The Ganong effect is sensitive to noise

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Background: The Ganong effect and noise

- **Ganong effect**: preference to interpret an ambiguous sound as a phone that makes a real word in its context, all else being equal

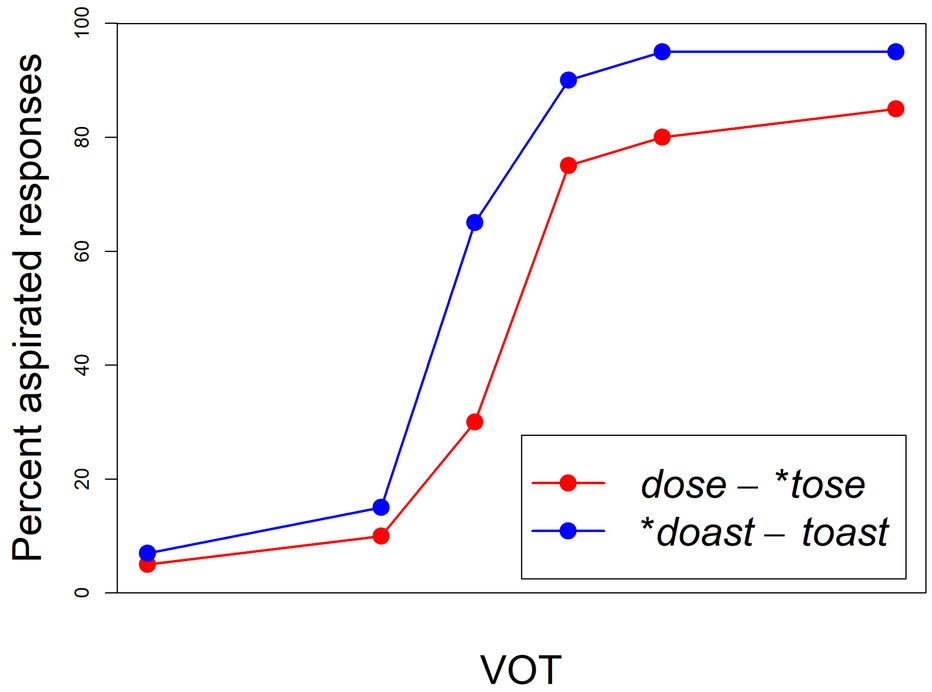


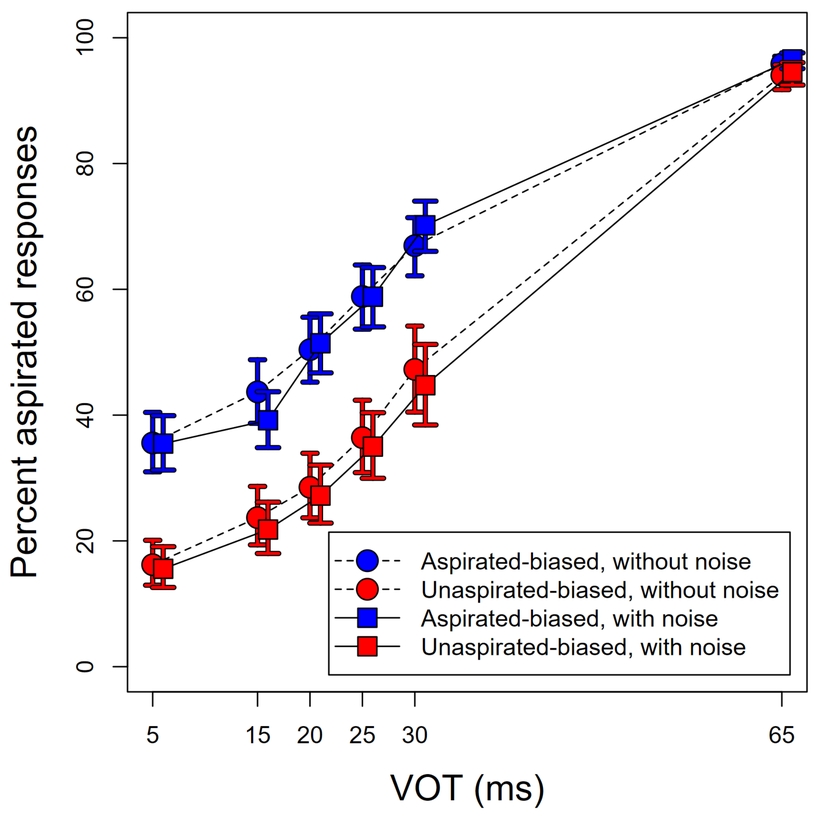
Figure adapted from Ganong (1980)

Does the Ganong effect get bigger in noise?

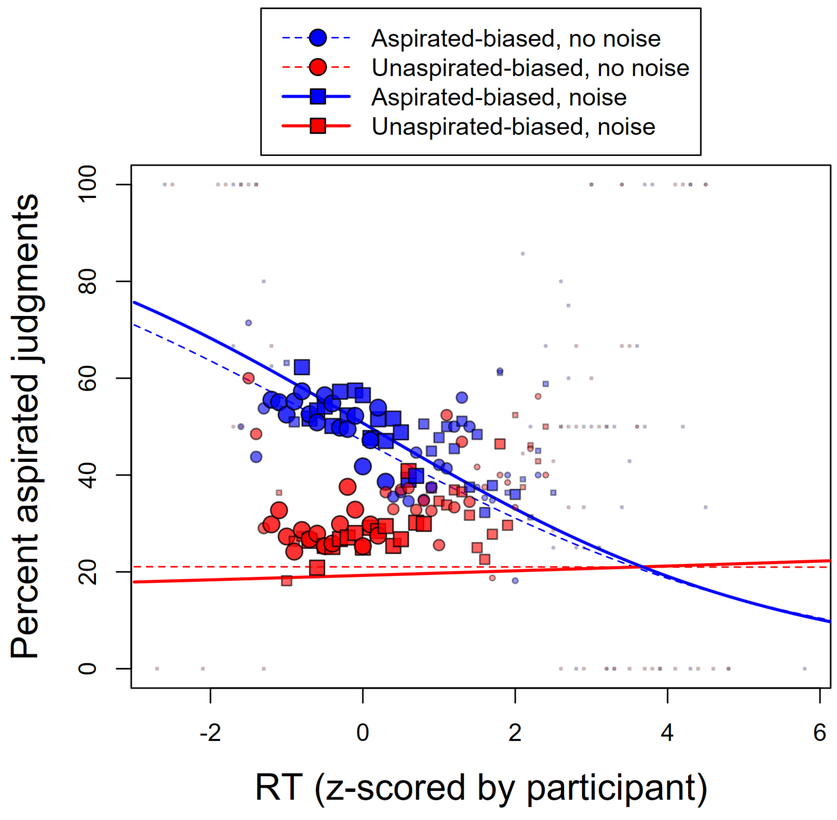
- It should: when bottom-up information is impoverished, top-down information should have a bigger influence
- But evidence for this is weak…
  - Burton & Blumstein (1995): Marginal but non-significant trend, between participants
  - McQueen (1991): Effect of noise only in fast responses, between participants
  - Pitt & Samuel (1993): Inconsistent effects of noise across various Ganong manipulations, very small N_{ptp}
  - McQueen et al. (2003): Effect of noise (except in slowest responses), between participants
- **Current study:** Test whether the Ganong effect is increased by noise with a larger-N, within-participants experiment

Results (N=60 Mandarin speakers)

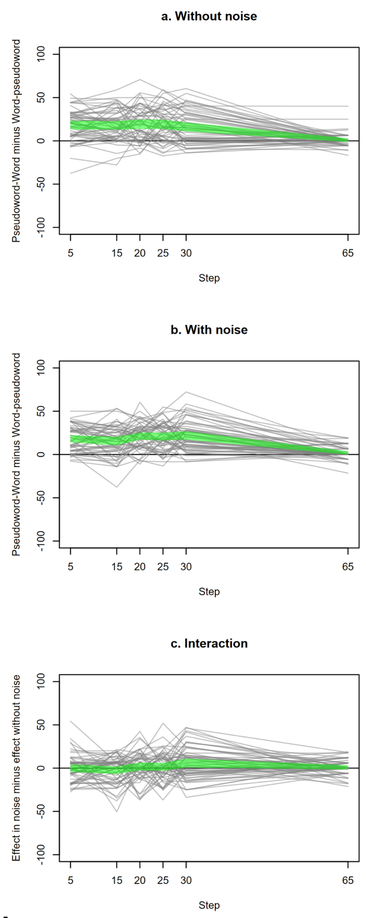
Phoneme identifications as a function of VOT



Phoneme identifications as a function of RT



Effects per participant, with 95% CIs



- Ganong effect indeed gets bigger in noise (95% CrI of bias*noise interaction: [0.03, 0.49])
- Effect seems bigger in the fastest responses (although the stats don't support a bias*noise*RT interaction) and at the 30ms VOT step

Methods

- Three initial 6-step VOT continua (*bi-pi*, *dai-tai*, *gong-kong*)
- Each spliced onto 6 syllables: 3 that yield real words at the unaspirated end of the continuum (e.g. *bìmiǎn – *pìmiǎn*) and 3 that yield real words at the aspirated end (e.g. **bìrú - pìrú*)
- Each step of each stimulus continuum presented twice without noise and twice in four-talker babble
- 432 trials (18 continua * 6 steps * 2 repetitions * 2 noise conditions)
- Participants completed 2AFC
- Bayesian generalized mixed-effects models {brms}