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Listeners evaluate native and non-native speakers differently (but not in the way you think)

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Abstract

Speaking in a foreign accent has often been thought to carry many disadvantages. Here we probe the social evaluation of foreign-accented vs. native speakers using spoken utterances that either obey or violate the pragmatic principle of Informativeness. We show that listeners form different impressions of native and non-native speakers with identical pragmatic behavior: specifically, in contexts where violations of Informativeness can be detrimental to or misleading for the listener, people rated underinformative speakers more negatively on trustworthiness and interpersonal appeal compared to informative speakers, but this tendency was mitigated in some cases for speakers with foreign accents. Furthermore, this mitigating effect was strongest for less proficient non-native speakers who were presumably not fully responsible for their linguistic choices. Contrary to previous studies, we also find no consistent global bias against non-native speakers. Thus the fact that non-native speakers have imperfect control of the linguistic signal affects pragmatic inferences and social evaluation in ways that can lead to surprising social benefits.

Keywords: underinformativeness; social cognition; socio-pragmatic inferences; speech processing; pragmatics

Introduction

Foreign accents present several challenges for both the speaker and the listener. Accented utterances contain phonetic segments and prosodic contours that deviate from native speech. Since speech comprehension is optimized for one's native language (Cutler, 2012), any perceptual departure from the listener's own accent can cause non-native speakers to sound less intelligible (Bent & Bradlow, 2003; Munro & Derwing, 1995). It is therefore unsurprising that non-native speech is processed differently from native speech (Gibson et al., 2017; Hanulíková, van Alphen, van Goch, & Weber, 2012). From a social standpoint, non-native speakers are more likely to face discrimination; as members of an outgroup, they are considered less trustworthy, reliable, or 'morally upright' (Lev-Ari & Keysar, 2010; 2012; Tsurutani, 2012). Similarly, young children, and even infants, are less likely to make friends with, and learn from, social partners who speak in an unfamiliar foreign accent (Begus, Gliga, & Southgate, 2016; Kinzler, Dupoux, & Spelke, 2017).

Here, we take the position that non-native speech can affect socio-pragmatic inferences in ways that might *benefit* the non-native speaker. Specifically, the present research explored how listeners process native and non-native speech in contexts where the speaker is underinformative (i.e., says less than is conversationally required). According to the traditional Gricean framework, speakers are underinformative for two main reasons: either because they choose to be underinformative, being *unwilling* to reveal additional information, or because they are *unable* to say more (Carston, 1998; Grice, 1975).

Differences in attribution of speaker underinformativeness can affect social cognition and future behavior in different ways. Unwillingness can be perceived as a result of the speaker's intention to mislead, a violation of the co-operativeness principle (Grice, 1975) leading to communication breakdown. By contrast, a failure to communicate relevant information due to inability may be the result of the speaker's linguistic incompetence and thus be treated more leniently. Sensitivity to unwillingness and inability explanations of intentional actions in a rudimentary form emerges early in both human development and evolution. In one experiment, 9-month-old infants were more likely to become impatient with an adult who appeared to be unwilling to share a toy, compared to an adult who was unable to do so (Behne, Carpenter, Call, & Tomasello, 2005). Likewise, non-human primates showed more frustration behaviors when interacting with an unwilling compared to an unable experimenter (Canteloup & Meurnier, 2017).

Building on these patterns, it seems plausible that deficient pragmatic behavior such as underinformativeness may be processed differently for native and non-native speakers due to perceived differences in underlying reasons for such behavior (with underinformativeness being more likely to be attributed to inability in non-native compared to native speakers because of their imperfect control of the linguistic signal). Support for this view comes from recent experiments in which participants read and rated underinformative English sentences involving scalar terms (e.g., "Some dogs are mammals") that were attributed to either a native speaker of English with a strong Boston accent or a non-native

speaker with a strong Chinese accent; participants rated these sentences more highly when they were attributed to a non-native compared to a native speaker (Fairchild & Papafragou, 2018). In another demonstration (Fairchild, Mathis, & Papafragou, 2020), a speaker's underinformativeness made people less likely to choose to learn from this person again, but this effect was mitigated for non-native speakers.

These experiments suggest that language comprehenders form different top-down expectations based on speaker identity, and that such expectations drive further behavior and learning. However, this evidence comes from experiments involving written text where participants were directly informed about the speaker's native or non-native status. This leaves open the question of how socio-pragmatic processing emerges in conversation settings involving actual speech input, where listeners are rarely given explicit information about speaker identity. The present experiment used spoken stimuli to provide a more direct test of participants' social evaluation of native and non-native speakers. First, we examined whether listeners form different impressions of underinformative native- and foreign-accented speech by directly testing their ratings of the speaker on various personal traits. Second, we explored whether listeners' socio-pragmatic inferences depend on non-native speakers' L2 proficiency.

In the present experiment, listeners watched an illustrated story. The story took place in a ransacked mansion with a woman calling the owner to tell her about the robbery. We manipulated the woman's utterances to be native, non-native without grammatical errors, or non-native with many errors. We also manipulated whether the woman was informative about a critical aspect of the scene (the presence of money). After viewing the story, listeners rated the woman across various social and intellectual dimensions. In choosing the dimensions of evaluation, we followed decades of research in social psychology suggesting that social cognition universally consists of attributes relating to one's social nature and appeal known collectively as Warmth; these attributes tend to be clustered together, and are distinct from attributes related to one's mental abilities, intelligence or talents known collectively as Competence that also cluster together (e.g., Asch, 1946; Rosenberg, Nelson, & Vivikananthan, 1968; see especially Fiske, Cuddy, & Glick, 2007). We were also inspired by more recent work showing that, within the Warmth domain, traits that indicate 'moral character', such as trustworthiness, are separable from attributes that simply indicate pure 'social warmth', such as friendliness or sociability (Goodwin, Piazza, & Rozin, 2014). We assessed the competence of the speaker and, most crucially, two warmth dimensions: trustworthiness (e.g., how honest the speaker is, or reliable as a source of future information) and interpersonal appeal (e.g., how likeable the speaker is, or how likely to be one's friend).

Thereby, listeners were asked to rate the speaker in terms of her intelligibility, competence, as well as the critical warmth dimensions of trustworthiness (measured in terms of her honesty, and the likelihood that she would be a good witness to the police) and interpersonal appeal (measured in terms of her likability and the likelihood that she would be the listeners' friend). Based on pragmatic theory and prior work, we hypothesized that listeners would rate non-native speakers as less intelligible and less competent compared to native speakers, with the error-prone non-native speaker being considered more unintelligible and incompetent than the errorless non-native speaker. Of primary interest was how native and the two types of non-native speakers would be rated along the tested social dimensions given these basic differences. We also hypothesized that listeners would rate the woman more negatively in terms of all social attributes if she were underinformative than if she were informative (cf. Fairchild et al., 2020). However, we predicted that listeners would rate the underinformative foreign-accented speakers, particularly the errorful speaker, less negatively than the native-accented speaker (since their underinformativeness was less likely to be intentional).

Experiment

Participants

The final sample comprised 576 adult participants (322 females, 4 non-binary). All participants were monolingual native speakers of English and were recruited from Amazon's Mechanical Turk.

Materials and Procedures

Five pictures were used to create an illustrated story. The story took place in a mansion that had been robbed and vandalized and showed a woman calling the owner to tell her about the robbery. Pictures of the mansion were retrieved from a news article and edited using AdobePhotoshop2020. The woman in the story was a volunteer who was photographed from various angles speaking on a mobile phone and later inserted into the pictures. There was no narration in the story: using Qualtrics, the woman's utterances were played automatically as each picture slide in the story progressed, so that the picture slides could be presented like scenes in a movie clip. Each slide lasted for approximately 7 seconds.

The woman's utterances were recorded by a female English-Greek native bilingual speaker who produced three versions: native accented (NS), non-native accented without grammatical errors (NNS), and non-native accented with grammatical errors (NNS-Errors). The NNS-Errors condition differed from the NNS condition in that the woman produced many subject agreement and conjugation errors. These sentences came in either a native accented version for the NS speaker condition or the same non-native accented version for both the NNS and the NNS-Errors conditions. In total there were six between-subjects 2 (Informative vs. Underinformative) X 3 (NS, NNS, NNS-Errors) conditions, with 96 participants in each condition.

The woman in the story went through three rooms. Participants first saw the woman in the foyer of the mansion and said, "Hello Mrs. Jenkins I have bad news. Someone

came to your house. They broke everything" (NS and NNS) or "Hello Mrs. Jenkins. Me having bad news. Someone came into your house. They broken everything" (NNS-Errors). In the next scene, the woman was in an empty living room and participants heard her saying "Your things are gone" (NS and NNS) or "Your things gone" (NNS-Errors). In the third and final scene, participants saw the woman in the kitchen and behind her back were a crate of apples and a large pile of cash. As her back was turned from the apples and money, the woman said, referring to the robbers, "They took everything" (NS and NNS) or "They took all things" (NNS-Errors). Informativeness was manipulated in the final sentence (see Figure 1). Here, the woman turned towards the crate of apples and pile of money and said, "Oh! They left some apples and money" (Informative) or "Oh! They left some apples" (Underinformative).



Figure 1: Picture during the final sentence.

After watching the story, participants were asked to rate the woman on a 7-point Likert scale on various attributes in the following order: competence ("How competent do you think the woman in the story is?"), honesty ("How honest do you think the woman in the story is?"); likability ("How likeable do you think the woman in the story is?"); witness potential ("How likely do you think the woman will be a good witness for the police?"); intelligibility ("How easy to understand was the woman's English?"); and friendship potential ("How likely would you be to be friends with the woman in the story?"). We included 2 comprehension checks and excluded failers from the final sample. At the end of the experiment, participants in the Underinformative condition were also asked, "Why did the woman in the story mentioned the apples but not the money in the kitchen scene? Please explain".

Results

In order to test whether there were differences in listeners' ratings as a function of Speaker Identity and level of Informativeness, all ratings of interests were analyzed using a 2-way between-subjects 2 (Informativeness: Informative vs. Underinformative) X 3 (Speaker Identity: NS vs. NNS vs. NNS-Errors) ANOVA. Levene's adjusted p-values were used in cases of violation of sphericity, and the significance threshold (α = .05) for follow-up t-tests was Bonferroni-adjusted.

We begin with intelligibility analyses to confirm that our manipulation was effective (Figure 2). The analysis revealed a main effect of Informativeness, $F(1, 570) = 7.24$, $p = .007$, $\eta_p^2 = .013$: the Informative condition elicited better intelligibility ratings (M = 2.51, SD = 1.54) than the Underinformative condition (M = 2.81, SD = 1.78). As expected, there was a main effect of Speaker Identity, $F(2, 570) = 4.38$, $p = .013$, $\eta_p^2 = .015$, such that the NS (M =1.23, SD = 0.62) had better intelligibility ratings compared to both the NNS (M = 3.11, SD = 1.48), $t(255.37) = -16.20$, $p < .001$, and the NNS-Errors (M = 3.64, SD = 1.62), $t(245.04) = -19.16$, $p < .001$; moreover, the NNS had better ratings than the NNS-Errors, $t(376.92) = -3.30$, $p = .001$. There was no Speaker Identity by Informativeness interaction, $F(2, 570) = 1.03$, $p = .357$, $\eta_p^2 = .004$. Thus, participants distinguished among the three types of speaker in terms of how intelligible their language was (even though, perhaps unsurprisingly, they also used informativeness to evaluate how comprehensible the speaker's English was).

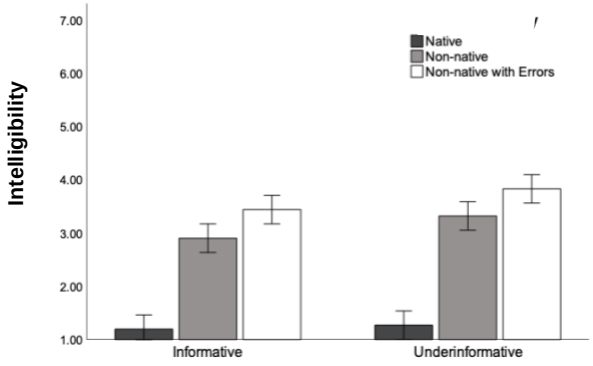


Figure 2: Intelligibility ratings (1 = Extremely easy [to understand]; 7 = Extremely difficult [to understand]).

Turning to the speaker's personal attributes, for competence (Figure 3), results showed only a significant main effect of Informativeness, $F(1, 570) = 19.15$, $p < .001$, $\eta_p^2 = .033$; an Informative speaker (M = 3.50, SD = 1.52) was considered more competent than an Underinformative one (M = 4.08, SD = 1.67). There was no effect of Speaker Identity, $F(2, 570) = .070$, $p = .933$, $\eta_p^2 = .000$, and no significant interaction, $F(2, 570) = .075$, $p = .927$, $\eta_p^2 = .000$.

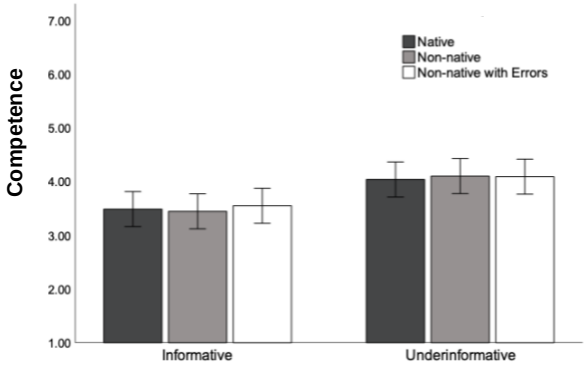


Figure 3: Competence ratings.

For the main analyses involving warmth attributes, we combined the honesty and witness potential ratings (high inter-item reliability, Cronbach's alpha = .80) to compute trustworthiness; similarly, we combined the likability and

friendship likelihood ratings (Cronbach's alpha = .82) to compute interpersonal appeal. For trustworthiness (Figure 4), results revealed a significant main effect of Informativeness, $F(1, 570) = 231.99$, $p < .001$, $\eta_p^2 = .289$, such that the speaker in the Informative condition ($M = 2.74$, $SD = 1.40$) was rated better than in the Underinformative condition ($M = 4.74$, $SD = 1.77$), $t(544.99) = -15.00$, $p < .001$. There was also a main effect of Speaker Identity, $F(2, 570) = 4.46$, $p = .012$, $\eta_p^2 = .015$: the NNS-Errors ($M = 3.47$, $SD = 1.76$) was overall rated better than the NS ($M = 3.93$, $SD = 2.01$), $t(375.31) = 2.36$, $p = .019$, and marginally significantly better than the error-free NNS ($M = 3.83$, $SD = 1.85$), $t(382) = 1.94$, $p = .053$; there was no significant difference between the NS and the NNS, $t(382) = .50$, $p = .616$. Importantly, there was a significant interaction between Informativeness and Speaker Identity, $F(2, 570) = 6.55$, $p = .002$, $\eta_p^2 = .022$: this interaction was due to the fact that, for the Informative condition, there was no main effect of Speaker Identity (NS: $M = 2.63$, $SD = 1.39$; NNS: $M = 2.84$, $SD = 1.40$; NNS-Errors: $M = 2.76$, $SD = 1.42$), $F(2, 570) = .54$, $p = .586$, $\eta_p^2 = .004$, but for the Underinformative condition, there was a main effect of Speaker Identity (NS: $M = 5.22$, $SD = 1.68$; NNS: $M = 4.81$, $SD = 1.71$; NNS-Errors: $M = 4.18$, $SD = 1.79$), $F(2, 570) = 8.79$, $p < .001$, $\eta_p^2 = .058$. Specifically, the Underinformative NNS-Errors was rated better than both the Underinformative NS, $t(190) = 4.14$, $p < .001$, and the Underinformative NNS, $t(190) = 2.50$, $p = .013$, but there was no difference between the Underinformative NS and NNS, $t(190) = 1.66$, $p = .099$.

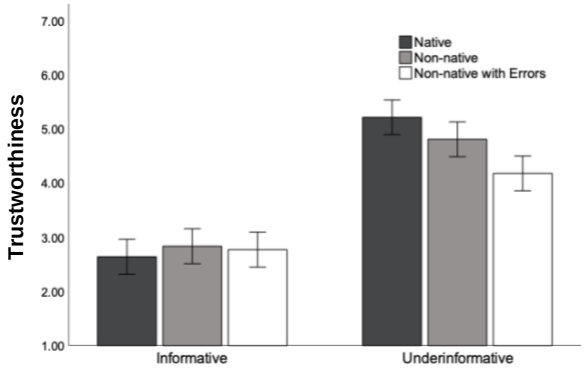


Figure 4: Trustworthiness ratings.

For interpersonal appeal (Figure 5), the ANOVA results revealed a significant main effect of Informativeness, $F(1, 567) = 155.15$, $p < .001$, $\eta_p^2 = .215$: the speaker in the Informative condition was rated better ($M = 3.40$, $SD = 1.27$) than in the Underinformative condition ($M = 4.78$, $SD = 1.41$), $t(566.08) = -12.32$, $p < .001$. There was also a significant main effect of Speaker Identity, $F(2, 567) = 6.12$, $p = .002$, $\eta_p^2 = .021$, such that the NNS-Errors ($M = 3.83$, $SD = 1.44$) was rated better than both the NS ($M = 4.28$, $SD = 1.56$), $t(380) = 2.98$, $p = .003$, and the error-free NNS ($M = 4.18$, $SD = 1.49$), $t(380) = 2.35$, $p = .019$, while there was no significant difference between the NS and the NNS, $t(380) = .67$, $p = .503$. However, there was no significant interaction between Informativeness and Speaker Identity, $F(2, 567) = 2.22$, $p = .110$, $\eta_p^2 = .008$.

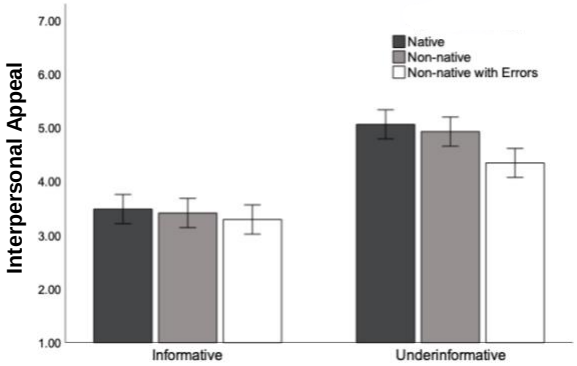


Figure 5: Interpersonal appeal ratings.

Turning to participants' justification responses in the Underinformative conditions, the majority invoked unwillingness (specifically, deception; e.g., "She wanted to keep the money). Even so, such responses were more likely for the NS (85%) compared to the NNS (75%) and the NNS-Errors groups (54%). Inversely, inability justifications were rare for the NS (3%) but became somewhat more frequent in the NNS (8%) and the NNS-Errors (13%). "Unsure" and other non-deception justifications also became more frequent for the two non-native groups (13% for NNS and 22% for NNS-Errors, compared to 0% for NS). Thus, as predicted, listeners interpreted underinformativeness differently across Speaker Identity conditions.

Discussion

Research over the past decades has shown that non-native speakers are at a disadvantage, both because of adults' and children's negative social attitudes and discriminatory behavior, as well as because of listeners' perceptual difficulty in processing accented speech. Contrary to this long-standing view, we found no global bias against non-native speakers. In fact, in some respects, they reveal a social advantage in how non-native speakers are evaluated in certain conditions.

Using spoken stimuli with different native vs. non-native accents produced by the same speaker, we discovered differences in listeners' social evaluations of the different speakers on various personal traits. As expected, listeners rated speakers differently on intelligibility; the native speaker was considered more intelligible than the error-free non-native speaker, who in turn was more intelligible than the error-prone non-native speaker. However, regardless of speaker status, informative speakers were also considered more intelligible than underinformative speakers. Furthermore, listeners also rated informative speakers to be higher in competence, but contrary to our predictions, there were no speaker differences in these ratings; the non-native speakers were not considered less competent than the native speaker. Also noteworthy is that, regardless of informativeness, the error-prone non-native speaker had higher ratings on interpersonal appeal compared to both the native and error-free non-native speakers. The present

experiment thus shows no global social bias against non-native speakers.

Most striking about our findings are listeners' ratings of the speakers across the warmth dimensions. The intelligibility differences did not lead to a global bias against non-native speakers. In fact, for some personal traits, we found a social *advantage* in how non-native speakers were evaluated. Specifically, underinformative speakers had worse ratings compared to informative speakers on a number of social traits, including competence, trustworthiness and interpersonal appeal. For trustworthiness, this effect was attenuated in non-native speakers, particularly for the less proficient speakers who were spared the deleterious consequences of failures to inform. Somewhat surprisingly, however, the protective effect of non-native speaker status did not arise for judgments of interpersonal appeal. Regardless, these findings show that individuals are not, by default, biased in favor of native speakers. Instead, they show that individuals form different social-pragmatic impressions in accordance with cues to speaker identity. Importantly, listeners were less likely to penalize non-native speakers in contexts where the stakes of omitting relevant information were high. When the important detail being left out involved a word that is both highly frequent and denotes something desirable and valuable (i.e., money), it would be more intuitive to think that listeners would form negative attitudes towards the speaker, regardless of speaker identity. The fact that listeners' attitudes still varied along the speaker's language background status indicates that speaker identity plays a strong role in our socio-pragmatic inferences.

The present experiment provides a more nuanced picture of how speech leads to social evaluation. Listeners can still extract cues to speaker identity during language comprehension to form social judgements, even after a very brief encounter with another interlocutor. Our findings extend support for the emerging view that cues to speaker identity can alter listeners' pragmatic interpretation in ways that can bring unexpected social advantages or disadvantages for different types of speakers (e.g., Fairchild et al., 2020).

Of particular significance is the fact that a social advantage in non-native speakers was found despite the fact that we used spoken stimuli. According to some theoretical accounts, negative social attitudes towards non-native speakers arise from intelligibility challenges associated with understanding accented speech. On such approaches, listeners are less tolerant of non-native speakers because foreign accents introduce additional processing demands (e.g., Davis, Johnsrude, Hervais-Adelman, Taylor, & McGettigan, 2005). The present experiment does not support this hypothesis. In our study, listeners rated the non-native speaker with grammatical errors to be least intelligible and the native speaker was considered most intelligible. Despite these intelligibility differences, the non-native speakers, particularly the error-prone speaker, were still at an advantage over the native speaker in listeners' interpretation of underinformative utterances. This raises a question about the effect of intelligibility in listeners' negative attitudes towards non-native speakers in prior work.

From a methodological standpoint, our findings also shed some light on the physical properties that define non-native speech. By manipulating foreign-accented speech along different levels of severity (i.e., error-free vs. error-prone), we showed that the greatest advantage for listeners' ratings was found in the error-prone non-native speaker. A recent study in 5- to 8-year-old children showed that phonological deviations in accented speech trumped grammatical and semantic errors in children's identification of foreign speakers (Hwang & Markson, 2018; see also Lev-Ari, van Heugten, & Peperkamp, 2017). Nonetheless, listeners rarely encounter non-native speakers with a strong foreign accent but few errors in other language domains. The current experiment addressed this issue by creating an extra speaker condition involving an error-prone non-native speaker (while keeping the accent severity constant).

It remains to be seen whether these results represent an actual non-native benefit, or whether listeners simply cushion non-native speakers from various kinds of social negativity. Our own view is that the social advantage experienced by the non-native speakers is more of a "negative lessening effect". As shown by the justification responses, listeners were more likely to forgive the underinformative non-native speakers, and considered them less dishonest than the native speakers, because the non-native speakers were not in full control of their linguistic production. This was unlike the justification responses given for the underinformative native speaker, whom listeners were more likely to think that they were willfully withholding important information. Consistent with previous findings (e.g., Fairchild et al., 2020), these responses show that non-native speakers were at an advantage only in contexts where ineptness is being compared against a more severe alternative explanation for unwanted social behavior.

It is not completely clear why the same negative lessening effect did not appear for all attribute ratings (i.e., interpersonal appeal). One reason could be that sociability and intellectual traits may contribute less to person impressions than trustworthiness (i.e., traits indicating moral character; see Brambilla, Rusconi, Sacchi, & Cherubini, & Yzerbyt, 2012; Goodwin et al., 2014; Leach, Ellemers, & Barreto, 2007). Also unclear is why informative speakers were rated as more intelligible than underinformative speakers. A likely reason could be the context of the story; it is more reasonable to expect a competent and intelligible speaker to mention information (i.e., the leftover money) that is deemed important for the listener.

Finally, questions arise about the origins of the pattern we have observed in human communication and social cognition. Research in young children suggests that humans may be predisposed to form social group categories and preferences based on accents before race (e.g., Kinzler. Shutts, Dejesus, & Spelke, 2009; see also, Baker, 2011). Similarly, newborns can already distinguish their mother tongue from other languages (Mehler et al., 1988), and by

five months of age, infants can detect other dialects of their native language (Nazzi, Jusczyk & Johnson, 2000). Future work needs to address whether social inferences from pragmatic behavior of native and non-native speakers can also be revealed in young children. If so, learners might also be selectively biased in favor of non-native speakers in certain types of evaluations.

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