Processing correlates of verb semantic complexity

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Predicate decomposition theory and construction grammar make distinctive assumptions of verb representations. Predicate decomposition hypothesizes that primitive predicate is encoded in verb representations, which suggests that verb with temporarily unaligned subevents would be conceptually more complex (Levin & Hovav, 2005) and thus more difficult to process. This is to say, for example, accomplishment verb ([[x ACT] CAUSE [BECOME [y <STATE>]]]) is more complex than activity verb ([x ACT<MANNER>]) as indicated by the reaction time data in McKoon & Love (2011). By contrast, construction grammar hypothesizes that participant role is encoded in verb representations (Goldberg, 1995), which implies that verb with more participant roles may be more complex and therefore has a higher processing cost (Ahrens & Swinney, 1995; Ahrens, 2003). However, it is not clear yet whether this claim in construction grammar would be supported by processing data, and if so, which one of these contrasting theories on verb semantic complexity would make a better prediction on processing difficulty.

In order to answer these questions, two experiments were conducted. Experiment 1 investigated the activation of verb representation by conducting a lexical decision task with 38 native English speakers. Experimental items are designed in four conditions: two-role/ accomplishment verbs (e.g. *break*), three-role/ accomplishment verbs (e.g. *assign*), two-role/ activity verbs (e.g. *hit*) and three-role/ activity verbs (e.g. *wipe*). Other variables such as length, frequency and number of argument structure were either matched or evaluated together with the verb condition in a linear mixed effect model. The results show that three-role verbs take a significantly longer reaction times than two-role verbs (p=0.035, figure 1.1); whereas there is no significant difference between activity verbs and accomplishment verbs (p=0.078, figure 1.2), suggesting a different observation from McKoon & Love (2011). A replication of McKoon & Love (2011) was further conducted and again failed to find a significant difference between activity and accomplishment verbs when variables that claimed to be matched in the original experiment were taken into the mixed model analysis (p=.513).

Experiment 2 examines the access and use of verb semantics in online sentence processing by conducting a self-paced reading task with 32 native English speakers. Experimental sentences are created with the same verbs in Experiment 1. Sentences across difference verb conditions are exactly alike up to the critical verb (e.g. *The construction worker* **hit***...* and *The construction worker* **assigned** *…*). Such sentences were presented to participants in Latin square lists so that no participant would read a same sentence segment twice. The results show that three-role verbs yield a significantly longer reading times than two-role verbs (p=0.041, figure 2.1), whereas there is no significant reading time difference between activity verb and accomplishment verb (p=0.953, figure 2.2).

The above findings jointly suggest that participant role information is more likely to be stored in verb representation and accessed during online sentence processing, as proposed by construction grammar.
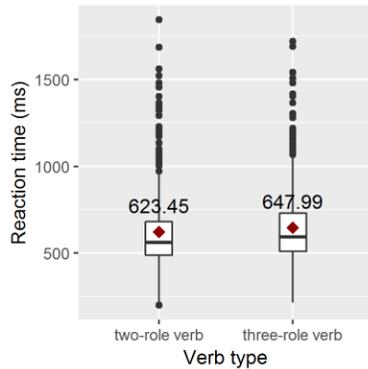
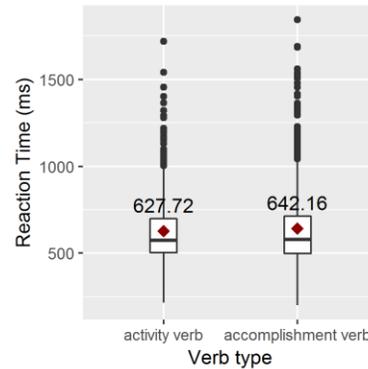Figure 1.1 Reaction times of two-role and three-role verb

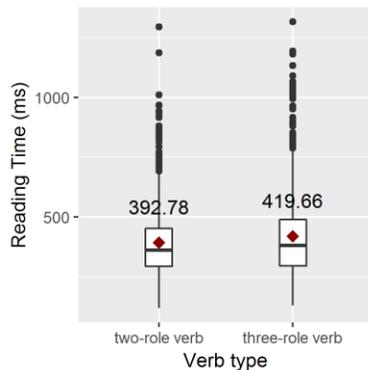Figure 1.2 Reaction times of activity and accomplishment verb

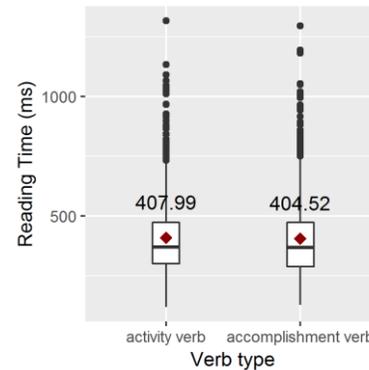Figure 2.1 Reading times of two-role and three-role verb

Figure 2.2 Reading times of activity and accomplishment verb

Key references

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