Expecting the unexpected: Examining the interplay between world knowledge and context in relatively unconstraining scenarios

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Real-world implausible information induces processing difficulties unless licensed by the context [1]. However, since most studies used explicit contextual cues to indicate a strong bias towards plausibility violations, it remains unclear how context and world knowledge interact in relatively unconstraining scenarios (e.g., a dream) where both plausible and implausible information seem acceptable. On the one hand, since comprehenders lack enough cues to form a specific prediction that shares a sufficient overlap with the irreal setting of the context, they may expect something real-world plausible (plausibility-driven approach) [2]. On the other hand, since "dreams" are usually associated with unusual events in real life, comprehenders may expect something implausible in a general way even without specific cues (context-driven approach) [3].

Exp 1 (sentence completion task, N = 52) had two conditions: factual versus dream contexts (Table 1, 24 targets, 26 fillers, in English). Each scenario described either a real-life experience or dream, ending with a "preposition + noun phrase" structure. The noun phrase was truncated for participants to complete. If comprehension is plausibility-driven, there should be no difference between the contents of the completions in the two contexts; if comprehension is context-driven, completions should have lower plausibility and higher variability in dream than in factual contexts. **Results*:*** (1) Two raters not involved in the study rated the **plausibility** of completions (Cohen's Kappa = 0.96), and the plausibility was higher in factual than in dream contexts ($p < .001$, using LMM). (2) The **variability** (indexed by entropy) of completions was higher in dream than in factual contexts ($p < .001$, using permutation-based ANOVAs).

Exp 2 (self-paced reading, N = 104) crossed context (factual vs. dream) and plausibility (plausible vs. implausible) in a 2 × 2 within-subjects design (Table 2, 24 targets, 60 fillers, in English). The materials were identical to Exp 1, except that they ended with a critical noun that was either plausible or implausible, followed by spillover regions. If comprehension is plausibility-driven, the same plausibility effect should be found in RTs for both factual and dream scenarios; if comprehension is context-driven, the plausibility effect should be attenuated or even reversed towards the end of the dream scenario but not the factual scenario. Log-transformed RTs were analyzed with LMM. **Results:** (1) **Critical & spill1 regions**: no significant effects. (2) **Spill2 & spill3 regions**: a plausibility effect (spill2: $p = .005$; spill3: $p < .001$). (3) **Spill4 region**: a context × plausibility interaction ($p = .008$), due to a plausibility effect in the factual ($p = .005$) but not the dream condition ($p = .252$). (4) **Spill5 region**: a context × plausibility interaction ($p = .010$). There was a plausibility effect in the factual condition ($p = .046$), but this effect was reversed in the dream condition ($p = .010$) due to longer RTs for plausible words in the dream than factual condition.

Conclusions: The current results provide novel evidence that context is powerful enough to bias comprehension towards world knowledge violations even when there are no explicit constraints indicating this bias (although this effect only emerged at the final region). This indicates necessary extensions for language comprehension models (e.g., the RI-Val Model [3]), by highlighting that information with extremely low cloze probability (i.e., information unrelated to both context and world knowledge in any direct way) can still be preferred in certain scenarios.

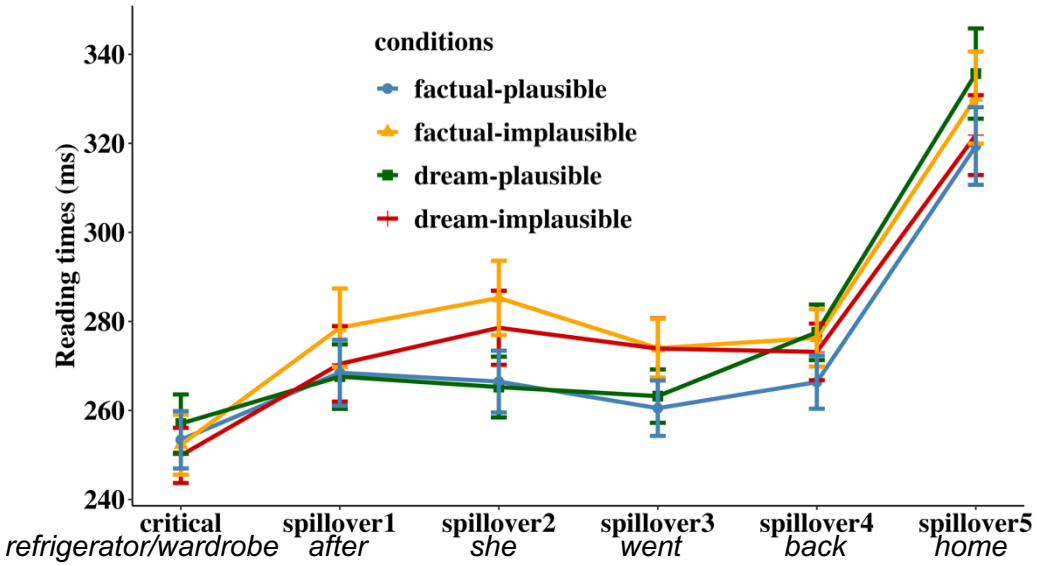
Table 1. Exp 1 example stimuli (a sentence completion task)

Factual	Dream
Mary is telling her friend what she **did** on Sunday. That day, she drove to the nearest grocery store with her husband, bought some fresh meat and vegetables, and then put them in _____.	Mary is telling her friend what she **dreamt** on Sunday. In her dream, she drove to the nearest grocery store with her husband, bought some fresh meat and vegetables, and then put them in _____.

Table 2. Exp 2 example stimuli (self-paced reading, stimuli presented word-by-word)

Factual	Dream
Mary is telling her friend what she **did** on Sunday. That day, she drove to the nearest grocery store with her husband, bought some fresh meat and vegetables, and then put them in the refrigerator$_{plausible}$ vs. wardrobe$_{implausible}$ after she went back home.	Mary is telling her friend what she **dreamt** on Sunday. In her dream, she drove to the nearest grocery store with her husband, bought some fresh meat and vegetables, and then put them in the refrigerator$_{plausible}$ vs. wardrobe$_{implausible}$ after she went back home.

Figure 1. Exp 2 mean RTs per region (the error bars represent the 95% confidence intervals)



References

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