530 Proposal: Motivation for experiments 1 and 2 of my dissertation

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Much research has investigated perceptual learning, the process whereby listeners exposed and adapt to a novel speech pattern from an unfamiliar speaker. A listener's perceptual system shifts rapidly; for instance, vowel perception can shift solely on the basis of the vowels in a preceding sentence (Ladefoged and Broadbent, 1957). Boundaries between fricative categories can be changed by exposure to relatively small amount of ambiguous fricative tokens, but they must be embedded within and associated with a lexical item in a language, and hearing ambiguous productions between two sound categories in nonwords does not induce perceptual learning (Norris et al., 2003). However, besides the categorical distinction separating words from nonwords, little is known about the factors that influence linking an shifted or ambiguous production of a sound with a category through a lexical item. My dissertation investigates the factors which can contribute to associating ambiguous atypical productions with a specific sound category through lexical items.

Given a continuum from a nonword like *dask* to word like *task* that differs only in one sound, listeners in general are more likely to interpret any step along the continuum as the word endpoint rather than the nonword endpoint (Ganong, 1980). This lexical bias, also know as the Ganong effect, is exploited in perceptual learning studies to allow for noncanonical, ambiguous productions of a sound to be linked to pre-existing sound categories.

Lexical bias, however, has been shown to be gradient. When an ambiguous sound is embedded later in a word, listeners are more likely to treat the production as a word than if the same sound is embedded earlier in the word (Pitt and Szostak, 2012). The same study found that when listeners are alerted to the ambiguous sound's presence, and told to listen carefully, lexical biases diminish overall, with listeners less likely to treat the production as a word. Most studies looking at boundaries between fricative categories use longer (2-3 syllable) lexical items ending with a fricative (Norris et al., 2003), but perceptual learning has also been found following exposure to shorter (1 syllable) lexical items beginning with an ambiguous sound (Clare, 2014). However, specific comparisons in perceptual learning effects across word position in these studies is impossible due to differences in languages under investigation (Dutch or English) and the nature of contrast (/t/-/d/, /s/-/sh/, or /s/-/f/). Studies also differ on the ambiguity of the sound, with some attempting to control for the Ganong effect by picking an ambiguous sound farther away from the more canonical word form (Reinisch et al., 2013) and some selecting a production halfway in between word and nonword (Norris et al., 2003). The first two experiments in my dissertation address this gap in the literature and investigate the mechanism underlying perceptual learning.

Given the difference in word response rates depending on position in the word, we would predict that listeners exposed to ambiguous sounds earlier in words would be less likely to accept these productions as words as compared to listeners exposed to ambiguous sounds later in words. In addition, given the reliance of perceptual learning on lexical scaffolding, this lower acceptance rate for the former group would lead to a smaller perceptual learning effect as compared to the latter group.

In these two experiments, listeners will be exposed to ambiguous productions of words containing a single instance of /s/, where the /s/ has been modified to sound more like /sh/ in a lexical decision task. In one group, the S-Initial group, the critical words will have an /s/ in the onset of the first syllable, like in *cement*, with no /sh/ neighbour, like *shement*. In the other group, the S-Final group, the critical words will have an /s/ in the onset of the final syllable, like in *tassel*, with no /sh/ neighbour like *tashel*. In addition, half of each group will be given instructions that the speaker has a ambiguous /s/ and to listen carefully, following Pitt and Szostak (2012).

The two experiments differ in the salience of the ambiguous stimuli, with salience here defined as the distance from a normal, natural production. A pretest was conducted with 20 listeners to determine the percentage /s/ response at each step of the critical continua (for instance, from *tassel* to *tashel*). In the first experiment, the continua steps selected for the critical item were around 30% /s/ response, following Reinisch et al. (2013). In the second experiment, the continua steps selected for critical items were around 50% /s/ response, following other methodologies (Norris et al., 2003; Kraljic and Samuel, 2005), which should be more susceptible to lexical biases. The differences in perceptual learning between the groups are predicted be less in the first experiment than in second, as the lessened salience of the stimuli in the second experiment is predicted to allow for a greater role of top-down attention on the processing of the exposure items.

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