

Polysemy processing and belief inferences in language comprehension: Examining the role of individual differences

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We examined whether belief inferences from polysemous appearance verbs could be over-ridden by pre-verbal linguistic context [1-3]. In a sentence like (a), readers will infer that “Fernanda believes the car is black”. The belief inference arises from the dominant sense of the polysemous verb. However, there is also a subordinate sense that does not support a belief inference. We were interested in the mechanisms of polysemy processing and the role of individual differences (IDs) in context effects.

We manipulated linguistic context that provided information about different viewing conditions. A non-veridical (negative) context described situations suggesting that objects may not appear their true size, shape, or colour (see a-d). These familiar contexts should invite a phenomenal reading of appearance verbs (second sentence in a-d). In contrast, neutral contexts are ambiguous as to whether the object looks its actual size, shape, or colour. We also manipulated inference consistency (third sentence), which was either consistent or inconsistent with the expected belief inference.

If appearance verbs trigger belief inferences, inconsistent items show lower plausibility ratings than consistent items in the neutral context condition. If context can prevent belief inferences, this pattern will reverse in the negative context condition. Our hypothesis (**H**) suggests that the negative context would not facilitate full suppression of the belief inference. We examined what ID variables are predictive of taking context into account, leading to stronger belief inference suppression.

We tested 68 participants with an eye-tracking task in which they read 48 three-sentence discourses (with 48 fillers) and rated the plausibility on a 5-point scale. It employed a 2 (context) × 2 (consistency) design. Participants also completed a battery of ID measures.

Results of 2×2 LME analyses found a significant context × consistency interaction ($t = 5.20, p < .001$) (Figure 1). Simple effects showed a significant con. vs. incon difference with a neutral context ($t = 5.78, p < .001$) but not with a negative context ($t = -.52, p = .61$), showing that linguistic context modulated belief inferences but did not fully override it, partially supporting **H**. A factor analysis of the ID battery showed 3 factors. Factor 1 loaded verbal abilities, Factor 2 loaded working memory, Factor 3 loaded reflection/inhibition. Correlations between factor scores and plausibility ratings in the negative conditions, showed significant results (see table 1). These findings demonstrate that ID measures are important for (1) taking context into account and (2) modulate the suppression of inappropriate comprehension inferences.

References

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Example sentences

- (a) *It was dark outside. The car looked black to Fernanda. She believed it was black. (Neg-Con)*
- (b) *It was dark outside. The car looked black to Fernanda. She believed it was navy. (Neg-Incon)*
- (c) *It was just getting dark. The car looked black to Fernanda. She believed it was black. (Neu-Con)*
- (d) *It was just getting dark. The car looked black to Fernanda. She believed it was navy. (Neu-Incon)*

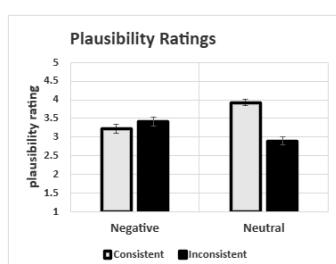


Figure 1: Mean plausibility ratings. Error bars show the standard error of the mean.

Correlations between variables

	Verbal Ability	WM	Reflection/EF
Negative – Consistent	-.42**	.07	-.24*
Negative – Inconsistent	.46**	.00	.21 [#]

Note. ** $p < .001$, * $p < .05$, [#] $p < .09$

Table 1: Showing correlation between the scores of each factor and plausibility ratings of the negative conditions.