

# Effects of talker’s dialect labeling and listener’s language experience on the perception of nasal codas in Shanghai Mandarin

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**Introduction** Speech perception is a multidimensional process that involves multiple sources of information, including social information. Among these social information, studies have shown that talker’s dialect labeling may influence listeners’ speech perception (e.g., Niedzielski, 1999; McGowan & Babel, 2020). However, Lawrence (2015) uses the same research paradigm as Niedzielski (1999), but does not find talker’s dialect labeling effect. Thus, the role of talker’s dialect labeling remains controversial. Moreover, listeners’ language experience have shown an impact on speech perception (e.g., Sumner & Samuel, 2009; Schertz et al., 2019).

The present study aims to further investigate how talker’s dialect labeling and listener’s language experience affect speech perception by examining the perception of a phonetically ambiguous nasal coda by Shanghai Mandarin speakers. Because the phonetic realization of the two nasal codas /n/ and /ŋ/ is different between Shanghai Mandarin and Standard Mandarin (see Figure 1), a nasal that is phonetically ambiguous in Shanghai Mandarin is closer to /ŋ/ in Standard Mandarin (refer to the green arrow in [Figure 1](#)).

**Predictions** (1) In the matched-guise study, listeners are more likely to perceive an ambiguous nasal as /ŋ/ if they are told that they are hearing Standard Mandarin than if they are told that they are hearing Shanghai Mandarin; (2) listeners with more exposure to Standard Mandarin are more likely to perceive the ambiguous nasal as /ŋ/.

**Methods** The experiment was conducted online following a matched-guise paradigm, using a within-subject design. Participants were first informed of a dialect label of the “speaker”. Then, during the experimental phase, participants selected the word they heard from the audio stimuli from two Chinese characters; the audio stimuli contained phonetically ambiguous nasals in Shanghai Mandarin, as evidenced by a norming test; the choice was a /in~iŋ/ minimal pair.

A total of 76 Shanghai Mandarin speakers aged 18-35 completed the online perception experiment. We collected their socio-demographic information and their experience with Standard Mandarin through a questionnaire.

**Results** 1788 valid responses were obtained. The mean /iŋ/ selection by participant ranges from 0.083 to 1, with a mean value of 0.507, as shown in [Figure 2](#).

To investigate the effects of the talker’s dialect label and the listener’s language experience on the perception of nasal codas in Shanghai Mandarin, we fitted a logistic mixed-effect regression model, coding the selection of /in/ word as 0 and the selection of /iŋ/ word as 1. The key factors that receive the most attention in this study are talker’s dialect labeling and listener’s language experience.<sup>2</sup> All categorical factors are sum-coded. The model output is shown in [Table 1](#), and the /iŋ/ selection by label-participant is visualized in [Figure 3](#).

As shown, the listener’s language experience has a significant effect on the /iŋ/ selection. The more language experience the participants have with Standard Mandarin, the more likely they are

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<sup>2</sup> The model formula: response ~ label \* language\_experience + block \* item\_order + word\_frequency + initial + tone + (1|participant)

to choose a /iŋ/ word. This is consistent with the prediction. However, the talker’s dialect label does not have a significant effect. This is different from the prediction.

**Discussion** In short, this study of nasal perception in Shanghai Mandarin found an effect of listener’s language experience on speech perception, but no significant effect of the talker’s dialect markers was found. The null effect of the talker’s dialect labeling differs from the results of many prior studies. A tentative explanation is that the effect of talker’s dialect labeling on speech perception is conditioned by the linguistic context, as suggested by Lawrence (2015). However, future research will need to explain exactly what features of context determine whether a talker’s dialect labeling is effective.

**Selected references**

Lawrence, Daniel. 2015. Limited evidence for social priming in the perception of the bath and strut vowels. In *ICPhS*.

McGowan, Kevin B, and Anna M Babel. 2020. Perceiving isn’t believing: Divergence in levels of sociolinguistic awareness. *Language in Society* 49:231–256.

Niedzielski, Nancy. 1999. The effect of social information on the perception of sociolinguistic variables. *Journal of language and social psychology* 18:62–85.

Sumner, Meghan, and Arthur G Samuel. 2009. The effect of experience on the perception and representation of dialect variants. *Journal of memory and language* 60:487–501.

Schertz, Jessamyn, Yoonjung Kang, and Sungwoo Han. 2019. Sources of variability in phonetic perception: The joint influence of listener and talker characteristics on perception of the Korean stop contrast. *Laboratory Phonology* 10:1–32.

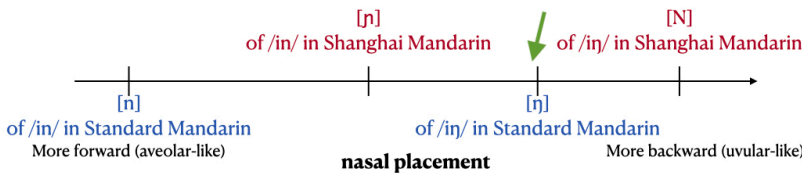


Figure 1: Phonetic realization of nasal codas in Shanghai Mandarin and Standard Mandarin

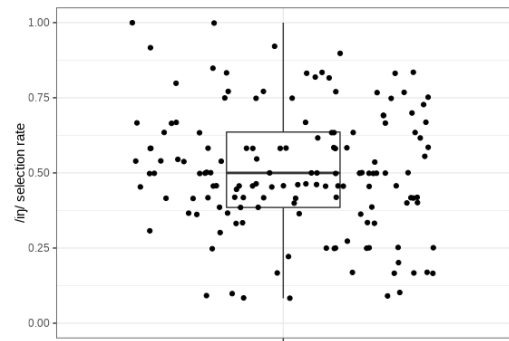


Figure 2: The average value of /iŋ/ chosen by each participant

	Estimate	Std. Error	z value	p value
Label (Beijing v. grand mean)	-0.037	0.246	-0.152	0.879
language experience	0.186	0.051	3.616	<b>0.000</b>
block (block 1 v. grand mean)	-0.099	0.098	-1.005	0.315
within-block order	-0.621	0.235	-2.646	<b>0.008</b>
word frequency (in v. iŋ)	-1.124	0.811	-1.386	0.166
initial (consonant v. grand mean)	-0.414	0.088	-4.717	<b>0.000</b>
tone (tone 1 v. grand mean)	-0.315	0.083	-3.786	<b>0.000</b>
tone (tone 2 v. grand mean)	-0.074	0.094	-0.788	0.431
tone (tone 3 v. grand mean)	0.340	0.119	2.865	<b>0.004</b>
Label : language experience	-0.014	0.030	-0.476	0.634
block : within-block order	0.067	0.168	0.401	0.689

Table 1: Model output of /in~iŋ/ selection

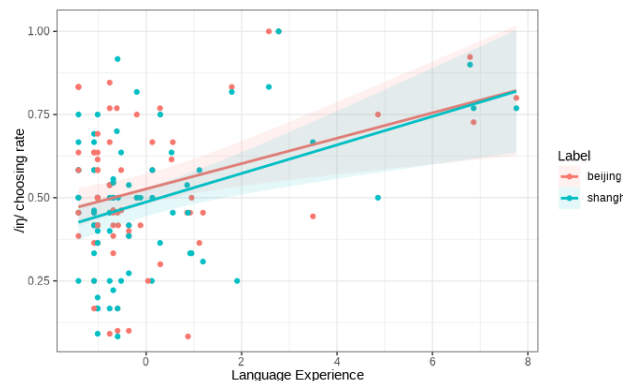


Figure 3: The /iŋ/ selection by label-participant