

## Does the *Animated First Principle* hold for picture naming too?

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Experiments on sentence processing reliably show effects of animacy on grammatical function assignment and word order, but there are contradictory findings as regards effects of animacy at the phrase level. While effects of animacy on conjunct ordering were absent in previous sentence recall tasks [1, 2] or not consistently found across experiments [1], a picture naming task in German by Franz et al. (2021) [3] showed a modulation by animacy. When presented with two pictures displaying an animate and an inanimate noun, adult and child speakers were more likely to start with the animate noun (e.g., 'dolphin and planet'). Yet, in addition, adults preferred to name pictures from left to right. In the current study, we investigate whether the principle "the most animated NP precedes all other NPs" [4] also applies to coordinated NPs and how the effect might be influenced by speakers' reading/writing habits. Based on prior studies on spatial biases in scene perception and description [e.g., 5, 6], we expect that the ability to read and write in the script of the spoken language influences picture naming and that the preferred sequence of naming may depend more on the directionality of the script than on animacy. For this, we compared picture naming in adult speakers of German (left-to-right script), similar to [3], and speakers of Arabic (right-to-left script).

We created 30 animate-inanimate noun pairs that were matched for frequency, including frequency data for children, syllable length, stress pattern and visual salience of the pictures. These noun pairs were presented together with a set of fillers without animacy contrast in a picture naming task, where we manipulated the position of the animate noun (left vs. right). We started in the lab with a group of German speakers (GermanLab,  $n=33$ ), using the software OpenSesame. The lab group named the pictures from left to right with only two exceptions (see Fig. 1, left; Table 1). Next, we tested a group of Arabic-German bilingual speakers in Arabic (ArabicWeb,  $n=25$ ). Due to the pandemic, this group was tested via a shared screen presentation in Zoom during which we noted their responses. To control for influences of this altered design, we tested a further control group of German-speaking adults via Zoom (GermanWeb,  $n=24$ ). There was no significant between-group difference for GermanLab and GermanWeb, indicating that testing via Zoom did not affect picture naming. The comparison between ArabicWeb and GermanWeb revealed a significant between-group difference (Est. = -8.37, SE = 1.5,  $z = -5.6$ ,  $p < 0.001$ ): While the German speakers showed a strong preference to name pictures from left to right in accordance with their reading/writing habits, a non-significant trend towards a right-to-left preference was found for the Arabic speakers (see Fig. 1, right). Crucially, the position of the animate noun did not modulate adult speakers' responses (condition across groups: Est. = -0.97, SE = 0.7,  $z = -1.3$ ,  $p = 0.2$ ).

Our results from picture naming in German and Arabic, unlike [3], suggest that an effect of animacy on the ordering of nouns, if it existed, was cancelled out by a spatial bias. This spatial bias seemed to be related to the directionality of the script. Next, we will use the same materials and test a group of German-speaking preschool children to investigate whether animacy modulates picture naming if no script has been learned yet.

## References

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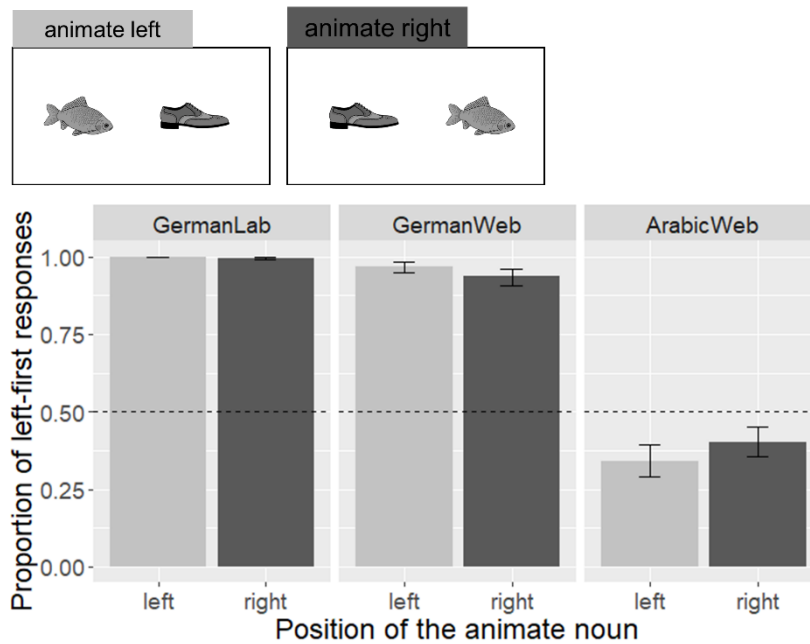


Figure 1. Proportion of left-first responses for animate nouns in left position and animate nouns in right position for German (left, middle) and Arabic speakers (right). Error bars show the bootstrapped confidence intervals. The dotted vertical lines mark chance level.

	Directionality	animate left	animate right
<b>GermanLab</b>	Left first →	494 (100%)	490 (99.5%)
	Right first ←	0 (0%)	2 (0.5%)
<b>GermanWeb</b>	Left first →	348 (97%)	336 (94%)
	Right first ←	12 (3%)	23 (6%)
<b>ArabicWeb</b>	Left first →	124 (34%)	144 (40%)
	Right first ←	239 (66%)	215 (60%)

Table 1. Total number of left-first responses and right-first responses for animate nouns in left position and animate nouns in right position per group. Percentages are given in parentheses. Null responses were excluded.