

Contextual Choice Between Synonymous Pairs of Metaphorical and Literal Expressions: An Empirical Study and Novel Dataset to *tackle* or to *address the question*

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Metaphors represent a "necessary, not just nice" element of everyday thought and communication [6, 4], and frequently manifest themselves in general-domain text corpora [2, 8]. Accordingly, metaphors pose a real challenge across Natural Language Processing (NLP) applications, and research on metaphorical language detection and interpretation has produced a large number of resources. Up to now, however, there is no empirical study providing a basis for understanding the choice between a synonymous pair of a literal and a metaphorical expression, when they can be used interchangeably in a given context. Consider the following discourse:

- (1) "For her, writing is an effective tool to express your viewpoints... To write is already to choose, thus, writing should be done along with a critical mind and a caring soul. [...] Reading lets her travel to far-off imagined places and situations."

(1) might be followed by the sentence "She also learns a lot from (i) *devouring*/(ii) *reading books*, especially from the socio-political and historical ones.", where both (i) and (ii) seem equally acceptable. The underlying choice leads to the following research questions: Why would one favor the metaphorical expression *devour a book* over its literal alternative *read a book*, or vice versa? Is the choice driven by the preceding context, and to what extent? We address these questions in an empirical study: We extract 1,000 discourses from the British English corpus *ukWaC* [1] containing 50 pairs of English synonymous metaphorical/literal verb–object and subject–verb expressions collected from previous work [5, 7]. (Table 2 provides an overview of a few pairs.) For each instance, we asked 15 participants in crowdsourcing experiments to:

Task 1: rate on a scale 1–6 the degree of literalness vs. metaphoricity of the expression-preceding discourse, to shed light on whether context plays a role in the choice of metaphorical vs. literal paraphrase expressions within that discourse;

Task 2: provide a binary decision that favors one expression over the other, to gain insight on conditions for metaphorical vs. literal language usage.

Results: Our human-annotated dataset shows that the selected discourses are generally perceived more metaphorical than literal (62.2% vs. 37.8%); however, there is no clear preference in using metaphorical vs. literal expressions (49.3% vs. 50.7% – see upper part of Table 1). Only when looking at the individual 50 pairs we find a more diverse picture. Cases where the literal usages were preferred (e.g., *devour/read book*) may be explained by the rather strong emotional effect of the metaphorical expressions [5], if they are not coherent with the context. A preference for the metaphorical expressions, as in *fate lie/be*, may be explained by the high conventionality of these metaphors. Overall we observe tendencies challenging the context-induced hypothesis [3], which assumes that language usage is primed by the preceding context, and which we extend to metaphorical vs. literal usage. While a metaphorically-rated discourse primes for the use of a metaphorical expression (30.3%), it also primes for the use of a literal expression (32%), and only 18.7% of the literal expressions are preceded by literally-judged discourses (bottom part of Table 1). Figure 1 shows a slight downward trend for the average proportion of literal expressions – and, in parallel, a slight upward trend for the average proportion of metaphorical phrases – with increasing medians (i.e., when the discourse is rated more metaphorical). Also note that literal expressions are favored over metaphorical ones across all medians (i.e., irrespective of the metaphoricity of the discourse.)

Conclusion: This work offers a new approach and dataset to study metaphor vs. literal language usage in relation to discourse embedding. Our collection counters the theoretical context-induced hypothesis and even more so provides a valuable starting point for explorations on further discourse conditions for metaphorical vs. literal choices, such as lexical semantic relatedness [9] and contextual abstractness [10].

A Appendix

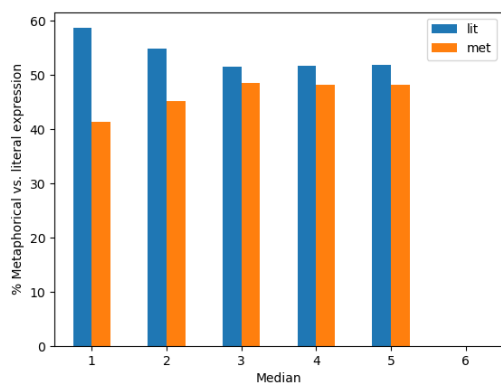


Figure 1: Proportions of metaphorical vs. literal expressions across median ratings for all discourses.

| metaphoricity of discourse (annotated) | |
|---|-------------|
| metaphorical | 622 (62.2%) |
| literal | 378 (37.8%) |
| metaphoricity of expression (annotated) | |
| metaphorical | 493 (49.3%) |
| literal | 507 (50.7%) |
| metaphoricity of discourse-expression | |
| metaphorical – metaphorical | 302 (30.3%) |
| literal – literal | 187 (18.7%) |
| metaphorical – literal | 319 (32.0%) |
| literal – metaphorical | 190 (19.0%) |

Table 1: Summary and comparison of annotations for Tasks 1 and 2. *Top part*: proportions of annotated metaphorical vs. literal discourses + proportions of annotated metaphorical vs. literal expressions. *Bottom part*: metaphoricity of annotated discourses in relation to metaphoricity of annotated expressions. Threshold for literal/metaphorical categories: median of 3.5.

| Metaphorical expression (met) / Literal expressions (lit) | #metexp (%) | (a) #met context metexp | (b) #lit context metexp | #litexp (%) | (c) #met context litexp | (d) #lit context litexp |
|---|--------------|-------------------------|-------------------------|--------------|-------------------------|-------------------------|
| subject-verb pairs (SV): | | | | | | |
| moon peep/appear | 111 (38.14%) | 105 | 41 | 180 (61.86%) | 86 | 57 |
| fate lie/be | 201 (69.07%) | 83 | 64 | 90 (30.93%) | 75 | 70 |
| distinction blur/disappear | 143 (50.00%) | 72 | 75 | 143 (50.00%) | 76 | 67 |
| verb-object pairs (VO): | | | | | | |
| grasp/understand meaning | 129 (44.48%) | 88 | 55 | 161 (55.52%) | 84 | 62 |
| breathe/instill life | 193 (66.55%) | 78 | 67 | 97 (33.45%) | 78 | 67 |
| devour/read book | 98 (34.15%) | 81 | 67 | 189 (65.85%) | 89 | 56 |
| tackle/address question | 113 (38.18%) | 85 | 62 | 183 (61.82%) | 79 | 67 |

Table 2: Summary of results when combining Tasks 1 and 2 for seven SV and VO example pairs. For each pair of metaphorical/literal expression, we show: number of times the metaphorical expression was chosen (%); number of times the preceding context of the metaphorical expression was rated as (a) metaphorical vs. (b) literal; number of times the literal expression was chosen (%); number of times the preceding context of the literal expression was rated as (c) metaphorical vs. (d) literal.

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