# Group A

**Minimal Exclusion** The first set of analyses used minimal exclusion criteria. First, we eliminated participants with 0 percent of fixations in any ROIs. This resulted in the elimination of 1 participants. Second, we excluded participants with validation accuracy under 10 percent, resulting in an additional 5 excluded participants. The following analyses included 52 participants.

**Cumulative Fixation Probabilities** For each sentence, the target time window began at the onset of the verb and ended 2000 milliseconds later. This window was then divided into 50-ms bins; for each participant and each trial, we recorded whether each object was fixated during the 50-ms bin. Collapsing over trials and participants, and averaging across distractors, we calculated the cumulative probability of fixation, shown in Figure @ref(fig:E1-spaghetti-fig).

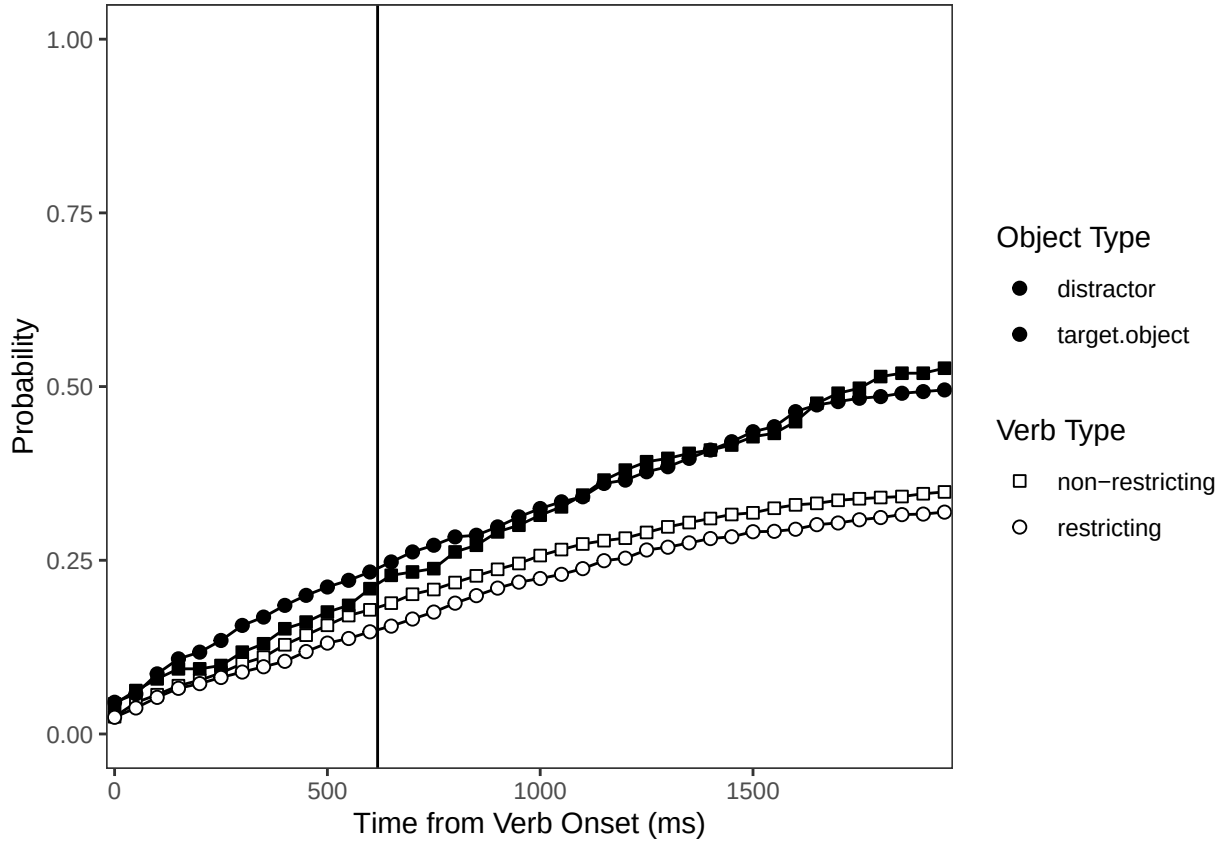


Figure 1: Cumulative probability of fixating distractor and target objects across conditions over time, with 0 ms aligned to the verb onset time. The vertical line marks the mean noun onset time across trials and conditions.

**Pre-noun fixations** In our first two analyses, we ask whether participants looked more to the target than to the distractor during the predictive time window, given that the verb is restricting. The first model tested

whether there were more fixations to the target object than to the distractor in the time window before the onset of the target noun. We ran a regression model predicting the cumulative fixation probability in the last 50-ms bin before noun onset from the verb condition (restricting = 1 vs. non-restricting = 0), object type (target = 1 vs. distractor = 0), and their interaction, along with random effects for participants and images (with no covariance between random effects because the model cannot converge with full covariance matrix). There were no significant effects, although the critical interaction was in the right direction [bar graph?] ($b$ = 0.05, $SE$ = 0.03, $p$=0.15).

**Pre-verb-offset fixations** Altmann and Kamide tested a second model, aligning the predictive time window with the offset of the verb rather than the onset of the noun as above. When we do the same, we again see that the critical interaction is not significant but numerically in the expected direction ($b$ = 0.05, $SE$ = 0.03, $p$=0.2).

**First target fixations after verb** Finally, we address whether participants look to the target faster in the restrictive vs. the non-restrictive condition, starting after the onset of the verb. [TO-DO: On average, participants looked to the target 349 ms after the noun onset in the restrictive condition (compared to ) and 349 ms after the noun onset in the non-restrictive condition (compared to )]. Thus, first fixations were not only delayed relative to those in the previous studies compared here, but also showed a smaller difference between conditions.

We ran a regression model predicting the timing of the first fixation to the target object, relative to the onset of the noun, with verb condition as a predictor, mean-centered verb duration as a covariate, and random intercepts and condition slopes for participants and scenes. There were no significant effects; participants looked sooner at the target in the restrictive condition, while accounting for verb duration and its interaction with condition, but this was not a statistically significant effect ($b$ = -121.91, $SE$ = 90.57, $p$=0.2).

**Aggressive Exclusion** The second set of analyses used more aggressive exclusion criteria. First, we eliminated participants with 20 percent of fixations in any ROIs. This resulted in the elimination of 15 participants. Second, we excluded participants with validation accuracy under 50 percent, which eliminated an additional 35 participants. The following analyses included 22 participants.

We tested the same three models under these more aggressive exclusion criteria. The first two models, comparing target and distractor fixations in the predictive window, produced very similar results; the critical interaction was not statistically significant (Pre-noun-onset window: $b$ = 0.07, $SE$ = 0.06, $p$=0.23; Pre-verb-offset window: $b$ = 0.05, $SE$ = 0.05, $p$=0.28). However, the final model, which tested the effect of verb condition on saccades to the target, yielded a statistically significant result, unlike in the previous set of analyses ($b$ = -193.35, $SE$ = 96.33, $p$=0.05).

**Calibration** Participants' calibration quality was measured as the mean percentage of fixations that landed within 200 pixels of the calibration point. Calibration quality varied widely, ranging from 3.16% to 98.87%.

We tested whether a participant's calibration quality was correlated with their effect size. There were three effects of interest: the verb-by-object interaction in predicting fixation probabilities, both in the (1) pre-noun-onset and (2) pre-verb-offset windows (calculated as the difference in target-over-distractor preference between verb conditions), and (3) the effect of verb on the timing of the first target fixation (calculated as the difference in target latency between verb conditions). Across the three effects of interest, calibration quality was not significantly correlated (Effect 1: Pearson's $r$ = 0.0310735, $p$ = 0.8268992, Effect 2: Pearson's $r$ = -0.0480924, $p$ = 0.7349375, Effect 3: Pearson's $r$ = 0.041228, $p$ = 0.7762011. However, when the two interaction effects are calculated as the target advantage in the restricting condition only (i.e. rather than a difference of differences), we see a significant correlation between target advantage and calibration quality in the wider pre-noun window (Pearson's $r$ = 0.2096605, $p$ = 0.1357603).