Focus reveals how people (variably) update event representations to novel material

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Prior psycholinguistic research suggests that people incrementally develop representations of *who* can do *what* in an event [1, 2, 3, 4]. While previous work has found that discourse constrains the set of upcoming events and their subjects [5, 6], naturalistic interaction often introduces new subjects and unlikely events. How do people update their event representations to accommodate such novel information? We address this question by applying linguistic focus [7,8] – a phenomenon which activates a set of contextually-relevant alternatives for a word – to different words in a discourse. For example, in sentences like *At the store, Omer bought only apple*s, people consider alternatives for the word after *only* ({*bread, beets, …*}) [9, 10], and such consideration is faster when possible alternatives are presented in discourse [11]. By focusing subjects and verbs, we can probe how people incrementally construct event representations that map possible subjects (given, new) to possible verbs (likely, unlikely). We make two predictions on how linguistic focus will affect this mapping during discourse processing. (1) Verbs should be processed according to their likelihood when following focused subjects, as focused subjects will be interpreted as alternatives to prior nouns with established (and therefore restricted) event expectations. (2) Focused verbs should be processed differently according to both their likelihood and their subject's givenness, as possible events are more constrained for given subjects in a discourse than for new ones. **Method**. We test these predictions with three G-Maze experiments [12, 13]. In each experiment, participants read 24 two-sentence English stories ("*John and* {X} *visited a pub. The regulars were surprised that David* {Y} *at the bar.*"); see Figure 1 for sample item. We varied three factors: the GIVENNESS of the subject in the second sentence (GIVEN (X=David), NEW (X=Serena)), the LIKELIHOOD of the event for established subjects in the discourse (LIKELY (Y=drank), UNLIKELY (Y=worked)), and the REGION that is focused. Experiment 1 (N=35) had no linguistic focus as a control, Experiment 2 (N=23) focused the SUBJECT, and Experiment 3 (N=38) focused the VERB. **Results** for Experiments 1-3 are visualized in Figure 2. We analyze log-transformed reading times between the SUBJECT and VERB regions using linear mixed-effects models[1]; the AFTER region is visualized to show that behavior converges outside of the critical regions. Unsurprisingly, we find that GIVEN subjects are read significantly faster than NEW subjects in the SUBJECT position across all experiments (blue vs. orange), replicating a GIVENNESS effect for nouns from prior work [9, 10, 11]. In Experiment 2, prediction (1) is borne out: LIKELY events are read faster than UNLIKELY ones in the VERB position (solid vs. dashed), but no significant differences are caused by GIVENNESS; additionally, the SUBJECT region is read faster than the VERB region. In Experiment 3, prediction (2) is borne out: again, LIKELY events are read faster than UNLIKELY ones in the VERB position, but also NEW subjects in UNLIKELY events are read faster than GIVEN subjects in those same events in the VERB region. **Discussion**. We determined how people rapidly update their event representations after reading *new* or *unlikely* material, a process that has received little attention in the literature. While people are generally slower to accommodate both new subjects and unlikely events, new subjects either 1) only participate in the same events as given subjects (when the subject is focused), or 2) are able to participate in a wider set of events than given subjects (when the verb is focused). These results suggest that people are sensitive to what events are possible *before* reading the verb itself.

[1] For all experiments: LogRTs ~ GIVENNESS*LIKELIHOOD*REGION + (1|Participant) + (1|Item).

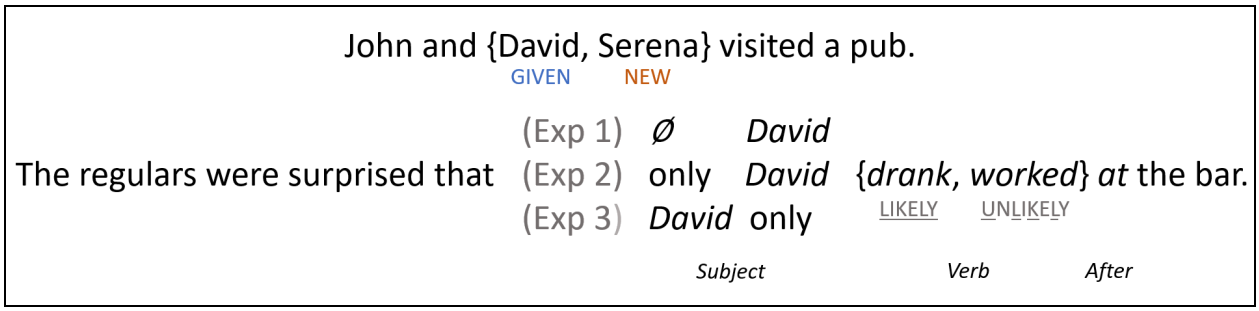

Figure 1: Sample experimental items for Experiments 1-3.
Italicized words reflect x-axes of Figure 2. Color and underlining reflect conditions in Figure 2.

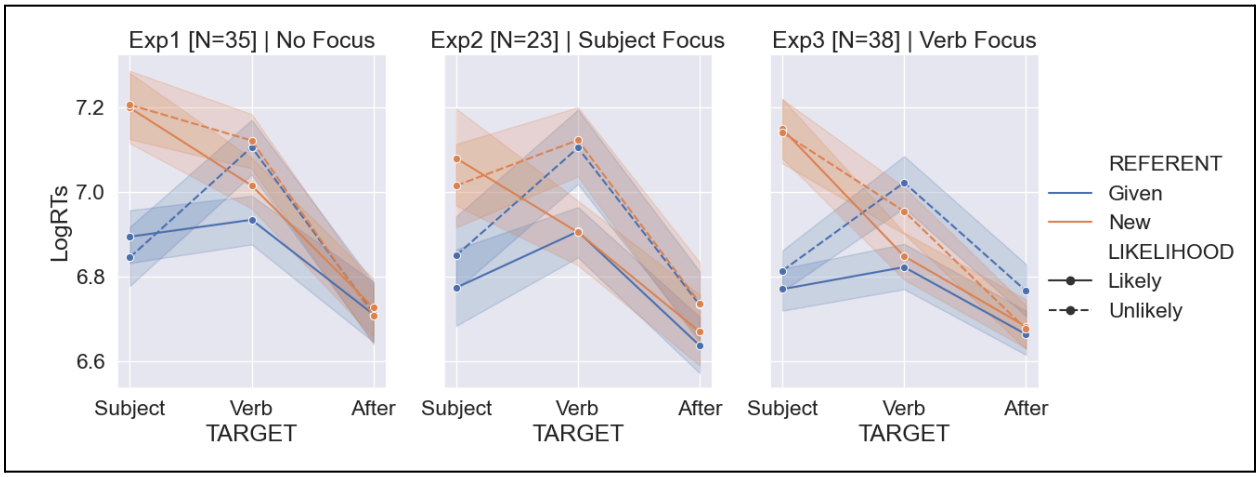

Figure 2: Positional results for the critical regions (NAME & VERB) and the word immediately following the VERB (AFTER). Error bars indicate bootstrapped 95% confidence intervals.

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