Two established generalizations about scalar implicatures are 1) their cancellation (or reversal) in downward entailing (DE) environments (Atlas and Levinson 1981, Sauerland 2004, and others), and 2) their immediate computation in online processing (Tanenhaus et al. 1995, Huang and Snedeker 2009, and others). Consider how this observation would apply to reading of the two structures sketched in (1).

In (1a), where the operator that introduces a DE-environment precedes the scalar item in its scope, we expect that readers don’t compute an implicature at all instead of computing it just to immediately cancel it. But in a structure where the scalar operator precedes the DE-operator as sketched in (1b), we predict that readers should first compute an implicature on the scalar item and subsequently cancel upon encountering the DE-operator.

We carried out a study to measure the effect on reading times of implicature computation followed by cancellation in configuration (1b). We looked at Japanese since it allows several ways to create configuration in (1b) as a head-final language. Specifically, we targeted two types of conditional clause structures in Japanese illustrated in (2). In the variant (2a), the conditional is marked both initially by mosi (‘if’) and by the conditional verbal suffix ireba. But in variant (2b), the conditional is only marked by the conditional verbal suffix ireba.

That the particle mosi in (2a) is really a conditional marked while tiisaku isn’t corroborated by the observation that (2b) would a grammatical sentence if it ends with the first tuite (i.e. before encountering ireba), while (2a) couldn’t end grammatically before ireba. Hence (2a) is a structure of the (1a) type, while (2b) corresponds to the (1b) type.

The following image shows a critical context for the evaluation of the sentences in (2). If participants compute an exclusive implicature of heart or smiley locally, participants should just accept sentence of (2) as true. But if they cancel the exclusive implicature as we expect, participants are predicted to judge (2) to be false.

In our study, we asked participants to read sentences in a moving window presentation. After having read a sentence, participants were shown a picture such as the above on the screen and were asked to press a key for a true/false response. To control for the effect of the conditional structures, we included items such as (3) with both conditional structures, but without an implicature trigger. In addition, we included filler items that contained a disjunction but not a subsequent downward entailing operator to make sure that participants would not generally cancel implicatures throughout the experiment.
We created 10 items per condition and 115 fillers for a total of 155 items per participant. **Result:** We report a preliminary result from 22 participants, but expect to be able to report a more conclusive result from a planned 60 participants by mid-September. In our preliminary data, the position of the DE operator had no effect on the rate of implicature computation, and that the majority of participants computed a (local) implicature. Namely for condition (2-a), participants responded true 87 out of 220 times, i.e. only in 40% of cases participants cancelled the implicature. For condition (2-b), the cancellation rate was 85 out of 220 cases, i.e. 39%. We take the absence of a significant difference here to argue that our processing systems decides where to carry out implicature computation and cancellation are carried out independent of the effort associated with it.
The reading time measurements show a small difference in the predicted direction that is not significant at this point. The data are shown in the following graphic where orange corresponds to (2-a), purple to (2-b), red to (3-a) and blue to (3-b). The critical region is region 4 which where the disjunction occurred in (2-a) and (2-b). We observe a slowdown for (2-b) relative to (2-a) as our hypothesis would predict. The control conditions don’t seem to show a comparable effect.

**Conclusion** We present an experimental study to measure the online processing effect of implicature computation and cancellation.

**References**