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Speaking with a foreign accent has often been thought to carry several disadvantages. Here, we probe a potential social *advantage* of non-native compared to native speakers using spoken utterances that either obey or violate the pragmatic principle of Informativeness. In Experiment 1, we show that listeners form different impressions of native and non-native speakers with identical pragmatic behavior: in a context in which omitting information could be deceptive, people rated underinformative speakers more negatively on trustworthiness and interpersonal appeal compared to informative speakers, but this tendency was mitigated 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. In Experiment 2, social lenience for non-native speakers emerged even in a non-deceptive context. Contrary to previous studies, there was no consistent global bias against non-native speakers in either experiment, despite their lower intelligibility. 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: informativeness, social cognition, non-native speech, speech processing, pragmatics

Foreign accents present several challenges for both the speaker and the listener. Accented utterances contain phonetic segments, speech rates, 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 make non-native speakers less intelligible (e.g., Bent & Bradlow, 2003; Munro & Derwing, 1995). From a social standpoint, non-native speakers are more likely to face discrimination: as members of an outgroup, non-native speakers are less likely to be offered job positions compared to native speakers with the same qualifications (Carlson & McHenry, 2006; Clark & Paran, 2007; Gluszek & Dovidio, 2010), and across cultures, accented non-native speakers can appear less credible, patient, or "morally upright" (e.g., Fuse et al., 2018; Lev-Ari & Keysar, 2010; Tsurutani, 2012). Even early in life, young children, and to some extent, preverbal infants, are less likely to befriend and learn from, social partners who speak to them in an unfamiliar accent (Begus et al., 2016; Kinzler et al., 2007, 2009).

In recent years, several studies have suggested that the effects of foreign accents on sentence processing are immediate, especially for syntactic phenomena. For instance, P600 neural responses to syntactic errors (e.g., "She mow the lawn") are attenuated when the errors are made by a non-native speaker (Hanulíková et al., 2012). Similarly, implausible utterances with errors involving double objects/dative constructions, transitive/intransitive verbs, or active/passive voice (e.g., "The girl was kicked by the ball") are more likely to be interpreted in a plausible way when delivered in a foreign accent, regardless of whether the accent was produced by a near-native English speaker or acted out by an actor (Gibson et al., 2017). In both cases, these effects demonstrate two important aspects about processing non-native accents. First, they show that listeners expect non-native speakers to be less competent and more error-prone; listeners thereby make use of these expectations in a top-down manner to adjust their sentence interpretations. Second, they reveal that listeners are more reliant on semantic cues (and thereby infer the more plausible interpretation) when non-native speech imposes extra processing noise (see also Davis et al., 2005; Gibson et al., 2013). A less-studied issue, however, is whether non-native speech signals also affect pragmatic interpretation in everyday discourse. Here, we take the position that non-native speech can affect sociopragmatic inferences in ways that might *benefit* the non-native speaker. To this end, the present research compared how listeners process native and non-native speech in contexts where the speaker either obeys or fails to obey the pragmatic principle of informativeness.

Informativeness and Underinformativeness in Communication

In successful communication is built on the assumption that speakers and hearers are engaged in a co-operative activity in which speakers strive to offer stimuli that are, among other things, as informative as required given the goals of the conversation (Grice, 1975). Failures to offer as much information as is required can have deleterious consequences, as anyone trying to work with incomplete driving directions, poorly written recipes, or vague instructions for furniture assembly can attest. There is evidence that, in production, speakers avoid underinformative utterances (e.g., Deutsch & Pechmann, 1982; Engelhardt et al., 2006; Katsos & Bishop, 2011; Katsos & Smith, 2009). Furthermore, comprehenders reject underinformative statements such as "Some dogs are mammals," even though these are technically true, at rates ranging from 60% (Noveck, 2001) to over 90% (Papafragou & Musolino, 2003; cf. also Bott & Noveck, 2004; Guasti et al., 2005).

Most relevantly for present purposes, violations of informativeness have consequences for social behavior. When young children hear underinformative sentences, they are more likely to ask for clarification or check the experimenter's gaze (Morisseau et al., 2013). Additionally, 6- and 7-year-old children adjust their learning strategies in response to underinformative teachers (Gweon et al., 2014). In a series of experiments, children were presented with a toy by a puppet teacher who either showed them the one (and only) function of the toy (informative context), or a puppet teacher who only showed them one function when there were in fact three other functions (underinformative context). Although the appearance and behavior of the teacher were identical in both contexts, children in the underinformative context rated the teacher poorly and explored the toy more to compensate for the information omission (see also Gweon & Asaba, 2018 for evidence from younger children). These findings indicate that comprehenders, from very early on in life, use contextual cues to make sociopragmatic evaluations about the speaker.

The majority of past studies have not explored the specific reasons behind underinformativeness (but see Bonnefon et al., 2009; Mazzarella et al., 2018 for exceptions). Nevertheless, it is reasonable to assume that underinformative utterances should be processed differently depending on the factors responsible for the speaker's failure to provide the needed information. According to pragmatic theory, speakers may fail to be informative 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; Sperber & Wilson, 1986). Differences in the origins of underinformativeness can affect social cognition and listener responses in different ways. Unwillingness can be perceived as a result of the speaker's intention to mislead or otherwise be unhelpful, a violation of the co-operativeness principle (Grice, 1975), leading to communication breakdown. By contrast, failure to communicate relevant information due to inability may be the result of the speaker's incompetence, inattention, or other temporary or more permanent limitation, and thus be treated more leniently. There is evidence that sensitivity to the unwillingness/inability distinction and its implications for explaining intentional action 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 et al., 2005). Likewise, nonhuman primates (e.g., chimpanzees, Tonkean macaques) showed more frustration behaviors and left the experiment earlier after interacting with an unwilling compared to an unable experimenter (Call et al., 2004; Canteloup & Meunier, 2017; Phillips et al., 2009).

Underinformativeness in Native and Non-Native Speech

Synthesizing the earlier discussion, it is clear that pragmatic principles, speaker identity and the inability versus unwillingness distinction intersect. Notice that, other things being equal, deficient pragmatic behavior such as underinformativeness is more likely to be attributed to inability (as opposed to unwillingness) in non-native compared to native speakers, because of the former group's imperfect control of the linguistic signal. If so, and assuming that the social costs associated with inability are lower compared to those associated with unwillingness (Behne et al., 2005; Call et al., 2004; Canteloup & Meunier, 2017; Phillips et al., 2009), underinformativeness may lead to lower social penalties for non-native compared to native speakers.

Recent evidence supports this hypothesis. In one study, underinformative English sentences (e.g., "Some dogs are mammals") were rated more highly when they were attributed to a non-native compared to a native speaker (Fairchild & Papafragou, 2018). In another study (Fairchild et al., 2020), readers were given explicit information about a character's language background (e.g., "Emma is from Boston and has a strong Boston accent" vs. "Yuqi is from China and has a strong Chinese accent") and then read a story in which the character failed to offer complete information to a friend (e.g., said that "there were apples and bananas" in the fridge but did not mention that there were also pears). When asked about the reasons for the omission, readers invoked incompetence more often for the non-native than for the native speaker (e.g., "She didn't know the word for pears"); inversely, they invoked unwillingness more often for the native speaker (e.g., "She wanted to keep the pears"). Perhaps most strikingly, in another experiment (Fairchild et al., 2020), people tended to avoid learning new facts from a speaker with a history of underinformativeness, but this effect was mitigated for non-native speakers. This finding supports the view that comprehenders have different expectations about native and non-native speakers (Lev-Ari, 2015; Niedzielski, 1999) and process their speech differently even when they only imagine—but do not hear—foreign accents. Consistent with this finding, other studies using speech stimuli have shown that non-native speech signals lead to less detailed encoding and greater reliance on top-down processing (e.g., Gibson et al., 2017; Lev-Ari & Keysar, 2012).

Together, these experiments suggest that speaker identity plays a crucial role in how language comprehenders make sense of language input and reason about others' (and their own) social behavior. They also suggest that what may appear to be a weakness in non-native speakers (their imperfect control of the linguistic signals in their second language) might have unexpected social advantages. However, these experiments involved written text that informed participants about the speaker's native or non-native status and thus do not tell us how people process non-native speech signals during spoken conversation. One possibility is that the same pattern would generalize to perceived, and not only imagined, accents because comprehenders' social-pragmatic reasoning about the roots of underinformativeness would be unaffected. According to this line of

reasoning, counterintuitively, the social benefits for non-native speakers should become more pronounced for speakers perceived to be less—as opposed to more—proficient in their second language (and hence less in control of the signal they produce).

An alternative possibility is raised by theoretical accounts according to which negative social attitudes toward non-native speakers are associated with intelligibility challenges associated with understanding accented speech (e.g., Fuse et al., 2018; Tsurutani, 2012). This class of accounts proposes that intelligibility costs lead to extra processing demands, and thereby, one might expect listeners to have a more negative social attitude toward non-native speakers (e.g., Fuse et al., 2018). These accounts predict that, when participants are exposed to actual native versus non-native speech, they should be unlikely to treat underinformative non-native speakers more leniently because of the processing costs incurred by non-native speech. In fact, these accounts expect that negative attitudes for non-native speakers should be accentuated for less proficient (and hence less intelligible) non-native speakers. In this paper, we test these competing predictions.

Present Study

In the present study, we used spoken stimuli within a single-story paradigm to provide a direct test of the social evaluation of native and non-native speakers on the basis of their pragmatic behavior (informative vs. underinformative). The primary goal was to probe whether non-native speakers who fail to be informative might enjoy a relative social advantage during spoken conversation. We compared listeners' ratings of native- and foreign-accented speakers (both less and more proficient) along various social dimensions. Our stimuli were produced by the same native simultaneous bilingual speaker who sounded native (i.e., North American English), proficient non-native (foreign-accented but without syntactic errors), or less proficient non-native (foreign-accented but prone to syntactic errors). Our stimuli were assessed for their intelligibility by the participants. We expected that listeners would rate non-native speakers as less intelligible compared to native speakers; we further expected a difference within non-native speaker subgroups, with the error-prone non-native speakers being considered less intelligible than the errorless non-native speakers.

Our design involved the evaluation of pragmatic behavior where one's failure to be informative could either be seen as potentially deceptive (Experiment 1) or more ambiguous (Experiment 2). Specifically, we examined listeners' social evaluations of native versus non-native speakers in a context where the speakers were informative or underinformative about the presence of a valuable entity (money; Experiment 1) or less valuable object (pineapples; Experiment 2). In choosing the dimensions of evaluation, we followed decades of research in people perception 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 et al., 1968; see especially Fiske et al., 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 et

al., 2014; Leach et al., 2007). 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 she is to be one's friend).

We hypothesized that underinformative behavior would lead to more negative evaluations of the speaker on all of the social dimensions in the present study (i.e., trustworthiness, interpersonal appeal, competence). Of specific interest was whether these social costs would at least partly be mitigated for non-native speakers, especially for those who are less proficient, or would be combined with potentially negative effects of non-native status, especially for the less proficient non-native speakers. One possibility based on pragmatic theory and prior work (Fairchild et al., 2020) was that non-native speaker status would selectively mitigate the negative effects of underinformativeness, especially for the less proficient speakers whose underinformativeness was less likely to be intentional. This mitigation should be most clearly seen in assessments of the speaker's trustworthiness, since they best capture the reasons for underinformativeness (unwillingness to divulge the information), but should also be reflected in judgments of interpersonal appeal (since people who omit information for selfish reasons should presumably be less likeable and less likely to be chosen as one's friends). On this line of reasoning, competence would not show the same non-native advantage (in fact, one might expect non-native speakers to be judged as less competent overall). A second possibility was that speaker status would lead to negative social evaluations for all traits, particularly for the error-prone non-native speaker, presumably for reasons related to processing difficulty (e.g., Fuse et al., 2018).

The results from these experiments have broader implications for accounts of how speaker identity affects non-native speech processing and social cognition. First, our experiments can provide insights into how listeners process the pragmatics of native and non-native utterances. Recall that, when reading stories, comprehenders show selective lenience toward underinformative non-native compared to native speakers (Fairchild et al., 2020; cf. also Gibson et al., 2017; Hanulíková et al., 2012). The present experiments allow us to determine whether non-native speakers might still enjoy social lenience for their pragmatic infelicities compared to native speakers, even when producing speech that is harder to understand.

Second, our experiments provide a more nuanced view into how listeners integrate contextual cues from speaker identity when they interpret spoken utterances. As mentioned already, despite decades of research on experimental pragmatics, and especially on the phenomenon of (under)infomativenesss, most prior work has studied this phenomenon in isolated sets of sentences where speaker information was minimal (e.g., Barner et al., 2011; Bott & Noveck, 2004; Guasti et al., 2005; Noveck, 2001; for reviews, see Breheny, 2019; Degen & Tanenhaus, 2019; but see Bonnefon et al., 2009; Mazzarella et al., 2018). Our experiments are among the first to examine the effects of speaker identity on how underinformativeness is understood by embedding a speaker's conversational contribution within an actual social environment.

Finally, our findings contribute to emerging efforts to integrate theories of pragmatics, social meaning, and social cognition. Importantly, the present study aims to bridge two traditionally separate lines of research relating to pragmatic processing and communication, on the one hand, and person perception and social attitudes, on the other. In terms of pragmatic processing, our experiments view

accents and other characteristics of non-native speech not only as linguistic stimuli that affect language processing, but also as sociopragmatic cues that allow listeners to make inferences about the identity of the speaker. Going beyond prior work that has examined how informativeness (or lack thereof) might arise from the speaker's epistemic state (e.g., Barner et al., 2018; Bergen & Grodner, 2012; Breheny et al., 2013; Fairchild et al., 2020; Kampa & Papafragou, 2020; Papafragou et al., 2018), the present research aims to show that listeners take into account a richer network of speaker abilities and preferences (e.g., withholding information about something of value) to interpret the speaker's pragmatic behavior and draw social judgments from speech input. In terms of person perception and attitudes, the present research addresses the question of how this integration of speaker background and pragmatic cues, within a particular discourse context, could form part of a person's evaluation and influence listeners' social impressions. Specifically, the present study proposes that certain characteristics of an individual that have traditionally been shown to be a target of social prejudice and disadvantage (e.g., being non-native speaker) could, in certain pragmatic contexts, offer a form of social advantage.

Experiment 1

The present study has received IRB approval from the University of Pennsylvania. In Experiment 1, we examined listeners' social evaluations of native and non-native speakers that either observed or failed to observe the communicative principle of informativeness. We created a potential deception scenario in which information omission is bound to be detrimental to the listener (and thus socially undesirable). Listeners watched a short illustrated story. The story took place in a ransacked mansion and showed a woman calling the owner to tell her about the robbery. We manipulated the woman's utterances to sound native (i.e., North American English), non-native without syntactic errors, or non-native with many syntactic errors. At the end of the story, we also manipulated whether the woman was informative about a critical aspect of the final scene (money that the robbers left behind). After viewing the story, listeners rated the woman 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). As mentioned already, we expected that listeners would rate non-native speakers as less intelligible compared to native speakers; we further expected a difference within non-native speaker subgroups, with the error-prone non-native speaker being considered less intelligible than the errorless non-native speaker. We also expected 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). 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.

Methods

Participants

The sample comprised 576 participants (M_age = 38.61 years; 322 females, 250 males, 4 non-binary). Participants were recruited from Amazon's Mechanical Turk and were compensated 50 cents for the 3–5-min study. All participants were monolingual speakers of English. Any participant who reported that they were not Monolingual English speakers in a pretest was automatically excluded from the study.

Materials and Procedure

Four pretest trials were administered to ensure that participants' sound system worked before commencing the experiment. These trials involved hearing various sounds (e.g., dogs barking), and participants' task was to choose the source of the sound in a forced-choice task. A warning slide appeared if participants incorrectly answered the first question. Participants were told that would be prevented from doing the actual experiment if they incorrectly answered the next three questions.
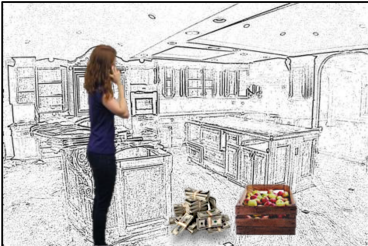
For the main experiment, three background pictures were used to create an illustrated story. Each picture showed a room of a mansion that had been abandoned and vandalized. The pictures were retrieved from a news article. A female volunteer who was photographed from various angles speaking on her mobile phone; her image was later inserted into the background pictures using AdobePhotoshop 2020. In each of the final story pictures, the woman was on her phone in a different room of the mansion. Participants heard a series of utterances in a female voice alongside the images that could readily be attributed to the woman in the story. Each of the woman's utterances was played automatically with each new picture. Each picture remained on the screen for approximately 7 s.

The woman's utterances were recorded by a female English-Greek native bilingual speaker who produced three different speaker versions: native accented (NS), non-native accented without grammatical errors (NNS), and non-native accented with grammatical (mostly subject agreement and conjugation) errors (NNS-Errors). We note that the foreign-accented speech stimuli contained elements that the bilingual speaker would adopt when switching to Greek. Phonological deviations in accented speech may be more important than grammatical and semantic errors in the identification of foreign speakers (for developmental evidence, see Hwang & Markson, 2018; see also Lev-Ari et al., 2017); however, non-native speech usually contains a combination of these. The NNS-Errors condition differed from the NNS condition in that the woman produced many errors. As an additional step toward equating the accent severity of the NNS and NNS-Errors conditions, we occasionally spliced various phrases from the NNS condition to the NNS-Errors condition in instances where utterances contained the same words or phrases using Praat (Boersma, 2001).

There was no narration in the story (see Figure 1). Participants first saw the woman in the foyer of the mansion and heard her saying, "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 a living room and participants heard her say, "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 money (US dollars). The crate of apples and pile of money were of the same size to control for object salience. 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

Figure 1

Storyline for Experiment 1 with Sentences Produced for the Native Speaker (NS), Accented Non-Native With No Grammatical Errors (NNS), and Accented Error-Prone Non-Native (NNS with Errors) Speaker

Scene Location	Spoken Sentences
Foyer	**NS and NNS**: "*Hello, Mrs. Jenkins. I have bad news. Someone came to your home. They broke everything.*" **NNS with Errors**: "*Hello, Mrs. Jenkins. Me having bad news. Someone broken into your home. They broken everything.*"
Living room	**NS and NNS**: "*Your things are gone.*" **NNS with Errors**: "*Your things gone.*"
Kitchen	**NS and NNS (*facing away from the apples and money*)**: "*I'm in the kitchen. They took everything.*" **NNS with Errors (*facing away from the apples and money*)**: "*Me in kitchen. They took all things.*"
Kitchen	**NS, NNS and NNS with Errors:** **Informative**: "*Oh. They left some apples and money.*" **OR** **Underinformative**: "*Oh. They left some apples.*"

Note. Note that the sentences used for the NS and the NNS contained the same words but were native accented or foreign accented, respectively. The last trial included the Informativeness manipulation. The Informative/Underinformative sentences contained the same words across the three Speaker conditions but were produced in either a native-accented version (NS) or a foreign-accented version (both NNS and NNS-Errors). For legibility, we have converted the room background pictures into line drawings.

was manipulated in the final sentence at the end of the story, where the woman turned toward the crate of apples and money and said, referring to the robbers, "Oh. They left some apples and money" (Informative) or "Oh. They left some apples" (Underinformative). The critical Informative or Underinformative sentence was the same across all speaker conditions. Thus there were only two speaker versions of the Informative and Underinformative sentence; one with the native-accented version for the NS speaker condition and the same non-native-accented version for both the NNS and the NNS-Errors conditions.

After watching the story, participants were asked to rate the woman on a 7-point Likert scale on competence ("How competent do you think the woman in the story is?"), as well as a range of warmth attributes: honesty ("How honest do you think the woman in the story is?") and witness potential ("How likely do you think the woman is to be a good witness for the police?") that jointly indicate trustworthiness; and likability ("How likeable do you think the woman in the story is?") and friendship potential ("How likely would you be to be friends with the woman in the story?") that jointly indicate interpersonal appeal. Participants were also asked to provide intelligibility ratings ("How easy to understand was the woman's English?"). Ratings were elicited in the following order: competence, honesty, likability, witness potential, intelligibility, and friendship potential.

To ensure that participants were paying attention, we also asked them two control questions to test their understanding of the story: "Which rooms did the woman in the story go through?" (Multiple Choice Question); "List everything you saw that was on the kitchen floor in front of the woman" (Open-ended Question). Participants ($n = 69$) who answered these questions incorrectly or only provided partial answers were replaced. To avoid carry-over effects in the test questions, the first of these control questions appeared between the honesty and likability questions, and the second between the witness potential and intelligibility questions. Data from participants who got their answers wrong in the control questions were excluded from our analyses. At the end of the experiment, participants in the Underinformative condition were also asked, "Why did the woman in the story mention the apples but not the money in the kitchen scene? Please explain."

Results

Attribute Ratings

Results from Experiment 1 are presented in Figures 2 to 5 (low values represent better ratings). To test whether there were differences in listeners' ratings as a function of Speaker Identity and Informativeness, all ratings of interests were analyzed using a 2-way between-subjects 2 (Informativeness: Informative vs. Underinformative) × 3 (Speaker Identity: NS vs. NNS vs. NNS-Errors) ANOVA, and Levene's adjusted p-values were used in cases of sphericity violation, and the significance threshold ($\alpha = .05$) for follow-up t-tests was Bonferroni-adjusted.[1]

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, $F(2, 570) = 178.75$, $p < .001$, $\eta_p^2 = .386$, 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).

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, $F(2, 570) = .075$, $p = .927$, $\eta_p^2 = .000$.

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 as more trustworthy than in the Underinformative condition ($M = 4.74$, $SD = 1.77$). 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 as more trustworthy than the NS ($M = 3.93$, $SD = 2.01$), $t(375.31) = 2.36$, $p = .019$, and marginally more trustworthy 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 were rated more favorably 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, $t(190) = 1.66$, $p = .099$. To further explore the nature of the significant interaction between Informativeness and Speaker Identity, we also conducted simple effects t-tests to examine the difference between Informativeness and Underinformativeness contexts for each Speaker Identity condition. These analyses demonstrate that the effect of Underinformativeness on trustworthiness was greater for the NS, $t(183.34) = 11.62$, $p < .001$, compared to the NNS, $t(183.20) = 8.75$, $p < .001$, and the NNS-Errors, $t(180.70) = 6.13$, $p < .001$.

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 as more appealing ($M = 3.40$, $SD = 1.27$) 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 as more

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[1] Likert-scale data are also sometimes analyzed using ordinal logistic regression. We repeated all of our analyses across experiments using this method and the results were in line with the ANOVA results reported in the text.

Figure 2

Intelligibility Ratings for the Speaker's English in Experiment 1
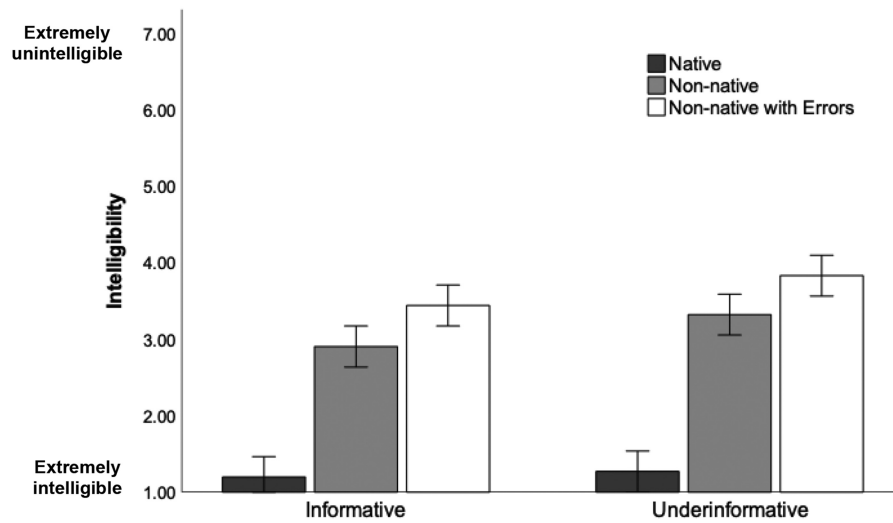
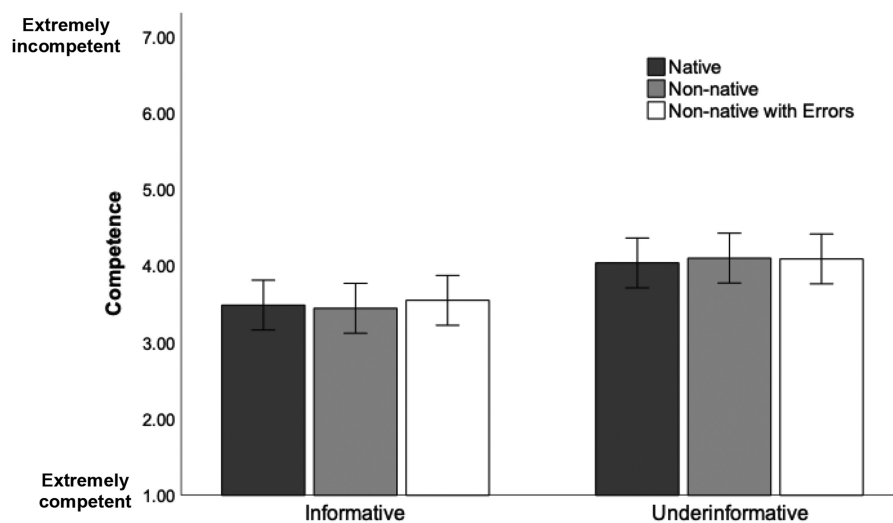*Note.* Error bars indicate standard error of the mean.

appealing 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, $F(2, 567) = 2.22$, $p = .110$, $\eta_p^2 = .008$.

Justifications for Underinformativeness

As mentioned earlier, participants in the Underinformative conditions were also asked to justify why the woman in the story mentioned only the apples. Justification responses were coded as involving inability, unwillingness, a mix of both, other, or unsure (see Table 1). We removed responses from a few participants who either did not provide any written response or wrote illegible or irrelevant responses (e.g., "last scene"; remaining data from $n = 93$ NS, $n = 93$ NNS, and $n = 87$ NNS-Errors). A striking pattern that emerges from the Table is that the majority of responses invoked unwillingness (specifically, deception) to explain the speaker's underinformativeness. Even so, such responses were more likely for the NS compared to the NNS and the NNS-Errors groups. Inversely, inability justifications were vanishingly rare for the NS but became somewhat more frequent in the NNS and the NNS-Errors groups. "Unsure" and other non-deception justifications also became more frequent for the two non-

Figure 3

Competence Ratings for the Speaker in Experiment 1

Note. Error bars indicate standard error of the mean.

Figure 4

Trustworthiness Ratings for the Speaker in Experiment 1
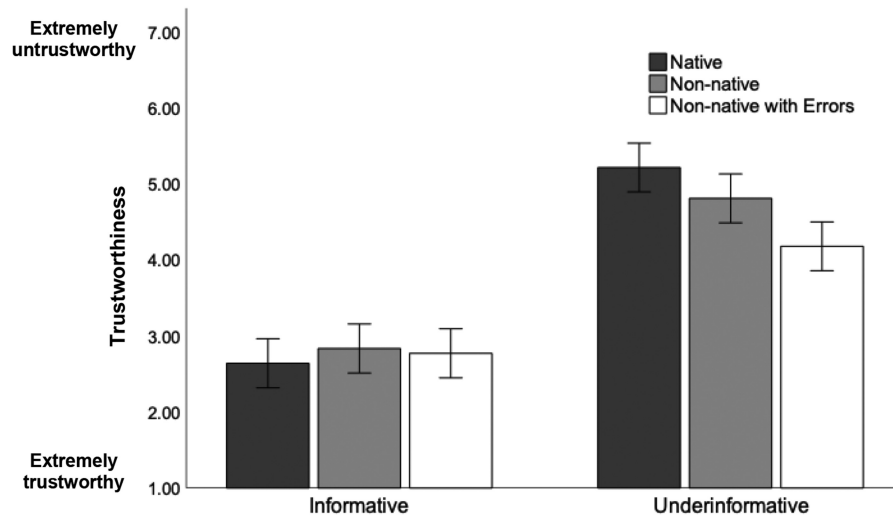
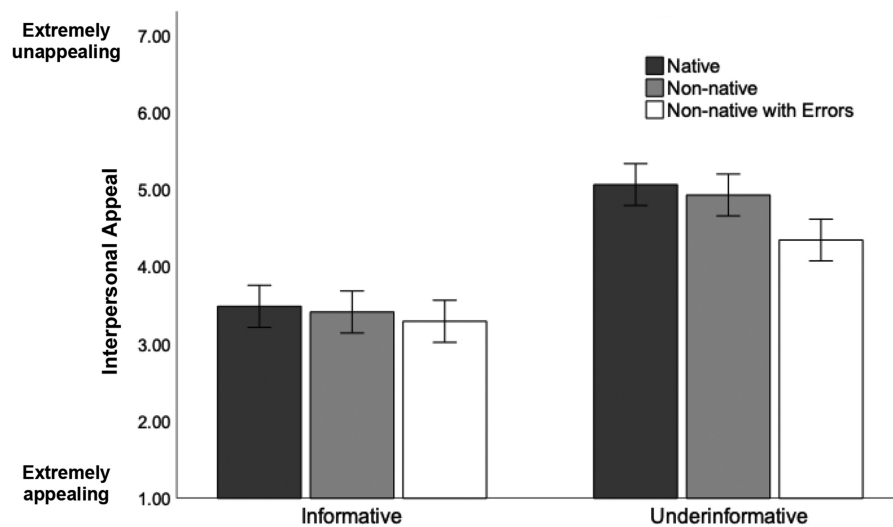*Note.*   Error bars indicate standard error of the mean.

native groups. A follow-up chi-square test confirmed that there was a significant association between speaker identity and justification type, $\chi^2(10) = 36.68, p < .001$, with a moderate effect size ($\Phi = .37$, Cramer's $V = .26$).

Discussion

Our results demonstrate that pragmatic violations have social costs: overall, speakers who offered less information than was necessary in the context were evaluated more negatively than those who were fully informative in terms of both their competence and warmth-related social traits (i.e., trustworthiness and

interpersonal appeal). Informativeness even affected intelligibility: informative speakers were considered to be speaking English that was easier to understand compared to underinformative speakers (see also Noveck, 2001; Papafragou & Musolino, 2003; and many later studies showing that underinformative sentences receive lower ratings compared to informative ones). These results confirm and extend prior work on the social implications of pragmatic failures (e.g., Fairchild et al., 2020; Fairchild & Papafragou, 2018; Gweon et al., 2014). Critically for present purposes, non-native speakers were partly protected against the social disadvantages of being underinformative compared to native speakers, with the degree of protection increasing for those non-

Figure 5

Interpersonal Appeal Ratings for the Speaker in Experiment 1

Note.   Error bars indicate standard error of the mean.

Table 1

Breakdown of Justifications Given by Listeners for the Speaker's Underinformativeness in Experiment 1 by Justification Type and Speaker Identity; Native (n = 93), Non-Native (n = 93), and Non-Native with Errors (n = 87)

Justification type	Native	Non-native	Non-native errors	Example
Inability	3.23%	7.53%	12.64%	
Linguistic difficulty	0.00%	2.15%	0.00%	"Maybe she couldn't pronounce the word money"
Cognitive or perceptual difficulty	3.23%	3.23%	12.64%	"Maybe she didn't notice that" "It was US Dollars so she may not have realized what it was"
Mix of two types of difficulty	0.00%	2.15%	0.00%	"She didn't notice it or didn't know the word for it in English"
Unwillingness	84.95%	75.27%	57.47%	
Deception	84.95%	75.27%	57.47%	"She wanted to keep the money"
Simplification	0.00%	0.00%	0.00%	
Other reasons	3.23%	6.45%	10.34%	"Maybe mentioning the apples would bring laughter to the woman"
Mix of inability, unwillingness, and/or other reasons	8.60%	5.38%	8.05%	"Maybe she intended to take it or did not see it"
Unsure	0.00%	5.38%	11.49%	"I am not sure"

native speakers who sounded least proficient (and thus responsible for their linguistic choices). Specifically, accented non-native speakers experienced a smaller dip in trustworthiness as a result of being underinformative compared to native speakers, with non-native speakers exhibiting both foreign accents and grammatical errors were spared even more. Furthermore, the majority of participants provided unwillingness/deception reasons for cases of underinformativeness but offered more inability and "unsure" responses when the underinformative behavior came from non-native speakers.

These results expand and confirm earlier data on how people interpret the pragmatic behavior of native and non-native speakers (Fairchild et al., 2020). Our results show that, even in spoken communication, being a non-native speaker can have some social advantages. Furthermore, these advantages benefit the least proficient non-native speakers more, presumably because these are the least likely to be in control of the stimulus they produce. This finding is reminiscent of a study (Fairchild & Papafragou, 2018) in which the degree of tolerance of underinformativeness in non-native speakers depended on how heavy their accent was said to be (with accent serving as a proxy for proficiency). A unique feature of our study was that the social advantages for non-native speakers emerged in a spoken context in which non-native speakers were clearly less intelligible. Contrary to previous claims in the literature (e.g., Fuse et al., 2018), there was no bias in favor of native over non-native speakers in any of the tested dimensions, and to the extent that a speaker difference was present (as in the warmth traits), there were biases in favor of non-native speakers. This is particularly noteworthy since our sample consisted of monolingual individuals recruited from the general US population.

Two puzzles remain in our data. First, unlike trustworthiness, the ratings for interpersonal appeal did not show an interaction between informativeness and speaker identity. One reason might lie in the inherent differences between these attributes, with trustworthiness being a better index of moral character (and one's overall "goodness") than information relating to social warmth (e.g., Goodwin et al., 2014). It should also be noted that, even for interpersonal appeal, there is a numerical trend in the same direction as trustworthiness (see Figure 5), especially as far as the error-prone non-native

speakers are concerned. Second, there was no significant difference in competence ratings across native and non-native speakers. We reason that competence ratings reflected general perceived ability and not simply linguistic knowledge: because the scenarios we provided showed a generally capable, proactive individual, these ratings did not differ depending on speaker type.

Experiment 2

Experiment 1 raises the question whether the social advantage for non-native speakers' trustworthiness would generalize to other contexts, including situations where the stakes of failing to mention relevant information may be lower. In Experiment 2, we addressed this issue by using a modified paradigm in which the object that was left out by the speaker was both less valuable/desirable and named by a less frequent word ("pineapples")[2] than the unmentioned object in Experiment 1 ("money"). By replacing "money" with "pineapples," it would seem less likely that the speaker omitted the object for selfish reasons and increased the likelihood that the omission was due to other factors (lack of word knowledge or lower relevance of the object). Thus, compared to the deception-oriented scenario of Experiment 1, Experiment 2 was a more ambiguous case of underinformativeness. A social-pragmatic account expects that the social penalties for underinformativeness would be low; however, if at all present, such penalties should still be adjusted favorably for non-native speakers. Alternatively, one might observe a general social cost for non-native speakers depending on their proficiency level over and above any Informativeness effects.

Methods

Participants

A new sample of 576 participants ($M_{age} = 40.05$ years; 252 females, 323 males, 1 non-binary), with 96 participants per

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[2] According to the Corpus of Contemporary American English (COCA corpus; https://www.english-corpora.org/coca/), "money" has a ranking of #215 (i.e., it is the 215th most frequent word), and "pineapple" #10570.

condition, was recruited for the 2 (Informativeness: Informative vs. Underinformative) × 3 (Speaker Identity: NS vs. NNS vs. NNS-Errors) design experiment. As in Experiment 1, all participants were recruited from Amazon's Mechanical Turk and were monolingual native speakers of English.

Materials and Procedure

The same pretest materials and procedures were used as in Experiment 1. In the main experiment, we adopted the same materials and procedure as in Experiment 1 but the money in the final story picture was replaced by a crate of pineapples placed in the same location as the money. The woman in the story (voiced by the same speaker from Experiment 1) either said, "They left some apples and pineapples" (Informative) or "They left some apples" (Underinformative). Participants answered the same questions as Experiment 1, except for the justification question, where "money" was replaced by "pineapples."

Results

Attribute Ratings

Results are shown in Figures 6 to 9. As in Experiment 1, we began by conducting a between-subjects 2 (Informativeness: Informative vs. Underinformative) × 3 (Speaker Identity: NS vs. NNS vs. NNS-Errors) ANOVA on intelligibility ratings (Figure 6). There was no main effect of Informativeness, $F(1, 570) = 0.013$, $p = .910$, $\eta_p^2 = .000$. As expected, there was a main effect of Speaker Identity, $F(1, 570) = 94.83$, $p < .001$, $\eta_p^2 = .250$. Follow-up two-tailed t-tests revealed that the NNS was judged as speaking less intelligible English ($M = 2.82$, $SD = 1.47$) compared to the NS ($M = 1.70$, $SD = 1.14$), $t(359.486) = 8.38$, $p < .001$, and the NNS-Errors was judged as speaking English that was more difficult to understand ($M = 3.69$, $SD = 1.60$) than the NNS, $t(379.054) = 5.52$, $p < .001$. Thus, just like Experiment 1,

participants distinguished among three types of speakers corresponding to how native-like they sounded. There was no Informativeness by Speaker Identity interaction, $F(2, 570) = 1.50$, $p = .225$, $\eta_p^2 = .005$.

The same analysis on competence ratings (Figure 7) revealed no significant main effect of Informativeness, $F(1, 570) = 0.27$, $p = .602$, $\eta_p^2 = .000$, no main effect of Speaker Identity, $F(1, 570) = 0.16$, $p = .855$, $\eta_p^2 = .001$, and a marginally significant interaction between Informativeness and Speaker Identity, $F(2, 570) = 2.81$, $p = .061$, $\eta_p^2 = .010$.

For our main analyses of interest regarding warmth, as before, we used the combined ratings of honesty and witness potential (Cronbach's $\alpha = .63$) to compute trustworthiness and the combined ratings of likability and friendship likelihood (Cronbach's $\alpha = .79$) to compute interpersonal appeal. For trustworthiness (Figure 8), the omnibus analysis did not reveal a significant main effect of Informativeness, $F(1, 570) = 1.81$, $p = .179$, $\eta_p^2 = .003$. There was a significant main effect of Speaker Identity, $F(2, 570) = 3.98$, $p = .019$, $\eta_p^2 = .014$, such that the error-free NNS ($M = 2.63$, $SD = 1.19$) was generally rated as more trustworthy than the NS ($M = 2.98$, $SD = 1.36$), $t(365.12) = 2.70$, $p = .007$, but not as more trustworthy than the error-prone NNS-Errors ($M = 2.75$, $SD = 1.18$), $t(382) = 1.04$, $p = .301$, who in turn was only marginally significantly more trustworthy than the NS, $t(382) = 1.74$, $p = .082$. Importantly, there was also a significant interaction between Informativeness and Speaker Identity, $F(2, 570) = 3.75$, $p = .024$, $\eta_p^2 = .013$. As in Experiment 1, for the Informative condition, there was no main effect of Speaker Identity (NS: $M = 2.77$, $SD = 1.32$; NNS: $M = 2.51$, $SD = 1.08$; NNS-Errors: $M = 2.88$, $SD = 1.18$), $F(2, 570) = 2.35$, $p = .097$, $\eta_p^2 = .016$, but for the Underinformative condition, there was a main effect of Speaker Identity (NS: $M = 3.19$, $SD = 1.38$; NNS: $M = 2.75$, $SD = 1.28$; NNS-Errors: $M = 2.63$, $SD = 1.17$), $F(2, 570) = 5.18$, $p = .006$, $\eta_p^2 = .035$. Follow-up two-tailed t-tests exploring this effect found that the Underinformative NS was rated as less trustworthy than both the NNS-Errors, $t(190) = 3.05$,

Figure 6

Intelligibility Ratings for the Speaker's English in Experiment 2
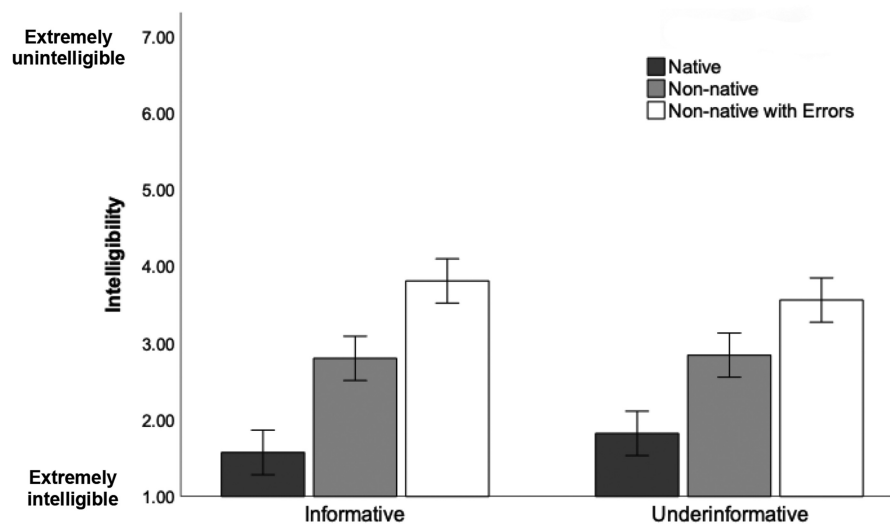
Note. Error bars indicate standard error of the mean.

Figure 7

Competence Ratings for the Speaker in Experiment 2
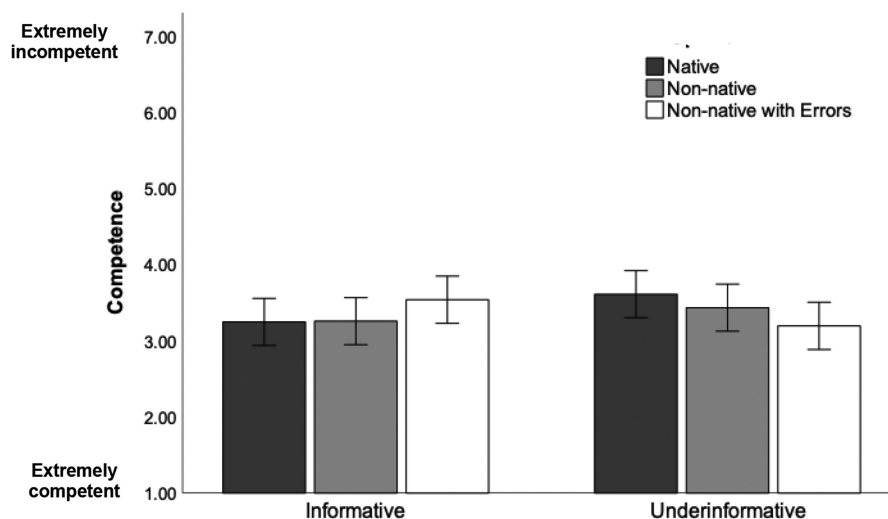
Note. Error bars indicate standard error of the mean.

$p = .003$, and the Underinformative NNS, $t(190) = 2.34$, $p = .021$, but there was no difference between the Underinformative NNS and NNS-Errors, $t(190) = .65$, $p = .518$. Additional follow-up simple effects *t*-tests were conducted to examine the nature of the difference between Informativeness and Underinformativeness contexts for each Speaker Identity condition. They showed that the underinformativeness penalty on trustworthiness was only significant for NS, $t(190) = 2.20$, $p = .029$, but not for the NNS, $t(190) = 1.37$, $p = .172$, or the NNS-Errors, $t(190) = 1.44$, $p = .151$.

For interpersonal appeal (Figure 9), the analysis did not reveal a significant main effect of either Informativeness, $F(1, 550) = .12$, $p = .735$, $\eta_p^2 = .000$, or Speaker Identity, $F(2, 550) = .76$, $p = .469$,

$\eta_p^2 = .003$. There was also no significant interaction between Informativeness and Speaker Identity, $F(2, 550) = 2.10$, $p = .123$, $\eta_p^2 = .008$.

Justifications for Underinformativeness

Listeners' justifications for the speaker's omission (Underinformative condition only) were coded as in Experiment 1 (see Table 2). We removed responses from a few participants who either did not provide any written response or wrote illegible or irrelevant responses (e.g., "last scene"; remaining data from $n = 83$ NS, $n = 75$ NNS, and $n = 88$ NNS-Errors). Overall, the justifications were

Figure 8

Trustworthiness Ratings for the Speaker in Experiment 2
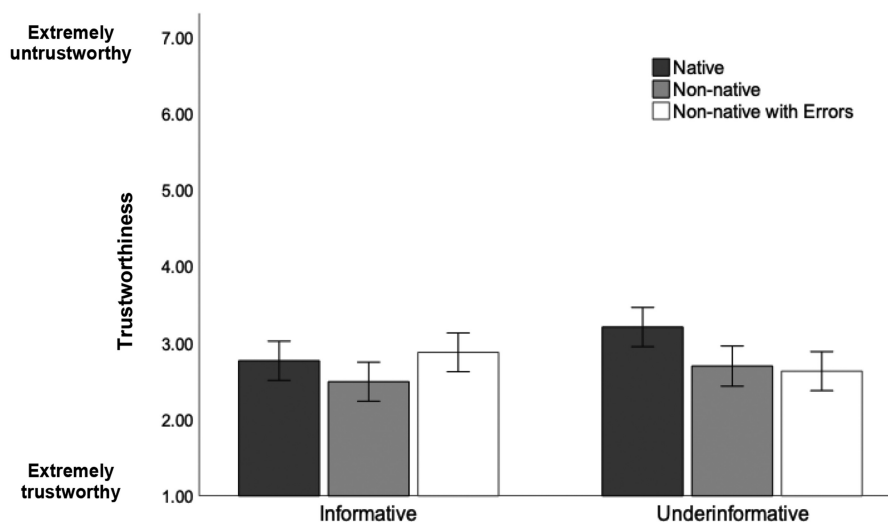
Note. Error bars indicate standard error of the mean.

Figure 9

Interpersonal Appeal Ratings for the Speaker in Experiment 2
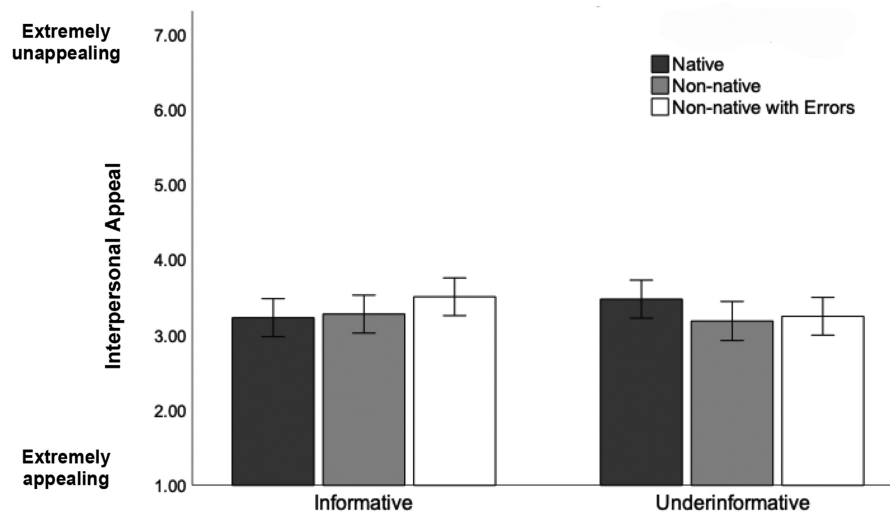
Note. Error bars indicate standard error of the mean.

quite variable, unlike Experiment 1. Nevertheless, a major pattern emerging from the Table is that inability responses (especially those attributed specifically to linguistic difficulty) grew from NS to NNS to NNS-Errors. For the last group, the proportion of linguistic difficulty responses was almost 40%. For unwillingness, there was a corresponding decrease from the NS group to the two non-native speaker groups. A follow-up chi-square test revealed that speaker identity was significantly associated with the different justification types, $\chi^2(15) = 301.30$, $p < .001$, and the effect size was high ($\Phi = 1.05$, Cramer's $V = .61$).

Discussion

As in Experiment 1, listeners rated native and the two groups of non-native speakers differently in terms of how intelligible their speech

was. Informativeness did not affect perceived intelligibility, neither did it affect any of the target dimensions of evaluation for the speaker (competence, trustworthiness, and interpersonal appeal)—presumably because the omitted object was of low relevance to the listener, and of low value to the speaker. However, as in Experiment 1, there was an interaction between Informativeness and Speaker Identity in listeners' trustworthiness ratings: there were no speaker differences in trustworthiness ratings in the informative context, but for the underinformative context, both the error-free and error-prone non-native speakers were judged as more trustworthy than the native speaker. Relatedly, being underinformative reduced one's trustworthiness but only if one were a native speaker. No such effect appeared for interpersonal appeal, echoing results from Experiment 1.

Justifications for underinformative behavior were overall variable (unlike Experiment 1). Even so, there were more than twice as many

Table 2

Breakdown of Justifications for the Speaker's Underinformativeness in Experiment 2 by Justification Type and Speaker Identity; Native (n = 83), Non-Native (n = 75), and Non-Native with Errors (n = 88)

Justification type	Native (n = 83)	Non-native	Non-native errors	Example
Inability	26.51%	40.91%	60.22%	
Linguistic difficulty	2.41%	13.33%	39.77%	"She might not know the word for pineapples"
Cognitive or perceptual difficulty	22.89%	30.67%	20.45%	"She didn't know what they were"
Mix of two types of difficulty	1.21%	4.00%	0.00%	"She simply overlooked the pineapples or maybe she couldn't pronounce it in English"
Unwillingness	26.51%	14.66%	10.23%	
Deception	16.87%	9.33%	4.55%	"Maybe she is planning to take that pineapple"
Simplification	9.64%	5.33%	5.68%	"It was such a minor factor in the overall situation it wasn't worth clarifying"
Other reasons	20.48%	20.00%	7.96%	"Because pineapple was already there"
Mix of inability, unwillingness, and/or other	9.64%	4.00%	6.82%	"She's not competent enough and not honest"
Unsure	16.87%	13.33%	14.77%	"I don't know"

unwillingness interpretations of the underinformative behavior of native speakers compared to non-native speakers with grammatical errors. These results offer support for the sociopragmatic effects observed in Experiment 1. Again, we find no support for the idea that non-native (and less proficient) speakers receive less favorable social judgments.

General Discussion

Research over the past decades has shown that non-native speakers are at a disadvantage: both children and adults hold negative social attitudes toward and discriminate against non-native speakers; furthermore, listeners face difficulties in processing accented speech (e.g., Begus et al., 2016; Bent & Bradlow, 2003; Kinzler et al., 2007, 2009; Lev-Ari & Keysar, 2012; Munro & Derwing, 1995). Using spoken stimuli, we probed listeners' social evaluations of native and more or less proficient non-native speakers in the less-studied domain of pragmatics. Specifically, using a rating task along a number of social dimensions, we compared the social costs of failures to obey a central principle of pragmatics, Informativeness (Grice, 1957), in different kinds of speakers.

As expected, listeners rated speakers' productions differently in terms of intelligibility: the output from a native speaker was considered more intelligible than the output of an error-free non-native speaker, which in turn was more intelligible than the output of an error-prone non-native speaker. Despite these intelligibility differences, there was no 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, in a context where information omission could plausibly be linked to deception (Experiment 1), underinformative speakers had worse ratings compared to informative speakers on a number of social traits, including competence, trustworthiness, and interpersonal appeal. However, for trustworthiness, this effect was attenuated in non-native speakers, particularly for the less proficient speakers. In a context where deception was less likely (Experiment 2), underinformativeness led to less severe social penalties; yet for trustworthiness, even these penalties disappeared in the case of non-native speakers. Somewhat surprisingly, the protective effect of non-native speaker status did not arise for judgments of interpersonal appeal in either experiment. Our data suggest that non-native speakers are at an advantage over native speakers when underinformative, since listeners are more likely to attribute the speakers' behavior to incompetence (rather than to unwillingness or deception) compared to native speakers. These findings are in line with the view that pragmatic interpretations of the speaker's identity can lead to unexpected social benefits in cases where the speaker is thought to have imperfect control of the linguistic signal.

Intelligibility and Non-Native Speech Processing

Recall that, according to some theoretical accounts, negative social attitudes toward 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. The present experiments confirm that non-native speech is perceived as less intelligible than native speech but nevertheless find that non-native speakers, particularly error-prone speakers, are sometimes at an advantage over native speakers when they produce pragmatically deficient utterances.

Our findings suggest a nuanced picture of how intelligibility affects listeners' evaluation of native and non-native speakers in both our own and previous studies. For example, in experiments by Lev-Ari and Keysar (2010), listeners heard and rated trivia sentences written by a native-speaking experimenter (e.g., "A giraffe can go without water longer than a camel can") but recited either by native speakers or by (mildly or heavily) foreign-accented speakers. Listeners rated sentences spoken by native speakers as more truthful than those spoken by non-native speakers, but there was no difference between mildly and heavily accented non-native speakers. Lev-Ari and Keysar argued that listeners formed negative attitudes of non-native speakers (that in turn reduced their credibility) because foreign accents affected intelligibility. An alternative interpretation suggested by our own data is that intelligibility produces social judgments only indirectly: since lower intelligibility is related to lower linguistic competence, listeners in these studies might have attributed implausible sentences coming from non-native speakers to a lack of control of the speech stimulus (as they did in our own experiments). That is, listeners might have thought that the non-native speakers recited these implausible sentences because they could not produce the right words and ended up not saying what was originally intended by the experimenter who wrote them. For this reason, it seems plausible that listeners perceive non-native speakers as less credible not because of the increased processing demands posed by non-native speech, but because the properties that define non-native speech give evidence that non-native speakers are not in full control of their language signal (e.g., due to speech production or reading difficulties), regardless of their communicative intentions.[3]

At the same time, we note that linguistic incompetence could only be part of the reason for the non-native pragmatic advantage. As shown in listeners' justification responses, underinformative behavior from non-native compared to native speakers did indeed elicit more inability responses (e.g., "She might not know the word"), but there was no single prevalent incompetence explanation for such behavior. What we found, instead, was a more diffuse response for the non-native speakers where listeners were less likely to attribute the underinformativeness to unwillingness than the native speaker, but were also more likely to provide many other alternative interpretations, with linguistic incompetence being just one of the reasons, albeit the most common one. More generally, together with the higher proportion of "unsure" responses, the results might best suggest that individuals withhold their judgment more when making inferences about the underinformative non-native speakers.

Pragmatics and the Social Pros and Cons of Being a Non-Native Speaker

Our findings support the emerging view that cues to speaker identity can alter listeners' pragmatic interpretation in ways that can bring unexpected, and sometimes counterintuitive, social advantages to

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[3] Of course, being a non-native speaker does not always simply reduced control over the language signal; there are plenty of non-native speakers who have larger vocabularies than the average native speaker. Nevertheless, for most purposes, the general point stands.

non-native speakers, especially the least proficient ones (e.g., Fairchild et al., 2020; Fairchild & Papafragou, 2018). As the present data show, cues to speaker identity can affect sociopragmatic inferences about what the speaker says (and fails to say), and the possible motivations behind such pragmatic behavior, even after a very brief encounter with an interlocutor. This novel evidence shows how pragmatic processing, speaker status, and social reasoning intersect and broadens the empirical investigation of how non-native speech is processed beyond the domain of syntax (e.g., Gibson et al., 2017; Hanulíková et al., 2012).

It remains to be seen whether these results represent an actual social benefit for non-native speakers. Our own view is that the sociopragmatic advantage experienced by the non-native speakers is better described as a way of lessening a negative effect: these speakers were not in full control of their linguistic production and were thus less likely to willfully withhold important information. These findings are different from previous studies showing negative social attitudes and prejudice toward non-native speakers (e.g., Fuse et al., 2018; Tsurutani, 2012), but do not necessarily run against these previous findings: the present, limited advantage for non-native speakers occurred only in discourse contexts where unwanted social behavior (namely, unwillingness to cooperate) was more likely (cf. also Fairchild et al., 2020; Gibson et al., 2017). This line of reasoning makes further counterintuitive, and easily testable, predictions: for instance, just like being a non-native speaker lessens the negative effects of being underinformative, it should deprive one from the positive effects of underinformativenesss as well. More concretely, listeners should be less likely to attribute information omission to politeness in non-native compared to native speakers (politeness being a case where speakers typically avoid disclosing relevant information for face-saving reasons; Brown & Levinson, 1987). It is also likely that warmth traits other than trustworthiness (e.g., appeal) might be affected in these evaluations. Finally, even though the present evaluations of native and non-native speakers do not directly speak to whether people actually behave differently toward these groups, we expect such social attitudes to give rise to different patterns of social behavior (see Fairchild et al., 2020).

Our results leave open several questions for further research. A first question is whether the effects we found generalize across different foreign accents, since in the present experiments, a Greek-English bilingual speaker produced all the native and foreign-accented stimuli. Notice, however, that previous work showing a non-native advantage with written materials (Fairchild et al., 2020) had used non-native English speakers with Chinese accents. Similarly, Gibson et al. (2017) had found no difference between different non-native accents or real versus fake accents (e.g., Israeli-accented speech produced by a near-native speaker and Hindi-accented speech from a non-Indian professional actor). It is thus highly plausible that the observed effects are not limited to a specific accent. A related question, given that here the speaker was a Caucasian young woman, is whether results would persist for a different demographic group. We predict that there may be additional interactions with other social categories (e.g., gender). A body of research suggests that women tend to be at an advantage in second language acquisition (e.g., van der Slik et al., 2015). If listeners accrue such knowledge about men and women's linguistic abilities over the course of their interactions with different non-native speakers, then listeners may rate underinformative male non-native speakers more leniently compared to female speakers.

Second, our data pose further questions about how listeners process the speech of native and non-native speakers. In some sense, they are reminiscent of evidence that speaker properties affect pragmatic processing more generally. We know that, during referential communication, listeners' anticipatory gaze to possible referents in a scene is influenced by both prosodic focus (e.g., "Hang the red ball. Now hang the GREEN…"; Ito & Speer, 2008) and prenominal modification (e.g., "Touch the tall glass"; Sedivy et al., 1999) as people make use of contrastive information to resolve reference; however, these effects disappear when the speaker is unreliable (i.e., when listeners are told that the speaker is odd and see some odd trials; Grodner & Sedivy, 2011; see also, Hanna et al., 2003; Heller et al., 2008). In another study, people processed pragmatic inferences from disfluencies ("the…um…") differently when told that the speaker had object agnosia (Arnold et al., 2007). Other work suggests that listeners are less likely to rely on ignorant and inaccurate speakers in their learning choices (Koenig & Harris, 2005). In all of these prior studies, speaker-related information was provided partly or wholly in a top-down fashion. Importantly, in the present work, participants were exposed to the bottom-up accented signal with little additional information about who the speaker was. Future research on non-native speech comprehension should explore how and when listeners integrate both bottom-up and top-down contextual information during the online computation of sociopragmatic inferences (see also Bosker et al., 2014; Caffarra et al., 2018).

Third, questions arise about the developmental origins of the pattern we have observed in human communication and social cognition. Newborns can already distinguish their mother tongue from other languages (Mehler et al., 1988), and by 5 months of age, infants can detect other dialects of their native language (Nazzi et al., 2000). Research with young children suggests that humans may be predisposed to form social group categories and preferences based on accents before forming such categories and preferences based on race (e.g., Kinzler et al., 2007, 2009; see also Baker, 2001). Future work needs to address whether social inferences from the pragmatic behavior of native and non-native speakers can also be detected in young children. If so, learners might also be selectively biased in favor of non-native speakers in certain types of evaluations.

Final Thoughts: Pragmatic Reasoning, Speaker Identity, and Social Evaluation

At their broadest, the present experiments sketch a novel and detailed picture of how speech leads to person perception and social evaluation. From a theoretical perspective, our findings suggest that, during speech processing, listeners not only process the speech cues to make sense of the input, but also attend to features in the speech stimulus (e.g., variations from native speech sounds) and use them to form impressions about speaker identity, draw sociopragmatic inferences about what the speaker says (and fails to say), and eventually form social judgments.

From a methodological standpoint, our study introduces a new paradigm for studying pragmatic behavior within social environments. As mentioned earlier, prior studies in experimental pragmatics have mostly used isolated sentences without much contextual motivation and have linked pragmatic behavior such as the failure to be informative to only a limited range of speaker properties (e.g., speaker ignorance; see Breheny, 2019; Degen & Tanenhaus, 2019 for reviews of this literature). By using pragmatically richer

scenarios, and probing for speaker evaluations along a wide array of social traits, the present methods begin to reveal new connections between pragmatics and social meaning. Furthermore, by going beyond prior studies conducted with college undergraduates, and including a large number of participants from the general US population, the present paradigm opens up ways of studying sociopragmatic inferences in additional populations, including bilingual comprehenders, and through additional measures, including individual differences that might predict listeners' sociopragmatic understanding (e.g., Fairchild & Papafragou, 2021).

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