Background. Previous work suggests that, during online processing, definite NP subjects (DNPs) like *the surgeon* are held in memory and subsequently re-accessed once the matrix verb is reached (see e.g., Van Dyke & Lewis 2003; Kim & Osterhout 2005). However, there has been little work on sentences with quantificational NP subjects (QNPs) like *every surgeon.* In the formal semantics literature, these two subject types are treated differently. A DNP is said to be taken as an argument by a predicate, as in (1). A QNP is said to take a predicate as its argument, as in (2) (see e.g., Heim & Kratzer 1998; Montague 1973).

(1) *The surgeon completed the training.*
[[completed the training]]([[the surgeon]])
(2) *Every surgeon completed the training.*
[[every surgeon]]([[completed the training]])

Hypothesis. A DNP will be re-accessed immediately upon encountering the matrix verb (in-line with previous work on sentences with DNPs) while a QNP will be re-accessed immediately following the VP (in-line with formal semantic treatments of QNPs).

Methods. We conducted a combined Self-Paced Reading/Lexical Decision Task (LDT) study. 170 native English speakers read sentences like (3).

(3) *Given the change in the law, the/every surgeon certainly should have completed the training, reports The Guardian.*

The study was a 3x2x2 design with independent variables of: SubjectType (whether the sentence began with a DNP vs. a QNP), LDT ProbeType (whether the probe was semantically related vs. unrelated to the sentence subject or a nonce probe), and LDT ProbePosition (whether the probe was presented immediately following the matrix verb vs. immediately following the VP). The measured variable was RT in response to the LDT probe.

Predictions. For sentences with DNPs, RTs in response to a semantically related probe presented after the matrix verb would be faster than after the VP. For sentences with QNPs, RTs in response to a semantically related probe presented after the VP would be faster than after the matrix verb.

Analysis & Results. We built three GLMMs. The first investigated a ProbeType x ProbePosition x SubjectType interaction. We found significant effects of ProbeType and SubjectType ($p < 0.05$), significant ProbePosition x ProbeType and ProbeType x SubjectType x ProbePosition interactions ($p < 0.05$), and no effect of ProbePosition ($p = 0.19$). We then built two-way models to investigate a possible ProbeType x ProbePosition interaction as a function of SubjectType. For QNPs, we found a significant main effect of ProbeType ($p < 0.05$), no significant effect of ProbePosition ($p = 0.63$), and a significant ProbeType x ProbePosition interaction ($p < 0.05$). For DNPs, we found a significant effect of ProbeType only ($p < 0.05$). After calculating EMMs for the two-way models, we found no support for our predictions. Mean RTs in DNP conditions with a related probe were the same regardless of ProbePosition. After weeding out a problematic item, we saw differences in the QNP conditions: a weak crossover effect where related probes were responded to faster following the matrix verb vs. after the VP, and unrelated probes were responded to faster following the VP vs. after the matrix verb. After calculating EMMs, only the second of these contrasts was significant ($p < 0.05$).

Discussion & Conclusions. Processing sentences with DNPs vs. QNPs may involve different processing strategies. A DNP appears to be always available, as indexed by facilitated processing of a related probe, and no evident processing cost when processing an unrelated word, in both manipulated positions. When processing sentences with QNPs, however, the antecedent subject appears to be most available immediately following the matrix verb, as indexed by hindered processing of an unrelated probe in this position. Why we didn't see facilitated processing of a related probe immediately following the matrix verb when the sentence had a QNP remains an intriguing and open question that we will investigate via a study focussing solely on the processing of sentences with QNPs.

References: Van Dyke, J. A., & Lewis, R. L. 2003. Distinguishing effects of structure and decay on attachment and repair: A cue-based parsing account of recovery from misanalyzed ambiguities. *Journal of Memory and Language, 49*(3), 285–316. :: Kim, A., & Osterhout, L. 2005. The independence of combinatory semantic processing: Evidence from event-related potentials. *Journal of Memory and Language, 52*(2), 205–225 :: Heim, I. & Kratzer, A. 1998. Semantics in Generative Grammar. Malden: Blackwell :: Montague, R. 1973. The proper treatment of quantification in ordinary English. In Hintikka, K. J. J., Moravicsik, J. M E., and Suppes, P. (eds.), *Approaches to Natural Language* (Synthese Library, 49), Dordrecht: Reidel, 221-242.