When BEAT is 'exceed': verbal comparison in American Sign Language

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Abstract

One strategy for expressing comparison in American Sign Language is the verbal predicate BEAT, which parallels *exceeds*-comparatives documented in spoken languages but heretofore not in sign languages. It expresses non-identity of two referents on a graded scale with a transitive verb as a morpho-syntactic marker. The standard of comparison serves as object and the comparee as subject. Clausal arguments are allowed as standards and comparees. In documenting the BEAT comparative, we expand typological understanding of comparatives and of sign languages, highlighting syntactic and semantic properties of BEAT comparatives relative to other comparison expressions.

Keywords: comparatives, verbal structures, syntax-semantics, American Sign Language

1 Introduction

Constructions expressing gradable information have received significant typological and formal attention, especially comparatives, where research shows systematic morpho-syntactic variation in their expression, semantic consequences thereof, and correlations with other grammatical properties. However, there is little work investigating gradability and comparison in signed language. This gap is especially glaring given Stassen's (1985) observation that comparatives are a domain in which spatial language is grammaticalized for other purposes and sign languages are spatially rich visual-gestural languages. We contribute to recent efforts (e.g., Aristodemo and Geraci 2017; Gajewski 2015) to fill this gap with data from signed languages to inform our understanding of the typological and formal landscape of comparatives. We use evidence from Deaf users of American Sign Language (ASL) to show that ASL uses a spatial agreement verb, BEAT, for a verbal *exceeds*-style comparative and discuss the morpho-syntactic and semantic properties of this comparative construction.

1.1 Comparative constructions

Comparative structures (1) express a comparison between referents (*Eva* and *Bruno*) and the extent to which a gradable property (height) holds of them. The gradable property of height may be 'measured out' differently: *height* in (1a), *tallness* in (1b), *shortness* in (1c).

(1)   a. Eva exceeds Bruno in height.
         b. Eva is taller than Bruno.
         c. Bruno is shorter than Eva.

The structural 'choices' in (1) are systematic and, oftentimes, non-interchangeable. We can

identify comparative structures by the shared core components of meaning. The *comparee* is the referent that the comparison is about; the *standard* is the referent that the comparee is being compared to. The comparee is *Eva* in (1a, b) but *Bruno* in (1c). Likewise, the standard is *Bruno* in (1a, b) but *Eva* in (1c). The *comparative predicate* expresses the gradable property being compared; again, the property of height in (1) is expressed with distinct predicates (*height, tall, short*). Finally, the *comparative marker(s)* are the specific morpho-syntactic elements that put them all into a comparative structure, including degree morphology, such as *-er* in (1b, c) and lexical items of comparison *(than)*; in Table 1, we include the preposition *in* that is used to introduce the gradable property (*height*) as a nominal in (1a).

Table 1: Parts of a comparative

Comparee	Eva
Standard	Bruno
Comparative Predicate	height, tall, short
Comparative Markers	exceeds, -er, than, in

Significant research on the syntax and semantics of comparatives (e.g., Sapir 1944; Bresnan 1973; Kennedy 2007, a.o.) and on cross-linguistic patterns (eg. Ultan 1972; Stassen 1985; Beck et al. 2009; Baglini 2012, a.o.) has been conducted, but has focused on spoken languages. Questions remain concerning the syntactic and semantic patterns of comparative structures in signed languages, as well as the typological range seen in spoken languages. Here we investigate an ASL verbal comparative formed with BEAT; this heretofore undocumented construction contributes to understanding of linguistic properties of sign languages and of comparatives. Given BEAT comparative properties, we suggest that future studies of this structure can offer insight into (a) how spatialization can be used for non-individual referents, (b) patterns of subordination and subordinate clauses in ASL, and (c) the structure of (nominalized) clauses and their syntactic-semantic types in ASL and more generally.

1.2 Comparative structures in ASL

Comparative structures in ASL and other signed languages have received little attention in the descriptive and research literature, though a recent analysis of the expression of degrees and comparison in Italian Sign Language (LIS) is provided by Aristodemo and Geraci (2017). They show that, as in spoken languages, comparative structures in signed languages may build on spatial language. For example, a comparative built on the gradable predicate TALL in LIS may incorporate an iconic scale in which movement to a higher location in signing space is associated with a higher degree of the gradable property of height:

(2)   TALL-$_\beta$iconic-more$_\gamma$ (Aristodemo and Geraci 2017)

Figure 1. The gradable predicate TALL marked with iconic degree morphology in LIS (Arisotemo and Geraci 2017).

For ASL, a theoretically-informed overview is provided by Gajewski (2015) and limited discussion may be found in the descriptive literature, including language learning materials. ASL comparatives exhibit the classic distinction between synthetic (3a) and analytic (3b) comparison.

(3)   a.   EVA OLD.CMPR
                Eva is older.
        b.   TODAY MORE WARM
                Today is warmer.

The synthetic comparative (3a) is formed with a morphological marker .CMPR ('COMPARATIVE'), which changes the trajectory of the 'base' adjective sign by incorporating a relatively sharp upward movement at the end of the sign. Similar to Aristodemo and Geraci's proposal for LIS, this may be an iconic reflection of degree meaning. The .CMPR marker can combine with a number of adjectives, though its productivity is limited in as-yet underexplored ways. It may also be added to the sign MORE to form a superlative MORE + .CMPR (*most*). In addition, there are more morpho-syntactically complex comparatives. (4b), for example, combines the .CMPR marker with what is likely a conjoined comparative, though the conjunction in ASL, as in many languages, is not necessarily overt (Davidson 2013).

(4)   a.   BRUNO MORE TALL THAN EVA
                Bruno is taller than Eva.
        b.   BRUNO OLD, IX$_j$ $_j$EVA OLD.CMPR
                Bruno is old, Eva is older.

We focus on ASL comparatives with the verb BEAT (Figure 2) as the comparative marker (5).

Figure 2. Comparative marker BEAT. Image from Martin (2017), who we thank for permission to use it.

(5)   a. $_i$BRUNO COOK $_{(i)}$BEAT$_j$ $_j$SCHIETZ
                Bruno cooks better than Scheitz.
        b. $_i$SISTER IX$_i$ RICH $_{(i)}$BEAT$_1$
                My sister is richer than I am.
        c. $_i$EVA TALL, $_j$BRUNO TALL $_{(i)}$BEAT$_j$
                Eva is taller than Bruno.

d. $_i$EVA CLUMSY IX$_i$, $_j$BRUNO $_{(j)}$BEAT$_i$
Bruno is clumsier than Eva.

e. $_i$MARY FAMOUS $_{(i)}$BEAT$_j$ ($_j$EVA) [1]
Mary is more famous (than Eva).

(6)   a. $_i$[WIN FIVE GAME] $_{(i)}$BEAT$_j$ $_j$[WIN FOUR GAME]

b. $_j$[WIN FOUR GAME] $_i$[WIN FIVE GAME] $_{(i)}$BEAT$_j$
Winning five games beats winning four games.

We propose that this verbal predicate construction constitutes an *exceeds*-comparative, as in the Hausa example in (7).

(7)   Doki   ya -fi   rago   girma
Horse   it -exceed   goat   bigness
A horse is bigger than a goat (Hausa, Stassen 1985:43, #20)

Like *exceeds*-comparatives, BEAT comparatives use transitive verbal structure, but with a verb that means BEAT instead of the more common *exceeds* or *surpasses,* and introduces the standard of comparison as an object argument. Like normal ASL objects, the comparative standard may be either overt (5a) or null (5b). The BEAT comparative may also be used in a construction that parallels the conjoined comparative in (4b). This is the structure in (5c), where both comparee (EVA) and standard (BRUNO) are associated with overt predicates (TALL). Documentation of *exceeds*-comparatives frequently localizes them to South Asian and Sub-Saharan languages for mysterious reasons (see Beck et al. 2009, i.a., for suggestions on parametric variation). Thus, their existence in ASL offers new insight into the distribution of comparative structures, enriching our typological understanding of (sign) language.

2 The BEAT comparative

The BEAT comparative may be used as a general marker of comparison. A similar structure with a predicate glossed as BEAT-AUX (8) has been documented for Spanish Sign Language by Costello (2015:196).

(8)   a.   SIBLING-FEMALE IX$_x$ MONEY $_x$BEAT-AUX$_1$
My sister's got more money than me.

b.   IOAR IX$_x$ JEISON$_y$ IX$_y$ CLUMSY $_x$BEAT-AUX$_y$
Ioar is clumsier than Jeison.

Costello (2015) analyzes BEAT-AUX as a comparative agreement auxiliary. While agreement auxiliaries are found in many signed languages, there is no evidence for such elements in ASL. Thus, while both Spanish Sign Language and ASL have grammaticalized a comparative marker from a transitive verb, there is no evidence that this process involved a category shift in ASL – we suggest that BEAT still functions as a transitive verb, even in its comparative usage.

As illustrated in Figure 2, BEAT is produced with an H-handshape.[2] As a 'regular'

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[1] The optionality shown by parentheses is typical for ASL arguments (in context); see section 2.

[2] There is another verb, produced with a fist handshape, that is often glossed BEAT, which we will not

transitive verb (9), BEAT has the expected meaning given its gloss: the subject defeated the object in some traditionally competitive scenario (e.g., an election). Here, as in its comparative usage, BEAT may inflect for spatial agreement with subject and object, shown by subscripts in the glosses.[3]

(9) $_i$TRUMP $_{(i)}$BEAT$_j$ $_j$CLINTON
        Trump beat Clinton [in the election].

In (10-11), BEAT start/end locations depend on which referents serve as the comparee (subject) and standard (object) arguments. As with the role reversal of Bruno and Eva in (1a-c), the examples in (10) show that, in principle, any referent is equally felicitous as either comparee or standard. The role of Scheitz as comparee or standard is distinguished by spatial markings on the verb. Similarly in (11), the first BEAT 'agrees' with the 3rd person referent (IX_i) comparee locus and first person ($_1$) standard, then switches to indicate agreement with a first person standard and a third person comparee.[4]

(10) $_i$SCHEITZ $_j$BRUNO $_{i\text{-}j}$TWO-OF-THEM READ BOOK UNDERSTAND' { $_{(i)}$BEAT$_{(j)}$ / $_{(j)}$BEAT$_{(i)}$ }[5]
        Scheitz and Bruno both read books, but {Scheitz/Bruno} reads better than
        {Bruno/Scheitz}.

(11)   PAST-WEEK CLASS TEST, IX_i STUDY+++ $_{(i)}$BEAT$_1$ BUT GRADE $_{(1)}$BEAT$_i$ [6]
        Last week there was a class test, they studied more than me but I got a better grade.

Though there is significant word order variability in BEAT comparatives, much of this variability is reducible to general patterns of word order variation and argument omission in the language. In all variants (Table 2 for (5b) above), however, the comparee functions like a subject and the standard like an object in terms of spatial marking on BEAT.

Table 2: Parts of the comparative in (5b)

Comparee	SISTER
Standard	1st person
Comparative predicate	RICH
Comparative markers	BEAT

For example, in (12), BEAT agrees with the locus of a quantified object (MOST WOMEN $IX_{i\text{-}arc}$). Morphological number marking is a characteristic of object agreement in ASL, further

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discuss as it does not form comparatives. The fist seems similar to the iconic representation underlying the grammaticalized comparative marker BEAT-AUX in Spanish Sign Language.

[3] Optionality of spatial agreement markers are marked in examples by parentheses.

[4] The morpho-syntactic status of spatial markers on verbs in ASL and other signed languages is a contentious topic that is orthogonal to the issue at hand. Moreover, because the fine-grained syntactic analysis of BEAT comparatives is still under investigation, the exact argumental role of the comparee and the standard relative to BEAT is still to be determined, though a preliminary (and coarse) analysis as subject (comparee) and object (standard) appears appropriate.

[5] Fischer and Lillo-Martin (1990) describe UNDERSTAND', derived from UNDERSTAND, and compare it to similar derivationally-related pairs (WRONG'/WRONG; SUPPOSE'/SUPPOSE; FINISH'/FINISH). They argue UNDERSTAND' is a subordinating conjunction. Wilbur (2013) argues from position, brow raise, and function that it is associated with a restrictive dyadic operator.

[6] We use 'they' as gender-inclusive transcription for third person singular ASL indexical, $IX_{i/j/k}$.

aligning BEAT comparatives with verbal predication and the standard with object arguments.

(12)   DOCTOR SAY MOST WOMEN IX$_{i\text{-arc}}$ POSS$_1$ AGE, POSS$_1$ HEARTRATE FINISH $_{(1)}$BEAT$_{i\text{-arc}}$
        The doctor says my heartrate is better than most women my age.

In both non-comparative and comparative functions, however, omission of overt subject marking is possible, and the object marking is always obligatory if available (22-23), as in the verbal agreement system more generally (Padden 1983[1988]).

To create a comparison, a comparative predicate must supply the gradable dimension of comparison. The comparative predicate may be included alongside the comparee subject (5a-b), the standard object, or with both (5c). In such cases, there is argument overlap between the comparative predicate and the BEAT comparative marker. In (5b), (see also Table 2), SISTER is both property-holder of RICH and comparee of BEAT. The presence of this secondary predication would be a defining characteristic of the BEAT comparative were it not also possible to supply the comparative predicate from context alone:

 (13) $_i$GIRL $_{(i)}$BEAT$_{j\,j}$[POSS$_i$ MOTHER]
        The girl has got her mother beat.
        Context 1: she has better grades in college
        Context 2: she has a better apartment
        Context 3: she applies CPR better
        Context 4: she is (considered) smarter
        Context n: ...

In such cases, the BEAT comparative may be no different from its transitive verb origins.

As with other verbs, BEAT comparatives may combine with modals; we illustrate this with CAN in (14) but other modals exhibit similar behavior. Though modals can also appear in the comparee or standard, the sentence-final modal in (14) appears to take scope over the entire BEAT comparative. Preliminary fieldwork suggests that the modal must be in sentence-final (vs. pre-verbal) position in these cases and that this restriction may be related to stativity, a pattern that also supports the grammaticalization of BEAT as a comparative marker.

(14) $_i$EVA SWIM $_i$BEAT$_j\,_j$MARY CAN
        Eva can swim faster/better than Mary (≈ Eva beats Mary in swimming.)

In addition to modals, the gradable meaning of BEAT comparatives can also be modified by differentials, such as BY-A-HAIR (15a) and TWICE MORE THAN (15b).

(15)   a. $_i$BRUNO TALL (BY-A-HAIR) $_{(i)}$BEAT$_{j\,j}$KARL
             Bruno is (a little bit) taller than Karl.
        b.   IX$_i$ FINISH SMOKE+++ $_{(i)}$BEAT$_2$ TWICE MORE THAN IX$_2$
             They smoke twice as much as you.

Together, the examples in (14) and (15) illustrate the two main points of the current proposal: this usage of BEAT is verbal and comparative.

3 Semantic and structural properties of the BEAT comparative

Having established that BEAT is a transitive verb that allows for comparison of its 'subject' and 'object', we turn to other observations. There are some restrictions on which gradable predicates can be used with BEAT. These suggest that the BEAT comparative is sensitive to the split between dimension and evaluative adjectives (Bierwisch 1989). Dimension adjectives tend to be quantitative and compatible with typical measurement systems, whereas evaluative adjectives tend to be open-scale and not quantified. RICH (dimension, quantifiable) works as expected (16) but NICE (evaluative) does not work at all; OLD is questionable in the context with people, but is unexceptional when comparing houses (17).

(16) $_i$MARY RICH/*NICE/?OLD $_{(i)}$BEAT$_j$ $_j$EVA
      Mary is richer/nicer/older than Eva

(17) POSS$_1$ HOUSE OLD $_{(1)}$BEAT$_i$ POSS$_i$ HOUSE
      My house is older than their house.

Certain examples of the BEAT comparative appear to be norm-related (Bierwisch 1989). (18), for example, is only acceptable if both Karl and Bruno 'count as' tall, regardless of who is taller and by how much (the utterance assertion). This appears to be a 'quirk' anchored in the meaning of the comparative predicate: the adjective TALL (an IX-handshape moved upward along the non-dominant hand) always means exceeds a norm of height.

(18) $_i$KARL TALL, $_j$BRUNO TALL (ONE-INCH) $_{(j)}$BEAT$_i$
        Karl is tall, Bruno is one inch taller than Karl — Bruno and Karl are both tall.

Crucially, norm-relatedness is not an obligatory component of BEAT comparative meaning, as seen with other gradable predicates. In contrast to (18), neither Einstein nor Hawking are stupid in (19a), and (19b) is acceptable even if the signer's son's room is not clean.

(19) a. $_i$EINSTEIN STUPID $_{(i)}$BEAT$_j$ $_j$STEPHEN HAWKING (STUPID)
          Einstein is stupider than Stephen Hawking.
      b. ($_i$SON, $_j$DAUGHTER ROOM BOTH DIRTY BUT …)
          (My son and daughter's rooms are both dirty but...)
          $_i$SON ROOM CLEAN $_{(i)}$BEAT$_j$ $_j$DAUGHTER ROOM
          My son's room is cleaner than my daughter's room.

The BEAT comparative may also be used to compare quantities of object arguments (20a) and to express adverbial comparison of both quantity (20b,c) and quality (20c). Here, again, other overt comparison markers may optionally be present (20b, d).

(20) a. $_i$EVA DRINK WATER $_{(i)}$BEAT$_j$ $_j$MARY
              Eva drinks more water than Mary.
      b.   IX$_i$ SMOKE+++ (MORE) $_{(i)}$BEAT$_2$ IX$_2$
              They smoke more than you.
      c. $_i$SCHEITZ COOK $_{(i)}$BEAT$_j$ $_j$BRUNO
              Scheitz cooks better/more than Bruno.
      d. $_i$EVA MORE OLD $_{(i)}$BEAT$_j$ $_j$BRUNO
              Eva is older than Bruno.

Interestingly, however, there are also constraints on interpretive possibilities. For example, BEAT comparatives resist a quantity interpretation in cases like (21).[7]

(21) $_i$MARY IX$_i$ READ BOOK, $_j$EVA IX$_j$ READ BOOK, $_{(j)}$BEAT$_i$
        √Eva reads faster/better than Mary.
        #Eva read more books than Mary.

Moreover, if there is a degree as the standard, additional marking (FINISH) seems required.

(22)   BRUNO PAPER *(FINISH) BEAT 15 PAGE
        Bruno's paper is longer than 15 pages.
(23)   BRUNO POUND *(FINISH) BEAT 150
        Bruno weighs more than 150 (pounds).

However, like (21), the quantity interpretation is unavailable even with overt FINISH in (24).

(24)   *BRUNO BOOK BUY (FINISH) BEAT THREE
        Bruno bought more than three books.

Morphologically, like other *exceeds*-comparatives, BEAT comparatives may express gradable information without overt degree morphology. In English, for example, not only do *exceeds*-comparatives lack overt degree markers, they resist overt degree modifiers (25).

(25)   My sister exceeds me in swimming (?*{better/more/faster})

However, BEAT comparatives may combine with other markers of comparison (26) (also 20d).

(26) $_i$SCHEITZ BIG, $_j$BRUNO BIG.CMPR $_{(j)}$BEAT$_i$
        Bruno is bigger than Scheitz.

Interestingly, 'double comparative' combinations that include both analytic and synthetic comparative markings are attested in older varieties of English and other languages (Corver 2005), suggesting that the 'redundant' marking of (26) is not typologically unattested. As noted earlier for (4b), other comparative marking strategies in ASL are also possible.

    Another morpho-syntactic particularity of the BEAT comparative is its allowance of overt clausal material in both the comparee and standard positions.

(27)   IX$_1$ VISIT+++ $_i$MOM $_{(i)}$BEAT$_j$ (IX$_1$ VISIT) $_j$DAD
        I visit my mom more than (I visit) my dad.

In this respect, BEAT comparatives further support Baglini's (2012) proposal (*contra* Stassen 1985) that *exceeds*-comparatives, as in Wolof (28), allow both phrasal and clausal standards.

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[7] This could be a property associated with the comparative predicate rather than with BEAT (as observed with norm-relatedness of the adjectival predicate TALL).

(28) Randal däkk-a   gén-a-yomb   toxal jikko
      Move   village-Clf   SURPASS-a-easy   change character.
      It is easier to move villages than to change character. (Wolof, Baglini 2012)

Interestingly, the alternation between COMPAREE-BEAT-STANDARD (SVO) and STANDARD-COMPAREE-BEAT (OSV) order correlates with preferences for overt clausal material in the standard/comparee (as annotated by ?*() around TALL in the standard of (29b).

(29) a. $_i$EVA TALL $_{(i)}$BEAT$_j$ $_j$BRUNO (?TALL)
            Eva is taller than Bruno.
      b. $_j$BRUNO ?*(TALL), $_i$EVA (TALL) $_{(i)}$BEAT$_j$
            Eva is taller than Bruno.

Finally, though diagnostics for individual vs. degree comparison are still under investigation, certain comparative subdeletion structures with BEAT are clearly ungrammatical (30a).

(30) a. *$_i$DOOR HEIGHT, $_j$TABLE WIDE $_{(j)}$BEAT$_i$
      b. $_j$TABLE WIDE, $_i$DOOR HEIGHT, IX$_j$ WIDTH MORE THAN IX$_i$ HEIGHT
            The table is wider than the door is tall.

4 Discussion and future directions

Kennedy (2007) provides diagnostics for assessing if a comparison is explicit or implicit. Explicit comparison has specialized morphology that encodes ordering relations relative to the relevant gradable scale, whereas implicit comparison 'piggybacks' on the context sensitivity inherent in the positive form. Applied to BEAT comparatives, these diagnostics provide insight into whether BEAT itself is a degree morpheme for expressing comparison or the construction as a whole gets its comparative meaning from some other source, including implicit comparison. Diagnostics thus far tested suggest ASL BEAT is an explicit comparative:

- Degree standard: BEAT comparatives may be used to express comparison with a degree standard, as shown in (22) and (23) above.
- 'Crisp' judgements: BEAT comparatives are felicitous in so-called 'crisp judgment' contexts where the difference between compared objects is small, as in (15a), (18) and (31b).

(31) a. Context: Eva's essay is 1000 words long and Mary's essay is 200 words long.
            $_i$EVA PAPER $_{(i)}$BEAT$_j$ ($_j$MARY)
      b. Context: Eva's essay is 1000 words long and Mary's essay is 998 words long.
            $_i$EVA PAPER (BARELY/ALMOST) $_{(i)}$BEAT$_j$ ($_j$MARY)

- Norm-relatedness: Certain comparative predicates give rise to norm-relatedness, but this is not a semantic property of the BEAT comparative itself (19).

Together, these patterns suggest that BEAT comparatives are a genuine instance of a degree construction, with the BEAT predicate itself serving as the dedicated morphology of explicit

comparison. In summary, we have shown that:

- BEAT forms an *exceeds*-type verbal comparative that allows clausal standards;
- BEAT is an explicit marker of degree comparison;
- BEAT comparatives may co-occur with other comparative markers;
- BEAT comparatives may directly take a degree as their standard and may combine with differential markers; and
- BEAT comparatives interact syntactically and semantically with aspectual marking (FINISH), modals, and different adjective types.

Though BEAT comparatives exhibit many commonalities with documented comparative constructions, including *exceeds*-comparatives, they nevertheless illustrate many patterns that do not fit into existing theoretical or typological discussions of comparative structures.

Acknowledgments

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