

**Conceptual parallels between event and object reference in English:  
A new paradigm shows that demonstratives refer to more complex events**

Joshua Wampler & Eva Wittenberg (UC San Diego)  
jwwample@ucsd.edu

Referring expressions like proforms (“it”) and demonstratives (“that”) are at the center of discourse relationships, yet very little is known about how people resolve reference to events, as opposed to reference to people and objects. Previous work suggests that factors influencing reference resolution are 1.) **the form of the referring expression**: proforms are more likely to refer to simple/easily accessible entities, while demonstratives are more likely to refer to complex/less accessible entities ([1],[2],[4]); and 2.) **clause-level aspectual factors**: imperfective clauses facilitate access to the internal structure of an event and the entities involved, while perfective clauses focus attention on the result state of the event as a whole ([3],[5]). Studying these differences in the domain of event reference has proven difficult, as “it”, “this”, and “that” may refer to both objects and events. In this study, we report results from a novel experimental paradigm used to investigate reference resolution when both simple and complex events are available in the preceding discourse. We avoid the ambiguity of nominal referring expressions by focusing on the behavior of two English adverbial referring expressions: “so” (proform) and “thus” (demonstrative).

We ask if the form of referring expression and/or the aspectual environment in which it occurs has an effect on the complexity of the event referent ultimately chosen for interpretation. On analogy with the distinction between “that” and “it”, we predict that referents of “thus” will be more complex than those of “so”. Alternatively, if event reference is not sensitive to the form of referring expression, we expect to see no difference in complexity. Furthermore, on the assumption that referential access to the (less complex) sub-events of a complex event depends on aspectual factors, we predict that referents of referring expressions embedded in perfective clauses will be more complex than those of imperfective clauses. If aspectual factors have no effect on access to sub-events, there should be no difference in complexity across clause types.

**Methods:** We modified instructions from the internet (e.g., how to use an ATM) to include a subordinate clause containing the verb “do” in imperfective or perfective form, followed by either “so” or “thus” (e.g., “after doing so”, “having done thus”) (Fig. 1). Two versions (“so” and “thus”) of 12 sets of instructions were created, half with perfective aspect, half with imperfective aspect. In 24 fillers, we used explicit verb phrases (e.g., “after folding the paper”) in place of referring expressions. Participants saw a set of instructions side by side with a Gantt chart representing the time course of the steps (Fig. 1). Each step of the instructions contained one event (e.g., VP). Each chart contained 3-5 unfilled rows corresponding to underlined events (one critical item and 2-4 distractors), which participants were asked to fill in according to their understanding of *when* the underlined event occurred. A higher number of filled cells would indicate a more complex event, consisting of more sub-events. Each participant saw all 36 instructions, pseudorandomized using a Latin square design.

**Results:** We constructed a linear mixed-effects model with FORM and ASPECT as fixed effects and items and subjects as random effects. Initial results (N=104 of planned 120) show a significant main effect of FORM ( $p < .001$ ), with referents of “thus” being more complex than those of “so”. The numerical effect of ASPECT did not reach significance ( $p > .2$ , Fig. 2).

**Discussion:** These findings suggest that the interpretation of referential complexity is influenced by form-specific preferences of individual referring expressions, and support the idea that demonstratives are cues to more complex referents. These results furthermore suggest that 1) our paradigm is sensitive enough to detect these effects, and may prove useful in future studies on event reference; and 2) referential constraints found in the object domain are also found in the event domain. We are running a follow-up study using “it” and “that”, in an attempt to replicate these results with nominal referring expressions; we will report preliminary results.

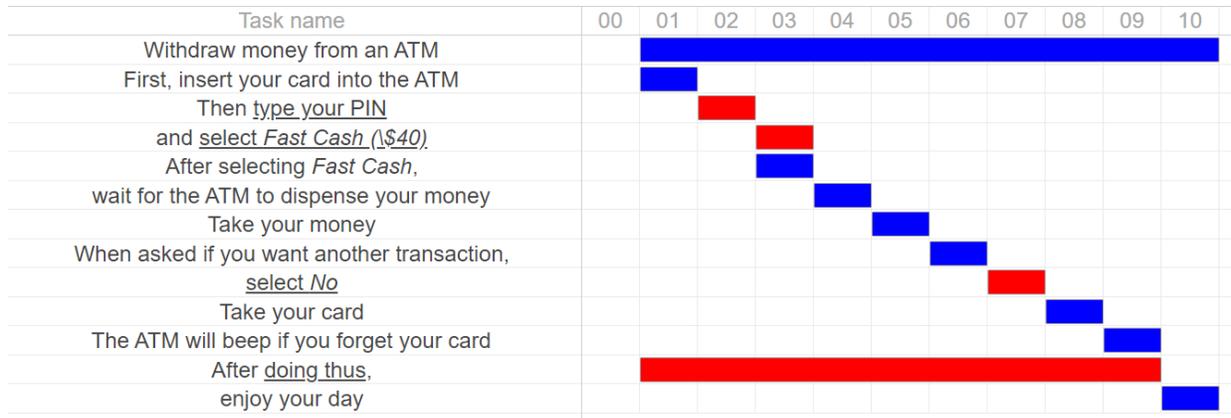


Figure 1: Example stimuli with instructions and Gantt chart. Red cells are those filled in by participants.

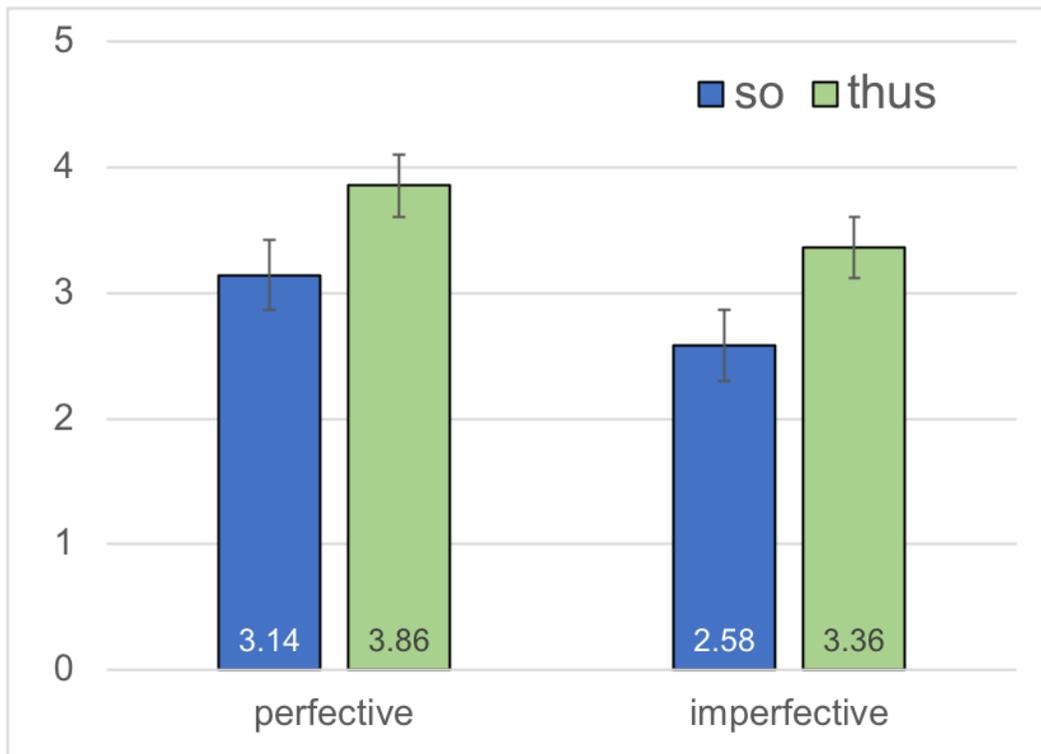


Figure 2: Mean antecedent complexity by referring expression and aspect (Error bars represent standard error).

- [1] Brown-Schmidt, Sara, Donna K. Byron, and Michael K. Tanenhaus. 2005. Beyond salience: Interpretation of personal and demonstrative pronouns. *Journal of Memory and Language*. 53:292-313.
- [2] Çokal, Derya, Patrick Sturt, and Fernanda Ferreira. 2018. Processing of It and This in written narrative discourse. *Discourse processes*. 55:272-289.
- [3] Ferretti, Todd R., Hannah Rohde, Andrew Kehler and Melanie Crutchley. 2009. Verb aspect, event structure, and coreferential processing. *Journal of Memory and Language*. 61(2):191-205.
- [4] Gundel Jeanette K., Nancy Hedberg, and R O N Zacharski. 1993. Cognitive status and the form of referring expressions in discourse. *Language*. 69:274-307.
- [5] Wampler, Joshua. 2019. Do thus: An investigation into event reference. Unpublished manuscript. UC San Diego.