Promotional Modifiers and Reviewer Attention: A Paired Noun-Level Analysis

Anonymous Author(s)

Anonymous Institution

Abstract. Promotional wording is common in scientific writing, but its relationship to peer review remains unclear. We ask whether promotional modifiers act like "spotlights" on the nouns they modify. Using paper-review data from a large machine learning peer-review corpus, we compare reviewer treatment of the same noun across papers where that noun is modified by a promotional word versus papers where it is not. Our design is noun-matched: for each noun, we compare review sentiment and review-sentence mentions in the modified and non-modified conditions, then run paired t-tests on noun-level differences. We find that promotional modification aligns with slightly more positive reviewer sentiment and substantially more reviewer attention. The results support a qualified spotlight interpretation: promotional language shapes reviewer visibility more strongly than review tone.

Keywords: promotional language · peer review · sentiment analysis · scientific writing

1 Introduction

Scientific papers often use evaluative modifiers such as *novel*, *robust*, or *important*. Prior work shows that promotional language has been increasing in scientific and funding contexts and may shape how scientific merit is communicated [2, 1]. We ask whether such language also changes how reviewers talk about the same concept. This noun-matched framing matters because reviewer language differs strongly across nouns such as *model*, *method*, *problem*, and *dataset*. A global comparison of promotional versus non-promotional uses would therefore confound modifier effects with lexical differences.

2 Data and Method

We downloaded paper submission from ICLR 2017-2021. We first identified nouns that are modified by any of the promotional words identified by Millar et al. [2]. We used a Roberta based classifier to confirm if the promotional word was used in a promotional way. For example, we excluded the use of 'first' as in its numerical sense. Then we identified the same noun in other paper submissions where it is not modified by any promotional words.

We also mined the reviews and identified if the noun was mentioned by the reviewers. If so, we computed the sentiment score of the review sentence containing the noun.

For each noun, we compute its mean reviewer sentiment in the modified condition and its mean reviewer sentiment in the non-modified condition, then subtract the latter from the former to obtain one noun-level paired difference. We repeat the same procedure for review-sentence mentions. We then run paired t-tests across these noun-level differences, so each noun serves as its own control across the two conditions. Our main analysis filters obvious extraction artifacts such as isolated letters and malformed noun fragments.

3 Results

The matched analysis yields 661 nouns. Reviewers express slightly more favorable sentiment when authors modify a noun with promotional wording. Across clean nouns, mean sentiment is -0.237 in the modified condition and -0.278 in the non-modified condition, for a mean paired difference of $+0.041$ (paired t-test: $t = 3.06$, $p = 0.0022$). The attention result is larger: reviewers mention a noun in more review sentences when authors modify that noun with promotional wording, with a mean paired difference of $+3.81$ sentences (paired t-test: $t = 16.40$, $p \ll 0.001$). The sentiment result remains positive and significant under stricter minimum-support thresholds, and yearly sentiment effects stay positive in all four years.

4 Discussion

The results support the spotlight hypothesis in a qualified sense. When authors use promotional modifiers, reviewers pay more attention to the nouns those modifiers target and respond to them slightly more positively. The stronger pattern is visibility rather than tone. The main limitations are automatic sentence-level sentiment measurement, noisy noun extraction, and the associational nature of the design.

References

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