COSI (acronym for conceptual-semantic interference) (#18034)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What’s the main question being asked or hypothesis being tested in this study?
We ask whether the locus of semantic interference in the picture-word interference (PWI) task is at the lexical level exclusively (e.g., Damian & Bowers, 2003; Levelt, Roelofs, & Meyer, 1999; Schriefers, Meyer, & Levelt, 1990) or is also – partly – at the conceptual level. We test this hypothesis by looking at effects from semantically related versus unrelated distractor words (SOA 0 ms, written distractor words) in a lexical task, when participants name the target pictures, and in a conceptual, non-lexical task, when participants decide on the natural size of the depicted objects. If the locus of the effect is at the lexical level only, there should be semantic interference in naming but not in size decision.

3) Describe the key dependent variable(s) specifying how they will be measured.
Reaction times, measured from target-picture onset to the onset of the (vocal or manual) response, and errors.

4) How many and which conditions will participants be assigned to?
Participants are randomly assigned to either the naming task or the size decision task. All participants receive 2 distractor conditions: semantically related and unrelated distractors.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Frequentist ANOVAs and Bayesian analyses (F1, F2) with the fully crossed factors task (naming vs. size decision) and distractor relatedness (semantically related vs. unrelated) and t-tests (t1, t2) testing for distractor relatedness effects per task. Task is measured between participants but within items, distractor condition is measured both within participants and items.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Outliers are defined as RTs < 150 ms and > 2500 ms, these observations are excluded from the RT analyses.
Exclusion of individual observations in the naming RT analyses in the case of (a) no or an erroneous response, (b) disfluent naming response or a non-speech sound produced by the participant triggering the voice key, (c) technical problem (e.g., voice-key malfunction). Exclusion of individual observations in the size decision RT analyses in case of (a) no or an erroneous response or (b) technical problem.
Exclusions of participants with > 20% errors or mean RTs > 1,200 ms overall. These participants will be replaced.
Complementary statistical analyses are conducted with all tested participants to check whether participant exclusion has some impact.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
Participant sample size: 64 participants with 32 participants per task (randomly assigned), only native speakers of German, 18 – 36 years. Item sample size: see next point.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Materials: The logic of our study relies on the presence of a sizeable semantic interference effect in naming. Therefore, we need to test semantically closely related target-distractor pairs. Because of the size decision task, we also wish to control for size congruency of the target objects and the objects denoted by the distractor words in order to control for effects of response (in)congruency. According to our intuition, it is very difficult if not impossible to find target-distractor pairs differing in size (size-incongruent pairs, e.g., large – small as “horse – snail” or small – large as “envelope – newspaper”) that are semantically as closely related as target-distractor pairs not differing in size (size-congruent pairs, e.g., large – large as “giraffe – zebra” or small – small as “apple – cherry”). Therefore, we a-priori define size-congruent pairs as experimental items and size-incongruent pairs as filler items. This results in 40 experimental items (20 large-large and 20 small-small) and 40 filler items (20 large-small and 20 small-large) plus 8 practice items.
Outlook: If there would be no semantic interference effect in size decision (possibly because the task, when compared to naming, is too easy), we would increase task demands by presenting participants with degraded target pictures in a subsequent size-decision experiment (following the logic outlined in Mädebach, Markuske, & Jescheniak, 2018)