Degree infinitival clauses[*]

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Abstract I discuss the structure and semantic composition of the so-called 'Attributive-with-Infinitive' construction (Fleisher 2008, 2011) – a construction that contains a positive gradable adjective in the attributive position and a gapped infinitival clause. Studying the way the adjective combines with the infinitival clause will suggest a new type of an infinitival clause – a degree interval-denoting one. The analysis will have consequences for the nature of a 'positive morpheme.'

Keywords: Degrees, positive construction, infinitival clause, ellipsis

1 Introduction

Examples of the 'Attributive-with-Infinitive' construction (AIC) I will be concerned with are below (the term coined in Fleisher 2008, 2011):

(1)   a.   *War and Peace* is a [**long** book] [**for John to read __**].

        b.   John is an [**old** man] [**to __ run a marathon**].

The defining formal properties of this construction are: 1) a positive form of a gradable adjective in an attributive position, and 2) an infinitival clause with a gap in the position of one of its DPs. I will only be concerned with those adjectives that don't take infinitival arguments lexically, like *difficult* or *easy* do.

Semantically, (1) involve reference to a 'goal' or 'purpose' and state that the degree reached by the subject of the sentence on a certain scale exceeds the maximum degree compatible with this purpose / goal. For example, (1a) means that the length of *War and Peace* exceeds the lengths of books compatible with John reading them. Similarly with (1b) – John's age exceeds the maximum age compatible with running a marathon.

The examples in (1) are roughly synonymous with the *too*-construction (*too long; too old*), which encodes precisely this 'inappropriateness' semantics with respect to a particular purpose. Sentences with *too* – as well as the corresponding AIC – can be paraphrased with a comparative construction with an existential modal element in the standard clause (Meier 2003; von Stechow, Krasikova & Penka 2004):

(2)   a.   *War and Peace* is longer than it **may/can** be
                (given a purpose of John reading it).

        b.   John is older than he **may/can** be
                (given a purpose of him running a marathon).

The main question I will be concerned with is the following: how does this interpretation of the AIC arise from the two ingredients (an adjective and an infinitival clause) and the way they combine? Is this effect pragmatic or more directly compositional? Should the 'modal comparative' paraphrase in (2) have any structural and semantic consequences?

The answers to these questions crucially rely on the correct structure that needs to be assigned to the sentences in (1) – in particular, the status of the infinitival clause that is part of these constructions.

The existing analysis of the AIC (Fleisher 2008, 2011) suggests that the infinitival clause does not have any direct syntactic or semantic relation to the DegP or AP, and opts for a pragmatic relation between the purpose and the standard that the positive gradable adjective makes use of.

I will argue for the opposite of Fleisher's conclusion: I will motivate an analysis for the AIC under which the infinitival clause is an argument of the positive morpheme POS, thus bearing a direct relation to the DegP. In particular, I propose that the infinitival clause in the AIC denotes a degree interval – for example, if John can maximally read 200 pages, then *for John to read* would denote an interval with the maximum point at 200 pages. In other words, I propose a semantic type for an infinitival relative clause that hasn't been attested in the literature yet – namely, type $\langle dt \rangle$. The analysis that I propose will have consequences for the status of the positive morpheme POS – the properties of the AIC discussed here will receive an explanation under the semantics of POS as a generalised quantifier over degrees. Therefore, the AIC adds an argument in favour of the existence of POS in the first place via its detectable quantificational behaviour.

The paper is structured as follows: first, I eliminate the possibility that the AIC is just a *too*-construction with a silent or omitted *too* and motivate the need for a different analysis for the AIC. Then I sum up Fleisher's 'pragmatic' analysis of the AIC (Fleisher 2008, 2011) and argue against it. Finally, I present my own analysis and discuss its consequences.

2   The AIC is not a *too*-construction

One possibility that would make the construction much less interesting is that it just contains a silent *too*, as these constructions are basically synonymous. I would like to point out some differences between the *too*-construction and AIC that show

that this analysis can't be right. First, differential measure phrases are licensed in *too*-construction but not in the AIC:

(3)   a.   This is 100 pages **too** long a book for John to read __ in one day.

        b. * This is (a) 100 pages long (a) book for John to read __ in one day.

Moreover, the gap is obligatory in the infinitival clause in AIC, while only optional in *too*-construction:

(4)   a. * *War and Peace* is a long book to assign it.

        b.   *War and Peace* is **too** long a book to assign it.

I talk about some interpretational differences between these constructions in the Discussion section.

I conclude that the analysis of the AIC has to say more than just postulating an unpronounced *too*. To figure out the correct structure and semantics of the AIC, the status of the infinitival clause in this construction needs to be clarified. On the face of it, it has hybrid properties – intuitively, it corresponds to a standard of comparison (degree complement) in (5b), as shown by a paraphrase in (2a), but looks like a plain infinitival adjunct, most likely, a relative clause, as in (5c).

(5)   a.   *War and Peace* is a long book [for John to read].   AIC

        b.   *War and Peace* is a longer book [than *Pnin* is].   COMPARATIVE

        c.   *War and Peace* is a book [for John to read].   RELATIVE CLAUSE

These two parallels potentially correspond to two different analyses of the AIC. The first analysis gives an infinitival clause in the AIC the semantics of a standard of comparison that is thus a complement of a degree head. Alternatively, it could be analysed as a plain infinitival relative clause, as in (5c) – in this case, the effect on the standard of comparison in AIC has to be derived by some additional mechanism. Fleisher (2008, 2011) goes for the second option. Let me sketch this latter analysis in enough detail to formulate the prediction it makes and show these predictions are not borne out.

3 Fleisher's analysis

Fleisher (2008, 2011) treats AIC infinitives as regular relative clauses adjoining to the lowest NP, the structure of the DP thus being the same no matter if the gradable adjective is there or not:

(6) $[_{DP}$ a $[_{NP}$ (POS long) $[_{NP}$ book $[_{CP}$ for John to read $]]]]$

The interpretational effect of the interaction between POS and the proposition introduced by the infinitival clause apparently cannot be derived in a straightforward compositional way under this analysis. Fleisher argues that this interaction can nevertheless be emulated using pragmatic mechanisms of salience.

In a nutshell, Fleisher proposes that the NP with the infinitival relative clause (*book for John to read*) makes the set of books that are compatible with John reading them salient enough in context to affect the calculation of the standard for truthful application of *long* – in this case, to count as long, an object does not have to exceed the length standard for books in general, but rather for books that are ok for John to read (*book for John to read*). In very plain English, if *War and Peace* is longer than the books that are ok for John to read, it's no longer good for this purpose.

The mechanism at play here is, according to Fleisher, similar to what is going on with attributive adjectives in a DP without an infinitival relative clause. Say, in a DP like *a tall man*, the NP *man* also does not interact with a DegP directly, but it makes the set of men salient enough in the context that the membership standard for the predicate *tall* is calculated with respect to the class of men – in other words, the NP *man* indirectly restricts the domain of the adjective *tall*.

The infinitival clause in the AIC thus denotes, under Fleisher's analysis, roughly, a set of books that are good for John to read or that are compatible with John reading them (the good / compatible component to be clarified later).

I will argue against this analysis – not only the particular implementation, but against a more fundamental choice that underlies it. In particular, I am going to say that the infinitival clause cannot be considered an (NP) adjunct. I will offer several arguments in favour of a 'compositional' view, under which the infinitival clause in AIC is a complement of the degree head:

i. The inference patterns observed in AICs are not compatible with Fleisher's predictions;

ii. NPIs are not expected to be licensed (but in fact they are);

iii. AIC infinitivals and infinitival relatives differ in syntactic distribution (the former but not the latter show island sensitivity);

iv. AICs and regular infinitival relatives show different modal force;

v. The head NP is not needed at all;

vi. AICs but not regular relatives license low degree modifiers.

4 Against the 'pragmatic' analysis

4.1 Inference patterns

The first observation is that the NP adjunct analysis gives the wrong predictions in terms of inference patterns in these constructions. A sentence with the simple DP with an attributive adjective entails that the NP predicate holds for the subject:

(7)   John is a **tall** boy. → John is a boy.

However, this pattern does not hold in AICs – if *War and Peace* is a long book for John to read, it is clearly not the case that it is a suitable book for John to read (as a simple relative clause construction very strongly suggests):

(8)   *War and Peace* is a **long** book for John to read. ↛
        War and Peace is a book for John to read.

4.2 NPI licensing

Regular infinitival relative clauses and infinitives in the AIC differ in the acceptability of NPIs. In (9a) but not in (9b) NPIs are licensed, which is unexpected under the view that the two share the same structure and semantics:

(9)   a.   *War and Peace* is a **long** book [for **anybody** to **ever** read].

        b. ?? *War and Peace* is a book [for **anybody** to **ever** read].

4.3 Syntactic distribution

AIC infinitival clauses and infinitival relatives can be shown to have different syntactic distribution. For example, the latter, but not the former, are acceptable when the host DP is in the subject position:

(10)   a.   [A book for John to read] is on the table.

        b.   [A **long** book for John to read] is on the table.   ≠ *too long*

Interestingly, the sentence in (10b) is not ungrammatical, but just fails to have the 'inappropriateness' reading. What it can mean is that there is a long book on the table, and it is a book for John to read – this is the 'regular' attributive + infinitival relative clause reading.

I suggest that the 'inappropriateness' reading is absent in (10b) because it occurs in a syntactic island (in this case, a subject island). Another illustration of a syntactic island blocking the 'inappropriateness' reading comes from definite description islands – again, AICs contrast with infinitival relatives:

(11)   *War and Peace* is a/the book for John to read during the spring break.

(12)   a.   *War and Peace* is a long book for John to read during the spring break.

      b.   # *War and Peace* is the long book for John to read during the spring break.
           ≠ *too long*

This is totally unexpected under Fleisher's analysis, as for him the 'inappropriateness' reading and the 'regular' reading are just one and the same reading. In the analysis I formulate in this paper, island sensitivity will follow, as movement will be an essential part of the derivation.

4.4   Modal force

There is a striking difference between infinitival relatives and the AIC in the available modal force. As observed in Hackl & Nissenbaum 2012, infinitival relatives are generally ambiguous between universal and existential modal readings:

(13)   He has come up with many **problems** *for us to work on*.
      = problems we MUST / CAN work on

      a.   ...so we'd better keep at it until they're all solved.   (= MUST)

      b.   ...if we want to work on a problem.   (= CAN)

Recall the paraphrase of the AIC with an existential modal, given in the introduction:

(14)   *War and Peace* is a **long book** *for John to read in one day*.
      = The length of W&P exceeds the length a book CAN / MAY have
      given a purpose of John reading it in one day.

This reading is parallel to an existential (CAN) reading of (13) in terms of modal force. Substituting the existential modal for a universal one in a paraphrase of (14) gives the interpretation that the AIC doesn't have:

(15)   *War and Peace* is a **long book** *for John to read in one day*.
      ≠ The length of W&P exceeds the length a book MUST / HAS TO have
      given a purpose of John reading it in one day.

The lack of a universal reading of the AIC, as demonstrated in (15), is surprising under the assumption that the AIC contains an infinitival relative clause.

4.5   Head NP is not necessary

One more property of the infinitival clauses that contribute to the 'inappropriateness' reading when they are used in combination with gradable adjectives is that they don't really need a head NP to host them:

(16)   *War and Peace* is a bit **long** [for John to read].

This is incompatible with the view that the infinitival clause is a relative clause that needs to combine with the head NP. Evidently, all that is needed for the 'inappropriateness' reading to arise from the combination of the infinitival clause and the gradable adjective is an infinitival clause and a gradable adjective, and a non-compositional theory of their interaction makes this interaction opaque and much less straightforward without enough justification.

For an analysis of the construction in (16), see Kagan & Alexejenko 2010; Bylinina 2012, 2013.

4.6   Low degree modifiers

A final observation has to do with distribution of low degree modifiers with gradable adjectives found in AICs. Those adjectives are primarily **relative** gradable adjectives (Rotstein & Winter 2004; Kennedy & McNally 2005; Kennedy 2007). One of the tests that has been used to distinguish relative adjectives from other classes of gradable adjectives is their incompatibility with low degree modifiers such as *slightly* or *a bit*. The combination of relative adjectives and low degree modifiers is not ungrammatical, but it is acceptable only under a particular interpretation:

(17)   #/(?) slightly / a bit tall / long / short / wide...

The interpretation under which (17) is acceptable is precisely the 'inappropriateness' interpretation (Bylinina 2012; Solt 2012). This effect cannot be easily accommodated under the 'non-compositional' view that Fleisher formulates. It is not clear how calculating the standard based on a set of books or a set of books that are good for John to read could make a difference in acceptability of low degree modifiers.

4.7   Intermediate summary

The facts discussed above strongly suggest that an alternative analysis is needed that would assign a different status to the infinitival clause in the AIC.

One might wonder to what extent the counterarguments against Fleisher's analysis of the AIC target his particular implementation rather than the idea of a 'non-compositional' treatment of the construction. One could imagine another implementation of the pragmatic analysis – for example, the infinitival clause could be analysed as a purpose clause attaching to the VP-level (Faraci 1974; Jones 1985; Nissenbaum 2005).

I leave out the argumentation (see Bylinina 2013), but the purpose-clause analysis doesn't fit the data any better than the relative clause one. Rather, the pragmatic

approach to this construction should be given up and an alternative analysis should be developed along less pragmatic, but more structural, lines. In the following two sections I develop such an alternative.

5 My analysis

5.1 Degree infinitival clauses

I propose an analysis that groups the infinitival clause in the AIC together with a wider class of clauses that define a degree or set of degrees. Examples of this kind most famously include standard clauses in comparative and other degree constructions, as well as so-called 'amount relatives' (Carlson 1977; Heim 1987; Grosu & Landman 1998).

Consider standards in comparative constructions first. A standard of comparison in English is introduced by *than*, which can take either a DP or a CP:

(18)   John is taller [than Mary (is)].

It is questionable if all *than*-phrases involve ellipsis, but, importantly, *than* **can** take a clausal complement, which is an uncontroversial analysis for (19) (Bresnan 1973; Hackl 2000; Lechner 2004):

(19)   John is taller [than Mary is d-~~tall~~].

Practically all the existing analyses of clausal standards of comparison involve degree abstraction in the standard clause:

(20)   ⟦than Mary is⟧ = λd. Mary is d-tall

The degree-abstraction analysis is not unique to comparative constructions. Rather, it is a standard way of treating a number of constructions with quantificational degree morphology – equative constructions (von Stechow 1984; Bierwisch 1989; Schwarzschild & Wilkinson 2002), superlative constructions (Bresnan 1973; Heim 2001; Gajewski 2010), and probably more.

The crucial difference between the degree constructions discussed so far and the AIC is the lack of – at least, overt – degree morphology in the matrix clause of the AIC, making the 'degree' relation between the matrix clause and the infinitival clause opaque. In this respect the AIC is close to 'amount relatives' (Carlson 1977; Heim 1987; Grosu & Landman 1998):

(21)   a.   It will take us the rest of our lives to drink the champagne that they spilled __ that evening.

b.   LF≈ It will take us the rest of our lives to drink the λd they spilled d-much champagne that evening.
A. the amount of champagne
#B. the actual champagne

(21) has an 'amount' interpretation which is distinct from the regular relative clause interpretation – the latter has the strange implication that the champagne once spilled on the floor would be drunk again, while the amount reading just makes a statement about quantity of the spilled champagne.

The degree abstraction that happens inside a relative clause, as illustrated in (21b), has some implications for the status of the gap that the relative clause contains. Let's look at the existing analyses of relative clauses to list the possible ways to treat the gap and thus set the stage for an analysis of amount relatives that I will later use as an inspiration for my analysis of the AIC.

The theories of relative clause structure can be grouped into two classes: head-external and head-internal analyses. The classic version of a 'head-external' analysis of relative clauses was developed in Chomsky 1977. The analysis involves operator movement from the base position of the gap to the edge of the relative clause CP. This CP modifies the head NP that is base generated outside of the relative clause CP. The head-external analysis has a version ('matching' analysis) where both the external and the internal head have some structure, but the material in the CP-internal copy is elided under identity with the external head (Sauerland 1998).

Under a 'head-internal' analysis, the head NP originates inside the relative clause CP and then moves out, leaving a trace behind. The CP directly serves as a complement of the determiner. Under this analysis, the head NP and the gap are part of the same movement chain – which means that potentially the head NP could reconstructed in its base position at LF and be interpreted inside a CP in the position of a trace (Kayne 1994; Sauerland 1998; Bhatt 2002).

The head-internal and head-external structures for relative clauses are not competing analyses – rather, relative clauses show regular ambiguity between head-internal and head-external structures, as proposed in Carlson 1977; Heim 1987; Sauerland 1998.

Which of these options is a better starting point for the analysis of amount relatives? The existence of the amount readings of certain relative clauses has been taken as a reason for assuming a relative-clause-internal representation of the head – so that the degree abstraction would happen inside the relative clause. This effect could be achieved both under a raising analysis and under a matching analysis of relative clauses – what is crucial is having enough (unpronounced) interpretable material in the position of the gap inside the relative clause (for more details see Grosu & Landman 1998).

I would like to suggest the same for the infinitival clause in the AIC: under my analysis, it ultimately gives a degree description, quite like amount relatives. For this, the gap inside the infinitival clause in AIC has to contain some interpretable unpronounced material that would provide a degree variable to abstract over:

(22)   *War and Peace* is a long book for John to read in one day.
         LF≈ 'W&P' is a long book λd for John to read a d-long book in one day.

From this preliminary sketch of an AIC LF, it is clear that the interpretation of the whole NP involving a gradable adjective happens inside the infinitival clause – quite parallel to the case of amount relatives discussed above.

5.2   Infinitival clause as part of the AIC

Recall the discussion about whether AICs can be seen as semantically – and, potentially, structurally – isomorphic to comparative constructions, where the subordinate clause defines a standard of comparison for a degree head in the matrix clause:

(23)   a.   *War and Peace* is a long book [for John to read].   AIC

         b.   *War and Peace* is a longer book [than *Pnin* is].   COMPARATIVE

The previous section proposes that the AIC infinitival clause is semantically similar to the standard clause in comparatives. In this section I argue for an analysis of the AIC that deepens the analogy between the two constructions. Contra Fleisher 2008, 2011, I suggest that the analysis of (23a) as parallel to (23b) is a viable, intuitive and empirically justified option.

I propose that the AIC is just like the comparative, with two differences: 1) the degree head is the positive morpheme rather than the comparative morpheme; 2) the complement of the degree head is the infinitival clause rather than a *than*-clause. The parallel between POS and the comparative morpheme is quite close already, as they both basically encode a relation between two degrees or sets of degrees (the POS entry modified from Kennedy 2007):

(24) $[\![\text{POS}]\!] = \lambda G_{\langle d, et\rangle} \lambda x_e.\mathbf{max}(\lambda d.G(d)(x)) > d_{ST}$

(24) states that POS takes a gradable predicate of type $\langle d, et\rangle$ and an individual as its arguments and checks if the individual's degree exceeds the standard d_{ST}. The standard is given by the context, but does not enter into a relation with POS as its argument. Pursuing an analysis that gives the infinitival clause in AICs the status of a standard-denoting expression would force us to allow for this possibility of POS having an argument slot for the standard degree. Let me develop an implementation of this idea for AICs.

Let's take a look at the existing analyses of MORE and see how they make use of the standard of comparison. There are two denotations for MORE that are very often found in the literature – a 2-place MORE and a 3-place MORE (Heim 1985; Bhatt & Takahashi 2008; Merchant 2009):

(25)   a. $[\![\text{MORE}_2]\!] = \lambda D_{\langle dt \rangle} \lambda D'_{\langle dt \rangle}.\mathbf{max}(D') > \mathbf{max}(D)$

       b. $[\![\text{MORE}_3]\!] = \lambda s_e \lambda G_{\langle d,et \rangle} \lambda x_e.\mathbf{max}(\lambda d.G(d)(x)) > \mathbf{max}(\lambda d.G(d)(s))$

In the case of a 2-place MORE, as shown in (25a), the comparative morpheme takes two sets of degrees and returns True if the maximal point of the second set exceeds the maximal point of the first set. How does the 2-place MORE get interpreted? It cannot stay in situ to get its interpretation because of the type mismatch between the adjective and the comparative morpheme. After MORE combines with the standard clause, the combination is of type $\langle dt,t \rangle$, while the type of the gradable adjective is $\langle d,et \rangle$. The degree phrase has to undergo QR, leaving the trace of type d behind. The movement of DegP is accompanied by lambda-abstraction over the degree variable, so that the resulting semantic type of the matrix clause would be $\langle dt \rangle$ – quite like the semantic type of the standard clause. Two arguments of type $\langle dt \rangle$ are exactly what MORE can combine with.

Movement of the DegP is also motivated by ellipsis resolution in the *than*-clause, which has been argued to be the case of antecedent-contained deletion (first proposed by Larson 1987). If the DegP with the *than*-clause remained in situ, this would result in infinite regress in the ellipsis site (see Heim 2001 among others).

An LF for the comparative construction with a 2-place MORE is sketched below:

(26)   [MORE$_2$ [λd than *Pnin* is d-long] [$\lambda d'$ *War and Peace* is d'-long]]

Under an alternative 3-place semantics of MORE in (25b), it combines directly with a gradable adjective and two individuals: the subject individual and the standard individual. Unlike a 2-place MORE, the 3-place MORE can be interpreted in situ, but can only combine with a phrasal standard of the type e, as shown in the following sketchy structure:

(27)   [*War and Peace* is [[MORE$_3$ [than *Pnin*]] long]]

Which of the analyses of comparative constructions should serve as a prototype for the analysis of the AIC? Neither of (25a) and (25b) is similar to the classic denotation for POS in (24). The 2-place MORE (unlike a 3-place one) can combine directly with a standard of type $\langle dt \rangle$ – the type of the degree infinitival clause in AIC, as argued for in the previous section. On the other hand, the 2-place MORE doesn't have an argument corresponding to the gradable adjective or the argument corresponding to the subject, which would make the interpretation of the AIC straightforward. The

3-place MORE has argument slots for the gradable adjective and the subject, but the standard argument that it takes is an individual rather than a degree or degree interval.

Recall from the discussion of 3- vs. 2-place MORE that the latter but not the former has to move out by QR movement to get its interpretation and to licence ellipsis in the standard clause. The properties of the AIC strongly suggest a very similar process – and thus, a very similar underlying structure. The denotation of POS that would have the right effect on the structure and the derivation thus can be parallel to the denotation of the comparative morpheme that has been argued for in order to derive similar effects. Thus I propose a 2-place POS with the same motivation as a 2-place MORE:

(28) $[\![\text{POS}_2]\!]_{\langle\langle dt\rangle\langle dt\rangle t\rangle} = [\![\text{MORE}_2]\!] = \lambda P_{\langle dt\rangle}\lambda Q_{\langle dt\rangle}.\mathbf{max}(Q) > \mathbf{max}(Q)$

To get interpreted, POS_2 needs to move out of its base position, quite like 2-place MORE. DegP movement leaves a trace of type d in the base position, accompanied by lambda-abstraction over the d-variable below the landing site of DegP. In this way the second $\langle dt\rangle$ argument of POS_2 is formed. The infinitival clause either moves with the positive morpheme, or is merged counter-cyclically (as argued in Bhatt & Pancheva 2004 for *than*-clauses). Basically, I suggest the following structure for the AIC, which is the same as the standard analysis of comparatives with a 2-place MORE:

(29) *War and Peace* is a long book for John to read.
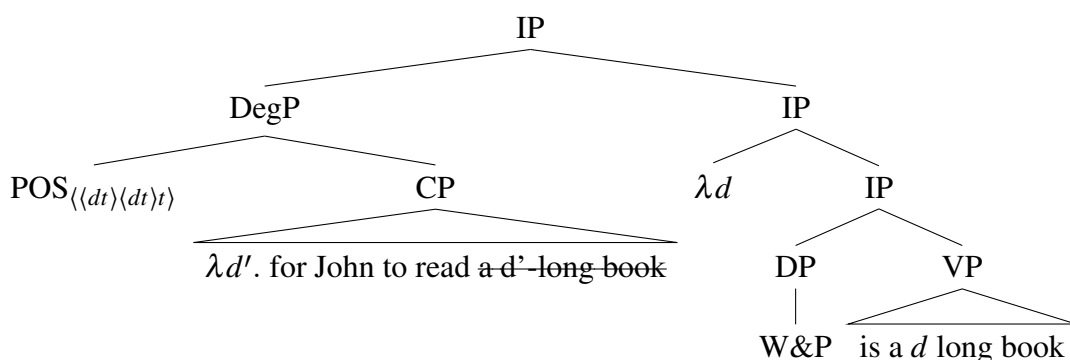
The semantic derivation is thus also totally parallel to that of comparatives:

(30) $[\![$*War and Peace* is a long book for John to read$]\!]$ =
$[\![\text{POS}_2]\!]([\![$for J. to read ~~a long book~~$]\!])([\![$*War and Peace* is a d-long book$]\!])$ =
$\mathbf{max}(\lambda d.$ W&P is a d-long book$) > \mathbf{max}(\lambda d'.$ for John to read ~~a d'-long book~~$)$

Let's see how this analysis deals with the properties of the AIC construction.

5.3   Deriving the new facts

First, island-sensitivity of the 'inappropriateness' reading that is characteristic of the AIC is naturally explained under an analysis that involves DegP movement.

Another property of the AIC discussed in the previous section is the obligatory gap in the infinitival clause. I hypothesise that this gap is a result of an ellipsis operation very similar to Comparative Deletion – the term coined in Bresnan 1973, 1975 to describe constructions in which an adjectival, adverbial, or nominal constituent is elided in the complement of *than* or *as*, as illustrated below for DPs in the complement of *than*:

(31)   a.   Fred reads more books [than Susan buys __].

b.   John saw a longer whale [than __ was ever seen].   (Sauerland 1998)

The gaps in (31) presumably result from the deletion of DPs identical to a DP in the matrix clause. Bresnan (1973, 1975) and Lechner (1999) show that one of the defining properties of Comparative Deletion is its obligatoriness. The silent copies of the DPs in (31) cannot be pronounced – quite like in the AIC, see example (4a):

(32)   a.   * Fred reads more books than Susan reads them / books / many books.

b.   * John saw a longer whale than it / a whale / a long whale was ever seen.

A further parallel between the AIC and the comparative construction is NPI licensing in the subordinate clause. Recall that NPIs are licensed in the AIC, which has served as one of the counterarguments against the 'non-compositional' analysis of the AIC. The standard clauses in comparative constructions are known to license NPIs as well (Hoeksema 1983; von Stechow 1984; Heim 2006):

(33)   *War and Peace* is longer [than **any** book you would **ever** want to read].

This is not a unique property of *than*-clauses that the AIC infinitival clause just happens to share. Rather, this is a property of 'standard clauses' in general, which has been documented at least for the complements of the superlative *-est* (Bhatt 2002; Howard 2008, 2013; Bhatt & Pancheva 2012) and for the complements of *too* (von Stechow 1984).

The explanation of NPI licensing in the standard clauses in degree constructions is beyond the scope of this paper. It is enough to point out here that grouping the AIC infinitival clauses together with other standard clauses proves natural given the NPI licensing facts.

Furthermore, recall that the AIC lacks the CAN / MUST ambiguity that would be expected under a regular relative clause analysis, but is not in fact attested. Hackl & Nissenbaum (2012) relate the CAN reading in the infinitival relatives to the reconstruction of the head NP into the gap position inside the infinitival clause.

The dependency between the interpretation of the material inside the infinitival clause and the modal force is observed in my analysis as well. I propose that in the AIC, the gap has material that is interpreted inside the infinitival clause, and the modal force of the infinitival clause is existential only, quite as expected (although I don't provide a reason why this dependency has to hold).

Finally, regarding low degree modifiers in the AIC, the degree complement analysis predicts them to be available. The infinitival standard clause picks a more precise degree as a standard for POS and satisfies the requirements of the low degree modifier (reasoning about the small differences). For a more detailed discussion, see Kagan & Alexejenko 2010; Bylinina 2012, 2013.

To wrap up, the analysis involving a 2-place POS as presented here covers a wide range of data, that would otherwise remain puzzling. Treating the infinitival clause as a standard-denoting expression similar to *than*-clauses explains some otherwise unexpected parallels between *than*-clauses and infinitival clauses in AIC – in particular, NPI licensing facts, the syntactic distribution of these clauses, as well as the acceptability of low degree modifiers.

6 Discussion

Although all the steps I make on the way to the analysis seem well motivated by the properties of the AIC and the infinitival clause, there is something worrisome about the result I have reached. The concern is that the denotation for POS that I propose looks too much like a comparative morpheme. On the one hand, the standard denotation for POS has been designed to encode an 'exceed' relation between the degree of the subject and the standard degree, which is basically what comparative morphemes do. On the other hand, there is a fundamental intuitive difference between comparative and positive constructions, related to the fact that POS makes use of a vague standard, and the fact that it cannot take an overt standard clause or phrase as its argument.

The AIC discussed here challenges the latter observation, as the infinitival clause serves as a standard argument for POS, according to my analysis. But if in this particular construction POS takes an overt standard, how does one exclude expressions like *2 meters* or *John's height* from potential overt standards for POS? One could go for a syntactic solution and propose that the 2-place POS subcategorises for infinitival complements only, but I am not sure how insightful this direction would be.

As a related issue, if the standard of comparison is explicitly given in the AIC, why does the vagueness seem to at least partly persist in this construction? It is not entirely clear to what extent it does, though. Context-dependency tests for vagueness (Kennedy 2007; Sassoon & Toledo 2011; McNally 2011) seem to group these constructions together with non-context dependent ones, although the judgements are quite shaky:

(34)   ??Compared to *Pnin*, *War and Peace* is a long book to read in one day.

However, the Sorites paradox holds, at least to a certain extent, suggesting that the AIC is vague: if you have a long book to read in one day, taking one line out of it would not make any difference with respect to the truth of *a long book to read in one day* applied to the result. And it's hard to imagine a precise point in the Sorites sequence where one bit of removed text would make the deciding difference.

As a fact pointing in the same direction, the AIC seems to allow for borderline cases. John being a tall guy to drive a certain car doesn't immediately exclude John from being able to drive it – unlike in, say, *too* constructions:

(35)   a. John is too tall to drive this car. #But he can still drive it.

        b. John is a tall guy to drive this car. But he can still drive it.

This fact might have nothing to do with vagueness, however. What is at stake here is the implicative nature of *too* that the AIC construction doesn't share (for a detailed discussion of implicative semantics of *too*, see Hacquard 2006; I show how this difference between *too* and the AIC arises in Bylinina 2013).

Therefore, it's hard to say how crisp or vague the 'purpose-related' standard is. One might argue that this apparent vagueness is inherited from the infinitival clause and its inherent modality. There might be some indeterminacy with respect to what set of possible worlds is included in the modal base. Consider Fleisher's example *Bob is a short guy for the Lakers to draft* – the crispness of this sentence depends on the crispness of criteria the Lakers have for the height of their team members. In case there are strict rules (say, the players should be taller than 190cm), the Sorites paradox will not arise for this sentence, as the precise boundary between true and false will be crossed eventually, and the second premise will not hold.

I don't have coherent solution to these issues. At the same time, I don't think that these puzzles related to vagueness of the AIC undermine the analysis I am presenting here. To the contrary, they illustrate an interesting and unique combination of properties of the AIC – it is somehow in between vague and crisp degree constructions, which is something that still lacks good understanding. The main contribution of my study is the discovery of this puzzle.

One more contribution of this paper is the motivation of the semantics of POS as a quantificational element, with its own scopal properties that can be indirectly

visible given the right environment. The idea that POS is present in the structure of the positive construction with gradable adjectives is still a controversial issue, and there are debates if such an element is needed at all (for a recent discussion see Sassoon & van Rooij 2012). My data show that even though this element is not overt, it shows quantificational behaviour like overt degree quantifiers. For similar conclusion on different data see O'Connor 2012.

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