Response Letter

How Synonymic Taste Words Alter Perceived Taste in American Consumers

Dear Reviewers:
We are very grateful for the time and effort you put into assessing our manuscript. Your insightful comments and questions have afforded us the opportunity to revise and thus considerably strengthen our work. We hope to have satisfactorily addressed all of your concerns. However, we will be happy to make further adjustments should you find anything to be unclear or amiss.
Cordially,
The Authors

R1

Thank you for giving me the opportunity to review this study. I found it interesting, and enjoyed reading it. The reporting structure and clarity is generally very good and the authors are to be commended for making their data available through OSF. I am not a corpus linguist, nor food scientist or advertising expert, so my comments should be seen as coming from an interested member of the applied linguistics research community with general, not specific, expertise in this area. Generally speaking, I think the study is of sufficient quality to publish, following minor revisions per my comments below.	Thank you for this very positive assessment. We are pleased you enjoyed reading our manuscript.
In the method, the description of the taste task left me with a couple of questions that I hope the authors can clarify. It is not clear to me when the participants were exposed to the 'taste synonym'. I am assuming that they will have seen the word first, before tasting, as this would make logical sense if you were expecting the word to influence their perception of the taste. However, the information about the second question they were asked to answer ("Sour…[etc] accurately describes this product") suggests that they might have seen the word afterwards. Would this not compromise that logic? So, some clarification here would be useful. I would also like to know what was on the labels on the samples. Was there a sample of the product with a label next to it that just had the word (e.g. "Sour") on it? Or did the label say something like "Sour Apple". Maybe an image of how the food was presented (i.e. with the label) and some clarification in the text would help resolve this.	We agree that this warrants clarification. Participants were required to taste samples in the order specified on their questionnaires. To guide participants, we placed the labels on tabletop sign holders at each station (in addition to the sample containers). Therefore, participants were necessarily exposed to the labels prior to tasting. The suitability rating, which participants were required to make before the taste rating, was only a failsafe to ensure that even inattentive participants engaged with the labels. To make this clearer, we have added some information to *3.1 Procedure* and reworded the sentence regarding our reasoning for obtaining a suitability rating. As per your suggestion, we have also added an image (Figure 2). All changes are highlighted in yellow.
The layout of Table 8 is a bit confusing to me, with the sampled product at the end of each day. This, I guess, is personal preference, but I would feel it more logical to have the name of the product in the first collum, then the more associated and less associated columns. And to have Day 1 above, rather than next to Day 2. It looks as though different products were	We appreciate your suggestions for Table 8 and have implemented them accordingly. As stated in *3.1 Procedure*, different products were indeed sampled on different days to ensure that participants remained unaware of the linguistic (rather than food-related) manipulation and that participants rated pairs of

sampled on different days. Why was this? i.e. Why didn't all participants sample all products?	identical foods against one another. To make this a bit clearer, we have moved this section up so that it precedes *3.2 Participants and stimuli*. The changes to the headings/numbering are highlighted in yellow.
Column headings on Table 9 are confusing. Column one says 'average rating' but all items in that column are products, not ratings. I think the first column should be 'Product', second should be 'Average rating with more associated label', and third should be 'Average rating with less associated label'.	We appreciate your suggestions and have implemented them accordingly. Please note that Table 9 is now Table 10 (as we separated Table 8 into two days as per your suggestion above). All changes are highlighted in yellow.
The authors have given some plausible responses to why the results of experiment 2 were as they were. But it all feels like a bit of a stretch (the cognitive load argument seems to really be clutching at straws). Given the small sample size, rating a small number of products, might it just as easily be explained by random noise? i.e. labels don't make any difference to taste perception (even with the marginally significant results for some pairings?). Did the authors conduct a power analyses (either ante hoc or post hoc, or both)? A type one error doesn't seem to be out of the question.	Because mixed-effects models are fairly complex and in our case involve nested data (each participant contributed 8 data points), we relied on model diagnostics rather than traditional power analyses. The Q-Q plot suggests that our model's error structure is appropriate, and the influence plot shows that no single observation exerts undue influence. However, the patterning in the heteroscedasticity plot points towards a missed predictor. In addition to mentioning that we suspect factors beyond association and specific types of products to be at play in *3.4 Results*, we have now uploaded the plots to the OSF (and mentioned that these are available in *3.3 Data analysis*, highlighted in yellow). Furthermore, we now posit an alternative explanation based on the common, negatively connoted metaphorical uses of the taste words *sour*, *frothy*, and *juicy* in *3.5 Discussion of Experiment 2* (highlighted in yellow).

R2

Summary This paper presents an innovative investigation into the semantic differences between synonymic taste words and their effects on taste perception. Through two complementary experiments—category fluency tasks (CFTs) and taste tests—the authors establish that (1) synonymic taste words exhibit subtle but significant semantic differences in terms of their food associations, and (2) these differences influence consumers' taste perceptions, with most foods being rated more favorably when labeled with more strongly associated taste descriptors. The study extends previous research by Johnson and Pfenninger (2021) on "crispy" versus "crunchy" to include five additional pairs of taste descriptors, demonstrating both the validity of category fluency tasks as alternatives to corpus analysis and the generalizability (with important	Thank you for this excellent summary.

exceptions) of association effects on taste perception.	
Strengths The paper's most significant contribution is its methodological innovation in using CFTs to identify food-taste word associations effectively. This approach provides a faster alternative to corpus-based methods while still capturing core semantic differences between near-synonyms. The thoroughness of the experimental design is commendable, with careful attention to participant selection, stimulus preparation, and statistical analysis. The authors skillfully reinterpret Johnson and Pfenninger's (2021) findings through the lens of their own data, providing a more nuanced understanding of how association affects taste perception. The broad definitional approach to "taste words" could be improved through references to neurophysiological research and allows for a comprehensive examination of the linguistic landscape of gustation. The paper's theoretical grounding in both corpus linguistics and experimental psychology creates a solid foundation for the cross-disciplinary work.	We appreciate your kind words regarding our manuscript's strengths.
Weaknesses While the laboratory setting was necessary for experimental control, as the authors acknowledge, this limits the ecological validity of the findings. The inability to include "crispy" and "crunchy" in Experiment 2 due to concerns about sensory fatigue means that direct comparison with Johnson and Pfenninger's (2021) work is somewhat limited. The authors also note challenges in explaining why certain foods (candy, milk, watermelon) defied the general preference for more associated taste word labeling. The paper would benefit from deeper exploration of cross-linguistic dimensions, particularly given that the title suggests a "cross-linguistic approach." The authors mention future research directions in other languages, but the current study focuses exclusively on American English.	Unfortunately, cross-linguistic investigations, which would necessarily require replicating both Experiment 1 (in order to obtain appropriate stimuli) and Experiment 2, are beyond the scope of this paper, which aimed to validate investigations into *crispy* and *crunchy* in American English. We agree that the title was misleading in this sense, and have now added "in American consumers" (title and Abstract) and "in American English" (Abstract). Furthermore, in *4.1 Limitations and Future Directions*, we now reiterate the potential of future, cross-linguistic CFTs with regard to culture-specific nuances. All changes are highlighted in yellow.
Connection to Literature and Extension to Metonymy The paper lacks significant engagement with research on taste descriptors, which represents a missed opportunity considering cross linguistic contributions to food discourse. The work of Sanz Valdivieso and López-Arroyo (2022) on wine terminology and metonym demonstrates that taste descriptors in English and Spanish often function metonymically in ways distinct from English counterparts. For example,	While studies of taste words in corpora/natural language are fascinating, their findings may not be directly applicable to our experimental/elicited data. However, your comment and the references you provided inspired us to explore the potential of figurative language to explain adherence versus deviation from the general preference for more association. As a result, we now posit an alternative explanation of our findings based on the common, negatively connoted metaphorical

Spanish wine descriptors like "aterciopelado" (velvety) connect texture and taste through metonymic extension in ways that reveal cultural conceptualizations of taste not captured in the authors' Anglo-centric approach. López Arroyo and Roberts (2017) have conducted extensive research on sensory descriptors in Spanish and English wine tasting notes, demonstrating significant cross-linguistic variation in metonymic patterns. Their corpus-based analysis reveals that Spanish employs more complex chains of metonymic relationships between sensory domains than English, particularly in mapping texture qualities to flavor experiences. Similarly, Sánchez-Manzanares (2013) has documented how taste descriptors frequently exhibit more explicit metonymic relationships between sensation and emotion than in English. Cross-sensory metaphoric and metonymic patterns could significantly enrich the authors' theoretical framework, particularly in explaining why certain foods perform differently with associated versus non-associated labels.	uses of the taste words *sour*, *frothy*, and *juicy* in *3.5 Discussion of Experiment 2*. Consequently, we also made several changes to *4.1 Limitations and Future Directions*, notably referencing López Arroyo and Roberts (2016), and to *4.2 Conclusion*. All changes are highlighted in yellow.
Methodological Recommendations The authors should consider extending their methodology to include: Metonymic analysis: Examining how taste descriptors function metonymically (PROPERTY FOR WHOLE, PART FOR WHOLE) would provide insight into why certain food-descriptor pairings generate stronger responses. Cross-linguistic CFTs: Conducting parallel CFTs in other languages would reveal whether association patterns are language-specific or reflect more universal sensory categorizations. Diachronic analysis: Investigating how taste descriptor associations have evolved over time could illuminate cultural and linguistic factors influencing current usage patterns. Consumer segmentation: As the authors suggest, testing across different consumer populations with varying levels of gastronomic expertise would determine whether association effects vary by demographic factors.	As aforementioned, we now posit an alternative explanation of our findings based on the common, negatively connoted metaphorical uses of the taste words *sour*, *frothy*, and *juicy* in *3.5 Discussion of Experiment 2*. True to Occam's Razor, this simpler explanation based on valence explains all our observed differences, regardless of metonymic patterns. While beyond the scope of this paper, we agree that additional CFTs with specific consumer segments and in other languages would likely yield some interesting, culture-specific similarities and differences. As mentioned above, we now reiterate the potential of future, cross-linguistic CFTs in *4.1 Limitations and Future Directions*. We agree that diachronic analyses are interesting to compare current to historic patterns in usage/natural data. For experimental data, an exciting avenue for future research might be to periodically replicate the CFTs and taste tests. Consequently, we have added a paragraph to *4.1 Limitations and Future Directions* which discusses the potential of periodic replication studies. All changes are highlighted in yellow.
Theoretical Implications The findings significantly advance our understanding of linguistic relativity in the domain of taste perception. The paper	We appreciate your kind words regarding our manuscript's theoretical implications.

demonstrates that synonymic taste words are not merely stylistic variants but semantic tools that shape sensory experience. This has implications beyond marketing to fundamental questions about how language structures perception. The study provides evidence for embodied cognition theories by showing that linguistic categories influence sensory processing. The processing load explanation for why less associated taste words sometimes improve perception of disliked products is particularly compelling and merits further investigation.	
Practical Applications The research has clear implications for food marketing, menu design, and product naming. The authors rightly caution against direct application without further research in naturalistic settings, but their findings suggest several promising directions: 1. For most products, using descriptors most strongly associated with those products will enhance perceived taste. 2. For potentially disliked products, less associated descriptors may improve reception by increasing cognitive load and reducing attention to negative taste aspects. 3. The methodology offers a rapid technique for testing descriptor effectiveness without extensive corpus analysis.	Thank you for your kind words regarding our manuscript's practical applications.
Conclusion This paper represents a significant contribution to both linguistic semantics and sensory science. Its methodological innovation in using CFTs to identify subtle semantic differences between synonyms provides an efficient alternative to corpus-based approaches while still capturing meaningful distinctions. The finding that taste perception is generally enhanced by more strongly associated taste descriptors, with important exceptions that merit further study, has both theoretical and practical implications. To strengthen future research, I recommend incorporating cross-linguistic perspectives, particularly focusing on metonymic extensions of taste terminology that may reveal cultural variations in taste conceptualization. Additionally, exploring how different consumer segments respond to taste descriptors would provide more nuanced guidance for practical applications. The paper succeeds in extending the state of the art regarding taste descriptors and synonymy, but would benefit from more explicit	Thank you for these concluding remarks. As aforementioned, we have strengthened *4.1 Limitations and Future Directions* by discussing how additional CFTs with specific consumer segments and in other languages would likely yield some interesting, culture-specific similarities and differences. Furthermore, we now posit an alternative explanation of our findings based on the common, negatively connoted metaphorical uses of the taste words *sour*, *frothy*, and *juicy* in *3.5 Discussion of Experiment 2*.

attention to metonymic patterns in gustatory language. Nevertheless, it represents a valuable advancement in our understanding of how linguistic choices shape sensory experience.	