

Pragmatic and knowledge range lenience towards foreigners

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ABSTRACT

Foreign-accented speech categorizes the speaker as an outgroup individual with a lower linguistic competence and a different knowledge heritage from a native speaker. Here we explore whether the identification of an individual as a native or a foreign speaker has an impact on trivia statement judgments, regardless of her foreign-accented speech. Italian native participants first read a bio description of a native and of a foreign speaker and then rate to what degree a series of statements associated with each of the speakers makes sense (Studies 1 and 2) or are true (Study 3). Importantly, the fluency processing between native and foreign speakers was kept constant by using a written presentation of the materials. Under-informative statements such as ‘Some frogs are amphibians’ were tested in Study 1. The results of Study 1 show more acceptable judgments when the sentences were associated with the foreign speaker. Unknown facts about world knowledge such as ‘Butterflies do not see gray’ were tested in Studies 2 and 3. The results show more acceptable (Study 2) and more true (Study 3) judgments when the sentences were associated with the foreign speaker. In addition, in Study 3 the foreign speaker was considered more trustworthy than the native speaker in a rating test at the end of the main judgment-sentence task. Our findings show that linguistic identity per se has an impact on evaluation judgments, suggesting that message interpretation cannot be dissociated from who is communicating the message.

1. Introduction

A sentence like ‘I have a large tattoo on my back’ could be considered a credible statement if made by an adult, but ironic if made by a child. The identity of the interlocutor is an essential cue for successful communication. As shown by recent research, expectations regarding the age, gender, political or socioeconomic status of the speaker are drawn extremely rapidly during sentence comprehension and impact its interpretation (Bornkessel-Schlesewsky et al., 2013; Foucart et al., 2019; Jiang et al., 2013; Van Berkum et al., 2008).

In the same vein, the interpretation of an utterance is affected by accented speech. In an influential paper by Lev-Ari and Keysar (2010), trivia statements about world knowledge facts, mostly unknown to the participants, were uttered by speakers with a native or a foreign accent (e.g., ‘A giraffe can go without water longer than a camel can’). Participants judged foreign-accented statements as less true than native-accented statements. Lev-Ari and Keysar interpreted their findings according to a ‘fluency-intelligibility’ account (see also Boduch-Grabka & Lev-Ari, 2021). As foreign-accented speech diverges from the standard accent, it would be harder to understand and it would be perceived as

less fluent; this in turn would negatively affect the credibility of a statement uttered with foreign-accented speech (Dragojevic et al., 2017; Oppenheimer, 2008; Schwarz, 2004). However, the role of processing fluency in message credibility (e.g., true/false judgments) has not been fully understood, as the results have not always been consistent. For example, Souza and Markman (2013) failed to find an effect of foreign accent on trust using the same paradigm as Lev-Ari and Keysar (see also Hanzlíková & Skarnitzl, 2017; Foucart & Hartsuiker, 2021; for a partial effect of accent on trust see, Podlipský et al., 2016). Furthermore, other studies using slightly similar paradigms have also failed to report significant effects between different types of accent speech on message credibility (Frances et al., 2018; Stocker, 2017).

Foreign-accented speech may not only affect the message's intelligibility, but it may also lead to an implicit categorization of the speaker as an outgroup individual (foreign) in terms of cultural and social heritage. Recent evidence shows that such categorization based on speech is an implicit and automatic process (Baus et al., 2017; Baus et al., 2021; Champoux-Larsson et al., 2021; Kinzler et al., 2010; Pietraszewski & Schwartz, 2014) and emerges in the first years of life (Begus et al., 2016; Howard et al., 2014; Liberman et al., 2017). Importantly, the

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classification of a person as an outgroup member entails the activation of the socio-cultural stereotypes associated with foreign groups and this in turn affects the trustworthiness of the message (Giles, 2013; Ryan, 1983; Stevenage et al., 2012; for evidence with children, see Kinzler & DeJesus, 2013). To avoid the possibility that trustworthiness was based on socio-cultural stereotypes, Lev-Ari and Keysar (2010) informed their participants that the speakers they heard were merely reciting statements provided by a native speaker and not the speakers' own statements. In this way, it was expected that the participants would ascribe the statements to native English persons rather than to the foreign speakers to whom they were exposed. However, since the auditory presentation of the material is interlaced with foreign or native speech signals, it is unclear whether such a procedure did avoid the automatic categorization of the speakers as native and foreign individuals. Thus, we cannot exclude that participants taking part in Lev-Ari and Keysar's study did activate associated stereotypes, influencing their judging of the statements.

While a large number of previous research has been focused on the impact of intelligibility accented-speech on trivia statement judgments (see for recent reviews, Formanowicz & Suitner, 2020), fewer studies have explored whether the identification of an individual as a native or a foreign speaker has an impact per se on trivia statement judgments. Our main aim here was to address this last issue. To avoid any influence of physical signal associated with the speech, a written modality presentation of the statements is required. To the best of our knowledge, only two studies have adopted this strategy to date. In the following, we briefly review these studies before introducing the main aim of our empirical research.

In one of these studies, Foucart et al. (2019) exposed to their participants in a familiarized phase to four speakers via short videos in which the speakers briefly described themselves. The speaker could have a native or a foreign accent and, in turn, they could be associated with a high or a low social status accent. In the main experimental task, electrophysiological measures were recorded while participants read three different types of sentences associated with one of the speakers. Sentences could contain true, false, or unknown statements, and participants were required to judge whether they were true or false on a 5-point scale. Ratings did not report significant differences between the different speech-accented speakers. However, ERP results suggested that statements associated with a low-status (accented) speaker were harder to process than statements associated with a high-status (accented) speaker.

In the second study, Fairchild and Papafragou (2018) used written materials to isolate the influence of speaker identity on sentence comprehension. In their study, participants first read a short-bio text description of two English speakers; one is described as a speaker with a native accent and one as a speaker with a foreign accent. Participants were then required to judge a series of written sentences attributed to the native or the foreign speaker. Besides true and false statements, the critical condition was composed of under-informative statements such as (1a).

(1) a. Some giraffes have long necks.

b. All giraffes have long necks.

c. Some giraffes, and possibly all, have long necks.

d. Some giraffes, but not all, have long necks.

Statements such as (1a) are literally true but sub-optimal in their manner of conveying information. From a logical point of view, (1a) is semantically compatible with (1b), as shown in (1c), but it is usually used to pragmatically intend a *not all* state of affairs, as in (1d). The enriched *not all* interpretation (1d) is a type of inference usually defined as a scalar implicature in linguistics (Fox, 2007; Gazdar, 1980; Sauerland, 2004); the listener assumes that the speaker could have used an alternative sentence containing *all*, which is more informative than a

sentence with *some*.

In the study by Fairchild and Papafragou, participants tended to accept under-informative sentences more when they were attributed to foreign speakers rather than to native speakers. The authors concluded that participants tend 'to forgive' foreign speakers since the choice of an under-informative sentence could be attributed to a lack of competence on the part of foreign speakers (see also Fairchild et al., 2020).

In sum, the use of written materials allows to investigate whether linguistic identity has an impact on statement judgments by keeping equal the fluency processing. Unfortunately, the evidence collected so far is difficult to interpret because while Foucart et al. (2019) did not report behavioral differences on unknown statement judgments, Fairchild and Papafragou (2018) adopted an acceptability judgment task with under-informative statements. The main aim of the current research is to shed some light on whether speaker identity (native/foreign) modulates the judgment of unknown trivia statements, similar to the ones tested in the original study by Lev-Ari and Keysar (2010). We decide to use the paradigm developed by Fairchild and Papafragou (2018) since it showed significant effects in the judgment ratings. Before focusing on the unknown statements, we decide to replicate the original finding of Fairchild and Papafragou (2018) with under-informative statements.

1.1. The present study

In Study 1 (Under-informative manipulation), our objective was to replicate the study of Fairchild and Papafragou on the derivation of the scalar implicature. To anticipate our results, Study 1 replicated the main finding of Fairchild and Papafragou. In Study 2 (Unknown manipulation), we used the same paradigm to investigate whether the native/foreign dimension affects the goodness of unknown world knowledge facts. Based on negative stereotypes towards foreign individuals, we should observe lower ratings of acceptability of unknown written statements for the foreign speaker (Giles, 2013; Ryan, 1983; Stevenage et al., 2012). In contrast, according to the account of 'fluency-intelligibility' (Lev-Ari & Keysar, 2010), no differences are expected since written sentences will be used and therefore the intelligibility associated with each speaker condition is the same. To anticipate our results, we did report evidence for an influence of linguistic identity in the acceptability of unknown written statements about world knowledge facts. Study 3 aimed to replicate and generalize the new phenomenon observed in Study 2.

Study 1 and Study 2 included two different studies each. In studies 1a and 2a we used the same procedure developed by Fairchild and Papafragou (2018). In studies 1b and 2b, the same procedure was used with the difference that in addition to the biography, face photographs were associated with each of the two speakers. This was done with the scope of increasing the association between speaker and sentence. It has been shown that messages that appear with photos are more easily understood and remembered (Newman & Zhang, 2020), and, at the same time, speaker faces enhance semantic processing of the message (Hernández-Gutiérrez et al., 2021).

Given that the sample size of their Experiment 1 of Fairchild and Papafragou (2018) was 114 participants, we decided to use a similar sample size and collected 126 participants per each single study (overall 252 for Study 1 and Study 2). The data collection of the two studies within Study 1 and Study 2 was designated and scheduled to begin at the same time. Due to an error in the distribution of participants in Study 1, more than the designated 126 participants were assigned to Study 1b and automatically, less than 126 to Study 1a. Participants who did not complete the whole experimental session, were not Italian native speakers, had a mean duration greater than three standard deviations of the group mean, or did not answer correctly the catch questions were discarded from the analysis.

2. Study 1: under-informative manipulation

2.1. Method

2.1.1. Participants

Data from two hundred and forty-four native Italian speakers were analyzed in Study 1 (mean age = 25.49, SD = 5.51), 99 (47 females) and 145 (60 females) for study 1a and 1b, respectively. Italian participants were recruited through the Prolific crowdsourcing platform (Palan & Schitter, 2018). The test was administered online and anonymously using Labvanced software (Holger et al., 2016). The experimental procedures were approved by the Research Ethics Committees of the University of Padova (Protocol number 3794).

2.1.2. Materials

The experimental set was composed of 20 under-informative sentences with the quantifier 'some', as in (1a). Furthermore, three filler conditions (20 sentences each) were added: true filler sentences containing 'some' ('Some hair is brown'); true filler sentences containing 'all' ('All snow is cold'); and false filler sentences containing 'all' ('All women are doctors'). By doing so, half of the sentences contained 'some' as a subject determiner and half of the sentences contained 'all' as a subject determiner (see Fairchild & Papafragou, 2018). All sentences were in Italian. The four types of sentences did not differ from each other in the number of words (all $t_s < 1$).

Following Fairchild and Papafragou, four bio-descriptions were created, adapting them to Italian culture. Each short-bio gave either a description of Claudia, a native Italian speaker with a strong Roman accent (Native speaker condition), or of Svetlana, a native speaker of Moldovan with a strong Moldovan accent (Foreign speaker condition). There were two versions of each speaker condition in which the speaker's hobbies and major varied (see Table 1). In addition, for study 1b, two color photographs of Caucasian women's faces were selected.¹

2.1.3. Procedure

Study 1a consisted of two blocks: a native speaker block and a foreign speaker block (counterbalanced between participants). Sentences within each block were evenly distributed across the four sentence types (10 of each), and were presented in a random order. At the start of each block, one of the four speaker bio-descriptions was presented and participants were instructed to read it carefully (familiarization phase). Then, three multiple-choice comprehension questions were presented to evaluate whether participants had read the bio-descriptions carefully. The participants were then instructed to read 40 sentences that were originally uttered by the speaker they had just read (judgment phase). Sentences were presented in random order. For each trial, a sentence appeared in

Table 1
Speaker short-bio descriptions.

Native speaker	Foreigner speaker
Claudia is a student at the University of Padova, attends the faculty of nursing/educational sciences She is very good at her course of study, and she plans to become a nurse/educator after earning her degree. She moved with her family from Rome to Padova. Claudia has such a strong Roman accent that her classmates often make fun of her. In her free time, Claudia loves walking/running .	Svetlana is a student at the University of Padova, attends the faculty of nursing/educational sciences . She is very good at her course of study, and she plans to become a nurse/educator after earning her degree. She moved with her family from Moldova to Padova. Svetlana has such a strong Moldovan accent that her classmates often make fun of her. In her free time, Svetlana loves walking/running .

¹ The material and dataset used in Study 1, Study 2 and Study 3 are available at the following OSF repository: <https://osf.io/4ewgh/>

the center of the screen together with the ratings scale below. The speaker bio-description was presented at the top of the screen. The participants had a maximum of 7 s to rate how much sense each sentence made on a five-point scale (1-“Completely no-sense” and 5-“Completely sensible”). To ensure that participants paid attention throughout the course of the study, we added six catch trials in which participants were asked to press a specific number on the keyboard.

For study 1b the same procedure was used with the following differences: during the familiarization phase, the two bio-descriptions were presented at the beginning of the experimental session together with one face photograph. Two face photographs of Caucasian young women were selected and association between face and language condition was counterbalanced across participants; during the judgment phase, sentences were presented together with the face at the top of the screen instead of the bio-description. The 80 sentences were presented in random order with a short break after 40 sentences. See Fig. 1 for details of the procedure.

2.1.4. Analysis

Analyses were performed on the responses to the critical sentence condition ratings using R software (R Core Team, 2018). Ordinal logistic regression was employed in the form of a cumulative link mixed model (Christensen, 2015), as implemented by the function *clmm* of the Ordinal package (Christensen, 2018).² In the mixed models, the factor Speaker (native vs foreigner) and Study (1a vs 1b) were introduced as fixed effect. Participant and Item were included in the model as random effects. Two models were constructed, with and without the interaction of the two fixed effects. The fits of the two models were compared using the Akaike information criterion (AIC; Akaike, 1987). The AIC compares the models at once and gives information on a model's relative evidence, so that the model with the lowest AIC has the best fit (Wagenmakers & Farrell, 2004). For complete analysis with filler sentences see Appendix A.

2.1.5. Results and discussion

Performance in the three comprehension questions presented at the end of the familiarization phase was very high, ensuring that participants had read the speaker descriptions carefully (99% and 98%, in Study 1a and Study 1b, respectively). The comparison between the two models revealed that the best model was the one without the interaction. The results of *clmm* revealed a main effect of the Speaker, $SE = 0.05$, $z = -2.01$, $p = .04$. In particular, ratings for under-informative sentences were higher in the Foreign speaker condition ($M = 2.55$, $SD = 0.95$) than in the Native speaker condition ($M = 2.49$, $SD = 0.93$). The main effect of Study was not significant, $SE = 0.21$, $z = 1.45$, $p = .14$. See Table 2 for results divided by study. The results show more acceptable judgments for under-informative statements when associated with foreign speakers than with native speakers. This pattern nicely replicates the main findings of Fairchild and Papafragou (2018) in Italian language and using Italian and Moldavian speakers' identity.

3. Study 2: unknown manipulation I

3.1. Method

3.1.1. Participants

Data from two hundred and thirty-nine native Italian speakers were analyzed in Study 2 (mean age = 25.32, SD = 5.12), 114 (62 females) and 125 (52 females) for Studies 2a and 2b, respectively. The same recruitment method as for Study 1 was used.

² We treated the Likert scale as an ordinal variable because in our opinion it is the most suitable approach. The same results emerged in Study 1 and Study 2 when the dependent variable is analyzed as a continuous variable using lmer.

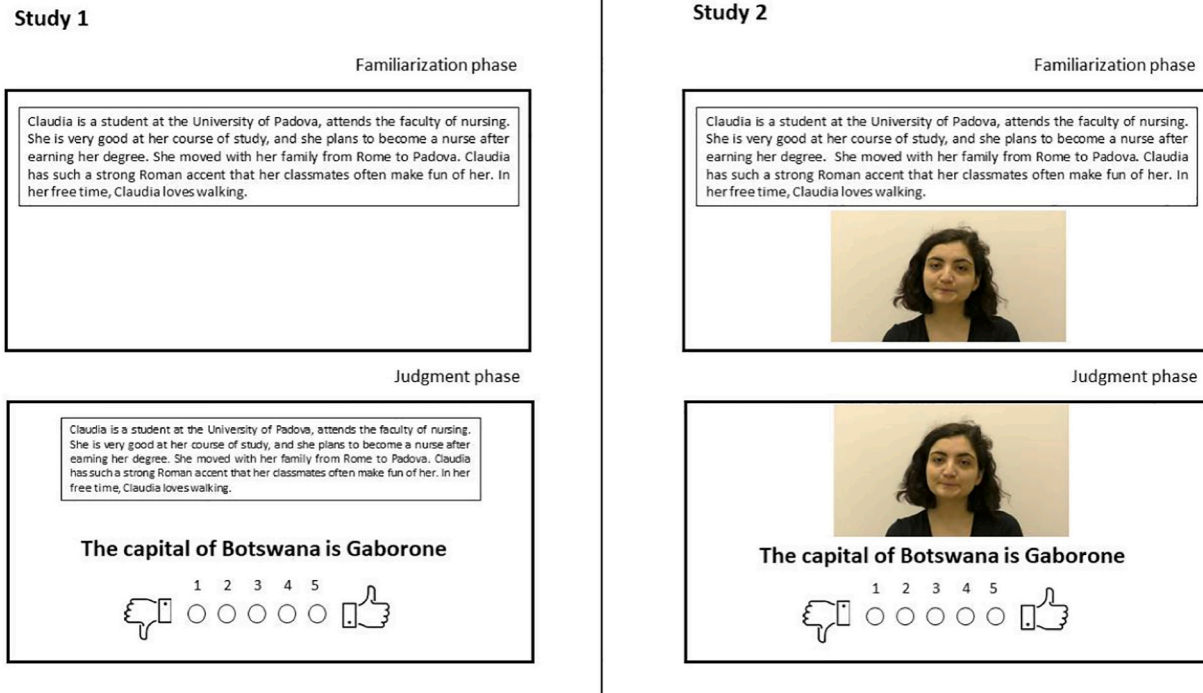


Fig. 1. Procedure of Study 1 (1a and 1b) and Study 2 (2a and 2b).

Table 2

Average of the ratings in Study 1 and Study 2 split by manipulation and type of study. Standard deviations are reported into parentheses.

Speaker	Study 1 (Under-informative)		Study 2 (Unknown)	
	Study 1a	Study 1b	Study 2a	Study 2b
Native	2.34 (0.87)	2.58 (0.96)	2.98 (0.40)	2.92 (0.43)
Foreign	2.45 (0.83)	2.62 (1.02)	3.02 (0.45)	2.96 (0.47)

3.1.2. Materials, procedure and analysis

The experimental set was composed of 20 unknown sentences (“The capital of Botswana is Gaborone”). Unknown sentences were trivia statements about world-knowledge facts mostly unknown to the participants. In addition, two filler conditions, 20 sentences each, were added: true known sentences (“To play tennis, you need to have a racket”) and false known sentences (“Arachnophobia is the fear of having fun”). The three sentence types did not differ from each other in the number of words (all $t_s < 1$). The same task and presentation modality as for Study 1 was used. The same analysis was performed as in Study 1. For complete analysis with filler sentences see Appendix A.

3.1.3. Results and discussion

Performance in the three comprehension questions presented at the end of the familiarization phase was very high, ensuring that participants had read the speaker descriptions carefully (98% and 99%, in Study 2a and 2b, respectively). The comparison between the two models revealed that the best model was the one without the interaction. The results of *clmm* revealed a main effect of the Speaker, $SE = 0.06$, $z = -2.13$, $p = .03$, as ratings for unknown sentences were higher in the Foreign Speaker ($M = 2.99$, $SD = 0.46$) condition than in the Native Speaker ($M = 2.95$, $SD = 0.42$) condition. The main effect of Study was not significant, $SE = 0.14$, $z = -1.14$, $p = .25$. See Table 2 for the results divided by study. Results show more acceptable judgments for unknown statements when associated with foreign speakers than with native speakers. To our knowledge this is the first evidence of such a positive

bias versus foreign speaker in message interpretation. Before further discussing this finding, we aimed to replicate it in Study 3.

4. Study 3: unknown manipulation II

The main objective of Study 3 was to replicate and test the generalizability of the results reported in Study 2. To this end, we introduced some modifications to the design of Study 2 and provided a conceptual replication rather than a direct replication (Agnoli et al., 2021). First, we changed the language assigned to the foreign speaker. This is because Moldovan is a romance language like the native language of the participants, that is, Italian. This fact could cause participants in Study 2 to still perceive the Moldavian accent as similar to their own accent. In Study 3 we aimed to increase the distance between the language of the foreigner and the native speaker, by using a language with a more diverse phonetic repertoire with respect to Italian. To this end, the language attributed to the foreigner was Lithuanian, a language belonging to the Baltic group. Second, we quadrupled the number of experiment items and tested 80 statements in the critical unknown condition. Third, although significant, the magnitude of the Speaker effects in Studies 1 and 2 was relatively small. This was probably due to the fact that a five-point scale was used. In Study 3, and following recent studies (Boduch-Grabka & Lev-Ari, 2021; Foucart & Hartsuiker, 2021), we used instead a 100-point slider and worked with a continuous rather than an ordinal dependent variable, following recent studies. Four, Study 1 and 2 showed that same patterns when statements were presented together with either bio-descriptions (studies 1a and 2a) or faces (studies 1b and 2b), suggesting that the modality of the implementation of the link between speaker and statement was not a key factor. On the basis of this, we decided to present the statements together with the speaker's face only. To help participants to associate the face with the corresponding assigned nationality, a national flag was presented together with their faces (see Grainger et al., 2017). Five, in Study 2 participants were required to judge how much the sentences made sense. This question differs from the standard question used in other studies evaluating unknown statements (Foucart et al., 2019, 2020; Foucart &

Hartsuiker, 2021; Hanzlíková & Skarnitzl, 2017; Lev-Ari & Keysar, 2010; Podlipský et al., 2016; Souza & Markman, 2013). Thus, in Study 3 we changed the main judgment task and asked participants to give their judgments on truthfulness instead of goodness. Finally, in Study 2 participants were not directly asked how trustworthy they find the speakers; therefore, it remains an open issue whether participants find foreign speakers more trustworthy than native speakers. To directly address this issue, in Study 3 we asked the participants to judge the two speakers in terms of reliability and pleasantness at the end of the statement judgment phase, to be able to make a conclusion on the participants' assessment of the speaker's moral character. To do that, we used one of the five solidarity traits (pleasant) reported by Dragojevic and Giles (2016). Furthermore, the affective response of the participants was assessed by having them indicate their feelings towards the speaker using a 100-point feeling thermometer scale (Dragojevic, 2020).³

4.1.1. Participants

Data from one hundred and fifteen native Italian speakers were analyzed in Study 3 (mean age = 25.28, SD = 5.03, 57 females). The same recruitment method as for Study 1 was used.

4.1.2. Materials

The experimental set was composed of 80 unknown sentences ('The capital of Botswana is Gaborone'). As for Study 2, two filler conditions, 40 sentences each, were added: true known sentences ('To play tennis, you need to have a racket') and false known sentences ('Water is a chemical compound of hydrogen and fluorine'). The three types of sentences did not differ from each other in the number of words (all $t_s < 1$). The same bio-descriptions as for studies 1b and 2b were used, with the following differences: i) Svetlana (Foreign speaker condition) was replaced with Adelė, a native speaker of Lithuania with a strong Lithuanian accent; ii) in the short-bio description related drawings congruent with the description were added in order to help the memory of the participants (e.g., the drawing of a girl running to illustrate that one of the speaker's favorites hobbies is to run); iii) during the judgment of the sentences, the flag indicating the speaker's country was presented together with the speaker's face.

4.1.3. Procedure

Half of the sentences within each sentence type were presented in the native-speaker condition and the other half in the foreign-speaker condition counterbalancing across participants. Pairing of faces with speaker conditions was also counterbalanced among participants. Speaker bio-descriptions were presented one at a time and participants were instructed to read them carefully. Three multiple-choice comprehension questions were presented at the end of the familiarization phase to evaluate whether participants had read the bio-descriptions carefully. The participants were then instructed to read 160 sentences that were originally uttered by the speaker they had just read about. Sentences were presented in random order. For each trial, a sentence appeared at the top of the screen with the slider below. The face of the speaker and the flag indicating the nation were presented in the center of the screen. The participants had a maximum of 7 s to rate the amount of truth each sentence made on a 100-point slider (1-'Completely false' and 100-'Completely truth'). In addition, at the end of the statement judgment phase, participants had to answer three questions about the two speakers: the first question asked participants to judge on a 100-point Likert scale what their overall feelings towards the speaker were (1-very negative; 100-very positive); the second and third questions asked

participants how much they found each speaker reliable and pleasant on a 7-point Likert scale (1-not at all; 7-much).

4.1.4. Analysis

Linear mixed-effects regressions were performed on the ratings to the critical Unknown items using the lme4 package (Bates et al., 2015). In the mixed model, the factor Speaker (native vs foreigner) was introduced as fixed effect, and Participant and Item as random effects. We compared this model with a null model with only Item and Participant as random effects. For complete analysis with filler sentences see Appendix B.

4.1.5. Results

Ratings for unknown sentences were higher in the foreign speaker condition ($M = 50.19$; $SD = 8.78$) than in the native speaker condition ($M = 48.68$; $SD = 9.02$). The results showed that the model including Speaker variable was better than the null model, $\chi^2(1) = 9.52$, $p = .002$. The model estimated an effect of Speaker of 1.52, $SE = 0.49$, $t = 3.08$, $p = .002$, in the direction of higher ratings for unknown sentences when attributed to the foreign speaker, showing that comprehenders judged sentences differently depending on whether they believed that a native or a foreign speaker had said the sentences.

Furthermore, paired *t*-test analyzes were performed to assess final judgments on positive/negative feelings towards the speakers and on how reliable and pleasant the speakers are. The results showed that foreign speakers were judged better in all three dimensions. In particular, compared to the native speaker, the foreign speaker was considered more positive (foreign $M = 77.05$; $SD = 16.60$; native $M = 73.87$; $SD = 18.96$; $t(114) = 2.11$, $p = .037$); more trustworthy (foreign $M = 5.56$; $SD = 0.97$; native $M = 5.38$; $SD = 1.09$; $t(114) = 2.28$, $p = .024$); and more pleasant (foreign $M = 5.57$; $SD = 1.08$; native $M = 5.31$; $SD = 1.04$; $t(114) = 2.46$, $p = .015$).

4.1.6. Discussion

In Study 3, Unknown sentences were judged to be truer when attributed to the foreign speaker than when attributed to the native speaker. This result replicates the pattern observed in Study 2. Critically, Study 3 generalizes the phenomenon to a new set of materials, with different nationality contrast (Italian/Lithuania), and using a continuous dependent variable instead of an ordinal dependent variable. Furthermore, the foreign speaker was judged as more trustworthy, more pleasant, and overall generated more positive feelings compared to the native speaker.

The fact that foreigners were considered more trustworthy, more pleasant and generated more positive ratings in Study 3, seems to suggest that foreigners generate a positive bias in our participants, contrary to previous literature (Dewaele & McCloskey, 2015; Fraser & Kelly, 2012; Fuertes et al., 2012; Giles, 2013; Gluszek & Dovidio, 2010). If this were the case, we should expect a positive correlation between the differences of the judgments on the statement in the two speaker conditions and the differences between the judgments over the speaker. That is, having a more positive opinion for a specific individual (i.e., the foreign speaker) could engage higher scores during the judgment task. To explore this possibility, we ran three correlation analyses on a participant basis. For each participant, the difference between the mean responses in the statement rating task between the two conditions (native/foreign) was calculated. We then correlated this difference with the difference between the two scores each participant gave to native and foreign speakers in terms of trustworthy, pleasant and positive/negative feelings. However, neither of these correlations was significant ($p_s > 0.47$).

5. General discussion

The influences of two factors may be responsible for sentences uttered to a foreign speaker being judged worse. One possible factor is

³ We thank an anonymous reviewer for pointing us out the need of directly evaluating the trustworthiness towards foreign and native speakers.

that foreign-accented speech is harder to understand and therefore may imply a reduction of cognitive resources devoted to message processing. A second possible factor is the automatic categorization of the speaker as a foreign individual that activates negative stereotypes. Indeed, foreign-accented speakers are usually judged as less trustworthy, less educated, less intelligent, and less competent than native-accented speakers (Dewaele & McCloskey, 2015; Fraser & Kelly, 2012; Fuertes et al., 2012; Giles, 2013; Gluszek & Dovidio, 2010). It is difficult to disentangle the influence of each of these two components when auditory materials are used. In this research, we used written materials. Our results showed that the categorization of speakers as foreign or native speakers per se modulates the acceptability and the truth of sentence statements regardless of differences of processing linked to fluency.

In Study 1, acceptability ratings for under-informative sentences increased when comprehenders believed the sentences were uttered by a foreign rather than a native speaker, replicating in Italian previous findings reported in English (Fairchild & Papafragou, 2018). In Studies 2 and 3, the acceptability and trustworthiness ratings for unknown sentences increased when participants believed that these sentences were stated by a foreign rather than a native speaker. This effect seems incongruent with the 'fluency-intelligibility' account (Lev-Ari & Keysar, 2010) and with the prediction of lower judgments for foreign speakers tied to negative stereotypes associated with individuals from the out-group. Finally, in Study 3, the foreign speaker was considered more trustworthy, more pleasant and generated more positive feelings than the native speakers.

Where does the advantage for foreign speakers come from? Regarding the under-informative condition, and in agreement with Fairchild and Papafragou (2018), we interpret the 'pragmatic lenience' towards foreign speakers in accordance to comprehenders's belief about the linguistic competence of foreign speakers. Since foreign speakers are expected to be less accurate in their lexical choices compared to native speakers, the choice of a pragmatic under-informative statement would be forgiven more often in foreign speakers than in native speakers (see also Fairchild et al., 2020 and Grey et al., 2018; Grey & Van Hell, 2017; Hanulíková et al., 2012 for a similar phenomenon with syntactic violations).

Regarding the advantage for foreigners in unknown statements, a possible explanation may rely on the different attribution of general knowledge to foreign and native speakers when an unknown sentence is presented. Participants might attribute a range of knowledge to foreign speakers that may be different from their own knowledge (Labov, 2006). Critically, the knowledge attributed to the native speaker can be expected to be very similar to the participant's own knowledge because the native speaker is an individual of the same social and cultural heritage. When an unknown statement is presented, participants would not have enough information to judge the acceptability or truth of the statement and would base the judgment on the knowledge attributed to the speaker. The higher ratings on the foreign condition suggest that participants tended to trust foreign speaker knowledge more than native (same) knowledge in case of uncertainty (unknown statements). Something we will call 'knowledge lenience' towards foreign speakers.

Indirect evidence for this 'knowledge lenience' towards foreigners may come from electrophysiological studies. For example, several studies have explored semantic processing under foreign and native speech conditions using the N400 which is a standard electrophysiological index of semantic congruency (Goslin et al., 2012; Romero-Rivas et al., 2015; Song & Iverson, 2018). These studies reported different N400 modulations between foreign-accented sentences and native-accented sentences, suggesting different semantic processing between the two speaker conditions. Based on our findings, we conclude that different semantic processing may be due (in part) to the different

knowledge attribution participants ascribed to foreign and native speakers. Thus, we predict that a similar electrophysiological modulation would be obtained if, instead of auditory sentences, written sentences associated with a foreign or a native speaker were used. Partially congruent with our prediction is the study of Foucart et al. (2019). These authors reported different modulations on the N400 component between sentences associated with speakers of different social status (high and low), suggesting that speaker identity modulates the semantic processing. Critically, as described in the Introduction, Foucart and colleagues used a written presentation of the sentences. It is relevant to note that foreign and native speech also differ on early ERP deflections, as the N100 and P200 components (Jiang et al., 2020; Romero-Rivas et al., 2016; for discussion see Foucart et al., 2020; Foucart & Hartsuiker, 2021).

Our findings also have relevant implications to account for the apparently inconsistent pattern of results that have been obtained regarding the role of accented-speech on trivia unknown statement judgments. As described above, some studies reported a negative bias in trust judgments for foreign-accented speech compared to native-accented speech (Lev-Ari & Keysar, 2010), while other studies did not report such an effect. It has been proposed that the contrasting pattern may be explained by adaptation. Speech perception is a highly flexible process that can adapt quickly to accented speech (Bradlow & Bent, 2008; Romero-Rivas et al., 2015). Some studies report that such a flexible adaptation may cancel out the impact of reduced processing fluency on sentence judgments (Boduch-Grabka & Lev-Ari, 2021; Lev-Ari & Keysar, 2010; Souza & Markman, 2013). Based on this, one factor determining the negative credibility for statements uttered with foreign-accented speech would rely on fluency processing. The findings we report here, which show an effect of lenience towards foreigners, suggest that there may be another factor affecting sentence judgments. This would be the linguistic and socio-cultural identity of the speaker. Once we know a particular individual is a foreign-speaker, we would tend to forgive her lack of linguistic competence because we expect this individual to be less competent linguistically than a native-speaker. At the same time, we attribute a range of knowledge to foreign speakers that differ from our own knowledge; this would lead to trusting foreign speakers under uncertainty conditions, that is, when for instance we are required to judge the credibility of unknown trivia statements. More research is needed to understand the possible interaction between these two factors (i.e., fluency and speaker identity) in message interpretation.

In sum, our results suggest that native speakers do not only tend to forgive less linguistic competence of foreign speakers, accepting as more sensible under-informative statements, but also, they tend to trust foreign speakers more in situations of lack of knowledge. These findings have relevant social implications since they suggest that the identity of our interlocutor affects the interpretation of the message. In other words, message interpretation cannot be dissociated from who is communicating the message.

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Declaration of competing interest

The authors declare that no financial interest or benefit has arisen from the direct applications of the presented research.

Appendix A. Analysis including filler conditions (Studies 1 and 2)

False statements that were judged with 4 or 5 ratings and true statements that were judged with 1 or 2 were considered outlier responses and removed from the analysis (6% and 3% for Study 1 and Study 2, respectively). For Study 1, the factor Speaker (native vs foreigner) and Sentence Type (Under-Informative, True-Some, True-All, False-All) were introduced as fixed effects. For Study 2, the factor Speaker (native vs foreigner) and Sentence Type (Unknown, True, False) were introduced as fixed effects. Participant and Item were included in the models in both studies as random effects. The same analysis as in the main analysis was performed. In Study 1, the comparison between the two models revealed that the best model was the one without the interaction. The results of *clmm* revealed a main effect of the Sentence Type, $p < .001$. The main effect of Speaker was not significant, $p = .31$ (see Table A1). In Study 2, the comparison between the two models revealed that the best model was the one with the interaction, $p = .006$. The results of *clmm* revealed a main effect of the Sentence Type, $p < .001$. The main effect of Speaker was not significant, $p = .21$ (see Table A2).

Table A1
Average of the rating in Study 1. Standard deviations are reported in parentheses.

Speaker	Sentence type			
	Under-informative	True (Some)	True (All)	False (All)
Native	2.46 (0.93)	4.56 (0.46)	4.50 (0.38)	1.40 (0.38)
Foreign	2.53 (0.95)	4.59 (0.46)	4.51 (0.35)	1.41 (0.38)

Table A2
Average of the rating in Study 2. Standard deviations are reported in parentheses.

Speaker	Sentence type		
	Unknown	True	False
Native	2.95 (0.42)	4.79 (0.28)	1.16 (0.26)
Foreign	2.99 (0.46)	4.76 (0.30)	1.18 (0.29)

Appendix B. Analysis including filler conditions (Study 3)

False statements that were judged above 75/100 ratings and true statements that were judged lower 25/100 were considered outlier responses and removed from the analysis (a total of 3.1% ratings). We compared three models. In all three models, Participant and Item were included as random effects. In the first model, the factors Speaker (native vs foreigner) and Sentence Type (Unknown, True, False) were included as fixed effects. In the second model we included the interaction between these two factors. In the null model there was not fixed effects. The results showed that the model including the interaction was better than the other two models, $p = .001$. The main effect of Sentence Type was significant, $p < .001$. The main effect of Speaker was significant, $p = .02$ (see Table B).

Table B
Average of the rating in Study 3. Standard deviations are reported in parentheses.

Speaker	Sentence Type		
	Unknown	True	False
Native	48.68 (9.02)	94.94 (5.12)	4.94 (5.44)
Foreign	50.19 (8.78)	94.08 (6.18)	5.39 (6.38)

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