A long-distance morphosyntax and semantics for comparative clauses

Introduction. We propose a new analysis of the morphological and semantic relations between expressions like -er/as and their clausal dependents headed by than/as. These relations have traditionally been analyzed as involving complementation, either followed by obligatory extraposition [B73] or via countercyclic late merger [BP04] (to explain e.g. *J ate more than M did cookies). On our approach, than/as clauses merge at a distance, adjoining to phrases containing -er/as. We derive the observed dependencies via an Agree relation whose semantic counterpart is λ-abstraction over an implicit argument. This analysis captures well-known as well as new observations, and also suggests a novel perspective on the semantic significance of Agree.

Syntactic analysis. We propose that than/as-phrases (be they clausal or not) adjoin to either the NP or VP that hosts the degree head -er/as [cp. A12]; see (1) for adnominal modification. The heads of these phrases bear an uninterpretable feature that is valued by -er/as (just as adjectives in some languages will bear the person/number/gender features of the nominals that they modify, following PT04). The form (than or as), qua probe, is determined by the particular comparative head serving as the goal. This sketch of our approach captures the two basic facts about comparatives in English: 1) The morphological relation e.g. between than and -er, and 2) the non-adjacency of those same elements.

(1) M ate [NP [NP more cookies] [than J did]].

Syntactic predictions. We predict that than-phrases should pattern like adjuncts, and the morphological relation to -er should pattern like other instances of non-local agreement. It is possible for than-phrases to be absent from the sentence, (2), like other adjuncts. The than-phrase can appear to the right of an extraposed element in a way that an argument cannot, cp. (3a)-(3b), even if that argument could have merged late to a QRed element (as in BP04), (3c). Furthermore, ACD-avoidance and scopal flexibility follow if than/as-phrases extrapose to VP (not shown here). Finally, unlike agreement based on selectional relations, which is obligatory over disjunction (4b), comparatives and equatives display closest conjunct agreement (4a).

(2) M owns twenty dresses. J owns more/as many suits.
(3) a. J wrote more similar t_i books [to mine]_i [than anyone else].
   b. *J wrote similar t_i books t_j [to mine]_i [of poetry]_j
   c. *J wrote every similar t_i book t_j [to mine]_i [of poetry]_j
(4) a. J is as tall or taller [than/*as anyone else]
   b. *J claimed or wondered [whether/that anyone was there]

Implicit arguments. New evidence suggests that the semantic dependence between than/as clauses and -er/as is indirect, mediated by an implicit argument. Sentences exhibiting null complement anaphora (NCA) contain expressions like win, notice, or ready which have a syntactically unexpressed, (definitely-interpreted) semantic dependent [P89; disc. & refs in W12]. Interpretations with NCA are distinct (i.e., /\) from silent existential closures (5), overt pronouns (6), demonstratives (7), or syntactic elisions (8).

(5) Context  There was a chess match.
   a. John won. /\ John won something.
   b. John ate. \(\sim\) John ate something.
(6) Whenever M shaves her head, J notices. /\ Whenever M shaves her head, J notices it.
(7) M is ready and M is not ready. /\ M is ready for this and M is not ready for that.
(8) Q Who, have the investigators noticed t_i was lying?
   a. I’d rather hear who, you have noticed t_i.
   b. /\ I’d rather hear who, you have noticed t_i was lying.

Examples (9)-(12) show that comparatives pattern like sentences with NCA.

(9) Context  J ate some cookies.
M ate more/as many pies. $\not\prec$ M ate more/as many pies than some amount.

(10) Whenever J enters a mountain-climbing competition,
   a. he vows to climb more/as many mountains next time.
   b. $\not\prec$ he vows to climb more than that/as many as that next time.

(11) a. M ate more cookies and she ate less cookies.
   b. $\not\prec$ M ate more cookies than that and she ate less cookies than that.

(12) Who did the baker bake more pies than $t_i$?
   a. I’d rather hear who, you have baked more pies.
   b. $\not\prec$ I’d rather hear who, you have baked more pies than $t_i$.

**Semantic analysis.** For simplicity, we focus on $[-er]$ in the nominal context. On measure function-based approaches [e.g. K99], $[-er]$ is $\lambda g \lambda d \lambda x. g(x) > d$, with an explicit $\lambda$ over the semantic value of the than-clause, and $g$ ranging over measure functions of type $\langle e, d \rangle$. On our approach, the right-hand side of $>$ is a definite of type $d$ that contains a variable $\delta$ over contextually-provided degree functions (i.e., type $\langle d, t \rangle$).

(13) a. $[-er]^A = \lambda g \lambda x. g(x) > d[A(\delta)(d)]$
    b. $[\text{many}]^A = \lambda x. \text{number}(x)$

Context alone can make a degree function salient, e.g. by an utterance like (14a). Followed up by e.g. (14b), that function is interpreted as the value of $A(\delta)$, whose degree argument will be bound by $\iota$.

(14) a. M owns some dresses.  $\rightarrow \lambda d. \text{number}(\text{suits-M-owns}) \geq d$
    b. J owns more suits.  $\top$ iff $\text{number}(\text{suits-J-owns}) > id[A(\delta)(d)]$

When present, comparative clauses necessarily value $\delta$. We posit that this is the result of a rule that $\lambda$-abstracts over $\delta$, (15), assigning the complement of than/as (type $\langle d, t \rangle$) on standard assumptions) to $\delta$. A derivation of an NP is given in (16), with the than-clause given schematically. In the paper, we show how this works with adjectival and verbal comparatives, as well as with disjunctions like (4a).

(15) $\llbracket \text{XP [than/as CP]} \rrbracket^A = \llbracket \text{XP} \rrbracket^A [\delta \rightarrow [\text{CP}]^A]$

(16) more cookies than J did
   a. $\llbracket [\text{thanP} \text{ than John \ did \ (eat cookies)}] \rrbracket^A = \lambda d. \text{number}(\text{cookies-J-ate}) \geq d$
   b. $\llbracket [\text{manyP} \text{ many } -er] \rrbracket^A = \lambda x. \text{number}(x) > id[A(\delta)(d)]$
   c. $\llbracket [\text{NP} \text{ more cookies}] \rrbracket^A = \lambda x. \text{cooking}(x) & \text{number}(x) > id[A(\delta)(d)]$
   d. $\llbracket [\text{NP} \ldots] [\text{thanP} \ldots] \rrbracket^A = \lambda x. \text{cooking}(x) & \text{number}(x) > id[\text{number}(\text{cookies-J-ate}) \geq d] \text{ by } (15)$

**Conclusions and prospects.** We propose an adjunction- and agreement-based syntactic analysis of the dependency between -er/as heads and than/as phrases that captures familiar as well as novel data simply. The cost of this syntactic simplicity is positing $\lambda$-abstraction without movement in the compositional semantics, one that allows subsequent adjuncts to bind implicit arguments of heads in its scope. Yet, there is evidence that such a rule will be necessary for NCA generally, e.g. consider the interpretations of (17).

Finally, future research should investigate whether this rule, so far unbounded, is subject to locality effects.

(17) a. John won even though he didn’t want to compete in the race.
   b. Nobody noticed when John walked into the room in a clown suit.
   c. Tipper was ready, despite the fact that she hadn’t been told in advance that there was going to be an interview.