

## How context determines focus alternatives in the speaker's mind

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Focus signals the importance of alternatives to the focused element (e.g., [1-3]). [2] describes the focus semantic value of a proposition as the set of propositions derived by replacing the focused expression with an element of the same semantic type. Focus interpretation introduces a variable referring to a contextual antecedent [2]. Thus, context can co-determine the set of alternatives. In the sentence „Sarah took pictures of [APES]<sub>F</sub> in the zoo.” with pitch focus on *apes*, relevant alternatives to the focused element include other animals, but could also extend to other things that can be photographed in a zoo (e.g., trees). Evidence that focus alternatives are real cognitive entities mainly comes from focus comprehension research (e.g., [4-5]). We investigated whether *speakers* make use of alternative sets when using contrastive accent in an utterance. We further tested how context determines such an alternative set. We ran three experiments using picture naming combined with lexical decision (LDT). The use of LDT during speech preparation to tap into language production processes was pioneered by [9] who observed longer LDT times for words that were co-activated during speech planning. Across experiments, both the way of inducing focus and the elements within an alternative set were manipulated: Focus was either introduced by the sequence of objects being presented (Exp.1&Exp.3, see examples 1 & 2) or by means of explicit instructions (Exp.2). Target words for the LDT were presented during the speech preparation phase of the picture naming task. In **Exp. 1 (“semantic context”)** (n=48) and **2 (“no context”)** (n=47), German natives named colored line drawings of objects, e.g., ‘The tiger is red.’. Ten taxonomically organized alternative sets (e.g., animals, tools) had been introduced implicitly in a familiarization phase, and were then presented in eight different colors during the main experiment. In **Exp.1**, object focus intonation (ObjFoc) or color focus intonation (ColFoc) in the spoken prime sentence (1B/B’) was induced by a preceding context sentence (1A/A’), minimally different in either object or color. In **Exp. 2**, no context sentences were used. Instead, we instructed participants block-wise to prosodically stress either the object (ObjFoc) or its color (ColFoc) whilst naming the pictures. In both experiments, target words (1C) were of the same category as the prime object, i.e., semantically related to the focus in the ObjFoc-condition (=alternative), but not in the ColFoc-condition (=no alternative). In **Exp. 3 (“color context”)** (n= 31), newly introduced alternative sets were organized by prototypical natural colors as a common feature of different objects (e.g., key, elephant, stone: “the set of grey things”). LDT targets (2C) shared the prime’s object’s prototypical color and were thus contextually relevant alternatives, but not semantically related. Focus intonation in the prime sentence (2B/B’) was induced by a preceding context sentence, either introducing an object of the same set (2A) or a different set (2A’) leading to contrastive prosodic marking only in the contrastive condition (2B). **Results.** Statistical analyses (LMM) revealed significantly longer reaction times ((log) RTs) in the ObjFoc-condition than in the ColFoc-condition (Exp.1;  $t=3.11$ ,  $p<.01$ ), i.e., participants took longer when the target was a semantically related alternative to the focused-marked prime word (Exp.1). Without context sentences, the effect disappeared (Exp.2;  $t=-0.09$ ). With different types of alternative sets (Exp.3), RTs in the LDT were significantly longer in the contrastive condition than in the neutral condition ( $t=-2.19$ ,  $p<.05$ ). Hence, target words were recognized more slowly when the target word represented an alternative to the focused-marked prime word. **Discussion.** Exp.1 and 3 show slower RTs for alternatives compared to non-alternatives in speech production. The findings of Exp.1 could also be caused by faster RTs in the ColFoc-condition, due to contextual priming. However, Exp.2 revealed that context cannot be entirely excluded. All problems from Exp.1 were carefully eliminated in Exp.3. The fact that here, again, slower RTs for alternatives were obtained, supports the interpretation of this effect as a “true” effect of focus production. **Conclusions.** Speakers do activate contextually relevant alternatives during focus production and context is crucial to determine the set of alternatives. Alternatives are not restricted to semantic associates to the focused element, but can have other sources, in line with [5-6]. The results suggest that in focus production, there is lexical competition between activated alternatives, in line with prominent language production accounts ([7-8]).

**(1) Example of an item set for each condition in the *semantic-context* experiment:**

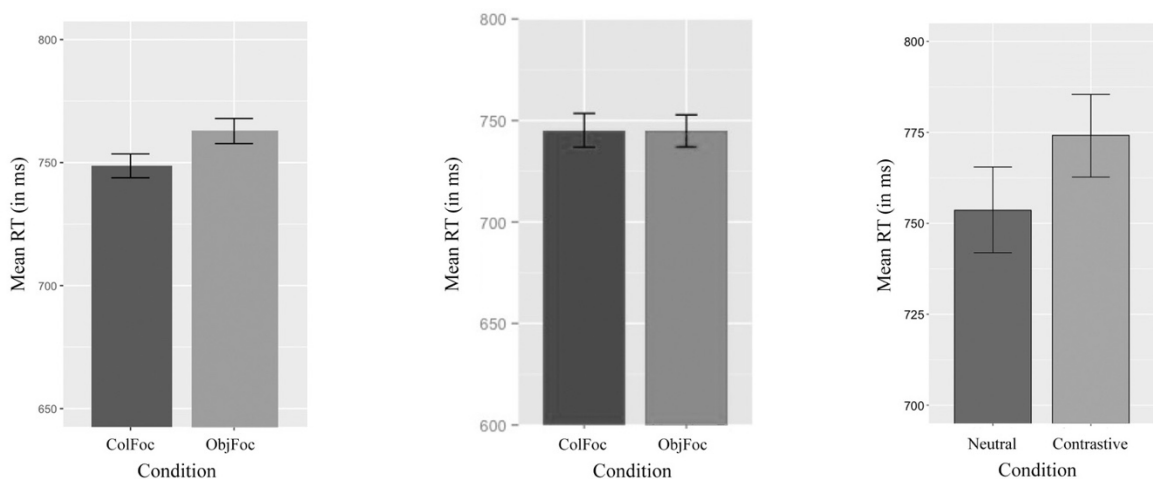
A. Context sentence	Der Apfel ist blau.	('The apple is blue.')	<b>Object focus</b>
B. Prime sentence	Das [Zebra] <sub>F</sub> ist blau.	('The [zebra] <sub>F</sub> is blue.')	
A'. Context sentence	Der Tiger ist rot.	('The tiger is red.')	<b>Color focus</b>
B'. Prime sentence	Der Tiger ist [blau] <sub>F</sub> .	('The tiger is [blue] <sub>F</sub> .')	
C. Target (probe)	Elefant	('Elephant')	

Category: wild animals; introduced alternative set: Zebra ('zebra'), Giraffe ('giraffe'), Tiger ('tiger'), Affe ('monkey')

**(2) Example of an item set for each condition in the *color-context* experiment:**

A. Context sentence	Das Iglu ist weiß.	('The igloo is white.')	<b>Contrastive focus</b>
B. Prime sentence	Das [Schaf] <sub>F</sub> ist weiß.	('The [sheep] <sub>F</sub> is white.')	
A'. Context sentence	Die Hose ist blau.	('The trousers are blue.')	<b>Neutral</b>
B'. Prime sentence	Das Schaf ist weiß.	('The sheep is white.')	
C. Target (probe)	Zahn	('tooth')	

Category: prototypically *white*-colored objects/animals; introduced alternative set: Teller ('plate'), Spargel ('asparagus'), Schaf ('sheep'), Kissen ('pillow'), Iglu ('igloo'), Zahn ('tooth')



**Figure 1:** Mean reaction times on the target words across all experiments: Semantic-Context Experiment (Exp.1, left); No-Context Experiment (Exp.2, middle) and Color-Context Experiment (Exp.3, right). Error bars represent standard errors.

## References

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