Explaining away in semantic/pragmatic adaptation

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Speakers exhibit considerable production variability at all levels of linguistic representation. Listeners deal with such variability by adapting to it and updating expectations [1-5]. This includes adaptation to uncertainty expressions: Listeners learn speaker-specific semantic representations and speaker preferences for different uncertainty expressions such as *might* and *probably* after exposure to speakers who use these expressions differently [5,6]. This behavior is predicted by a model based on Bayesian belief updating [5], which suggests that listeners track utterance-event probability pairs and refine expectations based on statistical input. However, it remains an open question whether this learning is purely **associative**, i.e., listeners track the associations between utterances and event probabilities independent of other contextual factors, or if listeners engage in a more elaborate learning process and **explain away** unexpected behavior if they are presented with a likely cause [7]. We build upon findings that speakers use uncertainty expressions differently depending on contextual factors [8,9] and investigate whether manipulation of one contextual factor – the speaker's mood – affects adaptation behavior. According to an associative account, we expect no effect of mood on adaptation behavior whereas an explaining away account predicts less adaptation if speaker behavior matches expected language use for the mood.

Exp. 1 (norming) tested whether mood affects expectations about the use of *might* and *probably*. 53 MTurk participants saw 36 images of an airline representative interacting with a customer, along with a seat map that illustrated the probability of the customer being randomly assigned their desired seat (see Fig. 1). Participants in the ***optimist*** and ***pessimist*** conditions saw a representative who was in a good or bad mood, respectively; participants in the ***neutral*** condition did not receive mood information. The probability of receiving the desired seat ranged from 0% to 100%. Participants were asked to rate likely responses to the customer's request by distributing 100 points across three items, "You'll probably get one," "You might get one," and a *something else* option. **Results**. As Fig. 2 shows, *probably* was rated higher than *might* for a greater range of probabilities in the ***optimist*** condition compared to in the ***pessimist*** condition. Like [4,5], we computed the area under the curve (AUC) for each participant and expression. The average difference between the AUC of *might* and *probably* was smaller in the ***optimist*** than in the ***pessimist*** condition ($t(34) = -2.51$, $p < 0.05$), suggesting that mood affects expectations about the use of *might* and *probably*.

Exp. 2 (explaining away) tested whether information about speaker mood affects adaptation. 268 MTurk participants saw 13 exposure trials (5 critical, 8 fillers) followed by 36 test trials. Exposure trials showed an image of an airline representative describing a seat map with window and aisle seats (critical trials: 60% window seats). There were 4 conditions–***OPTimist***, ***CONfident***, ***PESsimist***, ***CAUtious***–where participants in **OPT** and **CON** listened to a speaker using *probably* at 60%, and participants in **PES** and **CAU** listened to a speaker using *might* at 60%. Fillers were intended to boost trust in the speaker: on 5 trials, the speaker described a typical (25% or 90%) probability with the respective other uncertainty expression. On other fillers, the speaker said of a 100% window seat probability "You'll get one." Additionally, for the exposure in **OPT** and **PES**, participants were told the speaker was happy or angry, respectively. Test trials were the same as in Exp. 1, except before the first trial, participants were told the speaker was experiencing a normal day. **Results.** Fig. 3 shows ratings on test trials. The average difference between the AUC of *might* and *probably* was smaller in **CON** than in **CAU** ($t(133) = -5.1755$, $p < 0.001$), replicating the adaptation effect [5]. Further, the average difference between the AUC of *might* and *probably* was smaller in **PES** than in **CAU** ($t(135) = -2.38$, $p < 0.05$) and qualitatively smaller in **CON** than in **OPT**, suggesting that listeners adapted less when provided with a likely explanation for the speaker's language use.

Conclusion: These experiments provide evidence for listeners incorporating contextual cues when learning speaker-specific expectations about language use. The results further suggest that the extent of adaptation depends on how much observed behavior deviates from prior expectations; if priors and observed behavior closely match, there is less need to adapt and update expectations.

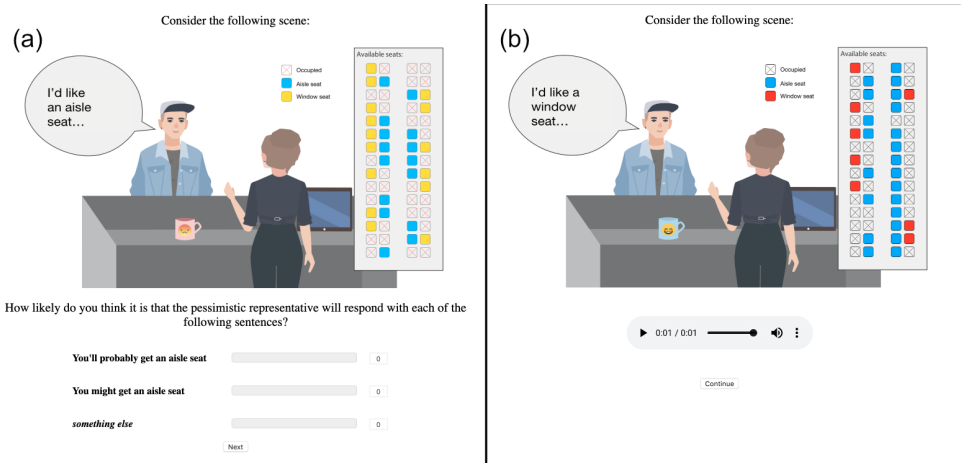

Figure 1: (a) Example trial from Exp. 1. (b) Example exposure trial from Exp. 2.

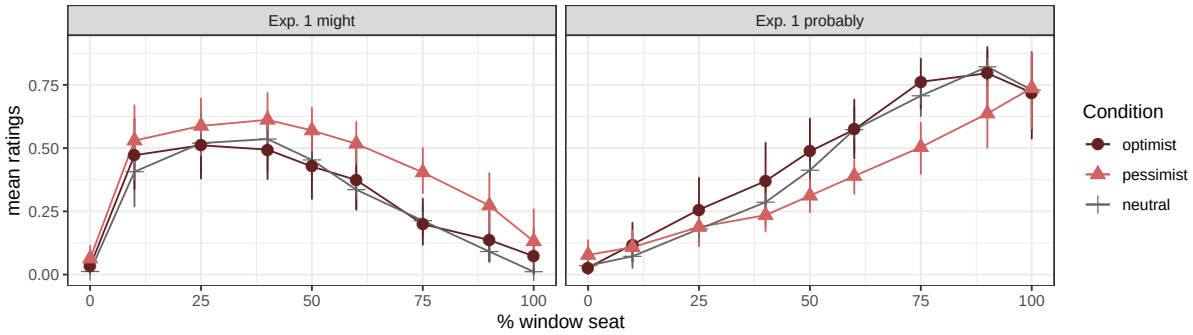

Figure 2: Mean ratings for utterances with *might* and *probably* for the three conditions in the norming experiment (Exp. 1). Error bars indicate bootstrapped 95% confidence intervals.

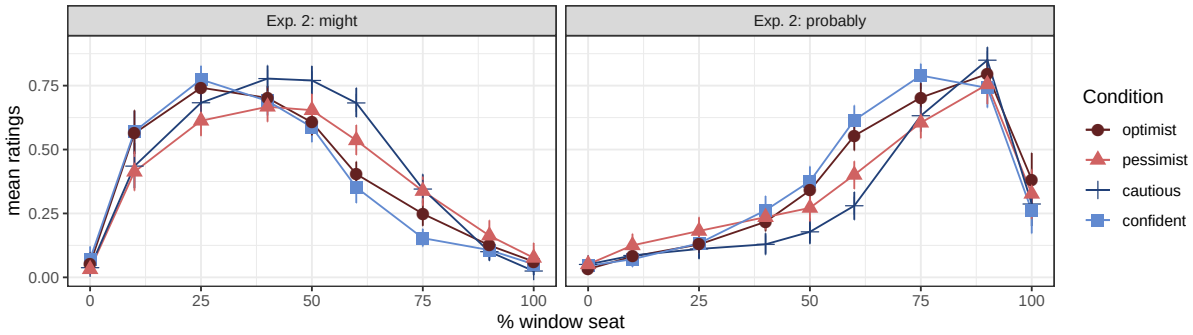

Figure 3: Mean ratings for utterances with *might* and *probably* for the four conditions in the explaining away experiment (Exp. 2). Error bars indicate bootstrapped 95% confidence intervals.

References

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