Irvine, California

September 1, 2018

Dear Dr. Sæbø,

We would like to thank you yet again for your comments on our revised paper, "On the grammatical source of adjective ordering preferences." We were sorry to hear that you found our revision to have moved in the wrong direction, but we are grateful for the additional chance to address the issues that remain. As you will recall, you identified a relatively clear path to publication on the basis of addressing the following concerns:

1. *Now for one thing, it is not clear that the decision to remove the discussion of the probability of no misclassification is wise. In particular, the probability that all and only the objects that are in fact, say, brown and small boxes are, in response to "small brown box" versus "brown small box", judged to be brown and small boxes can be regarded as just as important as the notion of successful reference resolution or correct classification of the intended referent that you now characterize. Besides, as it appeared from the previous version, relatively simple reasoning is sufficient to show that the probability of classifying, say, all three boxes where one is brown and small, one is brown and not small and one is small and not brown correctly with respect to being brown and small is higher when "brown" is processed first, without making the misclassification potential proportional to the cardinality of the set of objects. This argument would be relatively reader-accessible, and I recommend that you include it if you still consider it valid.*

   XXX

2. *Secondly, the assumption about the fixed processing budget and the concrete example of how ordering according to subjectivity maximizes the probability of successful referent resolution are now presented in a separate subsection which is very difficult to understand, not because of the amount or the level of mathematics, but because notations and formulations are unclear and there are inconsistencies and errors.*

   XXX

3. *Let me first comment on your statement just above the subsection 4.1 where you advise readers "who are already convinced by our argument or wary of math" to skip it: readers could not be "already convinced" because your argument has not yet been presented at this point, either formally or informally.*

   XXX

4. *You present a scenario where there is exactly one small brown box (sb), exactly one brown box which is not small (b) and exactly one small box which is not brown (s), and compute, roughly, on the one hand, the probability that sb is judged to be brown relative to the set of boxes and judged to be small relative to the set of brown boxes, and on the other hand, the probability that sb is judged to be small relative to the set of*

boxes and judged to be brown relative to the set of small boxes (although it is somewhat more complex than this). As desired, the former is slightly higher than the latter (.32 vs. .3024).

XXX

5. *Note, however, that the probability that sb is judged to be the unique box that is brown and small is not captured, that is, the probability that neither b nor s is judged to be brown and small is not taken into account, thus the paraphrase "successful (intended) referent resolution" is somewhat misleading.*

   XXX

6. *Now before that, you introduce 'ref'. It is unclear what 'ref' is in the definitions (3) and (4). It is paraphrased as "the intended referent(s)", but it must be something like a bound variable in an implicit universal quantification, so that*

   '$p_{adj}(ref, NP) = 1 - \varepsilon_a dj(|NP|)$'

   must be read as something like

   'for any object ref and any adjective adj and any set of objects NP, the probability that in response to adj, ref is judged to have the property expressed by adj relative to NP if ref in fact has (or is meant to have) that property, and is judged to not have the property expressed by adj relative to NP if ref in fact does not have (or is not meant to have) that property, equals 1 - the misclassification potential of adj as a function of the cardinality of NP'.

   XXX

7. *There are also some more minor inconsistencies and errors: in the tables (12) and (13), the sums do not in fact add up, as you have omitted a column of final products, and in (11), the misclassification potential function has a different type of argument from elsewhere.*

   XX

8. *Now while the issues I have noted so far can probaby be remedied in a relatively straightforward way, there is a further problem which requires more thought. Your comparison between "small brown box" and "brown small box" regarding correct classification of the box which is in fact or meant to be both brown and small is favorable for the former in your toy example and more generally as long as all else is equal regarding the properties expressed by the adjectives in the set under consideration and the misclassification potentials for the two adjectives are sufficiently far apart. But as soon as the scenario is changed so that, say, there are four boxes, one brown and small, two brown and not small, and one small and not brown, my calculation results in a slightly higher probability of correct classification of sb under the "brown small box" condition (.511376) than under the "small brown box" condition (.508896) provided the misclassification potential of "small" ranges from 26 to 38 relative to a set of 1 to 4 and that of "brown" ranges from 12 to 24 relative to a set of 1 to 4. As far as I can see, this also means*

that your theorem (14) is not valid in generality but would need to be qualified. It is essential that this problem is sorted out.

XXX

Thank you again for the thorough and thoughtful comments on our work. We hope that you will like the new version of the paper. Please let us know if you require additional information. We look forward to hearing from you!

Yours sincerely,

Gregory Scontras, Judith Degen, and Noah D. Goodman