

## Verbal form and event structure in sign languages

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Whether predicates describe events as inherently bounded (telic) or unbounded (atelic) is an emergent property that depends on several factors, including lexical semantics of the verb and semantic properties of their arguments; there is typically not dedicated morphology for marking the telic/atelic distinction (similar to mass/count in the nominal domain). It is thus surprising that sign languages have been recently proposed to have dedicated morphology to mark telicity, and moreover that this telic morphology takes a form which iconically reflects the underlying event structure - the “Event Visibility Hypothesis” (EVH) (Wilbur 2008). Specifically, the EVH says that telic/bounded predicates are marked with a morpheme *EndState* which iconically involves a clear boundary point in its form. The EVH has been extended with claims about its universality in sign languages (Wilbur 2008, Malaia and Wilbur 2012), its gradient nature (Kuhn 2017), and its iconic transparency (Strickland et al. 2015). We argue that despite some compelling correlations between interpretation of predicates with regard to events structure and their forms, the status of this relationship remains more open than it is currently considered, due to (a) lack of independent tests for telicity in sign languages that do not depend on translation assumptions, (b) lack of lexical coverage, (c) inability so far to dissociate telicity and perfectivity, and (d) lack of evidence that formal expressions of telicity are morphological in nature, rather than a lexical property. We provide new data bearing on each of these points and conclude that ASL may be much more similar to spoken languages than recent work implies.

**Tests of telicity.** Discussions of telicity in sign languages often assume that glosses in English match on telicity value with the sign in ASL (e.g. *DIE*, *PLAY*), by testing for telicity in English (e.g. *X for an hour/in an hour*) (Wilbur 2008). However, as noted by Kuhn (2017), the same ASL expression ONE HOUR can mean either for/in an hour in English, depending on verb form (1). We instead use two complementary strategies: ASL-specific tests proposed by Rathmann (2005): *NEED* (2) and *STILL* (3), and a lexical/conceptual test for homogeneity of the event given the predicate, described in [Table 1](#).

- (1) a. IX-1 SLEEP ONE HOUR. ‘I slept for one hour.’  
b. IX-1 SLEEP-slow ONE HOUR. ‘I fell asleep in one hour.’
- (2) a. BOY<sub>i</sub> IX<sub>i</sub> NEED 45 MIN WALK THREE ROUND  
‘A boy there needs 45 minutes to walk three laps.’  
b. #BOY<sub>i</sub> IX<sub>i</sub> NEED 45 MIN WALK ‘A boy there needs 45 minutes to walk.’
- (3) a. STILL RUN? ‘Is he still running?’ b. #STILL PUBLISH? ‘Is he still publishing it?’

In addition, many verbs in ASL can be repeated in a way that seems to remove the EndState marker (remove a sharp boundary) but suggests multiple events (Klima and Bellugi 1979, Rathmann 2005, Kuhn and Aristodemo 2017). Since repetition (of various kinds) marks pluractionality, for our tests of forms and of meaning we worked with signers to consider only cases with single arguments (a singular subject, object, and indirect object), at one point in time, to minimize pluractionality.

**Lexical coverage.** Previous work (Wilbur 2008, Strickland et al. 2015, Kuhn 2017) focuses on a small number of verbs at the extreme ends of the spectrum, like *PLAY* (atelic) and *DIE* (telic). We argue that just as in the analogous domain of mass/count, focusing on extremes like *milk* and *cat* leave out critical lexical items like *furniture*. We tested 22 ASL verbs on both form and meaning. [Table 2](#) illustrates

form results. We then tested the same 22 verbs for telicity, using the conceptual test for homogeneity (for all verbs, with three Deaf signers), confirmed also by the NEED/STILL tests (for most verbs, with one Deaf signer), seen in [Table 3](#). With respect to the form, the data are quite clear: signers are able to make consistent and clear judgments about which verbs do and do not require *EndState*, as well as which verbs can appear both with and without the form. However, in asking whether the forms were linked to the predicted telicity value, the results were far more mixed, which should not be surprising given possibilities for coercion (again, as in mass/count). In addition, while we found many verbs in ASL that were consistent with the EVH, we also found some notable violations of the EVH (Table 3).

**Telicity and Aspect.** Our homogeneity test for Telicity actually depends on using a non-imperfective aspect, which we can be confident about since some (telic) predicates fail homogeneity, which can only happen with telic predicates + perfective/neutral aspect. But might there be reasons to suspect that *EndState* might actually be a perfective marker itself? We consider several: a) ASL has many aspect markers, b) ~50% of spoken languages (according to WALS) have perfective/imperfective marking, and c) Alternating verbs like WRITE (Tables 2-3) might actually be evidence in favor -- if alternators are underlyingly telic, and presence/absence of EndState equals a perfective/imperfective division, then their alternation merely shows that imperfectives pass homogeneity even when on telic predicates.

**Formal morphological properties.** Finally, for Wilbur (2008), the EVH claims that telicity is marked morphologically, but provides examples of only extrema like DIE and PLAY, which are consistent also with a lexical-conceptual account of iconic telicity, given their absence of paradigmatic contrast. Kuhn (2017) argues that Wilbur's formulation of the EVH does not predict scopal readings that are available in ASL (4-b), nor further mappings between form and interpretation as seen in changes in acceleration and deceleration which ASL signers interpret as reflecting the speed and frequency of the events that they describe (5). He instead proposes a lexical-conceptual account, with an iconicity function in the lexical entry for a subset of predicates in ASL, by which telicity is a by-product of reaching the boundary of the production. (See (6) for his semantic denotation for the telic verb *close*.)

- (4) a. DIE(pronounced with small movement) 'start to die'
- b. DIE(pronounced with fuller movement, missing endpoint) 'almost/close to dying'
- (5) GIVE(fast)-GIVE(slower)-GIVE(slowest) 'give repeatedly, while decelerating'
- (6)  $[[\text{CLOSE}]] = \lambda x \lambda e. \text{pos}_v(\text{closure})(x)(e) \wedge \text{Icon}_\phi(\text{closure})(x)(e)$  (Kuhn 2017)  
'There was an increase in closure, and the closure progressed in the manner shown.'

Such an account also raises questions, including why some verbs, and all and only sign languages, use such a function in the denotation! We note that intuitions by signers in our study were especially robust regarding verb forms (as allowing *Endstate* or not), and suggest that the key to the story may be alternating verbs (*WRITE*, *READ*, *DRIVE*, *TYPE*, *SKI*), which not only allow both forms, but also allow iconic interpretations similar to (if not the same as) classifier predicates. We suggest that next steps for the study of verb form and event structure involve reconciling alternators' iconic nature with our observation that they also provide evidence of paradigmatic contrast, supporting the conclusion that *EndState* is a morphological marker (of either telicity or aspect) - and note that a lexically-conditioned expression is typical of morphological feature development in spoken languages (Joseph 1998).

**Conclusions.** We argue that shortcomings in several areas have led to exaggerated differences between sign and spoken languages, in both the morphological and iconic aspects of the EVH. We provide new

tests and data bearing on several points which we hope illuminates several ignored areas of this topic. We end by arguing that our results lead to more open question than answers, but that so far there is perhaps fewer surprising differences based on language modality than have been argued for so far.

**Table 1.** Test for homogeneity, with the verb *WRITE* in its *Endstate*-marked form.

Context: Mary is very busy and ambitious, but she has one hour free each day to work on her writing. She joins a writing group to help her use this time wisely. This week she is working on an essay, which she started on Monday and finished on Friday.
(a) Q: What did Mary do this week in the writing period? A: IX-Mary WRITE-Endstate ESSAY
(b) Q: What did Mary do on Tuesday in the writing period? A: * IX-Mary WRITE-Endstate ESSAY

**Table 2.** Verb form distribution of 23 verbs based on agreement by 3 Deaf ASL signers.

<b>ENDSTATE</b>	STEAL, DIE, DESTROY, LEARN DRINK, SLEEP, IMAGINE, THINK	READ, WRITE, DRIVE, TYPE, SKI
<b>No ENDSTATE</b>	PLAY, STORYTELL, STUDY, BREATHE SWIM, SKATE, LECTURE, PAINT, BUILD, DANCE	

**Table 3.** Verb form/meaning distribution of 23 verbs based on agreement by 3 Deaf ASL signers. (Alternators are color-coded to aid in visualization; if colors do not appear, it may simply be noted that verbs can appear in more than one box above.)

	<b>TELIC</b>	<b>ATELIC</b>
<b>ENDSTATE</b>	STEAL, DIE, DESTROY, LEARN, READ, WRITE, DRIVE, TYPE, SKI, DRINK	DRINK, SLEEP, IMAGINE, THINK
<b>No ENDSTATE</b>	SWIM, SKATE, LECTURE, PAINT, DANCE, BUILD	PLAY, STORYTELL, STUDY, BREATHE, READ, WRITE, DRIVE, TYPE, SKI, SWIM, SKATE, LECTURE, PAINT, DANCE

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### **Additional Submission**

An earlier stage of this work was presented at the 2017 Linguistic Society of America in Austin, TX.