Unable or unwilling?
Being under-informative is interpreted differently for native and non-native speakers

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Understanding native vs. non-native speech

- Non-native speech is processed more slowly and rated as less intelligible than native speech (e.g., Munroe & Derwing, 1994).
- Listeners expect non-native speakers to make syntactic errors (Hanulíková et al., 2012; cf. Grey & Van Hell, 2017; Gibson et al., 2017).
Negative bias towards non-native speakers

- Adults judge non-native speakers as being less trustworthy (Lev-Ari & Keysar, 2010) and more vague (Lev-Ari & Keysar, 2012).
- Even young children prefer to learn from, be friends with, and share resources with native over non-native speakers (Kinzler, Dupoux, & Spelke, 2007).
A positive bias

- We uncover a systematic difference in the interpretation of what native vs. non-native speakers say
  - in a new domain: pragmatics of non-native speech.
- Unlike some of the evidence above (Lev-Ari & Keysar, 2010, 2012; Kinzler et al., 2007),
  - the difference creates a bias in favor of non-native speakers.
- In exploring this case, we connect pragmatic and social inferences about speaker identity in novel ways.
Communication is a co-operative activity in which speakers strive to be informative (Grice, 1975).

Failures to offer necessary information are penalized:
- Adults generally disprefer true but under-informative statements ("Some dogs are mammals"; e.g., Noveck, 2001; Papafragou & Musolino, 2003; Bott & Noveck, 2004; Guasti et al., 2005).
- Children avoid learning new information from ‘teachers’ who have a history of being under-informative (Gweon et al., 2014).
Speaker is either unable or unwilling (Grice, 1975; Horn, 1979; Sperber & Wilson, 1986; Geurts, 2011) to convey the required information.

- In most processing studies, under-informativeness is either not motivated (e.g., presented out of context), or attributed to a narrow set of factors (speaker inability: Breheny et al., 2013; Bergen & Grodner, 2012; Papafragou et al., 2018; but see Bonnefon et al., 2009).
- Unwillingness largely ignored.
- Depending on its perceived cause, a failure to be informative is likely to affect social cognition and future behavior in different ways: other things being equal, unwillingness can signal a breach of the co-operativeness assumption and lead to communication breakdowns (Grice, 1975).
Inability and unwillingness are treated differently in action understanding

- Nine-month-olds react with more impatience when interacting with an adult who fails to give them a toy if the adult is unwilling – as opposed to unable - to give them the toy (Behne, Carpenter & Tomasello, 2005).

- Chimpanzees produce more frustration behaviors when interacting with an unwilling compared to an unable (but willing) experimenter (Call et al., 2005; cf. also capuchins - Phillips et al., 2009 and Tonkean macaques - Canteloupe & Meunier, 2017).
Under-informativeness and the unable/unwilling distinction

- Proposal: Listeners reason about an under-informative speaker’s intentions differently depending on the speaker’s native language (cf. also Fairchild & Papafragou, 2018).
  - Non-native speech is expected to be more error prone/less controlled by speaker intentions (Hanulíková et al., 2012; cf. Grey & Van Hell, 2017; Gibson et al., 2017).
  - Prediction: Pragmatic violations such as under-informativeness should be more likely to be attributed to inability (rather than unwillingness) in non-native speakers.
Implications for social cognition

• There are lower social penalties for unable but willing, as opposed to unwilling, social partners (cf. Behne et al., 2005).

• **Prediction:** Pragmatic violations such as under-informativeness should have a lower social penalty for Non-Native speakers than for Native speakers.

• Test case: Social Learning
  
  o Despite tendency to avoid learning from under-informative individuals (Gweon et al., 2014), listeners should be more willing to learn from an Under-Informative Non-Native speaker (probably unable to say more) than an Under-Informative Native speaker (perhaps unwilling to say more).
The present study
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Experiment 1: Explaining Under-Informativeness (Inability vs. Unwillingness)

- Does listener perception of under-informativeness differ for Native vs. Non-Native speakers?
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Experiments 2 and 3: Implications for Social Learning

- Do the perceived reasons for under-informativeness impact future learning from Native vs. Non-Native speakers?
### Experiment 1

\((N=126)\)

<table>
<thead>
<tr>
<th>Native Speaker Condition (N=63)</th>
<th>Non-Native Speaker Condition (N=63)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is <strong>Emma</strong>. <strong>Emma</strong> is a college student at the University of Delaware, majoring in history. She moved to Delaware from <strong>Boston</strong> three years ago and still has a strong <strong>Boston</strong> accent. In her spare time, <strong>Emma</strong> likes to paint and play the piano.</td>
<td>This is <strong>Yuqi</strong>. <strong>Yuqi</strong> is a college student at the University of Delaware, majoring in history. She moved to Delaware from <strong>China</strong> three years ago and still has a strong <strong>Chinese</strong> accent. In her spare time, <strong>Yuqi</strong> likes to paint and play the piano.</td>
</tr>
</tbody>
</table>
There are bananas and apples.

Why didn’t Emma/Yuqi say that there are bananas, apples and pears?
**Experiment 1**

$(N = 126)$

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<table>
<thead>
<tr>
<th>Justification Type</th>
<th>Native</th>
<th>Non-Native</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inability</td>
<td>39.68%</td>
<td>76.20%</td>
<td></td>
</tr>
<tr>
<td>Linguistic difficulty</td>
<td>7.94%</td>
<td>41.27%</td>
<td>She didn’t know the word for pears.</td>
</tr>
<tr>
<td>Perceptual or cognitive difficulty</td>
<td>31.74%</td>
<td>34.93%</td>
<td>She didn’t see the pears.</td>
</tr>
<tr>
<td>Unwillingness</td>
<td>60.32%</td>
<td>23.80%</td>
<td></td>
</tr>
<tr>
<td>Deception</td>
<td>26.98%</td>
<td>12.70%</td>
<td>She wanted to keep the pears.</td>
</tr>
<tr>
<td>Politeness</td>
<td>19.05%</td>
<td>3.17%</td>
<td>She knew her friend didn’t like pears, so she only offered her fruit she liked.</td>
</tr>
<tr>
<td>Saving face</td>
<td>6.35%</td>
<td>3.17%</td>
<td>She is embarrassed of her accent.</td>
</tr>
<tr>
<td>Other</td>
<td>7.94%</td>
<td>4.76%</td>
<td>It was her choice.</td>
</tr>
</tbody>
</table>

**Speaker Type affects Inability Justifications ($p < .0001$)**
Experiment 2

(N = 457)

Novel Object: Zeg

Cuts dough into noodles

Separates the noodles

Attaches to a table
### Native Speaker Condition (N=228)

**Emma Smith** is the inventor of the Zeg. She likes to create and build new tools, and is a member of an amateur inventor club. Emma also likes to hike and play the piano. She is originally from *Boston* but recently moved to Delaware and her neighbors say that she still has a strong *Boston accent*. 

### Non-Native Speaker Condition (N=229)

**Yuqi Chen** is the inventor of the Zeg. She likes to create and build new tools, and is a member of an amateur inventor club. Yuqi also likes to hike and play the piano. She is originally from *China* but recently moved to Delaware and her neighbors say that she still has a strong *Chinese accent*. 

**Experiment 2**

\( N = 457 \)
Emma/Yuqi is sharing her invention, the Zeg, at the amateur inventor club's annual public science fair. This is what Emma/Yuqi says about the Zeg to people who visit her display:

Under-informative

The Zeg attaches to a table.

OR

Informative

The Zeg attaches to a table, cuts dough into noodles, and separates the noodles.
Experiment 2
(N = 457)

Learning Choice Ratings

Test Question:
“How likely would you be to visit Emma/Yuqi’s display at a future science fair?”

0 not at all
5 extremely
Experiment 2  
\((N = 457)\)

**Learning Choice Ratings**

Interaction between Speaker Type and Informativeness  
\((F(1, 453) = 3.96, p = .047):\)

Listeners were more willing to learn from a **Under-Informative Non-Native speaker** compared to an **Under-Informative Native speaker** \((p = .040)\).

No difference for Informative speakers.
Experiment 3

(N = 400)

Same design as Experiment 2 but different test question:

Emma/Yuqi is developing a new tool called the Plib.

Test Question:
How would you like to learn about the Plib?

Emma

Sue
Interaction between Speaker Type and Informativeness ($p = .008$): Under-informative speakers more likely to be given a second chance as teachers if they were non-native speakers ($p = .017$). No difference for Informative speakers.
Summary

Listeners integrate stable properties of a speaker’s identity in pragmatic processing.
  
Under-informativeness was more likely to be attributed to inability (as opposed to unwillingness) in non-native as compared to native speakers.

Implications for social learning
  
Listeners were more likely to choose to learn (again) from an under-informative non-native speaker than an under-informative native speaker.
  
Presumably because listeners were less likely to assume that a non-native speaker was willfully under-informative.
Implications for non-native language processing

• Differences between native and non-native speech processing in the domain of pragmatics.
  o The presence of a foreign accent offers the starting point for inferences about the identity and properties of the speaker.

• Our data go beyond prior research showing negative biases towards non-native speakers (e.g., Lev-Ari & Keysar, 2010, 2012; Kinzler et al., 2007).
  o What begins as a disadvantage (diminished linguistic ability) for non-native speakers can in other contexts be treated as a benefit (cf. also Hanuliková et al., 2012; Gibson et al., 2017; Fairchild & Papafragou, 2018).
Implications for non-native language processing

- Non-native speech is processed differently from native speech even in the absence of actual accents.
  - Our stimuli were written so non-native accents were imagined, not perceived.
  - These effects can only be due to expectations about non-native speech (Lev-Ari, 2015; Gibson et al., 2017; Fairchild & Papafragou, 2018) and not actual intelligibility costs (Davis et al., 2005).
Implications for pragmatic processing

- Our results show that listeners consider both what the speaker is able and what the speaker is willing to say when they make conversational inferences (e.g., Grice, 1975; Sperber & Wilson, 1995; Geurts, 2011).
  - Argue for studying pragmatic phenomena such as violations of informativeness in context, and not in isolation.
  - Flexibly generalize to a wide range of additional cases (e.g., inability explanations are likely for child native speakers, or in cases of hard-to-name objects).
  - Suggest that linguistic detail can carry information about the speaker that can have further social costs and benefits.
  - Connect pragmatics to social meaning and the interpretation of rational action.

Thank you!