

### Imprecision and speaker identity: How social cues affect meaning resolution

It's been shown that listeners use the semantic and pragmatic properties of linguistic utterances to draw social inferences about the speaker (Acton and Potts 2014, Beltrama 2016). These findings raise the question of whether, and how, social information conversely serves as a cue for meaning resolution, in combination with other factors. Focusing on *imprecision* as a case study, we show that (i) reasoning about precision induces a processing cost, especially when it leads to rejecting a statement; and (ii) this cost is modulated by the social identity of the speaker.

**Background** –Speakers' descriptions can be associated with varying margins of imprecision: an actual time of "2:57" could be reported precisely as "2:57", or less precisely as "3 o'clock" (Lasersohn 1999 i.a.). Crucially, it's been shown that the choice of precision systematically licenses inferences about the interlocutor's identity, with highly precise speakers typically associated with clusters of social qualities (i.e., "educated, articulate"; Beltrama 2018) and social groups ("Nerds", Bucholtz 2001). Imprecision thus offers an ideal test-bed to investigate whether listeners reason differently about standards of imprecision depending on the expectations linked to the speaker's identity: the less precise a speaker is expected to be based on their identity, the more consideration will be given to tolerating imprecision.

**Methods** – We test this question with a picture selection task using the covered box paradigm. The stimuli introduced dialogues between two characters in a context; one character asks a question (e.g., "How much is the cheapest flight?") and the other one checks their phone and provides a response containing a quantity expression (e.g., "It's \$200"). Participants were then shown two images of a phone: one in which the screen is VISIBLE; and one in which it is turned face down (COVERED). They were then instructed to choose the VISIBLE screen if they believed its content fit what the speaker said; or the COVERED one if they believed it did not. Two factors were crossed in a 2x3 design. The first factor manipulated the Social Identity of the interlocutors, which were either NERDY or CHILL, expected to speak more or less precisely, respectively. The effectiveness of the social manipulation was ascertained in a norming study, in which the two sets of characters were confirmed to be associated with these social identities and expectations. The second factor manipulated the fit between the content of the visible screen and the character's response, with three levels: MATCH (Fig. 1); MISMATCH (Fig. 2); or IMPRECISE (Fig. 3).



Figure 1: Match

Figure 2: Mismatch

Figure 3: Imprecise

24 items were distributed in 6 lists with a Latin Square Design, interspersed with 24 fillers (involving 'socially neutral' characters uttering 'some'-statements). Quantity expressions in the experimental items described price, distance, or time, all in relation to getting from one place to another (e.g., airfare cost etc.). 71 participants were recruited online on Prolific. Two dependent variables were recorded: choice of VISIBLE vs. COVERED; and the response time (RT) for this decision (measured from display onset of the Visible/Covered picture options).

**Hypotheses** – Our first hypothesis (**H1**) is that calculating the threshold of imprecision to adjudicate an utterance should take additional processing effort; this should translate in longer RTs for numerals in the Imprecise condition than the other two, in which no such calculation is required. As for how social expectations shape this reasoning, we hypothesize that responses uttered by

nerdy speakers are held to higher precision standards, thus leading to higher rates of COVERED choices in the Imprecise condition (**H2a**); and that RTs in the Imprecise condition are sensitive to the social expectations about the speaker – rejecting the utterance should be faster when the speaker is Nerdy and slower when the speaker is Chill, and vice versa (**H2b**).

**Results** – The proportion of COVERED choices is illustrated in Fig. 4. The Mismatch and Match conditions yield the expected ceiling and floor COVERED choice rates. The Imprecise condition yielded a Covered choice rate of 33%, thus exhibiting an overall inclination towards leniency, but no effect of social identity (contra **H2a**). The response time data analysis focused on trials shorter than 10s (excluding less than 5% of trials). To address **H1**, we looked at RTs across Screen Fit conditions, shown in Fig. 5 (error bars = *se*). A mixed-effects model analysis with Screen Fit as a fixed effect, by-Subjects and by-Items random intercepts and slopes revealed RTs to be significantly higher for the Imprecise condition (collapsing visible and covered choices) (Imp vs. Match:  $\beta=-802.11$ ;  $se=121.16$ ;  $t = 6.62$ ; Imp vs. Mismatch:  $\beta=757.59$ ;  $se=126.03$ ;  $t = 6.01$ ). To test **H2b** we focus on the Imprecise condition, for which we do expect to find an effect of Social Identity on the RTs. The results are plotted in Fig. 6. We fit a linear mixed-effects model with Screen Choice and Social Identity as fixed effects, and by-Subjects and by-Items random intercepts and slopes. The model shows a main effect of Screen Choice, with Visible choices faster than Covered ones ( $\beta=-1574.9$ ;  $se=360.16$ ;  $t = 4.63$ ); and, crucially, an interaction between Screen Choice and Social Identity, with Covered choices faster when the speaker is Nerdy ( $\beta=-828.8$ ;  $se=341.0$ ;  $t = 2.42$ ).

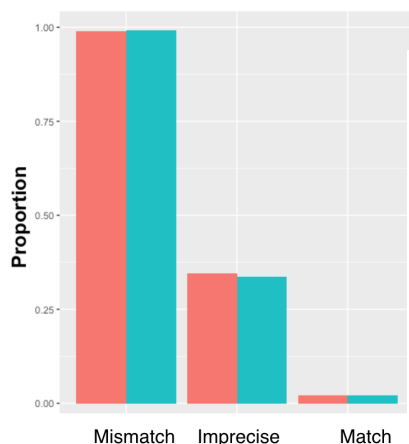


Figure 4: Proportion: covered

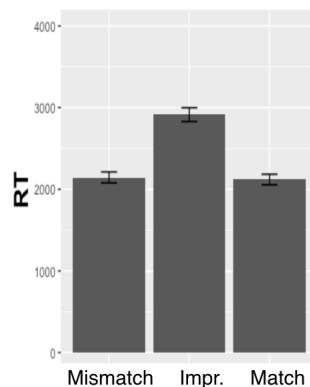


Figure 5: RTs: overall

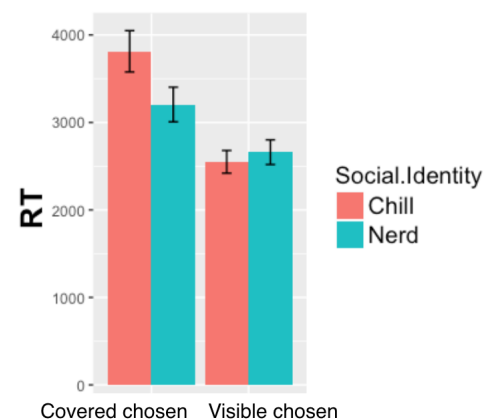


Figure 6: RTs: imprecise

**Discussion** – The results support two conclusions. First, the adjudication of imprecise statements requires additional processing in comparison to clearly false or true statements, regardless of whether the statement is eventually accepted or rejected. This indicates that the resolution of imprecision involves independent and costly pragmatic reasoning above and beyond the interpretation of the expressions it applies to. We suggest that this finding is compatible with Lasersohn’s (1999) idea that imprecision is computed pragmatically around the literal meaning of the expression; on this view, the faster RTs in the Match and Mismatch conditions are due to the fact that this computation is not necessary, since adjudication is possible based on literal meaning alone. Second, listeners do consider social information when navigating this process, as indicated by the greater delay for the Chill character for Covered choices in the Imprecise condition. This suggests that committing to a rejection is easier when the character is expected to speak precisely, and harder when they are not. More broadly, it provides evidence that pragmatic reasoning about resolving imprecision is indeed modulated by social information about the speaker, opening up a novel angle on the investigation of meaning processing.