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Andreas Wertgen, Tobias Richter and Jean-François Rouet

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Andreas G.Wertgen[1], Tobias Richter[1] and Jean-François Rouet[2]

[1]Department of Psychology IV, University of Würzburg

[2]CNRS and University of Poitiers

Author Note

The authors declare that there no conflicts of interest with respect to this preprint.

Correspondence should be addressed to Andreas G. Wertgen, University of Würzburg, Department of Psychology IV, Röntgenring 10, 97070 Würzburg, Germany. Email: andreas.wertgen@uni-wuerzburg.de

Abstract

Validation is an integral part of text comprehension. We used reading times and plausibility judgments to investigate combined effects of source credibility and plausibility on validation. Participants read stories with a high- vs. –low-credible person making knowledge-consistent, implausible, or knowledge-inconsistent assertions. Interactions of source credibility and plausibility were found for plausibility judgments and reading times, indicating that source credibility affects validation but that the pattern of effects depends on the degree of implausibility.

Keywords: Text Comprehension, Validation, Plausibility, Source Credibility, Source Information, Sourcing

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Evidence for a mechanism that validates incoming text information based on prior knowledge accumulates (e.g., O'Brien & Cook, 2016; Richter et al., 2009; Singer, 2013), yet the role that source information might play for validation is unclear. In the first study to address this issue, Foy and colleagues (2017) found an interaction of plausibility and source credibility: high-credible sources boosted plausibility of implausible assertions. By contrast, Wertgen and Richter (2019) examined this interplay with stories containing high or low-expertise sources stating assertions clearly consistent or inconsistent with general world knowledge. They found a different interaction pattern for plausibility judgments and reading times (RT), with stronger effects on spillover sentences: high-expertise sources increased plausibility and RT of knowledge-inconsistent sentences and RT of spillover sentences. A key to understanding the different interactive patterns of source credibility and plausibility might be the degree of implausibility. The present experiment tested this hypothesis by comparing the role of source credibility in the validation of knowledge-consistent, implausible and knowledge-inconsistent sentences.

Method

Participants

Ninety-nine participants (79.8 % female, 88.89 % students) with an average age of 24.4 years (*SD* = 8.14) participated in the experiment.

Materials

The 36 eight-sentence short stories based on Wertgen and Richter (2019) described everyday situations (e.g., vacations, restaurant visits). The third sentence described the protagonist either as a source with high or low credibility (person with high vs. low expertise in a certain field, e.g., a physics professor vs. a young child). The sixth (target) sentence was an assertion coming from the beforehand introduced person in direct speech. The assertion could be consistent, implausible or inconsistent based on world-knowledge (e.g., *"Watt is the unit of electric power./ Ampere is the unit of electric power./ Kilogram is the unit of electric power."*). We created 36 plausible filler stories as well.

Design

The design was a 2 (source credibility: high expertise vs. low expertise) x 3 (plausibility: world knowledge-consistent vs. implausible vs. world knowledge-inconsistent) within-subjects design. Each participant read one version of every story. The assignment of stories to experimental conditions across participants was counterbalanced. Participants saw the stories in a randomised order.

Procedure

Participants read all 72 stories on a computer screen in a self-paced fashion at the first appointment. They could advance to the next sentence by pressing a key. Practice trials were included at the beginning to familiarize participants with the self-paced reading method. Letters in

all sentences except the currently read one were masked with "x". After every filler story participants responded to a yes/no comprehension question. At the second appointment, participants read the stories again in a self-paced fashion and were asked to judge the plausibility of the target sentence on a scale from 1 (“not plausible at all”) to 7 (“very plausible”). Participants received money or course credit for participation.

Results

RT and plausibility ratings were analysed with linear mixed models with random effects (random intercepts) of participants and stories. All factors were contrast coded and their main effects as well as the interaction were entered as fixed effects in the model. Sentence length and the position of the story in the experiment were entered as centred predictors (fixed effects). RT deviation more than 2 *SD* from the participant or item mean were excluded from the analysis. Data from six non-native speakers and three participants with low comprehension performance (< 80%) were excluded.

Plausibility Ratings

We found a strong main effect of plausibility with a decline in plausibility from world-knowledge consistent ($M = 5.58$, $SE = 0.1$) to implausible ($M = 3.62$, $SE = 0.1$) to world-knowledge inconsistent ($M = 2.15$, $SE = 0.1$), $\beta = -1.63$, $t(3426.53) = -39.59$, $p < .001$ and $\beta = -0.16$, $t(3426.53) = -3.98$, $p < .001$. Importantly, there was a significant interaction effect (Figure 1), $\beta = 0.21$, $t(3426.76) = 5.15$, $p < .001$. In line with Wertgen and Richter (2019), a world-knowledge consistent statement by a high-expertise source was judged as more plausible as the same statement coming from a low-expertise source. In contrast, a high-expertise source stating something world-knowledge inconsistent weakened the plausibility compared to a low-expertise source.

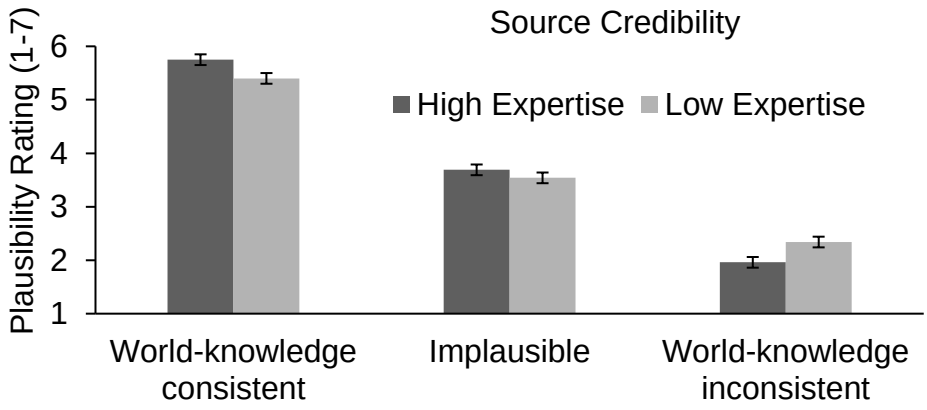

Figure 1. Mean plausibility ratings (with *SE*) of target sentence by experimental condition.

Target Sentence

There was a strong main effect of plausibility, β = 172.86, *t*(2248.66) = 5.524, *p* < .001. Participants read world-knowledge consistent sentences (*M* = 3811 ms, *SE* = 113 ms) faster than implausible (*M* = 4020 ms, *SE* = 113 ms) and world-knowledge inconsistent sentences (*M* = 4172 ms, *SE* = 113 ms). There was no interaction effect of plausibility and source credibility (Figure 2), indicating no influence of source credibility for initial processing.

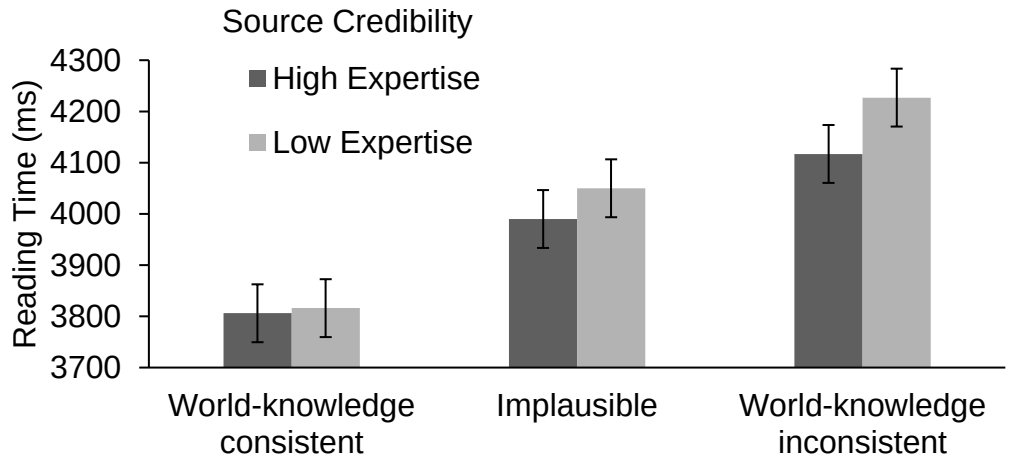

Figure 2. Mean RT (with *SE*) on target sentence by experimental condition.

Spillover Sentence

Analysis revealed a main effect of plausibility, β = 53.36, *t*(2673.87) = 3.215, *p* = .001. Sentences subsequent to world-knowledge consistent sentences (*M* = 2613 ms, *SE* = 71 ms) were read faster than sentences subsequent to implausible (*M* = 2658 ms, *SE* = 71 ms) or world-knowledge inconsistent sentences (*M* = 2715 ms, *SE* = 71 ms). Moreover, this effect was qualified by interaction effects between source credibility and plausibility on both contrasts (Figure 2), β = -44.48, *t*(2674.56) = -2.673, *p* = .008 and β = 46.79, *t*(2673.61) = 2.824, *p* = .005. High-expertise sources seem to weaken the plausibility of world-knowledge inconsistent spillover sentences and to boost the plausibility of implausible spillover sentences compared to low-expertise sources.

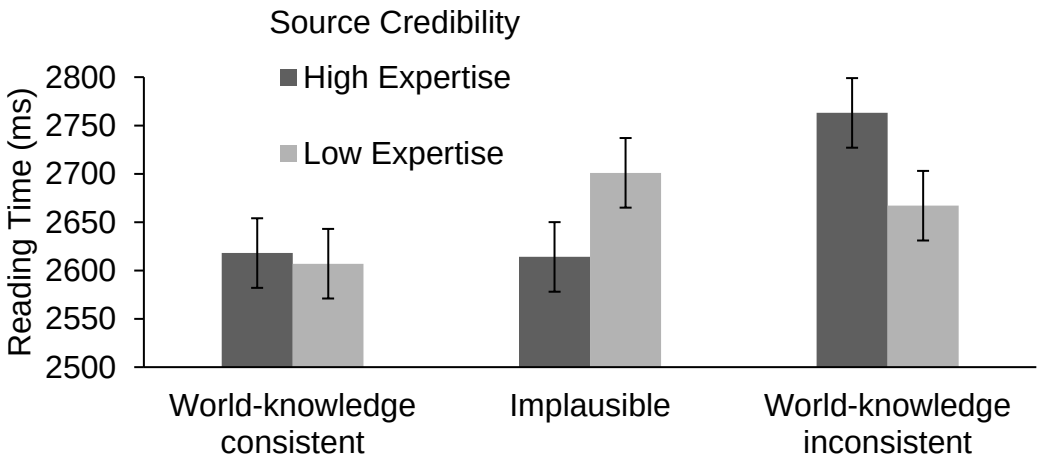

Figure 3. Mean RT (with *SE*) on spillover sentence by experimental condition.

Discussion

The results indicate that source information did not affect initial validation. However, source information affected processing on the spillover sentences and the off-line evaluation of plausibility, implying that source information can modulate validation processes in a delayed fashion. Participants judged world-knowledge consistent sentences stated by high-credible sources as more plausible compared to low-credible sources. RT were longer for spillover sentences after a world-knowledge inconsistent information by a high-credible source compared to a low-credible source. Interestingly, the effect flipped on sentences preceding implausible target sentences, boosting the plausibility by a high-credible source compared to a low-credible source. The degree of implausibility seems to determine the interaction pattern. Future research should attempt to disentangle the underlying routine and strategic processes.

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