The direct relation between prediction and adaptation
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INTRODUCTION
- Linguistic adaptation: change in linguistic behaviors/knowledge in response to linguistic input
- Error-based Implicit Learning (EIL) accounts: linguistic adaptation is a form of implicit learning through reduction of prediction errors (e.g., Chang et al., 2006, 2012)
- Previous findings in support of EIL accounts:
  - Prediction: language users can use various linguistic cues for prediction (e.g., world knowledge: Kamide et al., 2003; prosody: Nakamura, 2012; lexical information: Altmann & Kamide, 1999; syntactic information: Dahan et al., 2000)
  - Effect of bias: stronger adaptation to less preferred syntactic structures (e.g., Jaeger & Snider, 2013; Fine et al., 2013)
- Yet, direct links between prediction and adaptation have not been tested.

QUESTION
- Is adaptation guided by interactions between individuals’ predictive ability and parsing bias?

METHODS
- Participants: 47 native speakers of English with different degrees (50–100%) of low attachment (LA) bias as measured by pretest containing ambiguous relative clause (RC) attachment
- Prediction phase: Eye-tracking in Visual World Paradigm (VWP)
- Adaptation phase: Pre-post tests, eye-tracking in VWP

Prediction Phase (Visual World Paradigm)
- Measure of individual’s predictive ability: comparing fixations on the target item (e.g., the bike) between two conditions
- Biasing condition:
  I know the father of the boy that will [ride the] bike.
- Neutral condition:
  I know the father of the boy that will [need the] bike.

Adaptation Phase (Pre-post tests & VWP)
- PRE-TEST (Ambiguous RC attachment)
  "I meet the client of the hairdresser that is talking loudly.”
  Q: “Who is talking loudly?”
- ADAPTATION TASK 1 (Exposure to preferred RC attachment)
  e.g.) Low Attachment block
  "I see the cat of the woman that will [wear the] shoes.”
- POST-TEST 1 (Ambiguous RC attachment)
  - Measure adaptation toward preferred structures
  - Measure adaptation toward less preferred structures
- ADAPTATION TASK 2 (Exposure to less preferred RC attachment)
  e.g.) High Attachment block
  "I see the cat of the woman that will [wear the] collar.”
- POST-TEST 2 (Ambiguous RC attachment)
  - Measure adaptation toward less preferred structures

Results (Prediction Phase)
- More fixations on the targets at the biasing condition (b=.58, SE=.24, t=2.44, p=.02)
- Individual’s predictive ability

Results & Discussion (Adaptation: Pre-post tests)
- Analysis on LA interpretation at the post-tests as a function of
  1) exposure (after LA, block 1; after HA, block 2),
  2) individuals’ score of predictive ability
  3) individuals’ initial bias
- Main effect of exposure: more likely to assign an LA interpretation to the ambiguous RCs after the LA exposure (b=.44, SE=.17, Z= 2.60, p=.009) & less likely to assign an LA interpretation after the HA exposure (b=-1.03, SE=.16, Z= -6.56, p < .0001)
  - Readers adapt to the attachment in the recent context (stronger adaptation toward their less preferred structures; b=.44 after the LA exposure vs. b=-1.03 after the HA exposure)
- Main effect of Initial bias: the more biased toward an LA, the more LA interpretation at the post tests (b=.37, SE=.07, Z= 5.47, p < .0001)
  - An interaction effect between initial bias & exposure: the more initially biased toward an LA interpretation, the less likely to assign an LA interpretation after the HA exposure (b=-0.17, SE=.09, Z= -2.004, p=.05)
- Consistent with previous findings, we found that native English speakers make predictions and show adaptation toward the current linguistic input. However, in the pre-post tests, we could not find that adaptation was influenced by the individual’s predictive ability or interactions between predictive ability and parsing bias.
- Stay tuned!: preliminary results from eye-tracking data during two exposure stages did show that predictive ability and parsing bias affect adaptation during listening.

REFERENCES

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