Social-Processing Fluency in Voice-Based Judgments

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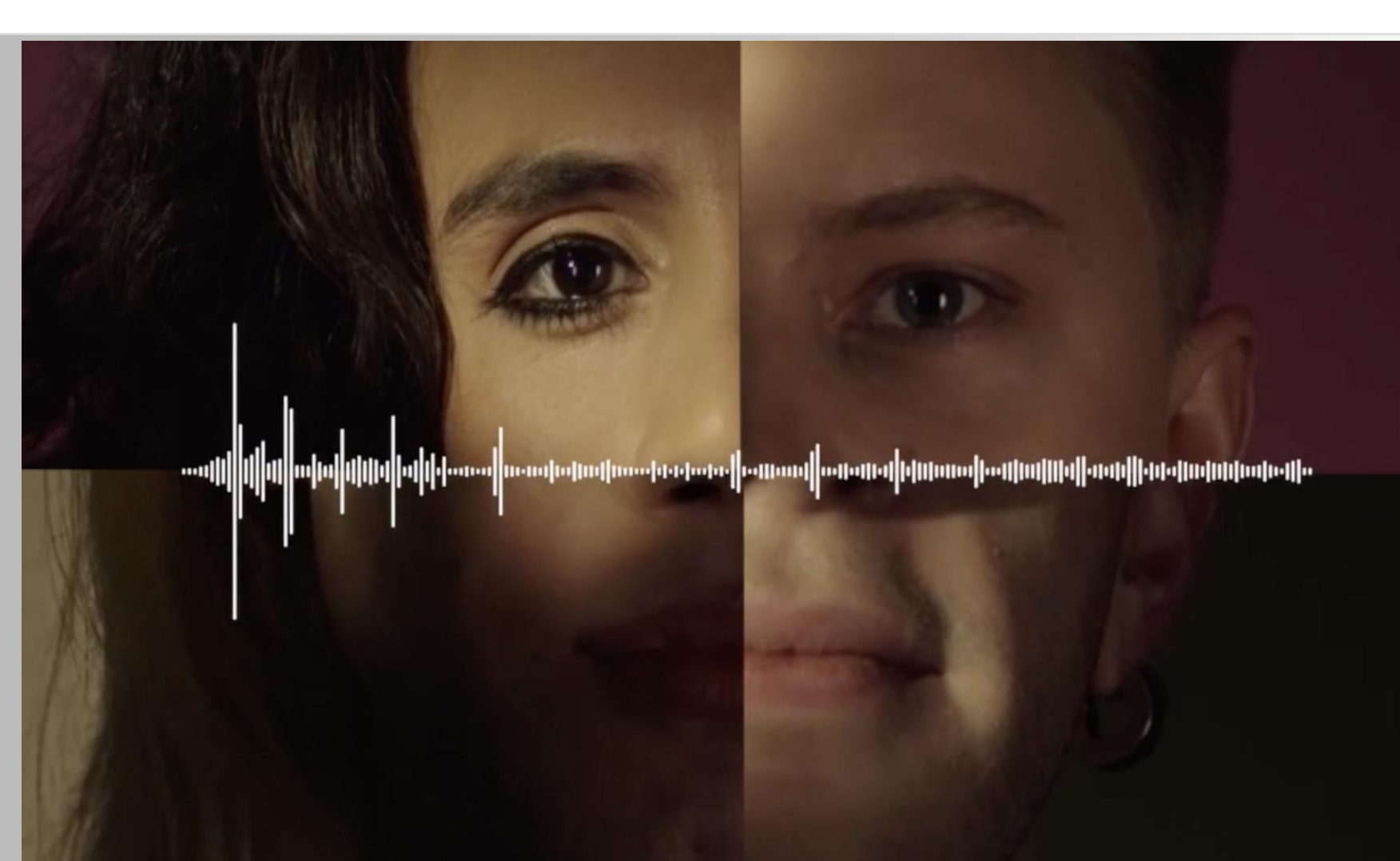
Introduction

Does using a gender-neutral voice affect information processing and product judgment?

- "Processing Fluency" literature says difficulty in processing the information presented in and product presented in that information at metacognitive level[1, 2] While research in this area has involved textual information,[3] scant research attention on fluency has been paid to the social nature of communication.

- We investigate a novel concept we call "***social-processing fluency***" related to the ease or difficulty of identifying the demographic information about the source of voice information (i.e., gender) used to determined social categorization [4, 5]

- **Through two preregistered experiments, participants evaluated products presented in a gender-ambiguous voice as worse compared to when the speakers' voice was gendered. The results were consistent with our social processing fluency hypothesis. Determining the gender of a voice is more difficult when the pitch of the voice falls below the range normally observed for females, but higher than the range normally observed for males, leading to disfluency in gender categorization and lower product perception.**
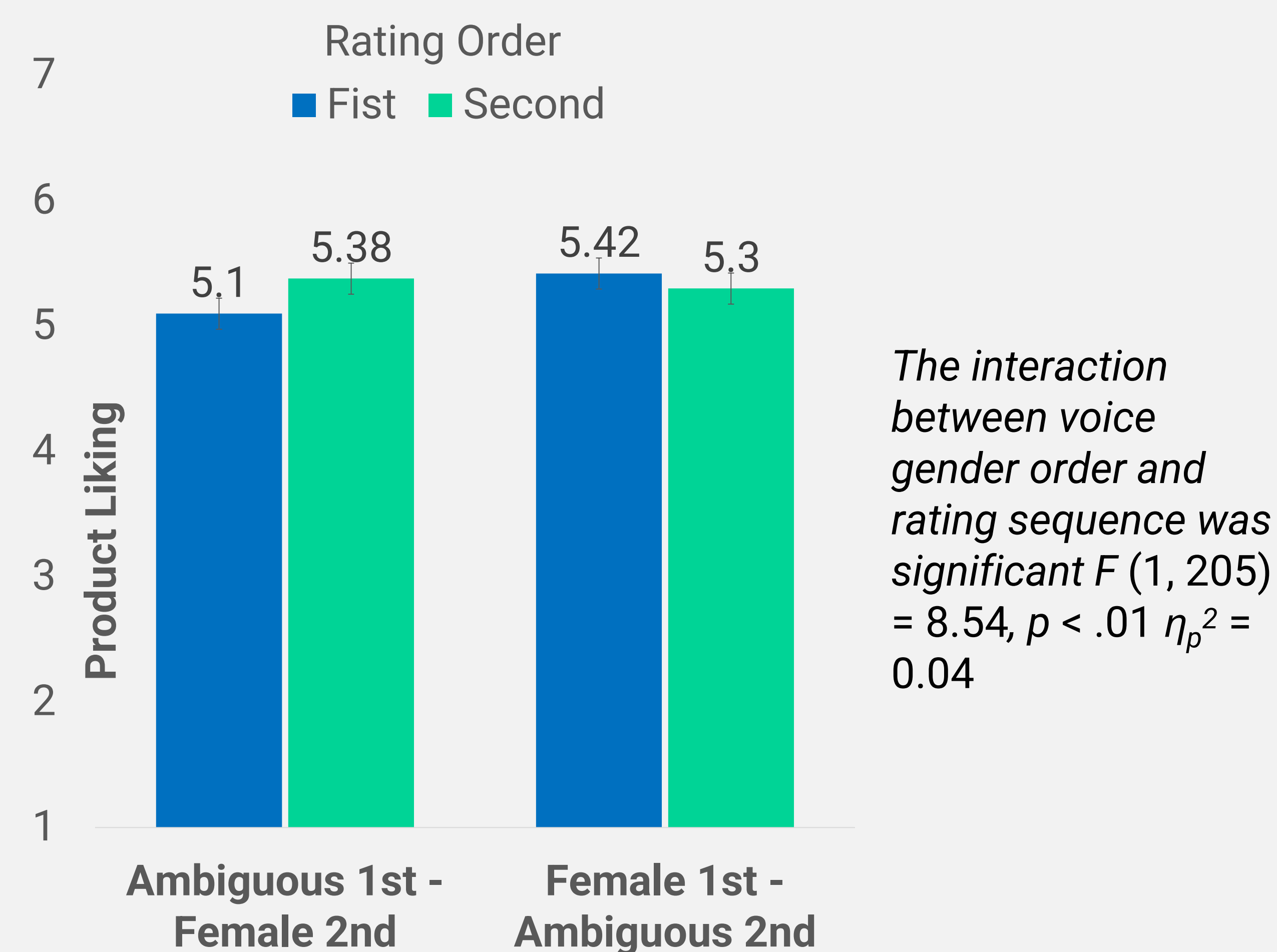
Experiment 1

- 109 Amazon-Mturk workers participated in a one-condition study: each participant rated a product read by the same voice.
- We manipulated the voice to make its gender ambiguous by changing its pitch using a digital audio editor software, AUDACITY. We reduced the pitch of a female voice by shifting one semitone down without affecting the tempo and other voice characteristics.
- **The more the speaker's voice-gender was perceived as ambiguous; the less people liked the product.**

As ambiguity increases, product liking declines
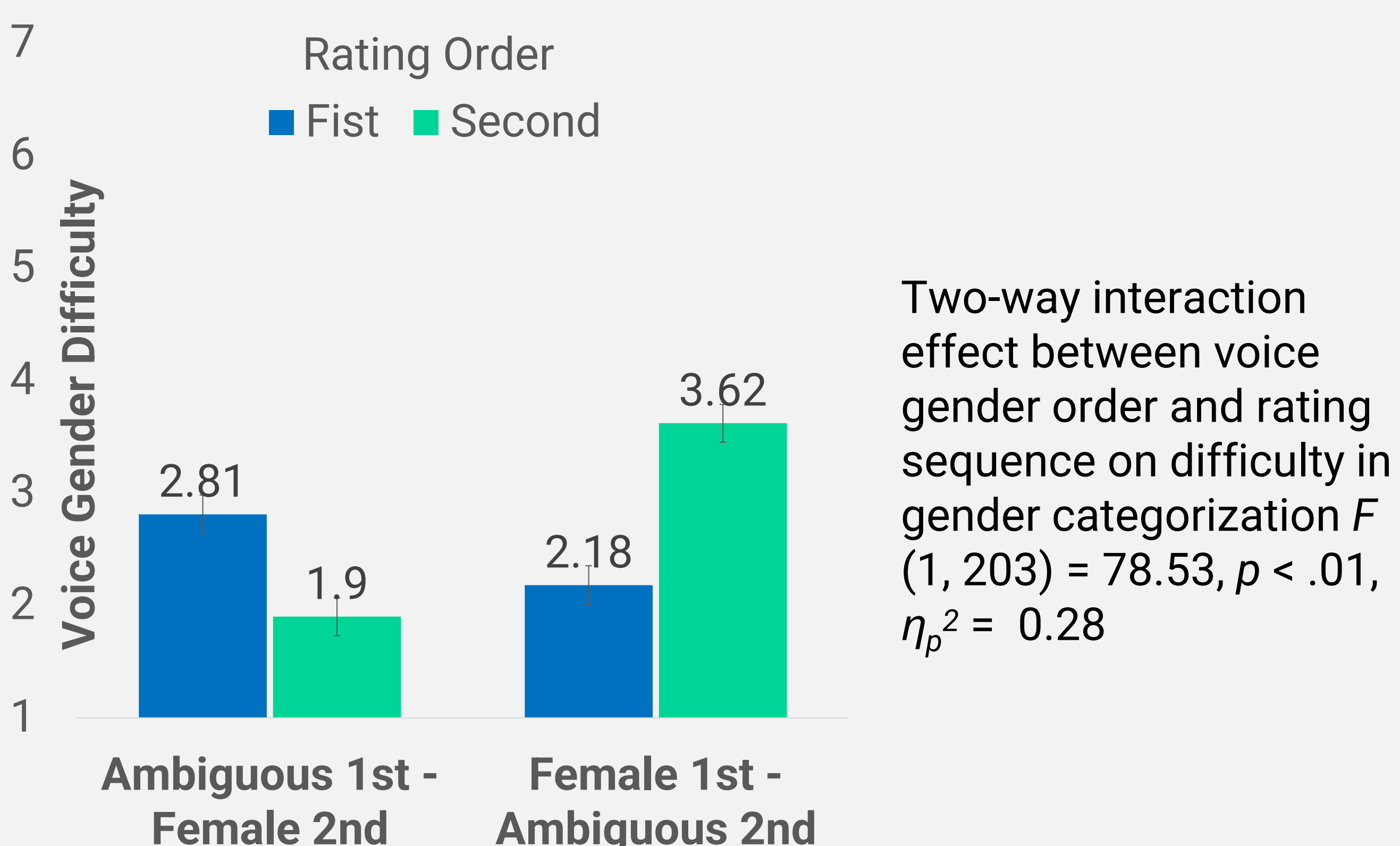r (109) = -.218, p = .022
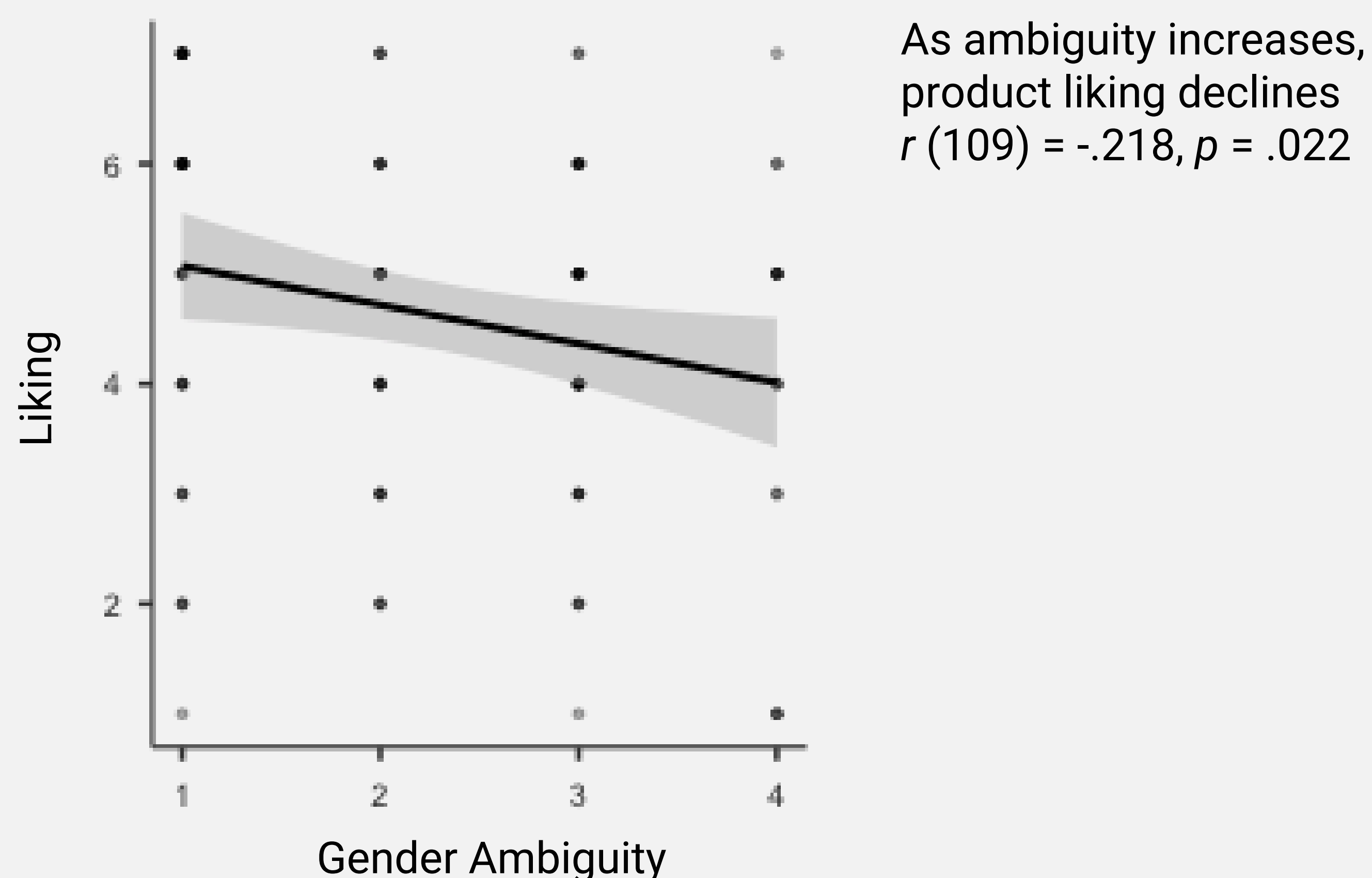
Experiment 2

- 2 (voice gender; within) by 2 (rating order; between) between-within subject design. Stimuli (brands) also counterbalanced.
- Each participant heard two similar toothpaste brand descriptions (counterbalanced). One brand was read aloud by a clearly female voice, the other we manipulated to lower the pitch to be gender-ambiguous.
- **Products described by a gender-ambiguous voice were liked less compared to those in a clearly female voice.**

The interaction between voice gender order and rating sequence was significant F (1, 205) = 8.54, *p* < .01 η_p^2 = 0.04

Experiment 2 - Social Disfluency

Regardless of the order of voice gender and brand order, when participants received information in the ambiguous voice, they had more difficulty in determining the gender of the speaker. The effect of gender ambiguity on product judgment is completely mediated by social disfluency (i.e., difficulty in determining the voice gender).

Two-way interaction effect between voice gender order and rating sequence on difficulty in gender categorization *F* (1, 203) = 78.53, *p* < .01, η_p^2 = 0.28

Experiment 2 Results

Social Disfluency (i.e., difficulty in determining the gender of the speaker) leads to lower judgment of a product presented in such a voice.

- Results show that when the ambiguous voice is first, participants like the first option less (*M* ambiguous_first = 5.10, *SD* = 1.23; *M* female_second = 5.38, *SD* = 1.23; *F* (1,203) = 8.67, *p* < .01); when the ambiguous voice is second, they like the first option more presented in a female voice (*M* ambiguous_second = 5.30, *SD* = 1.25; *M* female_first = 5.42, *SD* = 1.25, though the planned contrast test was not significant (*p* > .1).

- While not pre-registered, we can examine the ratings of the first brands (not hearing any product information in different voice gender before that) as a between-subjects test of the main hypothesis. Between voice gender conditions showed that those who heard first brand information in an ambiguous gender voice (M ambiguous_first = 5.10, SD = 1.23) evaluated it less favourably than those who were informed about the first brand in the female voice (M female_first = 5.42, SD = 1.25; F (1,205) = 3.48, p = .064), though only marginally so.

- These differences in gender categorization (i.e., social disfluency) completely mediated the liking of judgment (b total_effect = 0.40, SE =.14, 95% CI [0.13, 0.67], p < .01; b direct_effect = 0.12, SE =.16, 95% CI [-0.19, 0.43], p > .1).

Underlying Mechanism (Social Disfluency)

Regarding the underlying mechanism (i.e., social processing fluency), It shows that regardless of the order of voice gender and brand order, when participants received information in the ambiguous voice, they had more difficulty in determining the gender of the speaker relative to when the same information was presented in gendered voice. It means the reason why participants had difficulty in processing the social information was difficulty in gender evaluation. That is, the more difficult is voice gender categorization, the more difficult is social information processing.

Conclusions

- Introduce a novel metacognitive process "social-processing fluency" in an auditory context, contributing to the processing fluency[1,2,3], social categorization[4, 5], and voice information processing[6, 7] literatures.
- (Dis)fluency in processing social information about the source of a communication (i.e., gender of a voice) affects judgment of liking.
- Such disfluency in social processing is explained by difficulty in processing/evaluating the voice gender (i.e., gender categorization) not processing the content itself.

References

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