Affordance Norms for 3000 Highly Concrete Objects

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Correspondence regarding this article should be addressed to Nicholas P. Maxwell, Department of Psychology, Midwestern State University, 3410 Taft Blvd, Wichita Falls, TX, 76308, United States. Email: nicholas.maxwell@msutexas.edu. The final set of affordance norms is available for download via our OSF page [LINK]. The normed dataset can also be accessed via our interactive Shiny application [LINK]. The authors thank Morgan Ballesteros, Samantha Garcia, and Madisyn Metaxas for their assistance with cleaning the final dataset.

Abstract

[WORDS HERE]

Word Count: XXXX

*Keywords*: Affordances; Body-Object Interaction; Word Norms; Database; *R* Shiny

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The ability to process and retain concept information is a critical aspect of human cognition. Our collected knowledge of everyday objects allows us to successfully navigate our environment while also providing general information regarding the world around us. For researchers who study the cognitive processes underlying language and memory, having accurate measurements of what words mean and how individuals use them together is critical. Traditionally, researchers have classified concept information into two distinct categories: Lexical properties which describe linguistic characteristics of individual words w(e.g., frequency [CITE]; concreteness, [CITE]; age-of-acquisition [CITE]; etc.) and word-pair properties which describe various aspects of relatedness between cue-target word pairs (e.g., semantic feature similarity, [CITE]; word associations, [CITE]; etc.). While it’s important to account for both types of concept information when designing an experiment, the present study is primarily concerned with meaning-based measures of concepts rather than lexical properties related to a word’s written form.

From an empirical standpoint, an object’s meaning can be operationalized in a variety of ways. In practice, however, cognitive psychologists often make use of two broad classes of concept information when measuring meaning: Semantic representations (which can be further divided into XXX) and word associations. First, semantic features describe an object’s meaning in terms of its constituent features. For example, *dogs* have *tails*, *fur*, and *bark*, while *chairs* are comprised of *legs*, a *back*, and a *seat*, and depending on the design, might be made of *wood* or *metal*. To empirically measure semantic features, researchers commonly use feature production tasks, in which participants are presented with a series of objects and are asked to list the most important facets that comprise each item (see XXX, for review). By employing these tasks in large-scale norming studies, researchers have developed sets of semantic feature production norms (e.g., EXAMPLE; EXAMPLE; EXAMPLE), which can be used to assess the semantic similarity between any two measured concepts (see XXX). The past two decades have seen a proliferation of these norms, with feature production norms now available in a variety of languages (see XXX). Second, researchers can separately assess a concept’s meaning in terms of its connections with other objects. Termed associations, these measures are often described in terms of response probabilities (i.e., the likelihood that *cat* would elicit meow as a response; see XXX) and are assumed to form whenever words repeatedly co-occur with one another in natural language (Fishler, 1977; Nelson, McEvoy, & Dennis, 2000). As a result, associations can capture a variety of knowledge, including semantically unrelated concepts that are frequently used together (e.g., *peanut* and *butter*) as well as semantic knowledge (e.g., *drive* and *car*). Like semantic features, associations can similarly be captured via norming studies, and several of these sets of free association norms are readily available (EXAMPLE, EXAMPLE, EXAMPLE).

While semantic and associative measures are critical for understanding a variety of cognitive processes (e.g., memory, comprehension, perception, etc.), exclusively relying upon these measures results in a limited view of meaning. Specifically, when processing an object’s meaning, individuals also consider it in terms of its perceived use or functionality [SURVIVAL PROCESSING, ONE MORE EXAMPLE?] [TRANSITION TO AFFORDANCES] (i.e., affordances; Gibson, 1977). Unlike semantic-based measures, affordances describe interactive relationships occurring between an actor and an object rather than reflecting a specific object or its relationship to other concepts. For example, *chair* is associated with *table*, *seat*, and *couch* and is also comprised of several semantic features (*legs*, *back*, *armrests*, etc.), it also affords *sitting*, *pushing*, and *standing* upon. However, traditional measures of meaning are not likely to capture these actions. For example, [PULL SOME NUMBERS HERE] Thus, [SUMMARY SENTENCE]

A growing body of research suggests that [embodied stuff here]

While several normed databases are available online which catalogue semantic features and word associations, to date, no norming study has had participants generate affordances for objects. This is surprising, given that Psychology has a rich history of conducting mega-studies to generate standardized stimuli. However, [TRANSITION TO BOI]

[BOI HERE – DESCRIBE + SHORTCOMINGS]

[ALTERNATIVE APPROACH – OPEN ENDED W/ MULTIPLE RESPONSE]

[EXPAND HERE] [WHY IS UNDERSTANDING INTERACTIVE PROPERTIES IMPORTANT?] [SURVIVAL PROCESSING MAYBE?] [DIFFERENT “TYPES” OF SEMANTIC REPRESENTATIONS?] [BOI FACILITATES SEMANTIC PROCESSING]

**The Present Study**

[GOAL OF THE PRESENT STUDY] [FIRST DETAIL THE CREATION OF THE DATASET, THEN THE ONLINE INTERFACE, FINALLY DESCRIBE A SERIES OF VALIDATION STUDIES]

**Method**

**Participants**

Participants were recruited across two settings. First, XX undergraduate students were recruited from XX universities within the eastern and southern United States (see Table x for individual *n*s for each testing site). Second, an additional XX participants completed the study online via Prolific (www.Prolific.co). All university students completed the study in exchange for partial course credit, while Prolific participants were compensated at a rate of $3.50/half-hour. Prolific participants were required to have completed at least a high-school level degree or equivalent and to be native English speakers. For completeness, demographic information is reported in the Appendix (Table Ax).

**Materials**

[3000 CONCRETE NOUNS FROM THE MRC]

**Procedure**

[COLLECTOR] [SPECIFIC INSTRUCTIONS]

**Data Processing**

[BREIFLY DESCRIBE THE PROCESS AND PACKAGES]

[STARTED W/ 3000 ITEMS, ANY ITEMS REMOVED?]

[HOW MANY PARTICIPANTS WERE REMOVED?]

[POSSIBLY A FIGURE?]

**Online Interface**

[WORDS HERE]

**Results**

[WORDS HERE]

**Research Questions**

[WORDS HERE]

**Descriptive Data**

[WORDS HERE]

**Validity**

[WORDS HERE]

**Discussion**

[WORDS HERE]

**Conclusion**

[WORDS HERE]

**References**

[FIRST ONE HERE]