Ling 251, Topics in phonetics & phonology
Fall 2017, Kie Zuraw
Tuesdays & Thursdays 4:00-5:50 PM, Haines 110

Production planning and phonological grammar

Day 1, which will also serve as syllabus

28 Sept 2017 (Thursday of Week 0)

A convention I use in handouts: open circle means this is a question for you, a point for discussion, etc.

1. A thought experiment

- What does it take to pronounce the following sequence (adapted from Keating & Shattuck-Hufnagel 2002)

Japanese antique nineteen twenty-five motorcars[1]

Things to keep in mind

- metrical grid of each word in isolation
- application of English Rhythm Rule
  - constraint: NoClash
  - possible repair: move grid-mark left
    cf. Vogel, Bunnell & Hoskins 1995: phonetically, the Rhythm Rule is more de-accenting than accent shift (but no comparison to underlying σσ)
- could some chunks of this be pre-memorized?
- how might the process differ depending on time pressure or amount of preparation?

Closest relevant study: Hammond 1999 (judgments from English-speaking linguists)

- more shift for prefixed word1 (*málfòrmed thíng*)
- if word1 not prefixed, more shift when word1 is higher frequency (*<u>antique</u> book* vs. *<u>urbane</u> world*)
  - opposite trend in prefixed word1s!

[1] picture: a 1925 Otomo, from www.inmygarage.com. According to Japanese wikipedia, the brand name was inspired by the word *Automobile* (thanks to Roslyn Burns for pointing this out) and the inventor's ancestral surname *Omotoro*.

2. Similar case but longer-distance: Dutch adverbial stress retraction

Gussenhoven & Jacobs 1998

- *altíjd* 'always' becomes *áltijd* because if there is a following major stress within same Intonational Phrase:

(Naar de **wá**terstanden luistert ze al**tíjd**)$_{IntP}$ *no shift:* altijd *<u>after</u> other stress*
to the water-level-reports listens she always
'To the water level reports, she'll always listen.'

(**Ál**tijd luistert ze naar de **wá**terstanden)$_{IntP}$ *shift*
always listens she to the water-level-reports
'Always she'll listen to the water level reports.'

(Ze luistert **ál**tijd naar de **wá**terstanden)$_{IntP}$ *shift*
she listens always to the water-level-reports
'She'll always listen to the water level reports.'

(Waar ze al**tíjd** naar luistert)$_{IntP}$ (zijn de **wá**terstanden)$_{IntP}$ *no shift: IntP boundary*
where she always to listen are the water-level-reports
'What she'll always listen to are the water level reports.'[2]

[2] picture: a Dutch water level meter, by Niels Bosboom, from Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Normaal_Amsterdams_Peil_-_Woerden.jpg

3. Same thought experiment, different phenomenon

- Raddoppiamento Sintattico in Standard Italian and non-Northern similar varieties

Data from Absalom, Stevens & Hajek (2002)

- Doubling of word-initial consonant, if preceded by…
  - stressed vowel

    /dúe káni/ → [dú:e **k**á:ni] 'two dogs'
    /tré káni/ → [tré **kk**á:ni] 'three dogs'

  - plus certain function words

    /a miláno/ → [a **mm**ilá:no] 'to Milan'
    /kóme vá/ → [kó:me **vv**á] 'how's it going'

- What would it take to decide how to pronounce these?

  /ʧittá bélla/ /víta bélla/
  'beautiful city' 'beautiful life'

Things to keep in mind

- How is this different from the Rhythm Rule example?
- What kind of **planning window** is necessary/relevant?

4. One last thought experiment

- 3rd tone sandhi in Standard Chinese—a case we'll come back to later in the quarter!!
  - When two "third tones" (low dipping) in a row, first one becomes "second tone" (rising)

    /xiao3 ma3/ → [xiao2 ma3] 'little horse'

- What would it take to decide how to pronounce these? Differences between the two cases?

/lao3 li3 mai3 hao3 jiu3/ old Li buy good wine	'Old Li buys good wine'[3]
/xiao3 ma3 hen3 you3-hao3/ small horse very friend-good	'The small horse is very friendly' (Lin 2015)

- Depending on whose theory you believe (Lin 2015), the options could include:

  [**2** 3] [3 [**2** 3]]

  [**2 2**] [3 [**2** 3]]

  [**2** 3] [**2** [**2** 3]]

  [**2 2**] [**2** [**2** 3]]

Things to keep in mind

- How might the outcome change depending on the planning window?
- If you wanted to avoid overapplication (counterbleeding), how would your planning needs change?
- Lin observed many patterns that were not predicted by any theory and speculates that local speech planning could be responsible

⇨ Variation in all these rules could be sensitive to what information is available at the point where the rule has to decide whether it's applying

[3] The classic sentence—Cheng 1973 is earliest source I found.

5. Wagner's Production Planning Hypothesis

Wagner 2011, bulleting added (p. 161):

> "The hypothesis that across-word-boundary phonological processes (sandhi phenomena) are constrained by the locality of production planning
>
> - can explain why they tend to be variable
>   - speakers don't consistently encode the next phonological word
>   - so the conditioning environments may not be present
> - and makes new predictions for what types of processes should obey what type of locality pattern
>   - regressive processes should tend to be more variable than progressive ones
>   - processes should be more local when sensitive to low-level segmental information than higher level information since it is encoded later"

6. Things that are thought to affect the planning window

I cheated from overviews in Kilbourn-Ceron 2017a ch. 1—we will read more about most of these claims later, so see there or then for references

- Detail increases during planning
  - a word's syllable pattern is retrieved before its segments
  - /wSw/ before /bənænʌ/
- Windows with sharp edges are an idealization
  - we can start planning *antique* before we're finished planning *Japanese*
  - words further out are planned with less detail

  Japanese antique motorcars
- Phonological content might be retrieved only about one word ahead
  - Sternberg et al. 1978: when given a list of words to prepare and say, speakers take longer to start talking when the list has more words
  - they're also slower when the first word in the list has more syllables
  - but length of second word doesn't matter

banana **peach** pear pineapple	*takes longer than*	**peach** **banana** pears pineapple
pear **banana** **peach** pineapple	*takes same as*	pear **peach** **banana** pineapple

- Planning window gets longer when the first word in it is short
  - *Japanese nineteen-twenty-seven motorcars*
  - *Japanese antique motorcars*
  - Finding (Griffin 2003) comes from just naming pairs of objects though, so more like

    octopus knife owl knife
- The more frequent (or predictable, including syntactically) an upcoming word is, the sooner it's available
- Strain on working memory, and other "cognitive load", can slow down planning, reduce size of window
  - We can experience this consciously in daily life: if someone asks me a question while I'm playing guitar, I can only answer about one word at a time

- If time, let's discuss predictions of these findings for the phenomena above

7. Outline with sample works

1. The Production Planning Hypothesis
   see below
2. Speech planning basics: models and findings
   focus on reviews and overviews: Keating & Shattuck-Hufnagel 2002, Wheeldon 2013, Goldrick 2014, Buchwald 2014, Shattuck-Hufnagel 2014
3. OCP (repetition avoidance) and anti-OCP as a speech planning effect?
   Walker, Hacopian & Taki 2002, Frisch 2004, Rose & King 2007
4. Planning and directionality
   Tsay & Myers 1996, Politzer-Ahles & Zhang in press, Chen & Chen in press
5. (Self-)counterbleeding (and self-counterfeeding) as planning failure
6. Look-ahead (and its limits?)
   Advance planning of f0 (thanks to Susie Curtiss for this idea)
7. Phonetic and phonological paradigm uniformity
   Bermúdez-Otero 2010, Seyfarth et al. 2017
8. Speech planning and word structure
   Himmelmann 2014
9. Proposals about the relationship between grammar and planning
   (Zuraw 2009), (Bermúdez-Otero 2012), (MacKenzie 2012), (Smolensky & Goldrick 2016), (Tamminga, MacKenzie & Embick 2017)

- This will adapt as we go and you can suggest readings. In some cases I have more readings in mind than we can realistically cover and we can decide together which ones look best.

8. Big-picture questions we probably won't answer

- These questions loom behind everything, but I don't think we'll answer them
  - Is there a separate phonological grammar (that feeds into the processing system)?
  - Or is the grammar just a different level of description of the processing system?
  - If the grammar is a separate module, what kinds of information does it exchange with speech planning?
- We will check out proposals that incorporate aspects of speech planning into the grammar
  - and see what we think of these instances of breaking down the barrier
  - We'll also check out proposals on how to keep things separate
- I think that knowing more about speech-planning effects on observable phonological phenomena is a necessary prerequisite to thinking about the above questions

9. Question that will be largely outside the scope of this course

- What is the best model of speech planning?
  - Size of look-ahead window
  - Amount of "look-upwards" to, e.g., higher prosodic structure (Keating & Shattuck-Hufnagel 2002)
  - What is stored in lexicon (number of syllables?) and what is computed online (which segments belong to which syllable?)
- …except insofar as different models have different implications for planning effects in phonology

10. Course requirements

- 2 units: Attend class, do readings, take your turns presenting readings
- 4 units: That plus some kind of culminating research product
  - It could be a theoretical paper, an experimental design, a corpus study…
  - Meet with me some time in October to discuss what you want to do, then again in November

11. Plan for next upcoming sessions

- When it works, 2-person presentation scheme
  - as in Phonology 3
  - one person presents paper
  - the other presents a contrary view, applies the paper's proposal to some other set of data, etc.
- Not much of this for first topic, because we don't have a strong opposing viewpoint yet.

topic	*reading*	*who presents*
▪ English –ing/in', plus laying out the research program	Wagner 2012 [we read this in Ling 219 2 years ago]	Present: _____
▪ English tapping	Kilbourn-Ceron, Wagner & Clayards 2016	Present: _____
▪ Japanese high vowel devoicing	Kilbourn-Ceron & Sonderegger 2018	Present: _____
▪ French liaison—significant because doesn't involve lenition	Kilbourn-Ceron 2017b	Present: _____
▪ English t/d deletion		
▪ PPH view	Tanner, Sonderegger & Wagner 2015	Present: _____
▪ includes speech rate	Tamminga 2015	Present, and summarize similarity & differences vs. Tanner & al. findings: _____
▪ syntactic predictability and planning	Gahl & Garnsey 2004	Present: _____
▪ English is/'s contraction		
▪ planning view	MacKenzie 2012, ch. 5	Present: _____
▪ syntactic vs. phonological planning	MacKenzie 2016	Present: _____ _____, who presented Gahl & Garnsey, discuss MacKenzie's results from G&G's point of view
▪ Spanish vowel hiatus	Lamontagne & Torreira 2017	Present: _____

I'll post links for all the upcoming readings on a course web page and send you the link (probably tomorrow). In some cases, I'll e-mail you all the item.

References

Absalom, Matthew, Mary Stevens & John Hajek. 2002. A typology of spreading, insertion and deletion or What you weren't told about Raddoppiamento sintattico in Italian. *Proceedings of the 2002 Conferences of the Australian Linguistics Society*, no page numbers.

Bermúdez-Otero, Ricardo. 2010. Morphologically conditioned phonetics? Not proven. Belfast.

Bermúdez-Otero, Ricardo. 2012. The architecture of grammar and the division of labour in exponence. In Jochen Trommer (ed.), *The morphology and phonology of exponence: the state of the art*, 8–83. Oxford: Oxford University Press.

Buchwald, Adam. 2014. Phonetic processing. In Matthew Goldrick, Victor Ferreira & Michele Miozzo (eds.), *The Oxford handbook of language production*, 245–258. Oxford: Oxford University Press.

Cheng, Chin-Chuan. 1973. *A Synchronic Phonology of Mandarin Chinese*. Walter de Gruyter.

Frisch, Stefan. 2004. Language processing and segmental OCP effects. In Bruce Hayes, Robert Kirchner & Donca Steriade (eds.), *Phonetically based phonology*. Cambridge University Press.

Gahl, Susanne & Susan Marie Garnsey. 2004. Knowledge of Grammar, Knowledge of Usage: Syntactic Probabilities Affect Pronunciation Variation. *Language* 80(4). 748–775. doi:10.1353/lan.2004.0185.

Goldrick, Matthew. 2014. Phonological processing: The retrieval and encoding of word form information in speech production. In Matthew Goldrick, Victor Ferreira & Michele Miozzo (eds.), *The Oxford handbook of language production*, 228–244. Oxford: Oxford University Press.

Griffin, Zenzi M. 2003. A reversed word length effect in coordinating the preparation and articulation of words in speaking. *Psychonomic Bulletin & Review* 10(3). 603–609. doi:10.3758/BF03196521.

Gussenhoven, Carlos & Haike Jacobs. 1998. *Understanding Phonology*. Oxford: Oxford University Press.

Hammond, Michael. 1999. Lexical frequency and rhythm. In Mike Darnell (ed.), *Functionalism and Formalism in Linguistics, Volume I: General Papers*, 329–358. John Benjamins.

Himmelmann, Nikolaus P. 2014. Asymmetries in the prosodic phrasing of function words: Another look at the suffixing preference. *Language* 90(4). 927–960. doi:10.1353/lan.2014.0105.

Keating, Patricia & Stefanie Shattuck-Hufnagel. 2002. A prosodic view of word form encoding for speech production. *UCLA Working Papers in Phonetics* 101. 112–156.

Kilbourn-Ceron, Oriana. 2017a. Speech production planning affects variation in external sandhi. McGill University PhD dissertation.

Kilbourn-Ceron, Oriana. 2017b. Speech production planning affects phonological variability: a case study in French liaison. In Karen Jesney, Charlie O'Hara, Caitlin Smith & Rachel Walker (eds.), *Proceedings of the 2016 Annual Meeting on Phonology*.

Kilbourn-Ceron, Oriana & Morgan Sonderegger. 2018. Boundary phenomena and variability in Japanese high vowel devoicing. *Natural Language and Linguistic Theory*. doi:10.1007/s11049-017-9368-x.

Kilbourn-Ceron, Oriana, Michael Wagner & Meghan Clayards. 2016. The effect of production planning locality on external sandhi: a study in /t/. *Proceedings of the 52nd Annual Meeting of the Chicago Linguistic Society*.

Lamontagne, Jeffrey & Franciso Torreira. 2017. Production planning and directionality in external sandhi (poster). *Annual Meeting on Phonology*. New York University.

Lin, Isabelle. 2015. Over and over and over again: Tone 3 sandhi in Standard Mandarin. Presentation. UCLA, ms.

MacKenzie, Laurel. 2012. Locating variation above the phonology. University of Pennsylvania PhD dissertation.

MacKenzie, Laurel. 2016. Production planning effects on variable contraction in English. *Penn Working Papers in Linguistics* 22(2). 121–130.

Politzer-Ahles, Stephen & Jie Zhang. in press. Evidence for the role of tone sandhi in Mandarin speech production. *Journal of Chinese Linguistics*.

Rose, Sharon & Lisa King. 2007. Speech Error Elicitation and Co-occurrence Restrictions in two Ethiopian Semitic Languages. *Language and Speech* 50(4). 451–504. doi:10.1177/00238309070500040101.

Seyfarth, Scott, Marc Garellek, Gwendolyn Gillingham, Farrell Ackerman & Robert Malouf. 2017. Acoustic differences in morphologically-distinct homophones. *Language, Cognition and Neuroscience* 0(0). 1–18. doi:10.1080/23273798.2017.1359634.

Shattuck-Hufnagel, Stefanie. 2014. Phrase-level phonological and phonetic phenomena. In Matthew Goldrick, Victor Ferreira & Michele Miozzo (eds.), *The Oxford handbook of language production*, 259–274. Oxford: Oxford University Press.
Smolensky, Paul & Matthew Goldrick. 2016. Gradient symbolic representations in grammar: the case of French liaison. Ms. Johns Hopkins University & Northwestern University, ms.
Sternberg, S, S Monsell, R. L. Knoll & C. E. Wright. 1978. The latency and duration of rapid movement sequences: comparisons of speech and typewriting. In G.E. Stelmach (ed.), *Information processing in motor control and learning*, 117–152. New York: Academic Press.
Tamminga, Meredith. 2015. Modulation of the following segment effect on coronal stop deletion [slides]. Toronto.
Tamminga, Meredith, Laurel MacKenzie & David Embick. 2017. The dynamics of variation in individuals. *Linguistic Variation* 16(2). 300–336. doi:10.1075/lv.16.2.06tam.
Tanner, James, Morgan Sonderegger & Michael Wagner. 2015. Production planning and coronal stop deletion in spontaneous speech. *Proceedings of the 18th International Congress of Phonetics Sciences (ICPHS) in Glasgow, 2015*. Glasgow.
Tsay, Jane & James Myers. 1996. Taiwanese Tone Sandhi as Allomorph Selection. *Annual Meeting of the Berkeley Linguistics Society* 22(1). 395–405. doi:10.3765/bls.v22i1.1347.
Vogel, Irene, Timothy Bunnell & Steven Hoskins. 1995. The phonology and phonetics of the Rhythm Rule. In Bruce Connell & Amalia Arvaniti (eds.), *Phonology and phonetic evidence*, 111–127. (Papers in Laboratory Phonology IV). Cambridge: Cambridge University Press.
Wagner, Michael. 2011. Production planning constraints on allomorphy. *Canadian Acoustics* 39(3). 160–161.
Wagner, Michael. 2012. Locality in phonology and production planning. In A McKillen & J Loughran (eds.), *Proceedings of the Montreal-Ottawa-Toronto (MOT) Phonology Workshop 2011. Phonology in the 21st Century: In honour of Glyne Piggott. McGill Working Papers in Linguistics 22(1)*.
Walker, Rachel, Narineh Hacopian & Mariko Taki. 2002. Nasal consonant speech errors: implications for "similarity" and nasal harmony at a distance. *First Pan-American/Iberian Meeting on Acoustics*. Cancun.
Wheeldon, Linda. 2013. Producing spoken sentences: the scope of incremental planning. In S Fuchs, M Weirich, D Pape & P Perrier (eds.), *Speech production and perception volume 1: speech planning and dynamics*, 93–114. Peter Lang.
Zuraw, Kie. 2009. Frequency influences on rule application within and across words. *Proceedings of CLS (Chicago Linguistic Society) 43*, 283–309.