The effect of the learning context on novel word learning

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INTRODUCTION

- In second language teaching, introducing new vocabulary in semantic categories, i.e. *semantic clustering*, has long become the gold standard and remains the most common practice;
- Empirical evidence suggests that this practice might have a detrimental effect on word learning [1–4].

Why might the learning context matter?

- Interference Theory and Distinctiveness Hypothesis: Increase in similarity between target information and information learned either before or after the target information leads to an increase in difficulty of learning and remembering the target information [5, 6];
- Contextual Interference Effect: Semantic clustering during learning produces more contextual interference, which leads to more effortful processing and slower learning BUT better subsequent retention and transfer [7, 8].

RESEARCH QUESTIONS

Are novel names for existing concepts

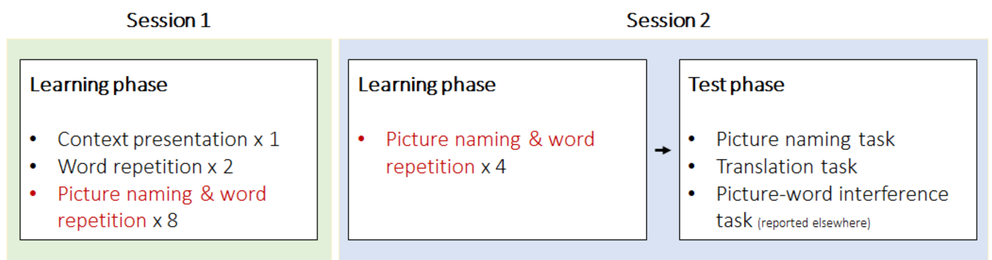
1. acquired faster if trained in a categorically related vs. unrelated context?
2. remembered and accessed better if trained in a categorically related vs. unrelated context?

DESIGN AND PROCEDURE

Participants

- 60 monolingual German native speakers (20% male);
- mean age 24.3, SD 4.22.

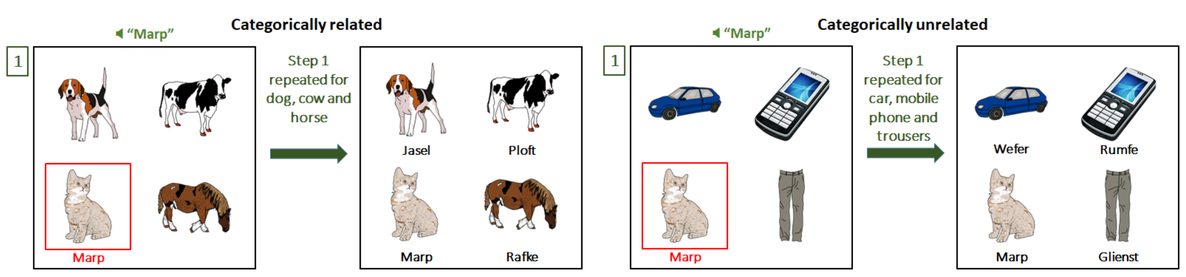
Procedure



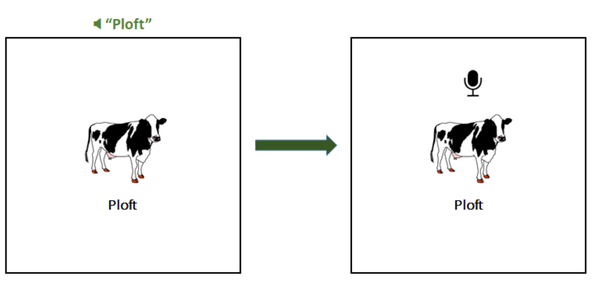
Procedure Overview

Learning phase

Participants learned novel labels for 24 familiar concepts such as plants, animals, tools etc. The novel labels consisted of novel phonological forms, phonotactically and orthographically legal in German.

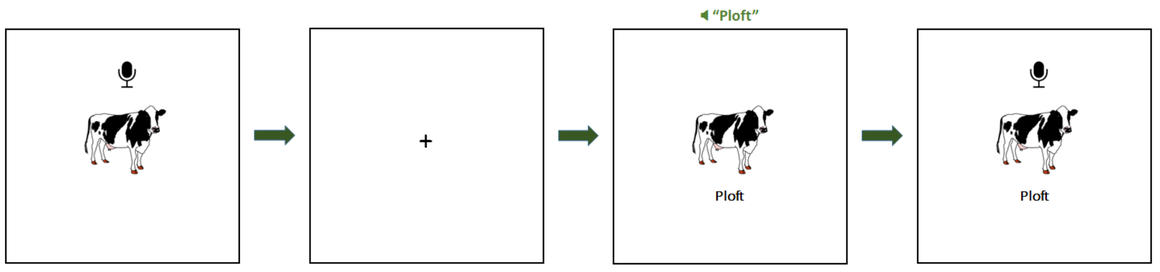


Learning Round 1: Context presentation for categorically related vs. unrelated context



Learning Round 2: Word repetition

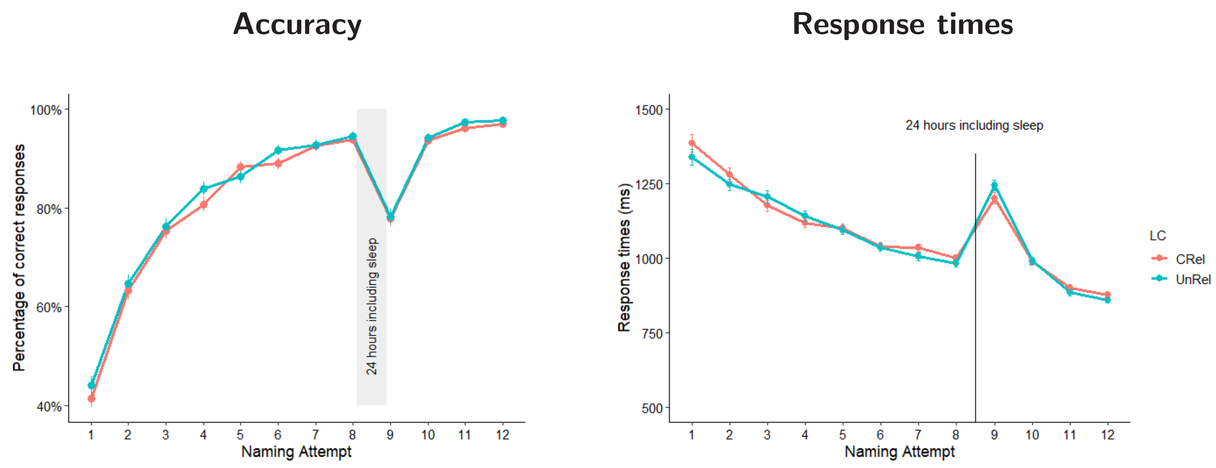
- 5 lists, 1 list per participant;
- 24 novel words taught in 2 conditions (CRel and UnRel) with 12 words per condition;
- 15 semantic categories per list: 3 in CRel and 12 in UnRel;
- Session interval: approx. 24 hours (mean 24.21, SD 2) including sleep.



Learning Round 3: Picture naming and word repetition

RESULTS

Learning phase



Growth Curve Analysis [9] on accuracy and RTs during learning:

- Linear, quadratic and cubic time terms in both models: $p < 0.001$;
- Effect of learning context on accuracy ($p = 0.008$), i.e. better performance for words taught in the categorically unrelated context;
- No effect of learning context on RTs ($p = 0.943$).

Test phase: Picture naming and translation tasks

Accuracy

- Participants performed at ceiling in both tasks:
  - Picture naming: CRel 95%, UnRel 97% correct;
  - Translation: CRel 92%, UnRel 94% correct.

Response times

Linear mixed effects models (R package lme4 [10]), controlling for order of trials, RT of previous trial and order within semantic categories:

- shorter RTs for words taught in the categorically unrelated context in both tasks.

DISCUSSION AND CONCLUSION

- In accord with the *Interference Theory*, *Distinctiveness Hypothesis* and *Contextual Interference Effect*, semantic clustering during learning leads to
  - a less efficient learning process;
  - a slower lexical access at test (*replication* of [1–4]);
  - with the latter being robust even after controlling for the order of trials within semantic categories and, thus, *not due to cumulative semantic interference* [11];
- No evidence for an interaction between naming attempt and condition:
  - No evidence for a difference in retention between the two learning contexts after a 24-hour delay;
  - No evidence for an advantage of semantic clustering in terms of retention and transfer as predicted by the *Contextual Interference Effect*;
  - This prediction needs to be examined with other (longer) delays.

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