Lifetime Effects and Presuppositional Scalar Strengthening
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When combined with past tense, a predicate like *be British* gives rise to the inference that the subject of the predicate is dead, which is often called *Lifetime Effects (LEs)*, e.g. (1a) vs. (1b).

(1)  
a. John was British.  
b. John is British.

Not all predicates give rise to LEs, e.g. *be ill* in (2a) does not necessarily suggest that John is dead. Generally, only those predicates that hold throughout one’s life-time give rise to LEs.

(2)  
a. John was ill.  
b. John is ill.

One caveat is that LEs sometimes do not arise for (1a) either, as shown in (3). Crucially, however, *be British* is understood here as not necessarily holding throughout one’s life-time.

(3)  
John was British, and became an American. He now lives in Boston.

Note that in both (2a) and (3), a different scalar inference tends to arise, namely, that the present tense counterpart is false.

Previous studies analyze LEs as arising from the interaction between scalar implicatures and discourse felicity (Musan 1995, Magri 2009, Thomas 2012). We propose an alternative presuppositional analysis based on recent work by Spector & Sudo (2016). (In the talk we will discuss advantages of our analysis over the previous ones, e.g. the projection properties of LEs)

**Mechanisms of scalar strengthening:** Following the previous studies, we assume that the past- and present-tense pairs like (1a) and (1b) are always *scalar alternatives*, and subject to scalar strengthening. We adopt Spector & Sudo’s (2016) two scalar strengthening mechanisms:

(4)  
a. **Presuppositional scalar strengthening:** If $S$ and $S'$ are scalar alternatives, and if the presupposition of $S'$ is stronger than the presupposition of $S$, the use of presuppositionally strengthened $S$ is infelicitous in context $c$ whenever the presupposition of $S'$ is satisfied in $c$. (cf. Maximize Presupposition)

b. **Assertive scalar strengthening:** If $S$ and $S'$ are scalar alternatives, and if the assertion of $S'$ is stronger than the assertion of $S$, then assertively strengthened $S$ presupposes whatever $S$ presupposes and $S'$ presupposes and asserts that $S'$ is false. (cf. Exh)

Following Spector & Sudo’s insights, we assume that whenever there are scalar alternatives, either of these operations need to apply.

**Presuppositional analysis of LEs:** It is reasonable to assume that predicates like *be British* and *be ill* presuppose that the subject is alive (or for inanimate subjects, exists) at the time interval under discussion (Musan 1995, 1997, Thomas 2012). For instance, (1a) is infelicitous for past time intervals when John was not alive. As expected, this inference survives under various types of embedding, just like canonical presuppositions (data omitted here).

We claim that the LEs of (1a) arise due to the stronger presupposition of (1b) via the presuppositional scalar strengthening (4a). Specifically, we assume an existential semantics for tense as in (5). Time intervals are assumed to be convex sets of moments, ‘$<$’ is the precedence relation among time intervals, and time($c$) is the current moment of utterance.
(5)  

a. \([\text{PAST}]^c = \lambda P \land \exists t \ [t < \{\text{time}(c)\} \land P(t) = 1]\)  

b. \([\text{PRES}]^c = \lambda P \land \exists t \ [\text{time}(c) \in t \land P(t) = 1]\)

Tenses being existential quantifiers, if the predicate has a presupposition about time intervals, it existentially project (Beaver 2001, Chemla 2009, Sudo 2012, 2014), e.g.:

(6)  

a. \([[(1a)]^c \neq \# \iff \exists t \ [t < \{\text{time}(c)\} \land \text{alive}(j)(t) = 1]\)  

b. \([[(1b)]^c \neq \# \iff \exists t \ [\text{time}(c) \in t \land \text{alive}(j)(t) = 1]\)

We claim that the presupposition of (1a) is weaker than the presupposition of (1b). Specifically, Following Altschuler & Schwarzschild’s (2012) analysis of stative predicates we assume that \text{alive} never holds for a single moment alone, i.e. for any moment \(m_2\), if \text{alive}(j)(\{m_2\}) = 1, then there is \(m_1\) such that \(m_1 < m_2\) and \text{alive}(j)(\{m_1\}) (this does not imply that John was alive at every past moment, because there are uncountably many moments). Suppose now that \([[(1b)]^c \neq \#\). Because John is alive at \{\text{time}(c)\}, there is a past moment \(m\) such that \text{alive}(j)(\{m\}) = 1, from which it follows that \([[(1a)]^c \neq \#\). On the other hand, when \([[(1a)]^c \neq \#\), it might not be the case that \([[(1b)]^c \neq \#\), depending on whether John is alive now.

Given this asymmetry in the presupposition, the presuppositionally strengthened version of (1a) becomes infelicitous in contexts where the presupposition of (1b) is satisfied. Conversely, (1a) is only felicitous in contexts where the presupposition of its alternative (1b) is not satisfied, i.e. it is not commonly known that John is still alive, \neg \text{CK}(\exists t \ [\text{time}(c) \in t \land \text{alive}(j)(t) = 1]). We follow Chemla (2008) in assuming that it can be pragmatically strengthened to \text{CK}(\neg \exists t \ [\text{time}(c) \in t \land \text{alive}(j)(t) = 1]). This is the LEs of (1a). A nice prediction of this analysis is that LEs survive in presupposition projection contexts, which is borne out (data omitted here).

This analysis also predicts that (2a) should also exhibit LEs. This is not a problem, because the mechanism of assertive strengthening (4b) could be used instead, in which case, (2a) would presuppose that John is alive now and asserts that John is not ill anymore. So our account predicts that the sentence is ambiguous, and LEs do not consistently follow. For (1a), on the other hand, (4b) would generate the presupposition that John is alive and the additional assertion that he is not British anymore. When one’s nationality is assumed to be constant, this would be trivially false, and the other reading with LEs generated with (4a) is prominent. When no such assumption is made, the strengthened assertion can be used, as in (3).

Finally, (1b) and (2b) have no scalar inferences, as both strengthening mechanisms are vacuous for them due to the lack of stronger alternatives (but one of them still applies by assumption).

**Domain restriction:** It is known that LEs fail to arise in some contexts where a particular past time is salient, e.g. (7) from Musan (1995: 19).

(7)  

On that day, I was introduced to Gregory and Eva-Lotta. Gregory was from America.

To accommodate such examples, we assume that \(\exists t\) in (5) has a domain restriction (Kusumoto 1999, Altschuler & Schwarzschild 2012, Thomas 2012), and the restriction stays constant across alternatives. If the domain excludes the current time, then the presupposition of the present tense counterpart becomes trivially false, trivially blocking LEs.