Poster Abstracts

Tonal Cues to Contrastive Phonation in Macuiltianguis Zapotec

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Languages often employ multiple acoustic cues to convey a single phonological contrast (e.g., Denes, 1955; Lisker, 1986). Tone and phonation, two laryngeal cues, can exist in this redundant relationship: contrastive tone is often additionally cued by non-contrastive creaky phonation; conversely, contrastive phonation type can be additionally cued by non-contrastive tonal movement (Gordon & Ladefoged, 2001). This study examines Macuiltianguis Zapotec (MacZ), a Northern Zapotec language in the Otomanguean family, analyzing a previously undocumented F0 cue to contrastive phonation. MacZ is "laryngeally complex" (Silverman, 1997), containing both contrastive phonation and lexical tone (Riestenberg, 2017). Therefore, the F0 cue to phonation, a spiking pattern in the F0 that appears on modal vowels but not on checked ([V$^{?}$]) vowels, surfaces in MacZ in addition to and independently of phonemic tonal contrasts.

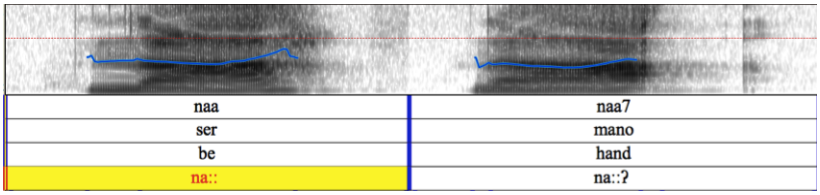

Figure 1: Minimal pair [ná::]/[ná::$^{?}$] with contrastive phonation; F0 spike on modal token

This study examines MacZ tokens produced by three native speakers, elicited from a word list. Of the data elicited, the study examines only word-final vowels that are phonologically either modally voiced or checked. The tonal spike analyzed is operationalized as a visible rise followed by a fall in F0, occurring during the last third of the vowel duration, with a difference of about 20Hz and lasting about 5-10 ms. Presence or absence of F0 spike was coded by acoustic profiling of the pitch track.

	Modal	**Checked**	
Spike	196	61	
Steady	127	214	598

Table 1: Number of phonetically spiking and steady tones by phonation type

A test of equal proportions on the data as reported in Table 1 revealed that the proportion of tokens with pitch spikes on modal vowels was significantly higher than that on checked vowels ($\chi^2(1, N=88.273, p<0.001)$). Figure 1 illustrates that given the minimal pair [ná::]/[ná::$^{?}$], the F0 spike surfaces only on the vowel with underlying modal voicing. Therefore, the F0 rise across the syllable that is present in both examples is the principle cue to lexical tone, while the spike in F0 at the end of [ná::] is a cue to modal phonation.

The F0 spike examined here appears to be a tonal cue to contrastive phonation, supplementary to the phonation cue itself and distinct from the F0 cue to lexical tone. Unlike in other Otomanguean languages, in which contrastive phonation occurs throughout the vowel and especially in the early portions thereof (Garellek & Keating, 2011), the glottalization

characteristic of a checked vowel in MacZ occurs only at the end of the vowel. As vowel-final phonation differences are difficult to perceive, the need for an additional perceptual cue to phonation contrasts in MacZ is not surprising.

Another possible explanation is that the spiking pattern in F0 is the surfacing of an intonational boundary tone, appearing here as an aspect of list intonation, which is prevented from surfacing by some property of the checked phonation type. Specifically, checked vowels may have an underlying or historical low tone, as glottalization and low F0 require similar articulatory configurations (e.g., Gordon & Ladefoged, 2001). Though this postulated low tone does not surface itself, it may block an intonational tone from surfacing. Alternatively, it may be the relatively short duration of checked vowels compared to modal vowels that simply does not provide enough sonority on which the proposed boundary tone may surface. In either case, if the phenomenon examined here is a cue to an intonational tone, its absence on checked vowels nonetheless provides an additional cue to contrastive phonation type.

In order to further understand the role of the F0 spike observed in the present study, it would be necessary to analyze the speech of more MacZ speakers, including speech that is not elicited from a word list. This would provide further insight into any intonational properties of this spike and other aspects of its distribution and, perhaps, variability. In addition, perception studies would illuminate the extent to which the spiking pattern observed here is necessary for or aids in the correct perception of contrastive phonation types in MacZ. Research of this nature would allow for further analysis of the phenomenon observed in the present study, in which one acoustic cue, F0, is responsible for independently encoding two different phonological contrasts.

References

- Denes, P. (1955). Effect of duration on the perception of voicing. *The Journal of the Acoustical Society of America*, 27(4), 761-764.
- Garellek, M., & Keating, P. (2011). The acoustic consequences of phonation and tone interactions in Jalapa Mazatec. *Journal of the International Phonetic Association*, 41(02), 185-205.
- Gordon, M., & Ladefoged, P. (2001). Phonation types: a cross-linguistic overview. *Journal of Phonetics*, 29(4), 383-406.
- Lisker, L. (1986). "Voicing" in English: a catalogue of acoustic features signaling/b/versus/p/in trochees. *Language and speech*, 29(1), 3-11.
- Riestenberg, K. J. (2017). *Acoustic salience and input frequency in L2 lexical tone learning: Evidence from a Zapotec revitalization in San Pablo Macuiltianguis*. Georgetown University, Washington. D.C. Ph.D. Dissertation.
- Silverman, D. (1997). Laryngeal complexity in Otomanguean vowels. *Phonology*, 14(02), 235-261.
- Zhang, J. (2004). The role of contrast-specific and language-specific phonetics in contour tone distribution. *Phonetically based phonology*, 157-190.

Gender-Region Interactions in Perceptual Dialectology Evaluations of Southern Speech

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This paper is grounded in Dennis Preston's finding that "a much higher proportion of respondents… identified a 'Southern' speech area than any other." (1993). He argues that the unusual regional distinctiveness of the American South can be attributed to judgments about language correctness. In this paper, I examine how perceptual dialectology judgments about the South's areal distinctiveness relate to judgments about speaker gender. In what ways does perceived speaker gender affect the intensity of regional dialect judgments?

The survey is framed as a measure of general dialect sensitivity to elicit candid judgments from participants. It utilizes twelve audio speech samples from the GMU Speech Accent Archive; in each clip, individuals from a variety of US geographic regions read an identical, content-neutral script. Participants were asked to respond to each audio prompt by reporting language judgments in five-item Likert scales for six attitudinal labels: intelligent, educated, wealthy, likable, formal, and correct. Participants were also asked to record perceived speaker gender. Then, participants were prompted to record geographic origin perceptions on a clickable map of the US. Lastly, participants were presented with the actual origin of the speech sample after submitting the clickable map. This measure shifted participant focus away from the attitudinal judgments and towards geographic accuracy, allowing for more candid judgments to emerge in the Likert tasks. The clickable maps were then compiled with heat mapping technology in Qualtrics to produce composite visual representations of clicking data for each of the twelve speech samples.

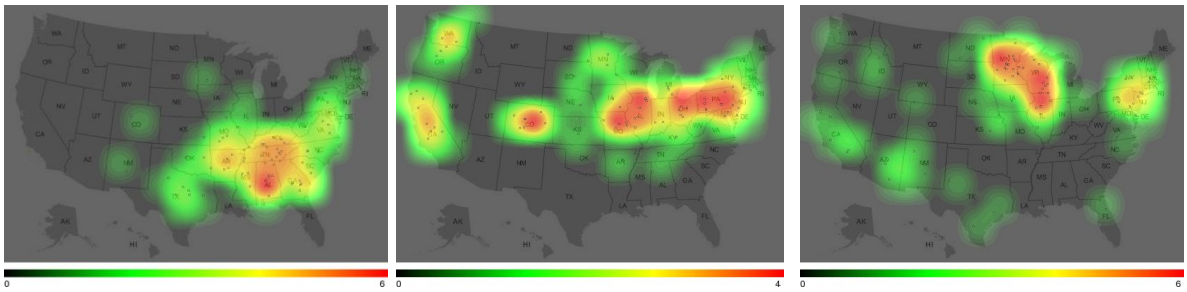

Figure 1: Orange Beach, AL (L), Seattle, WA (C), and Wisconsin Rapids, WI (R)

Single sample t-tests were performed on each attitudinal category for each audio sample, and these results were compared to composite heat maps to draw combined conclusions. The results of this study reproduce Dennis Preston's finding that the South is regionally distinctive. Specifically, this data suggests that perceptions of the South are relatively geographically compact, while geographic perceptions of non-southern speech are very spread out and ambiguous. Two sample t-tests suggest that reactions to speech perceived to originate from the American South are starkly divided based on the perceived speaker gender. Speakers perceived to be women are assigned significantly more positive attitude ratings than speakers perceived to be men across five attitudinal categories (intelligent, educated, wealthy, likeable, and formal).

Category	Women Mean	Men Mean	P-value

Intelligent	2.65	2.27	.000***
Educated	2.57	2.28	.001**
Wealthy	2.63	2.44	.022*
Likeable	3.60	3.41	.024*
Formal	2.53	2.30	.014*
Correct	2.86	2.80	.528

Table 1: Likert judgments for South-perceived speech

For speech samples perceived to originate from outside the compact southern region, speakers perceived to be women receive *less* positive attitude ratings than speakers perceived to be men across five categories, four of which were also significant for perceived southern speech.

Category	**Women Mean**	**Men Mean**	**P-value**
Intelligent	3.30	3.53	.000***
Educated	3.40	3.59	.002**
Wealthy	3.16	3.25	.116
Likeable	3.21	3.38	.009**
Formal	3.01	3.21	.004**
Correct	3.33	3.53	.002**

Table 2: Likert judgments for Non-South-perceived speech

I argue that linguistic representations in popular media selectively construct narratives about these speakers, and explore how exposure to linguistic stereotyping motivates unique gender-region interactions in perceptions of southern speech.

Selected References

Bucholtz, Mary, et al. “Hella Nor Cal or Totally So Cal? The perceptual dialectology of California.” *Journal of English Linguistics* 35, no. 4 (2007): 325-352.

Cramer, Jennifer. “Styles, stereotypes, and the South: Constructing identities at the linguistic border.” *American Speech* 88, no. 2 (2013): 144-167.

Fridland, Valerie, and Kathryn Bartlett. “Correctness, pleasantness, and degree of difference ratings across regions.” *American Speech* 81, no. 4 (2006): 358-386.

Labov, William, Sharon Ash, and Charles Boberg, eds. *The Atlas of North American English: Phonetics, Phonology, and Sound Change*. New York: Mouton De Gruyter, 2006.

Preston, Dennis. *Perceptual Dialectology: Nonlinguists’ Views of Areal Linguistics*. Dordrecht: Foris, 1989.

Purnell, Thomas, William Idsardi, and John Baugh. “Perceptual and phonetic experiments on American English dialect identification.” *Journal of Language and Social Psychology* 18, no. 1 (1999): 10-30.

Wolfram, Walt, and Natalie Schilling. *American English: Dialects and Variation*. Malden, MA: Blackwell, 1998.

QP-intervention Condition as a Constraint in Focus Environments

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Intro Cable (2007, 2010) proposes a QP-intervention Condition stated in (1). This constraint precludes a QP-projection headed by a Q-particle intervening between a functional head and its arguments.

In (2), the Tlingit Q-particle *sá* intervenes between a postposition and its complement, leading to ungrammaticality. In contrast, (3) has *sá* coming after the postpositional phrase and is grammatical.

(1) The QP-intervention Condition : A QP cannot intervene between a functional head and a phrase selected by that functional head. Such an intervening QP blocks the selectional relation between the functional head and the lower phrase.

(2) Aadoo teen sá yigoot?
who with Q you.went
Who did you go with?

(3) *Aadoo sá teen yigoot?
who Q with you.went
Who did you go with?

The QP-intervention Condition, however, faces several challenges. First, according to Cable's classification criteria, Japanese *mo* is a Q-particle. However, *mo* in plain quantificational sentence does not exhibit QP-intervention effect, shown in (4). *mo* only exhibits the QP-intervention effect in NPI uses as in (5). Since Japanese is a QP-adjunction language in Cable's theory, it is difficult for him to account for the fact *mo* has to obey QP-intervention Condition in its NPI use. Second, Sinhala as a QP-projection language in Cable's typology is expected to always exhibit the QP-intervention effect. However, data from Sinhala show that the Q-particle *da* in Sinhala, when attached to a wh-phrase to form an indefinite, does not obey QP-intervention condition. It only obeys it in question use and NPI use, shown in (6) and (7).

(4) hito-ga doko-mo-kara kitta
people-Nom where-from-mo came
People came from everywhere.

(5) hito-ga doko-(*mo)-from-mo ko-nakatta
people-Nom where-(*mo)-from-mo come-didn't
People didn't come from anywhere.

(6) Chitra [kauru da ekka] kataa kala
Chitra who Q with talk did-A
Chitra talked with someone.

(7) Chitra [kauru (*da) ekka] da kataa kalee?
Chitra who (*Q) with Q talk did-E
Who did Chitra talk with?

Given this puzzle, a natural question to ask is, should we keep QP-intervention Condition or abandon it? If we can find a parameter that groups the obeying examples as a natural class and the defying examples as a natural class, we may well abandon it. Can we find such a parameter? It turns out that the answer is positive. It is the presence/absence of focus that tells these two groups of examples apart.

Argument The correlation between the possibility of violating QP-intervention Condition and the presence/absence of focus is given in table 1. Take Sinhala for example. In Sinhala, a verb always ends with -E in focus environments and ends with -A in non-focus environments (Hagstrom 1998, Slade 2011). The data in (6) and (7) show that when QP-intervention Condition can be violated, the verb ends with -A and when it has to be obeyed, the verb ends with -E. The remaining question is, why does the presence of focus preclude the possibility of violating QP-intervention Condition? We argue that the QP-intervention Condition can be reanalyzed as a constraint on the Q-particle in focus environment, stated in (8).

Table 1: The Correlation between focus and QP-intervention Condition

	Focus	Evidence from verb-ending
QP-intervention violated	Absent	-E
QP-intervention obeyed	Present	-A

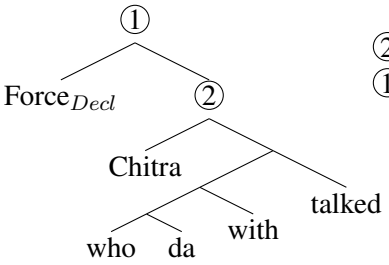
(8) Constraint on Q-particles in focus-environments:
A Q-particle comes into an LF structure as late as possible in focus environments.

Composition We adopt a Hamblin-style semantics for wh-words. A generalized version of Pointwise Functional Application (Hagstrom 1998, Yatsushiro 2009) is used. Here we use the Sinhala example to demonstrate the composition. The Q-particle *da* in Sinhala is analyzed as a variable over choice function which

will be closed by the Force head. In declarative sentence, the syncategorematic entry for the Force head is as in (9) and in interrogative sentence, its entry is in (10). In simple declarative sentence like (6), we end with the same truth condition regardless of the position of *da*, shown in (11) and (12). In interrogative sentence, the LF structure in (13) is licit but the one in (14) is ruled out by the constraint in (8).

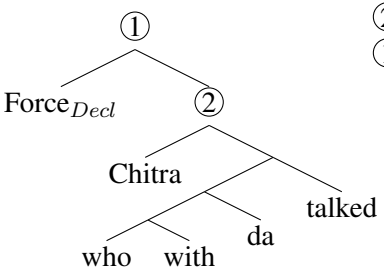
(9) $[\![Force_{Decl}\ \alpha]\!] = \exists f.[\![\alpha]\!]^{i \to f}$ (10) $[\![Force_{Q}\ \alpha]\!] = \lambda p \exists f.p = [\![\alpha]\!]^{i \to f}$

(11)



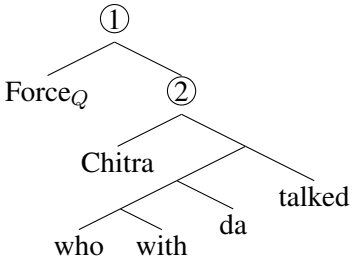
②=Chitra talked with i(who)
① = $\exists f$[Chitra talked with f(who)]
≡ Chitra talked with someone

(12)



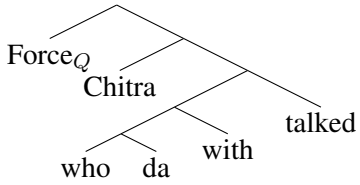
② =i{$\lambda P \lambda y.P(y)$ with $x|x \in who$}([[talked]])([[Chitra]])
① = $\exists f$[f{$\lambda P \lambda y.P(y)$ with $x|x \in who$}([[talked]])([[Chitra]])]
≡ Chitra talked with someone

(13)



② =i{$\lambda P \lambda y.P(y)$ with $x|x \in who$}([[talked]])([[Chitra]])
① = $\lambda p.\exists f[p = f\{\lambda P \lambda y.P(y)$ with $x|x \in who\}([\![\text{talked}]\!])([\![\text{Chitra}]\!])]$
≡ $\lambda p.\exists x[p =$Chitra talked with $x]$

(14)



RULED OUT by (8)!!!

Predictions Japanese lacks focus verb ending, but we can rely on the position of the Q-particle to tell whether the sentence constitutes a focus environment. Based on our theory, (15) should be a neutral context and (16) is a focus context. While (15) has plain quantificational use of wh-MO which participates in scope interaction, (16) only allows focus NPI usage of wh-MO, a fact predicted by our theory.

(15) hito-ga doko-mo-kara ko-nakatta
people-Nom where-mo-from come-didn't
People didn't come from everywhere. ($\forall > \neg$, $\neg > \forall$)

(16) hito-ga doko-kara-mo ko-nakatta
people-Nom where-from-mo come-didn't
People didn't come from anywhere. ($\forall > \neg$ only)

The effect of Spanish immersion schooling on the English comprehension of null subjects in child heritage speakers

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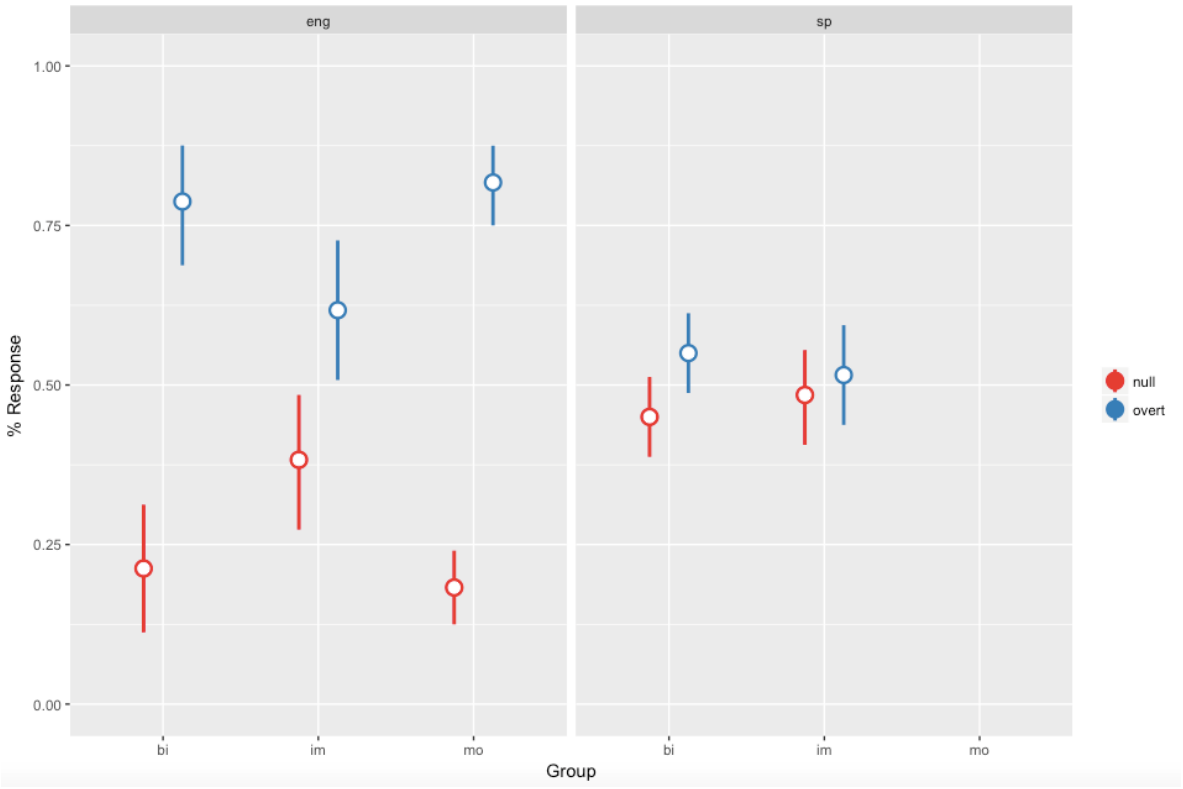
Heritage language bilingual children display differential outcomes to monolingual children and to dominant bilinguals in non-heritage contexts. Evidence that quantity of input influences the progress of bilingual development is robust, but less is known about input quality (e.g. Kupisch & Rothman, 2017). Though there is general consensus that bilingual first language acquisition entails the development of independent and parallel syntactic systems (Meisel, 1989), studies have found that some particular aspects of grammar, those that lie at the syntax-pragmatics interface such as the pro-drop parameter, are more likely to experience cross-linguistic influence in language contact situations (e.g. Muller & Hulk, 2000; Rothman, 2009). While researchers in monolingual child language have long noted the existence of a period of omitted subjects in the acquisition of languages which require overt subjects, like English, this null subject stage generally converges with adult-like patterns by age 4 (Orfitelli & Hyams, 2012). In languages such as Spanish that allow both null and overt subjects, children acquire the pragmatic conditions for their distribution by age 5 (Austin et al., 2017). This study aims to contribute to the understanding of the role of Spanish-English bilingual academic instruction on the comprehension of null subjects in English dominant heritage children living in the United States.

In this study, heritage speakers aged 4 to 7 attending a Spanish immersion (IM) school (n=16) and heritage speakers of the same ages attending an English monolingual (BI) school (n=15) completed an acceptability judgement task in both English and Spanish. The children were matched for proficiency and amount of exposure to Spanish in the home. English monolingual (MO) children (n=13) of the same ages completed only the English task. Following Sorace et al. (2009), the children watched video clips of Disney characters who acted out scenarios and then made statements involving null and overt subjects that were pragmatically felicitous or infelicitous in Spanish, and grammatical or ungrammatical in English. They were then asked to decide which of the characters spoke the target language ‘better’ in each statement.

The findings revealed differences between children in the IM school (39% acceptance of null subjects in English) and monolingual English children (19% acceptance of null subjects in English), but no significant difference in null subject acceptance in Spanish between the IM and BI bilingual groups. The BI group also performed similarly to the MO group in English. The differences between the IM and MO groups were statistically significant ($p<0.02$). These results suggest that immersion schooling does indeed play a role in the development of the pro-drop parameter, perhaps extending the English null subject stage in bilingual children due to conflicting input and increased activation of both languages in the same environment.

Fig. 1 Distribution by group of null and overt acceptance in English and Spanish

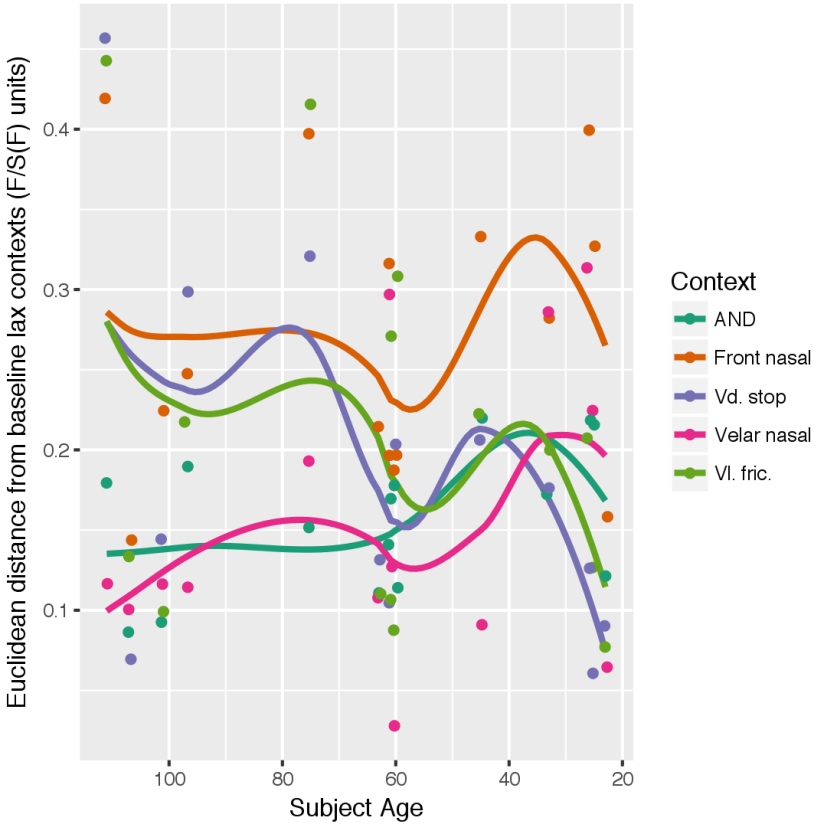


Parent L1-effects in NYC English short-a variation

Bill Haddican, Zi Zi Gina Tan, Sabrina Lagreca, Rebecca Rich, Kurt Werber, Michael Newman, Cece Cutler, Ariel Diertani and Christina Tortora (CUNY)

A set of recent studies has reported evidence of change in the New York City English (NYCE) short-a system (Becker and Wong, 2010; Becker, 2010; Newman, 2014; Newlin-Łukowicz, 2015; Coggshall, 2017). Taken together, these results suggest that the complex set of conditions on short-a tensing described in previous work (Trager, 1930; Labov, 1966, 2007) are increasingly absent in the speech of younger speakers, who tend instead toward one of several simplified systems. Importantly, with the exception of Newlin-Łukowicz (2015), none of the recent studies suggesting change have taken into account parent L1 in sampling independent of ethnicity, despite previous evidence of parent-L1 effects on short-a acquisition in different dialects (Payne, 1976; Labov, 2007). This poster reports on a recent production study intended to address this issue.

The data reported come from two sources: (i) a corpus of sociolinguistic interviews with 24 speakers from across the five boroughs and Nassau county; and (ii) oral history recordings from six Bronx residents gathered in the 1980s through the Bronx Oral History project. The thirty speakers are 16 women, 14 men, ranging in year of birth from 1906 to 1996, all native speakers of NYCE. Subjects are from a range of self reported ethnicities, with whites (n=20) over-sampled in an effort to test claims about white groups from Labov (1966). For half of the subjects, at least one parent was an L1 speakers of NYCE; for the other half both parents were non-native speakers. 9515 stressed short-a vowels were measured at 35% of duration using FAVE-Extract (Rosenfelder et al. 2014) and Prosodylab-Aligner (Gorman et al. 2011), via DARLA (Reddy & Stanford 2015).



LMER modeling with normalized F1 and F2 as the dependent variable reveals an effect of parent L1 independent of ethnicity, such that white subjects with at least one L1-NYCE-speaking parent better conserve Tragerian-system constraints for following voiceless fricative and *and* contexts, than those with no L1-NYCE speaking parent.

In addition, among whites with ≥1 NYCE-speaking parent (n=15), there is a following sound*age interaction on short-a, showing weakening of the Tragerian constraints as reported in the above literature. We illustrate this in the figure which shows, for

five environments, by-speaker mean euclidean distances from "baseline" lax context: voiceless stops, voiced fricatives and liquids. (Lines are loess smoothers.) The figure shows, for younger speakers movement away from lax realizations for traditionally lax environments *and* and velar nasals, and increased laxing for following voiceless fricatives and voiced stops.

A second issue addressed in this poster is possible change in the diphthongal quality of short-a. Traditionally, tensed realizations are described as ingliding diphthongs, and lax forms as more monophthongal (Labov 1966). A question that arises from the perspective of this description is whether the diphthongal quality of short-a is being lost in a way parallel to short-a tensing. We measured diphthongal quality for each token by taking the euclidean distance between nucleus and glide using the measurements for F1 and F2 at 20% and 80% of vowel duration. We used this measure as the dependent variable in modeling with log of vowel duration as a covariate. The analysis revealed an interaction between age and following sound, suggesting change in the diphthongal quality of short-a in different contexts that only partially follows the patterns of change observed for tensing. For younger speakers, following front nasal and *and* contexts show greater euclidean distance measurements relative to lax contexts, a result consonant with greater raising of the nucleus. The analysis revealed no reduction in euclidean distance measures for following voiced stop and voiceless fricatives contexts parallel to the change in F1 and F2 for the midpoint as described above. The results are consonant with the fact that, among olders subjects in the sample, tense short-a realizations with long diphthongal trajectories are relatively rare.

To summarize, this poster reports two main findings relevant to recent work on change in NYCE short-a: (i) evidence of change away from the Tragerian system controlling for ethnicity and parent L1; and (ii) evidence of change in the diphthongal quality of short-a conditioned in a way only partially parallel to change in location in F1∼F2 space.

Selected references:

Becker, K., 2010. Regional dialect features on the Lower East Side of New York City: Sociophonetics, ethnicity, and identity. Ph.D. thesis, New York University.

Becker, K., Wong, A. W., 2010. The short-a system of New York City English: an update. University of Pennsylvania Working Papers in Linguistics 15, 3.

Coggshall, E. L., 2017. Short-a in the Sixth Borough: A Sociophonetic Analysis of a Complex Phonological System in Jersey City. Ph.D. thesis, New York University.

Labov, W., 1966. The social stratification of English in New York City. Center for Applied Linguistics, Washington, D.C.

Labov, W., 2007. Transmission and diffusion. Language 83, 344–387.

Newlin-Łukowicz, L., 2015. Ethnicity, L1 interference, and sound change in New York City. Ph.D. thesis, New York University.

Newman, M., 2014. New York City English. Walter de Gruyter.

Payne, A. C., 1976. The Acquisition of the Phonological System of a Second Dialect. Ph.D. thesis, University of Pennsylvania.

Trager, G. L., 1930. The pronunciation of "short a" in American standard English. American Speech 5, 396–400.

Finite-State Models of Harmonic Serialism

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A foundational debate in the design of grammar formalisms for phonology is whether surface forms are derived from underlying forms *in series* or *in parallel*. The Sound Pattern of English (SPE) formalism of Chomsky & Halle (1968), following other generative approaches at the time, took the serial approach by casting phonology as a sequence of rules to be applied one at a time in a fixed order. Optimality Theory (OT, Prince & Smolensky 1993), on the other hand, simply views phonology as a mapping between surface and underlying forms, without considering this mapping to be decomposed into several derivational steps.

Computational analysis of SPE and OT shows that OT is strictly more powerful than SPE in the sense that OT can generate all input–output mappings that SPE generates, but not *vice versa* (Kaplan & Kay 1994, Frank & Satta 1998). This suggests any SPE analysis can be replicated in OT. However, OT cannot produce serial derivations, even though there are empirical reasons to believe that phonological derivations are fundamentally serial in nature. An example, due to McCarthy (2010), can be found in Macushi. In this language, unstressed vowels are deleted, as shown in the following data (Hawkins 1950).

(1)

Underlying	Intermediate	Surface
piripi	pirí.pí	prí.pí
wanamari	waná.marí	wná.mrí

(1) presents a problem for standard OT. The choice of which vowels to delete depends on which syllables are stressed, but EVAL does not know which syllable is stressed, since this information is not represented in the input to GEN. Instead, a natural analysis for (1) would propose that the surface form is derived from the underlying form in two steps. First, syllable boundaries and stress are assigned, resulting in an intermediate form. Then, unstressed vowels are deleted from the intermediate form, yielding the surface form.

This kind of analysis can be implemented in OT by modifying the framework to allow for opaque derivations. One such modification is *Harmonic Serialism* (HS), an alternate version of OT described in Prince & Smolensky (1993). In HS, surface forms are derived from underlying forms via a series of incremental changes. GEN is restricted so that candidates can only be obtained by inserting, deleting, or modifying one segment of the input. If the faithful candidate is chosen by EVAL, then that candidate is the surface form; otherwise, the grammar is applied to the winner again until a faithful mapping is obtained.

While HS allows for serial derivations, repetitive iteration of the grammar appears to be an extremely powerful mechanism, since all computable functions can be represented as iterated *finite-state transducers* (FSTs). On the other hand, the analysis of SPE by Kaplan & Kay (1994) suggests that phonological mappings are of at most finite-state complexity, and empirical work on the *subregular hierarchy* (Heinz et al. 2011, Chandlee 2014) suggests that they are even less complex. This presentation addresses the concern of iteration complexity by presenting a computational analysis of the serial derivations that appear in HS. From the analysis, the following formal results are

obtained about the expressive power of HS.

- An HS grammar describes a finite-state mapping as long as the sequence of changes it effects does not "change direction" arbitrarily many times.
- HS grammars with *positional faithfulness constraints* (Beckman, 1998) can generate arbitrary finite-state mappings as well as non-finite-state mappings.
- The length of an HS derivation, finite-state or not, is linear in the size of its input as long as markedness constraints are *tier-based strictly local* (Heinz et al., 2011).

These results follow from two key ideas. Firstly, HS has the property of *harmonic ascent* (McCarthy 2000), meaning that the behavior of EVAL is to choose candidates obtained from removing marked structure from the input. Secondly, a technique by Abdulla et al. (2003) allows us to simulate iterated length-preserving FSTs under certain conditions. When these conditions are met, HS grammars are guaranteed to be finite-state.

In conclusion, the contribution of this paper is as follows. Firstly, it presents a formal analysis of HS, investigating its expressive power. Secondly, it demonstrates that in practical cases, OT may be augmented with repetitive iteration without increasing its expressive power beyond that of FSTs.

References

Abdulla, Parosh Aziz, Bengt Jonsson, Marcus Nilsson & Julien d'Orso. 2003. Algorithmic Improvements in Regular Model Checking. In Warren A. Hunt & Fabio Somenzi (eds.), *Computer Aided Verification: 15th International Conference, CAV 2003, Boulder, CO, USA, July 8-12, 2003. Proceedings*, vol. 2725 Lecture Notes in Computer Science, 236–248. Berlin, Germany: Springer Berlin Heidelberg. doi:10.1007/978-3-540-45069-6_{25}.

Beckman, Jill N. 1998. *Positional Faithfulness*. Amherst, MA: University of Massachusetts Amherst PhD Dissertation.

Chandlee, Jane. 2014. *Strictly Local Phonological Processes*. Newark, DE: University of Delaware Phd dissertation.

Chomsky, Noam & Morris Halle. 1968. *The Sound Pattern of English*. New York, NY: Harper & Row 1st edn.

Frank, Robert & Giorgio Satta. 1998. Optimality Theory and the Generative Complexity of Constraint Violability. *Computational Linguistics* 24(2). 307–315.

Hawkins, W. Neil. 1950. Patterns of Vowel Loss in Macushi (Carib). *International Journal of American Linguistics* 16(2). 87–90. doi:10.1086/464069.

Heinz, Jeffrey, Chetan Rawal & Herbert G. Tanner. 2011. Tier-based Strictly Local Constraints for Phonology. In *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*, 58–64. Portland, OR: Association for Computational Linguistics.

Kaplan, Ronald M. & Martin Kay. 1994. Regular Models of Phonological Rule Systems. *Computational Linguistics* 20(3). 331–378.

McCarthy, John J. 2000. Harmonic Serialism and Parallelism. In *Proceedings of the North East Linguistics Society 30*, 501–524. Amherst, MA: GLSA Publications.

McCarthy, John J. 2010. An Introduction to Harmonic Serialism. *Language and Linguistics Compass* 4(10). 1001–1018. doi:10.1111/j.1749-818X.2010.00240.x.

Moreton, Elliott. 2008. Non-Computable Functions in Optimality Theory. In John J. McCarthy (ed.), *Optimality Theory in Phonology: A Reader*, 141–164. Oxford, United Kingdom: Blackwell Publishing Ltd. doi:10.1002/9780470756171.ch6.

Prince, Alan & Paul Smolensky. 1993. Optimality Theory: Constraint Interaction in Generative Grammar. Tech. Rep. 2 Rutgers University New Brunswick, NJ.

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"All" quantifiers can float, but not all quantifiers can float

Universal quantifiers (*all*/*both*/*each*) in Germanic/Romance differ from existential quantifiers and other functional elements in the nominal domain (e.g. Dem, Num, Poss), in that *they can float* (1). I argue that this follows from two exceptional properties of (universal) quantifiers: (i) all quantifiers are opaque to the Labeling Algorithm (Chomsky 2013), and (ii) *QP*-quantifiers (i.e., universal quantifiers at the top of the nominal domain; (2)) do not need to check Case in the syntax.

(1) a. The students$_i$ will *all/both/each* t$_i$ read two books.
b. *[(The) students$_i$ will *some/twenty* t$_i$ read two books.]
c. *Students$_i$ will *the/those/my* t$_i$ read two books.

(2) a. [$_{QP}$ **all** (of) [$_{DP}$ those [$_{NumP}$ twenty [$_{NP}$ students]]]] (English)
b. [$_{QP}$ **todos** [$_{DP}$ aqueles [$_{PossP}$ meus [$_{NumP}$ vinte [$_{NP}$ alunos]]]] (Portuguese)

Labeling: Chomsky (2013) argues that the label of a syntactic object SO created upon the merger of α and β is defined by a *Labeling Algorithm* (LA) applying at the point SO is transferred to the interfaces. LA identifies the closest head in SO = {α, β}, which thus provides the label to SO. If α is a head and β a maximal phrase, SO is labeled α(P). Though, Chomsky points out that the merger of two maximal phrases (SO = {WP, XP}) creates a labeling problem: Given that the heads W and X are equidistant to the SO node, LA cannot define the label of SO. Two possible solutions are available: (i) movement of WP or XP, which allows the remaining phrase to provide the label to SO (with traces being ignored by LA); (ii) feature sharing (agreement) between WP and XP, which allows SO to be labeled by the relevant feature. Note crucially that in a quantifier floating structure like (3), neither solution is available: Movement of neither QP nor XP takes place, and there is no feature sharing between QP and XP (note that while a QP can float in several positions in (4), the Labeling Algorithm is unforgiving to the DP in (5): There is no φ-agreement in those positions). The structure in (3) should thus be ruled out by LA, contrary to fact. Given what is known about the sentential spine and the selectional requirements of *will*, the ?-marked node in (3) must be labeled XP. In other words, LA must be oblivious to the quantifier and proceed directly to XP, seamlessly having XP project further. I propose this is indeed the case in quantifier floating.

(3) The students$_i$ will [$_{?}$ [$_{QP}$ all t$_i$] [$_{XP}$ read two books]]. {? {QP, XP}}

(4) The carpets will {all} have { } been { } being { } dusted for two hours. (Sportiche 1988)

(5) *[(There) will {the carpets} have { } been { } being { } dusted for two hours.]

Saito (2016) argues some elements are intrinsically opaque to (i.e. ignored by) LA. For instance, suffixal case in Japanese works as an *antilabeling device*, which among other things allows for multiple nominative subjects in the language (6). Assuming there is no φ-agreement in Japanese, DP-TP merger creates the phrase-phrase labeling problem. If the NOM-marked DPs are opaque to LA, LA search can proceed to TP, seamlessly labeling each relevant node as TP, as in (7).

(6) Bunmeikoku-ga dansei-ga heikin-zyumyoo-ga mizika-i (Japanese)
civilized.country-NOM male-NOM average-life.span-NOM short-PRES.
'It is in civilized countries that male's average life span is short.' (Kuno 1973, apud Saito)

(7) [$_{\mathbf{TP}}$ DP-NOM [$_{\mathbf{TP}}$ DP-NOM [$_{\mathbf{TP}}$ DP-NOM [$_{TP}$]

I extend Saito's proposal to quantifiers, which raises the question of why they can be opaque to LA. I suggest that this follows from a semantic requirement: A quantifier phrase is an operator that has its scope identified with respect to its sister, which requires that its sister projects (the sister thus being interpreted as the scope domain of the quantifier). Importantly, note that floating quantifiers are subject to scope-freezing, i.e., they must be interpreted in their surface position. I maintain that their being interpreted in that (floating) position is what allows for them to be opaque to LA, by necessity. In other words, floating is licensed by an interpretation output. In fact, the

property of being opaque to LA for interpretational reasons may apply to all quantifiers, not only to those that can float. Consequently, that allows for all quantifiers to QR at LF without creating a labeling problem (QR is thus another instance of phrase-phrase merger that can be resolved by the current proposal). In (8), for instance, the non-floating numeral *two books* can QR and merge with TP; being opaque to LA, the quantifier allows for the ?-marked element to be labeled as TP.

(8) a. Five students read two books. 5>2; 2>5

b. LF (inverse scope): [$_{?}$ [$_{NumP}$ two books]$_{i}$ [$_{TP}$ five students read t$_{i}$]] {? {NumP, TP}}

All quantifiers can QR, but not all quantifiers can overtly float, which is in fact our main question here. While the above proposal sets all quantifiers apart from other functional categories in the nominal domain, we still need to set QPs apart from other categories in the nominal domain (including existential quantifiers). That brings us to the second exceptional property of QPs.

Case: Quantifiers of category QP are exempt from the Case filter in the syntax (i.e., they do not need to be licensed for abstract Case, although they can), which grants them the ability to surface in positions where DPs (and smaller categories) are ruled out. Take for instance the quantifier *each/cada um* (9). In both English and Portuguese, the DP is licensed by the (partitive) preposition *of*/*de*, while the QP is licensed with nominative Case by being in the (non-floated) subject position. That shows that QP and DP bear two independent Cases (i.e., there is no Case transmission or concord here). When floating occurs in (10) the DP is licensed with nominative (note the absence of *of/de*). Thus, there is no abstract Case left for the quantifier, and yet the sentence is grammatical. I conclude that the QP can escape the Case filter in the syntax. That property is now restricted to quantifiers of category QP (as expected given the paradigm in (1) above). Moreover, this is further evidence for the noun-clause parallelism: While Bošković (1995) argued that CPs are only optionally assigned Case, I argue the same applies to the highest layer of the nominal domain, QP.

(9) a. *Each* **of** the students read two books. (English)

b. *Cada um* **d**os alunos leu dois livros. (Portuguese)

(10) a. The students read *each* two books. (English)

b. Os alunos leram *cada um* dois livros. (Portuguese)

Additional evidence for the proposal above comes from Brazilian Portuguese (BP). Contrary to European Portuguese and Spanish, BP disallows VSO order; (11a). Although locative inversion facilitates VS order (cf. (11b), where the PP is analyzed as receiving nominative Case while the subject is licensed with partitive; Avelar 2009), it is still not enough to license VSO order. A NumP e.g. in (12) is thus ruled out, for while the locative PP gets nominative and the direct object gets accusative, there is no Case for the subject. The prediction of the proposal that QPs do not need abstract Case is thus that QP subjects should be licensed in that construction, which is borne out, as is shown by the grammaticality of (12) with a QP. As the QP also does not pose a labeling problem, it may surface in that position, where any other nominal category is excluded in BP.

(11) a. *Comprou o João um computador. b. Nessa fábrica trabalha várias pessoas. (BP)
bought the John a computer in-this factory works several people

(12) Nessa fábrica comprou **várias pessoas* / *cada um* um computador.
in-this factory bought *several people / each one a computer

This paper addresses the question of why only one category in the nominal domain (i.e. QP) can appear in the so-called "floating" construction. Taking this to be an exceptional behavior, I tackle the question of what makes QPs exceptional. The analysis proposed here allows us to bring closer a number of constructions involving quantifiers (e.g. floating, raising, and exceptional VSO in BP). The analysis also provides additional evidence for Saito's (2016) proposal that some elements are inherently opaque to LA, and ultimately sheds further light on the Labeling Algorithm itself.

The difference between perception and production of prosodic information in Chinese *wh*-scope disambiguation

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Research Question: This study aims to investigate whether the same prosodic strategies are used to disambiguate sentence meanings in production and perception by focusing on *wh*-scope ambiguous sentences like (1) in Mandarin Chinese. As in (1), sentence final particles such as *-ma* and *-ne* are intentionally excluded in order to examine the prosodic effect independently. We conducted two experiments: production test and perception test.

(1) Zhengzhi wen-guo Lisi jian-guo shui?
Zhengzhi ask-Perf Lisi meet-Perf who
a. 'Did Zhengzhi ask who Lisi met?' (embedded scope reading of *wh*-phrase)
b. 'Who did Zhengzhi ask whether Lisi met?' (matrix scope reading of *wh*-phrase)

Experiment 1: We created four sets of stimuli. Each set consisted of eight conditions (=2*2*2: subject/object wh-phrase position, default/A-not-A construction, regular/D-linked wh-phrase). For each sentence, the contexts leading to different scope readings were provided. The participants (N=13) read each context first and were recorded while reading the target sentences.

Result: The lowest and highest pitch heights of wh-phrases, matrix and embedded verbs were measured. All data were normalized with Z-score. The biggest pitch excursion (linear regression: $p < .05$) was found on the *wh*-phrase for the matrix scope reading as in (2), and we also found that matrix verbs and embedded verbs are prosodically focused contingently upon syntactic structures and *wh*-phrase types.

(2) The pitch excursion on *wh*-phrases

Wh-type	A-not-A	Embedded Scope	Matrix scope	*p*-value
D-linked *wh*	No	1.918692	2.020285	< .05
Regular *wh*	No	1.257796	1.400369	
D-linked *wh*	Yes	1.604984	1.818547	
Regular *wh*	Yes	1.016003	1.222323	

Experiment 2: In the perception test, the same stimuli from Experiment 1 were utilized. A Mandarin native speaker recorded two versions of every target sentence by using prosodic strategies observed in Experiment 1. The 64 target sentences intermingled with 112 fillers were distributed across 4 sets in a Latin Square Design. The participants (N=30) were asked to choose one of the given answers as in (3) after listening to the audio file.

(3) Q: Zhengzhi wen-guo Lisi jian-guo shui? (Audio)

A: a. Shide('Yes', embedded reading of *wh*) b. Liujun('Liujun', matrix reading of *wh*)

Result: As in (4), the prosodic cues shown in the production test do not play a role in disambiguating *wh*-scope ambiguity in Chinese.

(4)

	Embedded scope prosodic cue	Matrix scope prosodic cue	p-value (logistic regression model)
Matrix scope reading	60%	65%	0.21

The prosodic patterns marking *wh*-scope found in Experiment 1 was not salient enough to determine the *wh*-scope in perception.

Discussion: This study shows that there is a mismatch between speakers' encoding and hearers' decoding of *wh*-scope information. This result is surprising compared to the prosodic effect on *wh*-scope in Japanese and Korean (henceforth, J&K). As a tonal language, Chinese is typologically different from J&K. The prosodic cues in J&K are crucial to distinguish the two *wh*-scope readings because the span of deaccented phrases exactly matches the range of syntactic/semantic *wh*-scope. Thus, the sentence level prosodic pattern reflecting speakers' intention can help hearers to decide *wh*-scope in J&K (Hwang 2011). In Chinese, since lexical tones should be reserved, the prosody at the sentence level, however, is restrained by the lexical prosody (Jun 2005). In sum, there is an asymmetry of disambiguating strategies between production and perception in Chinese.

References:

Jun, S.A. 2005. *Prosodic Typology: The Phonology of Intonation and Phrasing.* Oxford University Press.

Hwang, H.K. 2011. Scope, Prosody, and Pitch Accent: the Prosodic Marking of *Wh*-scope in Two Varieties of Japanese and South Kyeongsang Korean. Doctoral dissertation, Cornell University.

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ASL Register Variation L2 Interference: An Analysis of Nyle Dimarco's Speech

Introduction: We did an analysis of ASL register variation, by comparing a speaker's intrapersonal variation. We compared the two registers that operate at opposite ends of the spectrum: Informal and Formal. The speech samples utilized for this analysis were pulled from the speaker's Youtube vlogs. Wehypothesized an increase in English L2 interference in the formal register.. We found that in the formal register, DiMarco exhibited increased instances of accessing SAE in comparison to his informal speech sample. The parameters that we elected to analyze were fingerspelling, SAE preposition use, word order, and Non-manual markers.

Previous: In prior literature by Valli and Lucas (2000) it is shown that, across registers, we expect to find language usage differences within a single speaker of ASL. While Valli and Lucas discuss the grammatically permissible ways in which ASL may shift across registers, such as reduced perseveration or varying permissible lexical items, they do not discuss the specific influence of bilingualism on Deaf speakers. The prior literature we reviewed also does not discuss the potential ways in which a speaker who is fluent in both ASL and SAE may exhibit interference from L2 languages. Research exists for this in spoken languages, but less is present for sign languages.

Methods: We elected to focus on a single speaker. We chose Nyle DiMarco, who has stated in interviews that he has Deaf family, and did not learn oralism. He is an L1 user of ASL, with proven fluency in SAE as his L2. He went to Deaf residential schools through high school, and has a Bachelors in Mathematics from Gallaudet University. We analyzed 2 vlogs for informal speech samples, and 2 formal examples. We glossed an equivalent amount of speech time in the formal samples as the informal samples. Annotations were done using ELAN 4.9.1, with consulting input from a native Deaf user of ASL and SEE, with proven fluency in both SAE and ASL. We did not seek to ascribe potential reasons for why utterances were done, as that can be highly subjective. Instead, we chose to document visible speech utterances and quantify them accordingly.

Findings: We found an increased rate in fingerspelled utterances that were used to access a specific SAE lexical item within the formal example (see example 1). When discussed with the consultant, we were advised that these were lexical items did have ASL equivalents. There were 8 unique tokens of fingerspelled words that directly accessed an SAE word, in lieu of its equivalent ASL sign. Within the informal speech sample, only 4 instances occurred. Nyle also exhibited an increased rate of SAE preposition use in the formal sample (see example 2). We had predicted a more drastic shift in ASL-to-English word order, but the subject did not exhibit this behavior. His word order was consistent across both registers, except for one anomalous example of prescriptive ASL question structuring(see example 3). He also exhibited a L1 inteference, where "what" was signed in both the SAE and ASL word order locations. Finally, Nyle also showed decreased rate of non-manual markers. The most consistent NMS that he used were eyebrow raises for topicalization. The biggest difference aside from decreased rate of NMS was that he also chose to mouth specific SAE borrowings in the formal sample (see example 4).

Conclusion: Overall, we found that the speaker confirmed our hypothesis. This behavior was consistent across 3 of the 4 parameters analyzed. This research could potentially be expanded to see if this is a feature unique to DiMarco, or if it is consistent across bilingual ASL and SAE speakers. Additionally, research could also be done to continuing mapping out the borders between SAE and ASL, especially where speakers have a lower fluency in English.

Fingerspelling example:

(1) a. **Informal:**

mouth: "stay that way"
...PRO$_1$ THINK PRO$_1$ NEED ONLY STAY THAT W-A-Y
"...I think I just need to stay that way."

b. **Formal:**
THINK R-A-R-E OPPORTUNITY FOR PRO$_1$
"I think this is a rare opportunity for me."

SAE Preposition Example:

(2) a. **Informal:**
LOOK-FORWARD **TO** THIS MONDAY, LOOK PRO$_1$ **ON** L-I-V-E PRO$_2$
"Look forward to watching me this monday, Live!

b. **Formal:**
REALLY VERY HONOR **TO** B-E THIS PERSON
"[I'm] really very honored to be this person."

c. AND LAST, WANT THANK-YOU PRO$_2$ sign name: TUDOR T-U-D-O-R AND #MD INSTITUTE **FOR** mouth: encourage me man I am now: ENCOURAGE PRO$_1$ MAN PRO$_1$ A-M NOW THIS
"And lastly, I want to thank Tudor, and the Maryland Deaf Residential school, for encouraging me to be the man I am now, here."

Word Order:

(3) **Formal:** I-F NOT FOR IX-RIGHT #MD INSTITUTE,
rhet: PRO$_1$-POSS SUCCESS WILL? DON'T-KNOW
"I don't know if I'd be successful without the Maryland Residential Deaf school."

Non-manual Markers

(4) a. **Informal:**

nms-purse-lips: THINK THIS-WEEK PRACTICE 1-WEEK PERFECT
"I think practice has gone perfectly this week."

b. **Formal:**

...THIS EVENT INTEGRATE FOR PRO$_2$-PL, PRO$_1$-PL nms: Ø: THUS-FAR PERFECT
"This event has played out perfectly, so far."

References: ELAN (Version 4.9.1) [Computer software]. (2017, April 18). Nijmegen: Max Planck Institute for Psycholinguistics. Retrieved from https://tla.mpi.nl/tools/tla-tools/elan/. Governor Larry Hogan Honors Maryland Native and Deaf Advocate Nyle DiMarco. (2016, September 26). Retrieved November 21, 2017, from https://www.youtube.com/watch?v=sx3N7QXijvg. **DiMarco**, N. "nyle222". (2016, March 18). VLOG: DWTS Week 1 — Nyle DiMarco. Retrieved November 21, 2017, from https://www.youtube.com/watch?v=PdXDX6oq6bE. **Valli, C.**, and Lucas, C. (2000).*Linguistics of American sign language: An introduction.* Gallaudet University Press.

A Decomposition Analysis of Color Terms in Korean

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Introduction. Although adjectival meaning and structure have been well studied, there have been relatively few investigations of color adjectives (Kennedy and McNally, 2010, Hansen and Chemla 2017 a.o). In this paper, we bridge this gap by providing a decomposition analysis of color terms in Korean. Korean color terms come in two forms: native Korean roots, and borrowed Chinese roots. We propose that Korean color terms start out as property-concept roots and then combine with functional heads in the syntax to derive adjectival meaning. We show that both Chinese and Korean have to be nominalized or turned into a verbal predicate in order to appear in canonical adjectival positions, such as attribution or predication.

Color Terms in Korean. It has been controversial whether Korean has adjectives (Maling and Kim, 1998; Kim, 2002). Our decomposition analysis of color terms in Korean shows that color terms have more complex structure. First, there are two different expressions for color terms-borrowed Chinese roots (Class C), or native Korean roots (Class K). In both these classes, there is an addition of the morpheme *-sayk* (which means 'color'), to the end of the root. The *-sayk* ending is optional in the verb form when saying, for example, 'the car is blue-colored'. See below for an exhaustive table (1) illustrating the color terms in Korean.

(1)

English	Chinese Root (Class C)	Korean Root (Class K)	Verbal Form	Verbal Morphological Gloss
white	baek	hayan/hueen	hueen-sayk-(i-da)/haya-da	White-color (is)/White-colored
black	heuk	geomeun/kkaman	geomeun-sayk-(i-da)/kkama-da	Black-color (is)/black-colored
red	jeok /hong	ppalkkan	ppalkkan-sayk-(i-da)/ppalkka-da	Red-color (is)/Red-colored
yellow	hwang	noran	noran-sayk-(i-da)/nora-da	Yellow-color (is)/Yellow-colored
blue	cheong	paran	paran-sayk-(i-da)/para-da	Blue-color (is)/Blue-colored
green	chorok/nok	paran		
purple	jaju	bora		
orange	juhwang	-------		
pink	bunhong	-------		
grey	hoe	-------		

Observations. Color terms in Korean follow a pattern, namely, lower level color terms (i.e. color terms that develop in cultures first) such as *white*, *black*, *red*, and *yellow* have both Chinese and native Korean roots. Blue and green also have a Chinese and native Korean root, however there is a possibility of the 'grue' phenomenon occurring, i.e. the language might not have a true concept of blue vs. green, but rather a process which combines them into one blue/green definition in a native Korean term (e.g. *paran*). Where higher color terms are concerned, such as orange, pink, and grey, there is only a Chinese root, and in some cases, an English borrowing.

Analysis. We propose that the Korean roots and the Chinese roots start out as property concept expressions. However, their syntactic behavior differs as they combine with different functional heads. The native Korean roots, Class K, combine with a null verbal element and then combine with the nominal functional head, therefore being nominalized by the nominal marker *–sayk* (1). The semantics of the null verbal element is given in (2) where *Π* is a metavariable over property concept denoting expressions.

(1) Class K derivation
   a. [√hayan $\varnothing_v$] – sayk
   b. $[\![\varnothing_v]\!] = \lambda\Pi.\ \lambda x.\ [\Pi\ (x)]$

(2) $[\![$*hayan-sayk*$]\!] = \lambda x.$ [*x* is an instance of white color]
   Lit. 'being an instance of the property of white color'

Chinese roots are borrowed roots and hence they combine with a different functional head. This head is a nominal head that spells-out as *–sayk*.

(3) Class C derivation
   a. [[√baek + sayk_n]
   b. $[\![\text{-sayk}_n]\!] = \lambda\Pi.\ \lambda d.\ \lambda x$ [*x* is an instance of *Π* and $\mu(x) \geq d$]

(4) $[\![$*baek-sayk*$]\!] = \lambda x\ \exists d$ [x is an instance of whiteness and $\mu(x) \geq d$]
   Lit. 'being an instance of the property of white color measuring to some degree'

The evidence for the null verbal element comes from the fact that only Class K roots can participate in verbal forms, such as (5).

(5) a. hueen-sayk-i-da
      'white color is'
   b. hueen-sayk-haya-da
      'white colored'

Class C nominals can appear in comparative constructions only with the degree marker 'more'.

(6) i shirt.nun gu shirt poda daw baek.sayk(i-da)
   This shirt.top that shirt than more white colored(is)
   'This shirt is more white than that shirt.'

Follow-up survey. To test the use of Class C and Class K color terms, we are currently running a forced choice elicitation task. In the experiment, participants will either be asked to make a forced choice which involves a picture and a question asking the participant to choose which color from a list matches the image best. The second question type will be a fill-in-the-blank option where the participant will be able to write in their own option (in Korean) that best describes the image, eg. "The flower is _____ colored.".

Conclusion. We have shown that Korean color terms do not start out as lexical adjectives. They derive their adjectival meaning using functional heads in syntax. Two different functional heads derive adjective-like meaning. This account has consequences for degree semantics and the functioning of comparatives and degree expressions in the language.

Selected References. Hansen, Nat and Emmanuel Chemla. 2017. Color Adjectives, standards, and thresholds: an experimental investigation. *Linguist and Philosophy (2017) 40,* 239-278. doi: 10.1007/s10988-016-9202-7. ✷ Kim, A. 1985. Korean Color Terms: An Aspect of Semantic Fields and Related Phenomena. *Anthropological Linguistics, 27*(4), 425-436.

Gender difference in syntactic acceptability judgments

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While both large-scale experimental collection of grammaticality judgments and native speaker intuitions have been shown to be reliable methods of collecting grammaticality data (Sprouse and Almeida 2012, Sprouse 2011), over a large group, subjects identifying as female give on average 0.58 higher ratings to test sentences on a 1-7 scale than do subjects identifying as male. In areas where judgments are particularly nuanced or used in a comparative way, the gender makeup of subject pools could significantly alter the conclusions a researcher might draw from data. For instance, if one subject pool contains 90 females and 10 males and the next day's subject pool contains the inverse distribution, identically grammatical sentences on the second day will, on average, have a significantly lower rating.

The data to support this claim come from over 4000 individual sentence judgments from 300 unique native English speakers (150M, 150F), ages 18-71 on Amazon Mechanical Turk. Subjects rated a variety of English sentences, from grammatical (1) and ungrammatical fillers (2) to less clearly grammatical constructions (3-5) on a 1-7 grammaticality scale.

(1) Mitch never believed in the tooth fairy.

(2) *Carol jumps more than.

(3) ?Mary always probably kicked with her right foot.

(4) ?Which motorbike did Nick assume Roy earnestly to have driven too fast?

(5) ?Sandra allowed Max reluctantly to use her car.

No mention of gender was made in the task description, though gender information was anonymously collected as a fill-in-the-blank item along with other demographic information like age and native language. Although there were no significant differences found among different age groups or native language groups, female subjects rated grammatical and test types of sentences significantly higher ($p < .001$) than did males, as shown in Table 1. They also rated ungrammatical fillers significantly lower than male subjects.

Sentence Type	**Gender**	**Avg. Rating**	**St.Dev**
Grammatical	Female	6.67	.58
	Male	6.08	1.17
Ungrammatical	Female	1.44	.50
	Male	1.68	.79
Test Item	Female	4.10	1.45
	Male	3.52	1.71

Table 1: Acceptability ratings by gender

What might explain this difference? It is well-known that women are often innovators of language change (Labov 2001), adapting new constructions and linguistic trends on the

whole before men do. Thus it may be that women are more adaptable regarding nonstandard language in general, especially with less commonly heard constructions like (3). Labov also describes women as being less likely to use clearly nonstandard forms, which may contribute to their lower ratings ('stronger reactions') towards clearly ungrammatical fillers. Societal factors may also point to women being more accepting in general, in the sense that women have been shown to be more accommodating when it comes to stigmatized physical appearance (Latner et al. 2005) or behavior (Martin 1990) and may have internalized values of tolerance or cooperation more than men have. The result could also be tied to the particular subjects used (who were in this case recruited online). Perhaps in-person groups of subjects would behave differently, although preliminary data (based on 25 female and 15 male subjects) indicate that women's judgments are still higher in test sentences ($p < .05$) when recruited offline.

Though it can be assumed that most subject pools are homogeneous enough to not cause inaccuracies in conclusions drawn from acceptability judgments, researchers should consider collecting gender data from participants to ensure that gender is not responsible for skewing any of their results.

References

[1] Sprouse, J. (2011). A validation of Amazon Mechanical Turk for the collection of acceptability judgments in linguistic theory. *Behavior research methods* 43 (1), 155-167.

[2] Sprouse, J. and D. Almeida (2012). Assessing the reliability of textbook data in syntax: Adger's core syntax. *Journal of Linguistics* 48 (03), 609-652.

[3] Labov, William (2001). *Principles of Linguistic Change*, Vol. 2: Social Factors. Malden, MA: Blackwell Publishers Inc. pp. 261-293.

[4] Latner, J. D., Stunkard, A. J., & Wilson, G. T. (2005). Stigmatized students: age, sex, and ethnicity effects in the stigmatization of obesity. *Obesity*, 13(7), 1226-1231.

[5] Martin, C. L. (1990). Attitudes and expectations about children with nontraditional and traditional gender roles. *Sex roles*, 22(3-4), 151-166.

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Effect of Speaker on the Nonword Repetition Task in Monolingual and Bilingual Children and Adults

Keywords: language acquisition, bilingualism, sociolinguistics, nonword repetition task, social biases, children

Background: It is known that children as young as 14 months have a preference for their peers when imitating familiar gestures and remembering novel information (Ryalls et al. 2000, Zmyj et al. 2012). What is not well understood is the role of this 'peer-model advantage' in relation to monolingual versus bilingual language development. For children that speak a different home language and begin school with little knowledge of English, it was predicted that the peer-model may be more salient than for monolingual children since peers are a source of a language that they do not hear at home and there exists strong social pressures to learn English. It was found that in fact, there is an adult voice advantage for all groups.

Methodology and Participants: In this project, I investigate if monolingual and sequential bilingual children treat adult and peer voices differently using a nonword repetition task and a post-testing questionnaire about attitudes towards two voices heard during the experiment. 36 4-6yr old children of both language backgrounds were tested as well as 24 monolingual and bilingual adults. All participants were asked to repeat 16 nonwords of 1, 2, 3, and 4 syllables (e.g. /tʃoʊvæg/, /nɑɪtʃɔɪtɑʊvub/) taken from Dollaghan & Campbell, 1998. The stimuli nonwords were read by a 5 year old peer and by a 35 year old adult in counterbalanced orders. Repetitions were scored for phoneme accuracy, pitch matching, and word duration matching. After the nonword repetition task, participants were asked "What was your favorite voice? Why? What voice was easier to understand? Why?".

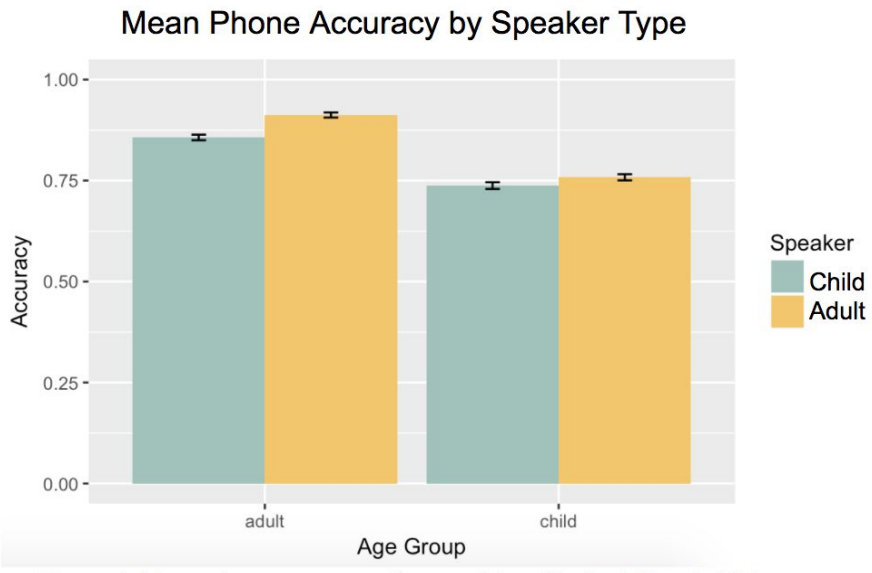

Figure 1: Mean phone accuracy (score of 1 or 0) of adult and child participants on adult and child input speakers

Results: Preliminary results suggest that there is an adult voice advantage for verbal repetition. Repeating after an adult voice yielded higher accuracy for adults and children of both language backgrounds at a significance of $p < .0001$. Surprisingly, there was no significant differences between bilingual and monolingual groups ($p < .18$). Figure 1 shows that children and adults both had significantly better

performance on the adult speaker in the nonword repetition task. Figure 1 collapses both bilingual and monolingual participants because, as previously mentioned, there was no significant difference in accuracy between the two groups. Length of the nonword (1-4 syllables) also had a significant effect on phoneme accuracy ($p < .0001$).

On post-testing questions adults of both language backgrounds rated the adult voice to be both 'favorite' and 'easier' at significant frequency ($p < .001$). However, both monolingual and bilingual children rated the adult voice as 'favorite' and 'easier' at chance. Similar to accuracy scores on the nonword repetition task, language background seems to not play a role in the social perception of the two voices in post-testing questions.

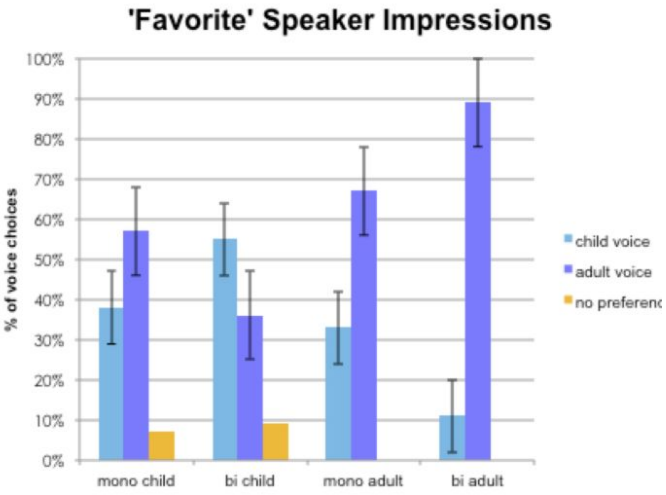

Figure 2: Percent of choice for 'favorite' input speaker by age and language experience

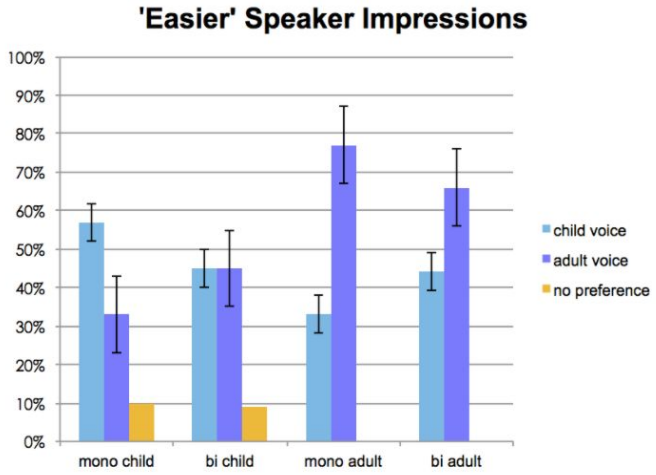

Figure 3: Percent of choice for 'easier' speaker by age and language experience

Discussion: Though children may show a peer-model advantage on motor repetition tasks, these findings suggest the preference for peers is not true for language repetition. These findings are evidence against the initial hypothesis that sequential bilingual children may be more receptive to peer input than monolingual peers on both verbal repetition and social perception measures. This study confirms recent findings by Cooper et al. that found that toddlers preferred adult speech models over own voice and peer voice models in an eye-tracking task. This recent study as well as the present study are invitations to further explore the intricacies of peer versus adult model preferences.

References: Cooper, A. et al. (2018). Toddler's Comprehension of adult and child talkers: Adult targets versus vocal tract similarity. *Cognition.* 173 pp. 16-20. || Dollaghan, C., & Campbell, T. F. (1998). Nonword repetition and child language impairment. *Journal of Speech, Language, and Hearing Research,* 41, 1136-1146. || Ryalls, Brigette Oliver, et al. "Infant Imitation of Peer and Adult Models: Evidence for a Peer Model Advantage." *Merrill-Palmer Quarterly,* vol. 46, no. 1, 2000, pp. 188–202. || Zmyj, Norbert et al. "The Peer Model Advantage in Infants' Imitation of Familiar Gestures Performed by Differently Aged Models." *Frontiers in Psychology* 3 (2012): 252. *PMC.*