Interpreting and producing complex temporal relations in embedded clauses: Comparing self-paced reading and elicited production in Dutch

Locating situations in time requires ordering certain intervals with reference to others (Reichenbach, 1947; Stowell, 2007). In a simple sentence like (1) *John was travelling*, the past tense locates the interval of ‘travelling’ before the utterance time. When another time interval is added in as a complex sentence like (2) *Mary said that John was travelling*, the interval of the embedded tense ‘was travelling’ is temporally located in relation to the interval of ‘saying’ and both occur in the past relative to the utterance time, determining a ‘past-under-past’ construction (Enç, 1987). In the absence of a disambiguating context, the interval of ‘travelling’ in (2) may be instantiated either before the ‘saying’ interval -- a past-shifted (P-S) interpretation -- or within it -- a simultaneous (Sim) or ‘sequence of tense’ interpretation (Abusch, 1988, 1997). The two readings are the result of the interaction of tense and grammatical aspect, which is expressed in (2) by the crucial combination of the past tense of the main clause and the imperfective past tense in the embedded clause. In particular, Arche (2006) analyzes the ambiguity to be a consequence of the semantics of the imperfective, which establishes an overlapping relation between two intervals, and the different intervals that the embedded clause can overlap with: the main clause interval of saying (Mary said that John was travelling *at the time of saying*) or a third interval located before saying (Mary said that John was travelling *at a time before saying*). In Dutch, these ambiguities arise with the simple past tense form (Hollebrandse, 2001, 2005). In the present study we investigate the interpretation and production of complex temporal ordering ambiguities in Dutch. Previous empirical research showed that these ambiguities arise in Dutch (see, for instance, Hollebrandse, 2000). However, it is not yet clear how Dutch natives process these ambiguities ‘real-time’ and how this processing relates to production.

We conducted two main experiments. Experiment 1 tapped into the on-line processing of temporal ordering ambiguities. We investigated this by using a self-paced reading task with a non-cumulative, moving-window display. The participants (*N = 25*) were presented with 64 short stories. They consisted of a brief context story and a target sentence with a structure comparable to (3) *Maria zei dat Jan reisde* (‘Maria said that Jan was travelling’). We manipulated the lexical aspect of the verb (state vs. event), tense (simple past (OVT) vs. past perfect (VVT)), and the context (P-S vs. Sim). A translated example of the different contexts and of the relevant target sentence is given below:

(4a [P-S]) Kim travelled through Europe with her mother. She saw her friend Jan after she had come back from her trip.
(4b [Sim]) Kim travelled through Europe with her mother. She saw her friend Jan during her trip.
(4) Kim said to Jan that she had travelled/ was travelling through Europe with her mother.

The target sentences contained either a temporal ordering ambiguity when the tense of the embedded clause was the imperfective simple past (OVT, e.g. ‘reisde’/’was travelling’), matching both a P-S and a Sim context, or no ambiguity if the embedded clause involved the past perfect (VVT, e.g. ‘had gereisd’/’had travelled’), which only matched a P-S context. We predicted that the processing of the target sentences would be more effortful when the tense of the verb in the embedded clause was not the best possible match with the interpretation given by the context, which would be reflected in slower reaction times (RTs). Since speakers try to communicate as unambiguously as possible (Barnlund, 2017), we expected that the
RTs would be slower with the ambiguous verbs. Experiment 2 addressed the production of complex temporal relations in embedded contexts. A different group of participants (N = 19) read the same contexts reported above. We then provided the same target sentence as in the first experiment. Crucially, we eliminated the verb from the embedded clause, so that the participants needed to write down the inflected form of the given infinitive. We hypothesised that the participants would produce more often an unambiguous past tense form of the verb, rather than the ambiguous OVT, based on the previously mentioned theory that speakers would try to communicate as unambiguously as possible.

The self-paced reading data shows that for events, the participants had longer RTs when a VVT appeared in a Sim context and when an OVT appeared in a P-S context. For states, the participants were slower when a VVT occured in all conditions. The elicited production data showed that the OVT appeared to be the most produced tense in every condition, but was significantly produced more often in combination with states (Sim = 72%, P-S = 91%) than with events (Sim = 38%, P-S = 44%). When an event occurred in a P-S context, the second-most produced tense was the VVT (30%). In the case of a state combined with a Sim context, the present tense was the second most used option (24%), which created the so-called double access reading (Abusch, 1988). This was the case also for events (22%), together with the ‘aan het’ construction (21%), which is a locative construction in Dutch and functions as a progressive marker (Booij, 2008).

The present work investigated how Dutch native speakers deal with the interpretation and production of complex temporal ordering ambiguities in embedded contexts. As expected, the self-paced reading data confirmed our prediction that the real-time processing of an ambiguous verb is more demanding. Surprisingly, the production data does not match our hypotheses, since the ambiguous form was most used across all conditions. The use of different methodologies provided more insights into which approach to adopt for the investigation of this subject. In fact, different methods and tasks proved to be complementary to each other, thus highlighting the similarities and differences between the interpretation and production of these ambiguities. The production task, for instance, indicated that Dutch natives often create the so-called double access reading (Abusch, 1988), which could not emerge with our stimuli from the reading task. This result replicates Hollebrandse’s (2000) findings with states and extends the same observation to eventive verbs. The overall data showed that a difference arises between the events and states in both interpretation and production. We interpret this result in relation to theories on verb classes and the durative nature of states (e.g. Vendler, 1957; Smith, 1999).

References: