Semantics reels us in: a first look at mind rhymes

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Numerous linguistic phenomena involve conveying an overt message simultaneously with a covert message (e.g., humor, sarcasm, etc.) [1,2,3], though identifying an exact trigger for these structures is challenging. We study a novel instance of such phenomena: *mind rhymes* (MRs), where the final intended target (IT) in a rhyming structure is replaced with a phonologically-unrelated overt target (OT) (examples 1-3 below). Compared to related phenomena, MRs elucidate a point of dual-message resolution that can be altered to unveil what factors aid in implicit and explicit language processing. In this work, we experimentally probe the conditions under which an IT can be recovered, and we computationally explore the contexts that license MRs.

Corpus Data. We gathered 200 MRs from humor websites, lyrics, and poems; we manually generated 50 additional MRs which were evaluated by two poets to be of comparable effectiveness to the naturally-found examples. These 250 MRs form a novel corpus and are the primary source of data for this study. For each IT, we collected a set of grammatical rhyming competitors of identical syntactic category from RhymeZone, an online rhyming dictionary.

IT Retrievability. From our corpus, we selected 16 experimental stimuli, which we normed by removing the OT and asking participants (N=19) for cloze completions. They generated the IT in 269 of 304 responses, indicating that the IT is salient. To experimentally probe the conditions that make an IT recoverable, we used the covered box paradigm [4]. At the beginning of each trial, a MR was shown with the target word left blank. After six seconds, a word and a black box appeared on the screen (sample trial below). Participants were instructed to select the word if it was a proper continuation of the stimulus; otherwise, choose the black box. For each trial, four potential words could appear: 1) the IT, 2) the OT, 3) an IT rhyme competitor, 4) a word semantically distant from the IT (cosine similarity of < 0.1). Each participant (N=20) was presented with 16 stimuli from the corpus in a Latin-square design. We collected participant decisions. **Conclusion:** Our results (Figure 1) indicate that people prefer phonological violations (OT targets) over phonological continuations (Rhyme Competitor targets) despite the strong rhyming signal, suggesting that there is an IT retrieval cue outside of phonological and syntactic structure present within the OT that is absent in alternative pairings.

Semantic Retrieval Facilitation. To probe the possibility that the OT/IT cue is driven by semantics, we extracted the GloVe embeddings [5] for each OT and IT in our corpus, along with the embeddings for all rhyming competitors. We calculated the cosine similarity of all relevant pairings (examples A-D below). OT/IT pairs have significantly higher cosine similarities (determined by Tukey's HSD; Figure 2) compared to random pairings of OT/ITs, OT/IT-rhyme-competitors, and random IT pairings; this effect is not present items with a taboo IT, likely because taboo words are inherently salient [6]. **Conclusion:** OTs and ITs are more semantically similar than alternative pairings, suggesting that the OT provides a semantic retrieval cue to the IT.

Mind rhyme examples from corpus
1. He's limber slouched / against a <u>post</u> / and tells a friend / what matters <u>least</u>. (IT: <u>most</u>)
2. The poems I <u>write</u> / are a real de<u>light</u>, /
   so please be po<u>lite</u> / when the rhyme is not <u>perfect</u> (IT: <u>right</u>)
3. I have a sad story to tell you. / It may hurt your feelings a <u>bit</u>. / Last night I walked into my bathroom / and stepped in a big pile of <u>shaving cream</u>. (IT: <u>shit</u>)

Example pairings for retrieval facilitation analysis

<u>A.</u> OT/IT: "perfect", "right"   <u>C.</u> OT/IT-rhyme-competitor: "perfect", "white"
<u>B.</u> Shuffled OT/IT: "shaving cream", "right"   <u>D.</u> IT/IT: "most", "shit"
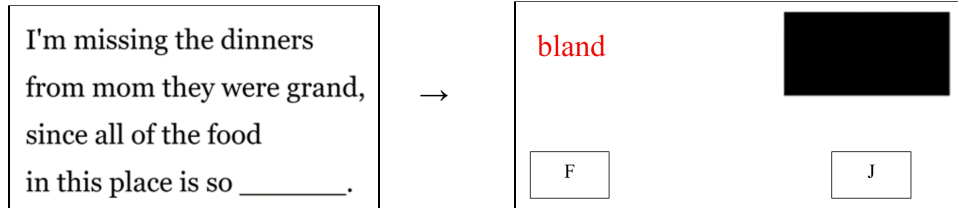
Sample CB Trial

I'm missing the dinners
from mom they were grand,
since all of the food
in this place is so _____.

→

bland

F   J

Figure 1

Covered Box Task Judgments

Figure 2

Mind Rhyme Pairs and Variations (With Taboo Split)
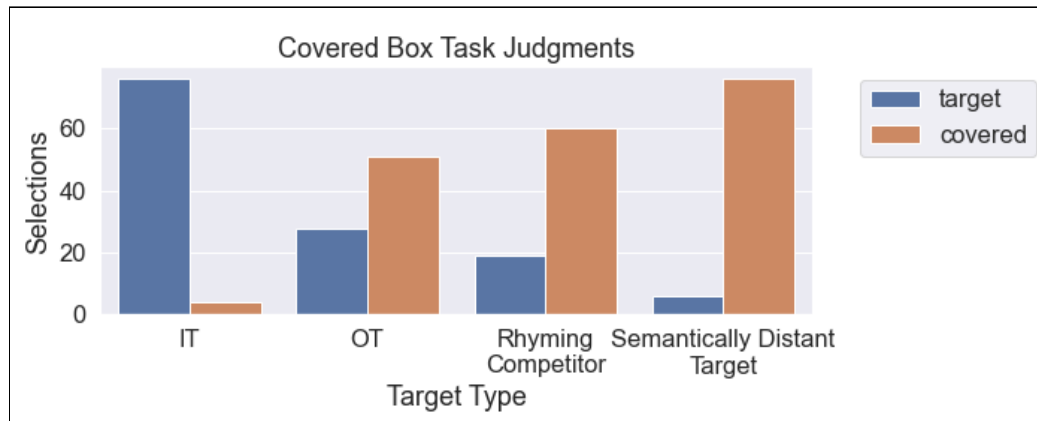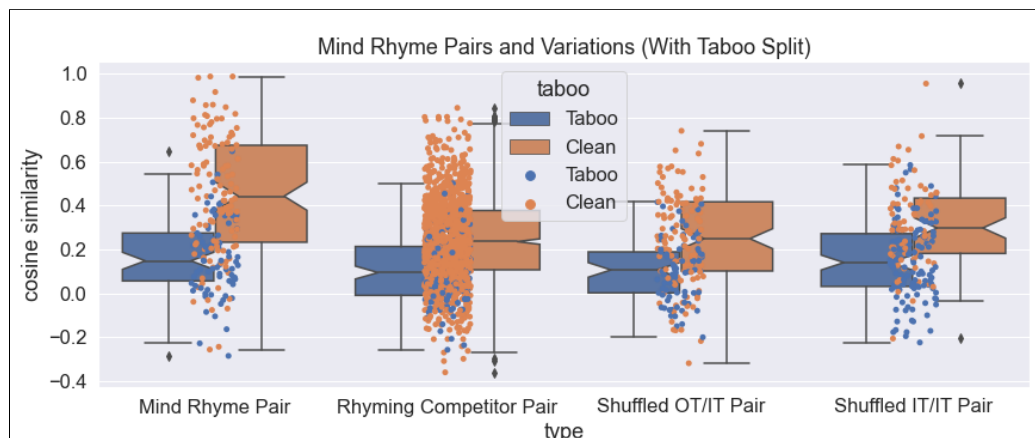
References. [1] Köveceses, 2010. [2] Gibbs, 1986. *Journal of Experimental Psychology*. [3] Veatch, 1988. *Humor*. [4] Schwarz et al., 2015. *Sinn und Bedeutung.* [5] Pennington et al., 2014. *EMNLP*. [6] Jay et al., 2008. *The American Journal of Psychology.*