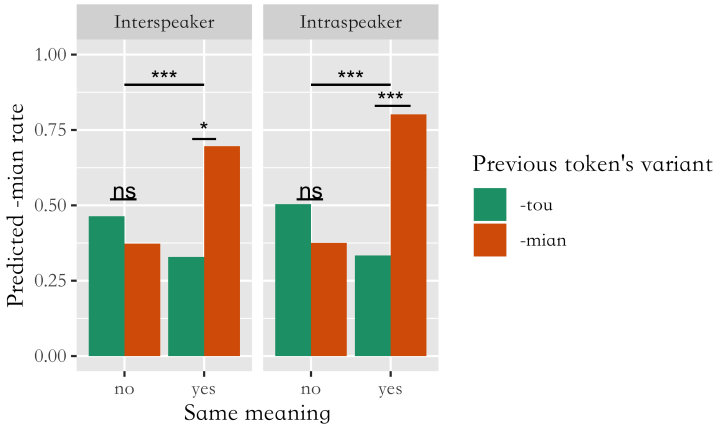

Figure 2: Predicted *-mian* rates for an average speaker.

5 Discussion

The current study investigates the persistence within speakers and convergence across speakers using locative variation in Chengdu Mandarin as a test case. We begin our discussion by providing answers to our research questions and then we raise some interesting points that pave the way for further research.

First of all, is there both a persistence effect within speakers and a convergence effect across speakers? The answer is "yes", and there is a persistence effect for intraspeaker cases as well as a

convergence effect for interspeaker ones. Second, are any potential persistence/convergence effects present within both same-meaning and different-meaning pairs of prior and current token's variant? The answer is both "yes" and "no". It turns out that the persistence/convergence effect are subject to the restrictions of the various meaning contexts. In particular, there is a persistence/convergence effect when the immediately preceding token's variant and current token's variant match in meaning. This applies to both interspeaker and intraspeaker scenarios. However, when meaning becomes different, the persistence/convergence effect disappear for both intra- and interspeaker contexts. This result, in fact, echoes with the previous findings reported in Tamminga (2016) where the priming effect does not always seem to emerge across different grammatical contexts in a way that we expect it to: for instance, in the *-ing/in'* alternation, persistence arises only when prior variant and current variant have the same morphological structure. To illustrate it with a more concrete example: recognition of *workin'* should be facilitated with the prior presentation of words like *jumpin'*, but not with words like *mornin'*. Tamminga argues that this might suggest that what appears to be a single *-ing/in'* variable is actually two different variables that do not prime each other. In our case, therefore, we might also wonder whether the (*-tou, -mian*) variable essentially involves two different kinds of variables when they bear distinct meanings. It raises the possibility that temporal locatives might be defined as one variable whereas spatial locatives should be understood as a different variable. However, note that the lack of a significant repetitiveness effect across different-meaning token pairs is a null result that cannot positively confirm that there is no effect. However, it does seem clear that meaning match boosts the persistence/convergence effects in both the inter- and intraspeaker contexts, which might be taken as evidence that these forms of repetitiveness are both the result of priming, following Clark (2018).

Third, is any potential meaning-based differentiation of the persistence/convergence effects consistent across the inter- and intraspeaker contexts? The answer is both "yes" and "no". As mentioned before, the persistence/convergence effects arise only when prior instance and current instance match their meanings. This meaning difference applies to both inter- and intraspeaker pairs. That is to say, the size differences of the persistence/convergence effect are detected only when meaning differs but not when speaker changes. Regardless of whether the meaning matches or not (same meaning vs. different meaning), the effect size does not differ according to speaker differences. However, given the limited number of data points, it would be premature to rule out the possibility that the underlying phenomena might be the same on the basis of the null results within the model.

An additional point about the null effect of previous variant in the different meaning contexts is that the *observed* (but not predicted) direction of the (non-significant) persistence effect is actually reversed in the interspeaker cases: at first blush, it seemed that there was an *anti-priming* effect when using the variable for different meanings in cross-speaker scenarios. This kind of reversal has been documented previously by Szmrecsanyi (2006), who calls it a *horror aequi* effect. The term describes cases where speakers avoid using (near-)identical grammatical structures in near proximity. A possibility that is compatible with a priming analysis is that this kind of reversal reflects the psycholinguistic mechanism of **inhibition**, which arises when a number of options are considered simultaneously and the options that don't get chosen instead need to be suppressed in order for processing to go ahead. For example, in their study of optional infinitival *to*, Melnick and Wasow (2019) found that the same function word gets facilitated by its prior use in one construction and inhibited in another. Similarly, we get facilitation when the prior and current instance share the same lexical meaning (e.g. temporal – temporal) but not when they bear different meanings (e.g, temporal – spatial). It is intriguing that our potential inhibition effect arises only in those cases that are maximally differentiated, i.e. in different-meaning and different-speaker combinations. Although the persistence effects were not significant in these contexts and the model did not support a reversal of the effect's direction, these maximally-differentiated contexts also have the smallest amount of available data, suggesting that the non-significance could plausibly be a result of lack of statistical power rather than a true null effect. Whether this reversal effect is real and stable or not requires further inquiry with more data.

Last but not least, one aspect of persistence that we have not yet addressed here and plan to pursue in our future work is to include the temporal distance between prior and current instances in our model to control for the decay of persistence effects over time. As suggested by Clark (2018),

the appearance of decay over time is also a hallmark of priming effects, so investigating decay-related questions might unveil further complexities involved in inter- and intraspeaker repetitiveness and shed light on how interspeaker convergence and intraspeaker persistence differ (or not) in a more systematic way. Questions of the temporal durability of persistence and convergence may also have implications for the understanding of language change. It has been suggested that priming can play a role in the "snow-balling" of language change, increasing the use of incoming variants to get changes off the ground (Mayol 2012, Pickering and Garrod 2017, Clark 2018). However, the viability of this suggestion may depend on the temporal properties of priming and its decay.

In summary, based on our results, in both intraspeaker and interspeaker cases, the re-use of the same variant is made more likely when the prior and current variant denote the same meaning category. The use of *-tou* or *-mian* in temporal locatives boost the use of the same variant again in temporal but not spatial locatives, and vice versa. Furthermore, the intraspeaker and interspeaker patterns are parallel in this respect, making a future analysis uniting these phenomena seem possible. Ultimately, though, we suspect that we may need to appeal to both socially-motivated accommodation and psycholinguistic priming to explain the full set of persistence/convergence facts. This area of inquiry will continue to be of interest for understanding the interplay of social context and psycholinguistic processing in the production of sociolinguistic variation.

References

Auer, P., and F. Hinskens. 2005. The role of interpersonal accommodation in a theory of language change. In *Dialect Change. The Convergence and Divergence of Dialects in Contemporary Society*, ed. P. Auer, F. Hinskens, and P. Kerswill, 35–57. Cambridge University Press.

Bates, Douglas, Martin Mächler, Ben Bolker, and Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67:1–48.

Bock, Kathryn. 1986. Syntactic persistence in language production. *Cognitive Psychology* 18:355–387.

Briggs, Charles L. 1986. *Learning how to ask: A sociolinguistic appraisal of the role of the interview in social science research*. 1. Cambridge University Press.

Cameron, Richard. 1992. Pronominal and Null Subject Variation in Spanish: Constraints, Dialects, and Functional Compensation. Doctoral dissertation, University of Pennsylvania.

Cameron, Richard, and Nydia Flores-Ferrán. 2004. Perseveration of subject expression across regional dialects of Spanish. *Spanish in Context* 1:41–65.

Chao, Yuen Ren. 1965. *A Grammar of Spoken Chinese*. Univ of California Press.

Clark, Lynn. 2014. Phonological repetition effects in natural conversation: Evidence from TH-fronting in Fife. In *Sociolinguistics in Scotland*, ed. Robert Lawson, chapter 8, 153–176. Palgrave Macmillan.

Clark, Lynn. 2018. Priming as a motivating factor in sociophonetic variation and change. *Topics in Cognitive Science* .

Giles, Howard. 2016. Communication accommodation theory. *The International Encyclopedia of Communication Theory and Philosophy* 1–7.

Gries, Stefan Th. 2005. Syntactic priming: a corpus-based approach. *Journal of Psycholinguistic Research* 34:365–399.

Hartsuiker, Robert J., Sarah Bernolet, Sofie Schoonbaert, Sara Speybroek, and Dieter Vanderelst. 2008. Syntactic priming persists while the lexical boost decays: Evidence from written and spoken dialogue. *Journal of Memory and Language* 58:214–238.

Labov, William. 2006 [1966]. *The Social Stratification of English in New York City*. Cambridge University Press.

Li, Charles, and Sandra Thompson. 1981. *A Functional Reference Grammar of Mandarin Chinese*. Berkeley, CA: University of California Press.

Liu, Feng-hsi. 1998. A clitic analysis of locative particles. *Journal of Chinese Linguistics* 26:48–70.

Mayol, Laia. 2012. An account of the variation in the rates of overt subject pronouns in Romance. *Spanish in Context* 9:420–442.

Melnick, Robin, and Thomas Wasow. 2019. Priming vs. inhibition of optional infinitival "to". In *Proceedings of the Workshop on Cognitive Modeling and Computational Linguistics*, 11–19.

Milroy, Lesley. 1980. *Language and Social Networks*. Oxford: Basil Blackwell.

Pickering, and Branigan. 1999. Syntactic priming in language production. *Trends Cogn Sci* 3:136–141.

Pickering, Martin J., and Victor S. Ferreira. 2008. Structural priming: A critical review. *Psycholinguistic Bulletin* 134:427–459.

Pickering, Martin J, and Simon Garrod. 2017. Priming and language change. *The Changing English language: Psycholinguistic Perspectives* 173:190.

Poplack, Shana. 1980. The notion of the plural in Puerto Rican Spanish: Competing constraints on (s) deletion. In *Locating Language in Time and Space*, ed. William Labov. Academic Press.

Poplack, Shana. 1984. Variable concord and sentential plural marking in Puerto Rican Spanish. *Hispanic Review* 52:205–222.

R Core Team. 2015. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.

Sankoff, David, and Suzanne Laberge. 1978. Statistical dependence among successive occurrences of a variable in discourse. *Linguistic variation: models and methods* 119–126.

Sun, Chaofen. 2006. *Chinese: A Linguistic Introduction*. Cambridge University Press.

Szmrecsanyi, Benedikt. 2006. *Morphosyntactic Persistence in Spoken English: A Corpus Study at the Intersection of Variationist Sociolinguistics, Psycholinguistics, and Discourse Analysis*. Mouton de Gruyter.

Tamminga, Meredith. 2016. Persistence in phonological and morphological variation. *Language Variation and Change* 28:335–356.

Thomason, Sarah G. 2008. Pidgins/creoles and historical linguistics. *The Handbook of Pidgin and Creole Studies* 242–262.

Travis, Catherine E. 2007. Genre effects on subject expression in Spanish: Priming in narrative and conversation. *Language Variation and Change* 19:101–135.

Travis, Catherine E, and Rena Torres Cacoullos. 2012. What do subject pronouns do in discourse? cognitive, mechanical and constructional factors in variation. *Cognitive Linguistics* 23:711–748.

Weiner, E. Judith, and William Labov. 1983. Constraints on the agentless passive. *Journal of Linguistics* 19:29–58.

Xiandai Hanyu Cidian, Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo. 1983. *Xiandai Hanyu Cidian (Modern Chinese Dictionary)*. Beijing. Shangwu Yinshuguan.

Department of Linguistics
University of Pennsylvania
Philadelphia, PA 19104
liaini@sas.upenn.edu
tamminga@ling.upenn.edu