Processing the Present Perfect Lifetime Effect:
An eye-tracking reading study on the integration of context, tense, and aspect

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Background Language comprehension involves the integration of multiple sources of information, both linguistic and non-linguistic. This integration of word and world knowledge has been demonstrated for verb tense and aspect (Carreiras et al., 1997; Madden & Zwaan, 2003), as well as semantic and specific real-world knowledge (Altmann & Kamide, 2007; Hagoort et al., 2004). The present study investigates the interaction between temporal verb morphology and knowledge of the lifetime of a real-world referent, i.e., alive or dead.

According to the ‘Lifetime Effect’, life status information (i.e., dead or alive) can be conveyed through temporal and aspectual cues in the verb, e.g., ‘My father is/was from Spain.’ (Chomsky, 1959; Katz, 2003; Klein, 1992). Violations of the Lifetime Effect have been shown to elicit processing costs when deceased individuals are described with the present simple, as in (1) below (Chen & Husband, 2018).

In addition to this present/past simple distinction, the English Lifetime Effect includes the use of the present perfect to describe experiences of the living, as in (2) and (3) below. This is due to the necessity of current relevance or future possibility in conjunction with the English present perfect, unlike in languages such as German (Katz, 2003). The present perfect therefore patterns much like the present simple in the Lifetime Effect.

(1) John and Bob both passed away last year. They are handsome.

(2) Beyoncé has performed/*performed at many music festivals.

(3) David Bowie *has performed/performed at many music festivals.

In sum, the present simple, present perfect, and past simple can be used to describe living individuals in different contexts, whereas only the past simple is acceptable with deceased individuals in these same contexts. The Lifetime Effect therefore involves the integration of contextual or long-term knowledge (lifetime) and linguistic information (tense/aspect). This interaction of tense, aspect, and contextual knowledge in the processing of temporal morphology is the focus of the present study.

Present study The current eye-tracking reading study aims to investigate violations of the lifetime effect in English containing the present perfect to describe deceased individuals. There are two two-level factors: life status (alive, dead) and verb tense (present perfect, simple future). For deceased individuals, both the present perfect and simple future are incorrect. The inclusion of the simple future (will do) serves as a control: the simple future refers explicitly to a future event and therefore is a more overt violation than the present perfect when describing accomplishments of deceased individuals.

Pilot data collected from 8 native English speakers are presented below. A total of 80 critical items were presented (20 items per condition) together with 128 filler items. Data collection for the full study is presently on-going.

Presentation Participants were visually presented with sentences describing the occupation and life status of a cultural figure, as in (4) below. These sentences constituted the lifetime context of the cultural figures. This was followed by a screen containing a critical sentence with either the present perfect or simple future, as in (5) below:

(4) Context (alive): Beyoncé is an American performer. She lives in California.

or (dead): Whitney Houston was an American performer. She died in 2016.

(5) Critical (present perfect): She has won many Grammys, so it’s said.

or (simple future): She will win many Grammys, so it’s said.
Participants were asked to make a binary goodness-of-fit judgement by pressing a Yes button if the critical sentence fit naturally with the preceding context, and No if not. Reaction times were recorded. Filler sentences were used to balance for proportion of correct sentences across living and deceased cultural figures, and included several types of distractor violations.

**Analyses** Dependent variables were reaction time and response to the goodness-of-fit task, and first pass, regression path, and total reading times for the eye tracking data. The region of interest contained the auxiliary and main verbs (*has done/will do*). A linear mixed-effects regression analysis was used on all dependent variables with factors and their interactions as fixed effects and participants and items as random intercepts and slopes.

**Pilot results** A main effect of tense was found in all measures, and a main effect of lifetime in all measures except reaction times. Furthermore, interaction effects were found in all measures: the dead-Present Perfect condition (e.g., *Whitney Houston has won*) elicited significantly longer reading times (Fig 1) and reaction times (Fig 2) at the verb region compared to any other condition, indicating implicit processing difficulties. However, the acceptance rate in the dead-Present Perfect condition was above-chance, although significantly lower than in the living condition and significantly higher than the dead-Simple Future condition (Fig 3). Meanwhile, dead-Simple Future trials elicited reaction times significantly shorter than in any other condition, and were rejected 95% of the time. Interestingly, reading times were not significantly different from the two living conditions. In sum, the English present perfect elicited implicit processing costs in the dead condition as reflected in the reading and reaction times, but above-chance acceptability ratings. Conversely, the control dead-Simple Future condition elicited the fastest reaction times, and near-ceiling rejections, but no reading time costs. Taken together, the results imply that immediate context defining a subject as being dead or alive modulates the processing of the Present Perfect as well as in the Simple Future, but does so differently between the two tenses.

**References**


