Mixed effects regression analysis

The main analysis reported in the paper is the mixed effects linear regression predicting the arc-sin transformed proportion of looks to the action image during a trial. Across all three experiments, we also preregistered a mixed effects logistic regression analysis directly predicting individual looks to the action image. We chose to carry out both analyses because each has advantages and drawbacks, with proportion of looks collapsing information about individual looks, while models of raw looks may not fully account for correlations between neighboring looks (though we did include previous look as a predictor). However, converging evidence from these two models would provide promising support for the hypothesis. Indeed, the results of the models agreed across all three experiments, so to save space, we only reported the linear regression on arc-sin transformed proportion of looks in the final paper. The results of the logistic regression on individual looks are summarized below.

Experiment 1

In Experiment 1, the mixed effects logistic regression predicted the log odds of looking to the action video as a function of condition and previous look (to the action video or not). It included a random intercept for participant and a random slope that accounted for participant differences in the effect of previous look. There was a significant main effect of condition ($\beta =$ 0.855, SE = 0.175, $p < 0.001$), such that participants in the verb condition were more likely to look at the action video. There was also a significant main effect of previous look (β = 4.761, SE = 0.225, $p < 0.001$) such that if a participant looked at the action video on their previous look, they were more likely to look at the action video on the following look as well.

Experiment 2

Similarly, in Experiment 2, the mixed effects logistic regression analysis directly predicted the log odds of looking to the action image as a function of condition and previous look. It included random by-participant intercepts and a random by-participant slopes for previous look. Participants in the noun condition were marginally less likely to look at the action image compared to those in the baseline condition (β = -0.395, SE = 0.23, p < 0.09), while participants in the verb condition were marginally more likely to look at the action image (β = 0.441, SE = 0.231, p < 0.06). There was also a significant main effect of previous look (β = 4.96, SE = 0.245, p < 0.001) such that participants were more likely to look at the action image if their previous look was to the action image.

Experiment 3

In Experiment 3, the mixed effects logistic regression model again directly predicted the log odds of looking to the action image as a function of condition and previous look. As before, we included random by-participant intercepts and random by-participant slopes for previous look. This model also revealed a significant effect of condition, such that children in the noun condition were less likely than children in the baseline condition to look at the action image (β = -0.263, SE = 0.101, p < 0.01). There was not a significant effect for children in the verb condition compared to children in the baseline condition (β = 0.138, SE = 0.106, p = 0.194). The effect of previous look was significant, such that if a child's look on the previous sample was towards the action image, their current look was also more likely to be directed towards the action image (β = 7.27, SE = 0.087, p < 0.001).

Exploratory generalization trial

In Experiment 1, following Havron et al., we included an exploratory generalization trial. On this trial, participants heard an ambiguous structure using the masculine *Le petit…* frame rather than the feminine *La petite…* that had appeared during training trials. Results indicated that participants in the verb condition looked significantly more to the action video than participants in the noun condition (β = 0.195, *SE* = 0.085, *p* = 0.024). Although we should be cautious given that it is based on a single trial, this finding suggests that syntactic adaptation may generalize to slightly different structures. Though this question was outside the scope of Experiments 2 and 3, it merits further investigation to determine the extent to which syntactic adaptation is structure-specific.