Absolute and Relative Adjectives and their Comparison Classes*

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Abstract This paper investigates core semantic properties that distinguish between different types of gradable adjectives and the effect of context on their interpretation. We contend that all gradable adjectives are interpreted relative to a comparison class (van Rooij to appear), and that it is the nature of the comparison class that constitutes the main semantic difference between the different subclasses of such adjectives: some select a class comprised of counterparts of the individual of which the adjective is predicated, while others - an extensional-category of this individual. The role of the context is to determine the elements that comprise the comparison class. It is proposed, following Kennedy (2007), that the standard of membership is selected according to a principle of economy whereby an interpretation relative to a maximum or a minimum endpoint within a comparison class takes precedence over one relative to an arbitrary point. This proposal captures so-called "standard shift" effects, that is, the influence of context on the interpretation of gradable adjectives from all subclasses, in their positive form and when modified by degree adverbials. Additionally, this proposal captures cases of apparent lack of context sensitivity (e.g. intuitive inference patterns, unacceptability of for-phrases, etc.) Finally, we show that the type of comparison class is aligned with the well known distinction between stage-level and individual-level predicates.

Keywords: Comparison class, Counterparts, Gradability, Context sensitivity, Absolute adjectives, Relative adjectives, Scale structure

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1 Introduction

This paper investigates the lexical semantics of gradable adjectives, general principles of grammar that contribute to their interpretation and the role of context in their decoding.

In the past several decades, the semantics of gradable adjectives has received a great deal of attention in the literature representing a number of linguistic traditions. Various typologies have been proposed to classify gradable adjectives, including Bierwisch's (1989) dimensional/evaluative distinction, the partial/total distinction by Yoon (1996) and Rotstein & Winter (2004), and the relative/absolute distinction by Unger (1975), Kennedy & McNally (2005) and Kennedy (2007).

A central question addressed in this paper is whether the standard of membership employed in the interpretation of gradable adjectives can be determined without reference to context. In this connection, the next two sections review recent accounts anchored in scale structure theory, which pertain to the interpretation of the positive form of adjectives, as in (1).

(1) a. John is tall

b. This shirt is dirty

c. This knife is clean

d. This glass is full

1.1 Absolute Adjectives: Arguments against context sensitivity

Kennedy & McNally (2005) and Kennedy (2007) argue that the scales of gradable adjectives come in four different forms, as in (2):

(2) Typology of Scale Structure

a. Open (e.g. *tall*, *short*)

b. Lower closed (e.g. *dirty*, *wet*)

c. Upper closed (e.g. *clean*, *dry*)

d. Totally closed (e.g. *full*, *empty*)

Evidence for this typology comes from the distribution of degree modifiers such as *slightly* and *perfectly*, which, according to this theory, pick out the minimum and the maximum degree on the scale, respectively:

(3) The Distribution of Degree Modifiers

a. {#slightly, #perfectly} tall

b. {slightly, #perfectly} dirty

c. {#slightly, perfectly} clean

d. {slightly, perfectly} full

In discussing context sensitivity of adjectival membership standards in relation to, e.g., the positive forms in (1), Kennedy & McNally (2005) posit the following generalization:

(4) An adjective *A* is interpreted relative to a context-dependent standard if and only if *A*'s scale is linguistically open. If *A* is associated with a closed scale, a (non-contextual) endpoint standard is employed in *A*'s interpretation.

To support this proposal, Kennedy (2007) stipulates a general grammatical principle of economy, quoted in (5):

(5) *Economy Principle*: Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions. (Kennedy 2007: 35)

The above principle dictates that, in selecting a standard of membership, an adjective's scale structure – which is part of its conventional meaning – takes precedence over contextual properties. It follows that a context-dependent standard is resorted to only in the event that the lexically encoded ('fixed') scale of an adjective lacks an endpoint. Thus, for each adjective in (1), a different standard of membership surfaces:

(6) Standards of Membership

a. *tall*: open scale ⇒ a context-dependent midpoint on the scale

b. *dirty*: lower closed scale ⇒ the scale's minimum endpoint

c. *clean*: upper closed scale ⇒ the scale's maximum endpoint

d. *full*: totally closed scale ⇒ the scale's minimum or maximum endpoint

Thus, according to Kennedy & McNally (2005) and Kennedy (2007), the typology of relative/absolute adjectives pivots on the type of standard employed in their interpretation. The standard of relative adjectives (e.g. *tall/ short*, *expensive/ cheap*, etc.) lies at some midpoint on the scale and is context-dependent. The standard of absolute adjectives (e.g. *dirty*/*clean*, *full*/*empty*, etc.) is located at the scale's absolute minimum or maximum point, in which case the context plays no role in interpretation.

This analysis seems to be supported by the distribution of for-phrases, which restrict the contextual domain that determines the standard (Siegel 1979):

(7) a. John is tall for a ten-year old

b. #This shirt is dirty for a T-Shirt

c. #This knife is clean for a kitchen knife

d. #This glass is full for a wine glass

According to Kennedy (2007: 37), "Interpretive Economy dictates that the absolute truth conditions are the ones that should surface" – which explains the infelicity of (7b), (7c) and (7d), where an unwarranted move is made to shift the absolute standard selected by *dirty*, *clean* and *full*.

Another piece of evidence in favor of this analysis comes from inference patterns such as those illustrated in (8):

(8) a. Relative (Contextual-std) Adj: X is taller than Y $\not\Rightarrow$ X is tall / Y is not tall

b. Absolute (Minimum-std) Adj: X is dirtier than Y $\Rightarrow$ X is dirty

c. Absolute (Maximum-std) Adj: X is emptier than Y $\Rightarrow$ Y is not empty

The above disparity in inference patterns between relative adjectives, such as *tall*, and absolute adjectives, such as *dirty* and *clean*, can be attributed to the different kind of standards evoked in their interpretation. A relative adjective like *tall* selects a contextual midpoint standard, and therefore a comparative such as "X is taller than Y" entails that the height of X exceeds the height of Y, but does not entail that either of them is above or below the selected contextual standard. By contrast, the comparative of a minimum-standard adjective like *dirty* entails that one individual necessarily exceeds the minimum standard and therefore counts as dirty. Similarly, the comparative of a maximum-standard adjective like *clean* entails that one individual necessarily fails to exceed the maximum standard and therefore counts as not-clean. This account of the given inference patterns rests on the assumption that the standard of absolute adjectives is fixed semantically to be an absolute-scale endpoint. It is not affected by contextual considerations.

Additional evidence consistent with the typology proposed by Kennedy & McNally (2005) and Kennedy (2007) comes from experimental work by Syrett, Bradley, Kennedy & Lidz (2006). Investigating the use of the definite article with nouns modified by gradable adjectives, these researchers discovered a striking contrast between *tall* and *full*, namely:

(9) *The tall one* vs. *the full one*:
When subjects are presented with two glasses, both neither tall nor full, they respond to requests for *the tall one*, identifying the latter as the taller of the two glasses, but reject requests for *the full one*. They consider these requests to be inappropriate in the given context.

This observation aligns with the proposal that the standard of relative adjectives is context sensitive: Speakers can accommodate a standard of tallness for the situation at hand, which only one of the glasses exceeds – thereby rendering the use of the

definite article licit. With an absolute adjective, such accommodation is impossible, since the standard is fixed semantically.

The disparity in the sensitivity of relative and absolute adjectives to context is developed by Kennedy (2007) to a comprehensive theory of vagueness. Kennedy argues that vagueness occurs only in the interpretation of relative adjectives and accounts for this phenomenon by appealing to their contextual midpoint standard.[1] Absolute adjectives, on Kennedy's account, are interpreted relative to a semantically fixed endpoint, and therefore do not give rise to vagueness.

Despite the advantages of the typology proposed by Kennedy & McNally (2005) and Kennedy (2007), independent evidence, to which we now turn, suggests that the interpretation of absolute adjectives is not as impervious to contextual influences as these theories have it.

1.2 Absolute Adjectives: Arguments for Context Sensitivity

Consider (10), which is taken from Cruse (1980), and (11):

(10) a. This kitchen knife is clean

b. This surgical instrument is clean

(11) a. This child's shirt is dirty

b. This tuxedo is dirty

Admittedly, the standard of membership of the adjectives *clean* and *dirty* depends on the object these properties are predicated of. Thus, the standard for *clean* must necessarily be lower in reference to a kitchen knife than to a surgical instrument, and the standard for *dirty* depends on whether at issue is a child's shirt or a tuxedo.

A similar rationale applies to the adjective *full*: for a gasoline tank to count as *full* it has to be filled to the top or almost to the top, but – as observed by McNally (2011) – a wine glass is usually considered to be full when filled up to about half of its capacity. In Italy, a completely full Espresso cup is less full than a half-full tea cup, and so on and so forth. It seems that contextual effects in the form of standard shifts triggered by linguistic and extra linguistic features are far from rare. In fact, it is hard to come up with an example where *full* is used in relation to a standard exactly corresponding to the scale maximum.

To Rotstein & Winter (2004) the data in (10) and (11) indicates that absolute adjectives may exhibit vagueness and context sensitivity just like relative ones. On their account, the standard of partial adjectives (Kennedy and McNally's 2005

1 Kennedy's argument is based on a set of observations concerning characteristics of vague predicates: (1) vague predicates display context variability; (2) vague predicates give rise to the Sorites paradox; and (3) vague predicates have borderline cases.

minimum-standard adjectives) need not be the scale minimum (or thereabout), and the standard of total adjectives (Kennedy and McNally's maximum-standard adjectives) is not necessarily the exact scale maximum. Rather, the standard can be anywhere between the minimum and the maximum points on the scale.

In this sense, Rotstein & Winter (2004) reject an analysis along the lines suggested by Unger (1975), who denies the existence of a vague, context-sensitive use of absolute adjectives like *full* and *flat*, and argues that, when using these adjectives to describe an object, we generally speak falsely. Rather, Rotstein & Winter (2004) follow Lewis (1979), who contends that a vague use of absolute adjectives does exist. Lewis explains the vague use of, e.g. *flat*, by appeal to a contextual domain restriction imposed by the quantifier word 'no': to be flat is to have no bumps, except for those bumps we are ignoring.

Other similar evidence suggesting that the so-called 'absolute' adjectives are sensitive to context comes from the data in (12):

(12) a. ?The gas tank is empty, but there are still a few drops left. It's not completely empty yet.

b. The gas tank is full, but you can still top it off. It's not completely full yet.

An analysis whereby absolute adjectives such as *full* and *empty* have absolute standards predicts that *The tank is full* is equivalent to *The tank is completely full*. Accordingly, it is predicted that examples such as (12) will be perceived as contradictory. However, they are not always judged to be so. In particular, examples such as (12b) appear to be rather natural (compared to (12a), which is indeed intuitively contradictory). To account for the naturalness of such examples, an additional, independent explanation is required. To Unger (1975), propositions conveyed by sentences like these are strictly speaking false. Their felicity and informativeness is explained in terms of general pragmatic principles governing the interpretation of 'loose talk' (see also in Kennedy & McNally 2005). By contrast, these examples are straightforwardly captured by an analysis that associates adjectives like *full* with a membership standard that can be significantly lower than the absolute scale maximum - an approach adopted by Rotstein & Winter (2004), as well as Mcnally 2011.

At the same time, relativizing the standard of absolute adjectives comes at a cost. While Rotstein & Winter (2004) successfully capture contextual effects in the decoding of absolute adjectives, it does not capture the clear-cut results obtained by the postulation of insensitivity to context. In particular, such an analysis fails to capture the range of facts discussed in the previous section of this paper, namely the intuitive contrasts between relative and absolute adjectives in terms of the distribution of for-phrases, the puzzle of the two glasses, and intuitive inference patterns.

Rotstein & Winter (2004) do not discuss the first two phenomena, but with respect to inference patterns they defend the predictions of their theory by raising concerns whether the patterns illustrated in (8) represent true entailments. Consider, for example, (13):

(13) a. Both towels are clean, but the red one is cleaner than the blue one (Rotstein & Winter 2004).

b. #The red towel is cleaner than the blue one, but both are clean (Kennedy & McNally 2005).

For Rotstein & Winter (2004), (13a) is not contradictory; in fact, they see this utterance as perfectly natural. However, if the cleanliness of both towels is represented by the same point on the scale (the scale's absolute maximum), then it is unclear how the comparison in (13a) can be accounted for. This sentence constitutes additional piece of evidence in favor of a context sensitive approach to absolute adjectives.

We agree with Rotstein & Winter (2004) regarding the felicity of (13a) yet we also agree with Kennedy & McNally (2005) regarding the oddness of examples such as (13b). Moreover, we take the examples in (13) to form a minimal pair: while the former is perfectly natural, the latter is clearly odd. We contend that any theory of the absolute versus relative distinction has to account for context effects in the interpretation of absolute adjectives, as well as for the intricate data illustrated by minimal pairs as in (12) and (13).

1.3 Intermediate Summary

We have discussed two types of analyses addressing the issue of whether the standard of membership of gradable adjectives can be determined without reference to context. We have demonstrated that neither type of analysis captures the entire set of relevant facts. Linguistic analyses such as Kennedy & McNally (2005), which follow the philosophical tradition of Unger (1975), adduce evidence that appears to speak against context sensitivity (cf. section 1.2) but fail to account for data in favor of the latter (cf. section 1.2). By contrast, analyses such as Rotstein & Winter (2004) account for evidence in favor of context sensitivity (1.2) but fall short when dealing with data that militates against it, such as (1.1).

Overall, the semantically encoded scale structure of a gradable adjective does not seem to determine fully whether or not its standard of membership depends on the context. Therefore, it cannot form the only basis for the distinction between relative and absolute adjectives. A comprehensive solution must be sought in a different direction, as discussed in the next section.

1.4 An Alternative Direction

In his typology, which distinguishes between dimensional adjectives such as *tall* and evaluative adjectives such as *industrious*, Bierwisch (1989) observes a fundamental difference between the comparison classes of adjectives from these two subclasses. Thus, for example, with regard to (14):

(14) a. All the pupils at this school are tall

b. All the pupils at this school are industrious

Bierwisch contends:

(15) "In the interpretation of (14a) other people must be taken into account, but to interpret (14b) they need not be". Put differently, "for some people to be tall there must be short people too, but for some to be industrious there do not need to be any lazy ones" (Bierwisch 1989: 89).

We concur with Bierwisch that for assigning truth conditions to (14b), lazy people need not be taken into account; however, based on the above discussion, we adopt the hypothesis that, by and large, the interpretation of all kinds of adjectives – including *industrious* in (14b) – is context sensitive. In order to reconcile the above two positions, the following question must be answered:

(16) To the extent that, for assigning truth conditions to sentences such as *John is industrious*, lazy people need not be taken into account, yet interpretation is context sensitive, who is John compared with? In other words, what is the comparison class in which John 'stands out'?

This question constitutes the point of departure for our investigation. We adopt a view that all gradable adjectives are interpreted in relation to a comparison class (van Rooij to appear), and explore the nature of this class in relation to the relative-absolute distinction. This approach enables us to address, and provide a new answer, to the following questions:

(17) Main questions addressed in this paper

a. What components of meaning distinguish between classes of gradable adjectives and contribute to the assignment of truth conditions?

b. What principles of grammar are involved in determining the type of standard in the interpretation of a gradable adjective?

c. What is the interaction between contextual parameters and the computational system in decoding a gradable adjective?

The Structure of this paper is as follows. Section 2 presents our basic proposal for the semantics of gradable adjectives, which incorporates insights and arguments

from the accounts discussed above. The data discussed in section 1 is accounted for by means of two types of comparison classes in the interpretation of relative and absolute adjectives. Section 3 identifies factors that predict which adjectives are associated with each type of comparison class.

2 Typology Based on Comparison Classes

2.1 Rationale

We propose that the interpretation of gradable adjectives is determined by the nature of the comparison class, which is assumed to be an essential element in their interpretation (cf. van Rooij to appear). We argue for two types of comparison classes: *a counterpart set* and *an extensional-category*, which differ fundamentally in that the former, but not the latter, is comprised of 'counterparts' (Lewis 1986).

A counterpart-set comparison class gives rise to a *within-individual* interpretation, in which the individual of which the adjective is predicated is compared to its counterparts - realizations of that individual in different indices. For example, we suggest that the description of a shirt as dirty or clean is based on a visualization of this particular shirt in various degrees of grubbiness rather than on its juxtaposition with other concrete shirts. Crucially, the constraint on the contextual variance, and therefore the nature of the scale (whether or not it is open on one or both ends), is imposed by the individual under consideration – e.g. we can easily imagine a maximally clean counterpart of the above shirt.[2]

By contrast, an extensional category comparison class is comprised of other members of the category to which the individual the adjective is predicated of belongs, including distinct individuals in the index of evaluation. This class generates a *between-individuals* interpretation, in which an individual is compared to other distinct individuals. For example, the comparison class of adjectives such as *tall* or *short* may comprise any of many possible categories, each imposing equally salient natural height bounds, or no bounds at all.

Both types of comparison class are subject to contextual considerations. Thus, context sensitivity comes into play through the individuals comprising the comparison class. The basis for determining a comparison class depends first and foremost on the individual of which the adjective is predicated. The comparison class highlights a set of values on the lexically encoded adjectival scale, which are relevant for interpretation in the given context.

2 The concept of counterpart comparison classes is imported from the intensional model developed in Toledo (2011) for the measure functions of absolute adjectives.

2.2 The Details of the Proposal

Consider a λ-categorial language as defined in Heim & Kratzer (1998) and semantic domains D_x, D_t, D_d and D_w (sets of individuals x, truth values t, degrees d, and indices of evaluation w). Let the functions f and C associate adjectives A in indices w with:

(18) a. Degree function along some dimension (e.g., dirt, height, etc.) f(A,w): $D_x \rightarrow D_d$

b. Function from individuals x to comparison classes, $\lambda x \in D_x$.C(A,x,w).

In this paper we will consider the set of relevant indices D_w to be a set of world-time pairs.

2.2.1 Variance Within vs. Between Individuals

We propose that an adjective's comparison class is based either on variance between individuals or on variance within individuals.

We say that an adjective A is interpreted based on variance within an individual if and only if the comparison class includes only different counterparts (possible temporal stages) of the same individual:

(19) For all x,w, for all y_{v1}, $z_{v2} \in$ C(A,x,w): counterparts(y_{v1}, z_{v2}).

An example of an adjective that selects a counterpart comparison class is *full*. The comparison class of *full* in *The cup is full* is constructed in such a way that only one individual contributes values. Intuitively, the comparison class consists of counterparts (possible temporal stages) of the cup that the sentence relates to. Other cups in the extensional context, i.e., in the world and time of evaluation, do not figure as members of the comparison class. They may play a role in determining the comparison class only indirectly, by rendering certain counterparts more salient; e.g., other cups in the extensional context which are full to an unusual degree may affect the comparison class considered, by making salient counterparts of the cup under discussion which are full to unusual degrees.

In general, we assume that world knowledge and contextual purposes (e.g. the precision level) affect interpretation by restricting a comparison class to counterparts in indices that are normal with respect to A, x and w (Lewis 1979, Kratzer 1981, Kratzer 2011, Nicholas & Morreau 1995).

By contrast, we say that an adjective A is interpreted based on variance between individuals if and only if its comparison class includes no two different counterparts (possible temporal stages) of the same individual:

(20) For all x,w, for all y_{v1}, $z_{v2} \in$ C(A,x,w), counterparts(y_{v1}, z_{v2}): $y_{v1} = z_{v2}$.

For example, intuitively, the comparison class of tall for a two-year-old is constructed in such a way that each individual contributes only one value (counterpart). If Galit and Assaf are part of the comparison class, only one temporal stage of each one of them is in the class, one in which they are two years old. Their heights at other ages are ignored, and their heights in worlds other than the world of evaluation (their actual height at age two) are also irrelevant.

2.3 How the Standard is Determined

2.3.1 Economy Principle

We propose that the standard of membership in the interpretation of the positive form of an adjective is determined based on three factors:

(21) a. The comparison class evoked in the interpretation of that adjective, which determines the degrees on its lexically encoded scale that are relevant for assigning truth conditions.

b. An economy principle (Kennedy 2007), which dictates that interpretation relative to a maximum or a minimum endpoint within a comparison class takes precedence over one relative to an arbitrary midpoint.

c. A grammaticalization principle by which the type of standard that is usually selected for an adjective is encoded as a default convention for this adjective. The default is employed whenever this is possible.

Let us explain how this proposal accounts for the default association of a counterpart comparison class with an endpoint standard and the default association of an extensional category with a midpoint standard.

Consider, for example, the adjective *full* in *This cup is full*. We assume that *full* is interpreted relative to a counterpart comparison class comprised of the same cup filled up to different levels.[3] The cup in question provides the class variance, including a counterpart that is perceived as maximally full. Accordingly, the economy principle dictates an interpretation relative to an endpoint. Note that this endpoint is not necessarily the maximum endpoint on the lexicalized scale of *full* but rather the highest degree of a counterpart in the comparison class. Furthermore, since *full* is usually predicated of individuals whose counterpart set has clear boundaries, we assume that the grammaticalization principle forces the encoding of a convention for

3 In Section 4 of this paper, we explain how a method for determining a comparison class is selected given an adjective and an argument; in other words, how we decide between a counterpart comparison class and an extensional comparison class. Then we come back to examine the precise connection between the absolute-relative distinction and the selection of a counterpart vs. an extensional class, respectively.

selecting a maximum standard. This situation is typical of total adjectives (e.g. *dry*, *closed*, etc.)[4]

Similarly, consider the partial adjective *dirty*, as in *This shirt is dirty*. Assuming that the comparison class includes counterparts of the shirt which manifest different levels of dirtiness of that same shirt, the individual (the shirt the sentence relates to) provides the class variance. Thus, the class is highly restricted by what is conceived as normal for that particular individual, including a counterpart that is conceived as minimally dirty. Consequently, based on the economy principle, the sentence receives an interpretation which is typical of absolute adjectives, namely one which is based on an endpoint standard. In addition, the grammaticalization principle forces the encoding of a convention for selecting a minimum standard for *dirty* - as is typical of partial adjectives (e.g. *wet*, *open*, etc.)

Finally, adjectives such as *tall* evoke an extensional category comparison class. The distribution of height in a given category is often normal, in the sense that it has a central tendency (the average). The more a certain height deviates from the average, the rarer it is in the population; normal distributions have a bell shape with no specific bounds - extremely deviating heights still exist. Therefore, the comparison class for *tall* may comprise any of many possible categories, each imposing equally salient natural height bounds, or no bounds at all. In this case, the economy principle dictates a midpoint standard, and the grammaticalization principle forces the encoding of this type of membership standard as the default convention of the adjective. This situation is typical of relative adjectives (e.g. *wide*, *deep*, etc.[5]

Crucially, this analysis allows us to dispense with the hypothesis that the scale of *tall* is linguistically construed as open on both sides. Zero height exists and is captured easily by speakers (as is also indicated by adjectives such as *flat*). On our proposal, the fact that the standard is not the absolute zero point on the scale derives from the fact that the height of, e.g., a child can never approach zero height. The crux here is that, typically, the bound of comparison classes of relative adjectives does not lie near the zero of their semantic scale. Nor is there a unique contextual non-zero minimum (or maximum) for children in the absence of a uniquely specified comparison class. The same holds true of most other individuals of which *tall* can be predicated (buildings, trees, animals, human beings, etc.)

In certain (admittedly rare) cases, adjectives that usually employ an extensional category comparison class, and therefore by default select a midpoint standard, might be decoded relative to a comparison class which contains either a minimum or a maximum value. For example, in the comparison class evoked in *tall relative to*

4 We thank Regine Eckardt (p.c.) for pointing out the role of grammaticalization.

5 Most likely, the distribution of e.g., height or width in the category of, for instance, tables is not normal, yet it is not bound either; so, it forms a basis for the selection of a midpoint-standard.

his brothers, both a minimum and a maximum value are included. Yet, as long as the default convention can be applied, it must apply, and therefore a midpoint standard surfaces.

However, sometimes the default convention encoded for an adjective cannot be used to select the standard. This happens, e.g., when the convention dictates the selection of an endpoint standard but the comparison class of the individual in question lacks such an endpoint. Typical examples are *The ocean is full* and *My hands are dry* (Kennedy & McNally 2005). In these cases, the default convention of selecting a maximum standard cannot be applied and recourse to the economy principle results in the selection of a midpoint standard.

2.3.2 The Definition of POS

Let POS be a function assigning adjectives A in indices w a set of instances. We define POS based on the interpretation of the null morpheme *POS* in Kennedy (1999). However, formally, rather than using maximum vs. minimum operations over sets of degrees (as in Kennedy 2007), in (22a)-(22b) we formalize the exact same truth conditions by means of quantification over individuals.[6]

(22) a. For a partial A_P (namely, an adjective whose argument's comparison class typically has a natural lower bound), $POS(A_P,w) = \lambda x \in D_x$, $\exists y \in C(A_P,x,w)$, $f(A_P,w)(x) > f(A_P,w)(y)$.

b. For a total A_T (namely, an adjective whose argument's comparison class typically has a natural upper bound), $POS(A_T,w) = \lambda x \in D_x$. $\forall y \in C(A_T,x,w)$, $f(A_T,w)(x) \geq f(A_T,w)(y)$.

c. For a relative A_R, $POS(A_R,w) = \lambda x \in D_x$. $f(A_R,w)(x) > s(C(A_R,x,w))$.

For example, *The cup is full* is true iff the cup is at least as full or fuller than any of its salient counterparts (so the cup's degree is the maximum for that cup). By contrast, *The table is dirty* is true iff the table is covered with more dirt than one of its contextually salient counterparts (so the table's degree exceeds the minimum for that table).

Conversely, *The child is tall* is true iff the height of the child is above some midpoint standard (s(A)) based on a comparison class ranging over different individuals (the child's classmates, boys of his age, boys in general, etc.) The comparison class

6 Nothing hinges on this decision, except that it enables us later on to treat degree modifiers as operations on domains of quantification. The resulting analysis is general enough to capture quantification over different sorts of entities, as required by different uses of degree modifiers such as *almost* and *completely*. For example, the combination *completely different* can be interpreted as conveying 'different in every respect'; hence, in this example, *completely* operates over a domain of 'respects', rather than over degrees.

can comprise of any prominent category of the subject. Most contexts of use are partial in that no single category is uniquely and unambiguously selected (cf. Kamp 1975, Klein 1980, van Rooij to appear).

In sum, the selection of a comparison class for an adjective is highly dependent on the context, but the classification of an adjective as either relative or absolute is generally systematic and governed by the principles in (21).

2.3.3 Contextually Ignorable Entities

In the proposed model we distinguish between two types of entities that are ignorable with respect to the assignment of truth conditions.

First, certain entities are contextually indistinguishable with respect to an adjectival property due to a coarse-grained precision level. Therefore, they are mapped to the same degree. For example, pairs of glasses which are all alike, except that one glass contains a few more drops than the other, are intuitively indistinguishable. This fact can be modeled by associating *full* with a degree function that maps the two glasses to the same degree (cf. Lewis 1979; van Rooij to appear).

Second, world knowledge renders certain entities in the comparison class ignorable. Consider, for example, a typical context in which a half full wine glass is regarded as *full*. What does it mean, formally, that glasses filled up to more than their half capacity are ignored? As in the first case discussed above, we do not take into account the degree distinctions between certain pairs of entities, e.g., half full glasses and fuller glasses. Formally, then, the degree function, f(full,w), maps all the glasses that are exactly half full and all the glasses which are more than half full to the same degree.

The second situation can be described as one with *a ceiling effect*. We do not make any distinctions in degree for glasses which are fuller than the highest normative value. In some situations such glasses - for example completely full glasses - become relevant; context draws attention to them, for example through the use of a degree modifier such as *completely*. We will represent this by the same means we represent cases in which the level of precision rises. Formally, we shift to a new degree function, one that maps glasses which are fuller than half of their capacity to a degree higher than that of glasses which are only half full:

(23) For any two degree functions f,g$\in D_{<x,d>}$,we say that g encodes finer-grained distinctions than f, "f $\subset$ g" iff
(i) $\exists$x,y$\in D_x$, (f(x) = f(y)) and $\neg$(g(x) = g(y)), but not vice versa:
(ii) $\neg\exists$x,y$\in D_x$, (g(x) = g(y)) and $\neg$(f(x) = f(y)).

A shift to a finer grained degree function has the consequence that the comparison class highlights a wider set of degrees. We elaborate on this point latter on, in section

2.5.2.[7]

Having described the main ingredients of our analysis, we will now illustrate the fruitfulness of the notion of a counterpart comparison class in accounting for the data discussed in sections 1.1 and 1.2 concerning absolute and relative adjectives.

2.4 Accounting for the Data

2.4.1 Inference Patterns

This analysis seems to tally with intuitive inference patterns:

(24) *full*/*empty*: a counterpart comparison class

a. x is full $\Rightarrow$ x is as full as x can be (x can't be fuller)

b. x is empty $\Rightarrow$ x is as empty as x can be (x can't be emptier)

(25) *dirty*/*clean*: a counterpart comparison class

a. x is dirty $\Rightarrow$ x can be cleaner (less dirty)

b. x is clean $\Rightarrow$ x can't be cleaner (less dirty)

(26) *tall*/*short*: an extensional category comparison class

a. x is tall/short $\not\Rightarrow$ x is as tall/short as x can be

b. x is tall/short $\not\Rightarrow$ x is not as tall/short as x can be

In the case of, e.g., *tall*, we may infer that x can be either taller or shorter, but nothing follows logically from either (26a) or (26b). However, in the case of adjectives such as *full/empty*, or *dirty/clean*, inferences can be drawn regarding the way a given individual can be, or normally is. This is so because the comparison class is comprised of counterparts - possible temporal stages of that same individual in actual but not present circumstances (namely, in the past), or in normal, although not actual, circumstances. A comparison to these counterparts validates inferences concerning how the individual can be.

7 To maintain a more conservative view of the degree function as always monotonic to amounts of the 'stuff' measured, we can also have it that entities whose degree is higher than a local maximum fall outside of the local comparison class. We can characterize cases in which such an entity enters the scene by a shift to a wider comparison class, rather than a shift to a new measure function with a higher ceiling effect, so to speak. The result, as far as the consequences this paper deals with, are effectively the same.

2.4.2 For-Phrases

The infelicity of for-phrases with absolute adjectives, discussed in (7), is explained on the grounds that a counterpart comparison class - which is the characteristic comparison class for these adjectives - is incompatible with the extensional category referenced by the for-phrase. For example, *full* in (7d) selects a counterpart comparison class comprised of the same glass filled to different levels, whereas the for-phrase references a set of different glasses.

Relative adjectives, such as *tall* in (7a), select an extensional category as a comparison class and are therefore compatible with for-phrases, which restrict the comparison class to objects that are members of the set defined by the nominal complement of the preposition *for*.

Additional evidence in favor of this analysis is provided by absolute adjectives that do co-occur with for-phrases. Kennedy observes that for-phrases are acceptable with total adjectives only if their application results in a move away from a maximum standard. Moreover, for-phrases do co-occur with absolute adjectives if the for-phrase references counterparts of the individual of which that adjective is predicated, as in (27).[8]

(27) Absolute adjectives that co-occur with for-phrases

a. Full for this bookshelf/restaurant

b. Well, Jones isn't angry compared to anyone else, he's just angry for JONES![9]

Thus, expressions like *full for this restaurant* are acceptable descriptions of objects that usually do not contain much of the relevant stuff (clients, in the given examples), but do so on the occasion under discussion. These for-phrase pick out different situations incorporating the object, or different stages of the object - which is precisely what the proposed analysis predicts. Likewise, adjectives like *angry* may reference a comparison class ranging over situations with a given individual, e.g. Jones, providing that there is some regularity across these situations, such that the occasion on which the description *angry for Jones* is used stands out.

Similarly, , as observed by McNally (2011), when there is a shift from a maximum standard due to modification by *very*, for-phrases are licensed.[10]

8 We thank Chris Kennedy (p.c.) for drawing our attention to these examples.

9 We analyze *angry* as an absolute adjective because it licenses modification by minimizers, as in *slightly angry*.

10 McNally 2011 proposes that classification in relative adjectives depends on similarity to other concrete examples, whereas classification in absolute adjectives is rule-based. The notion of a 'rule' can be represented by means of different possibilities, representing norms concerning how an individual or a kind can or should be, in line with our counterpart set comparison class. The main difference with us is that there is no reference to endpoints at all.

(28) For a Friday, the dentist's schedule is very full

This example shows that when absolute adjectives such as *full* are modified by *very* they can license for-phrases ranging over different stages; this example presupposes the existence of regularity in the extent to which the schedule is full across Fridays. We will come back to the facilitating effect of *very* on the licensing of for-phrases in the section about degree modifiers.

2.4.3 Definite Descriptions

Let us go back to the experimental data reported in Syrett et al. (2006) (cf. 9 above), concerning situations with two glasses, g_1 and g_2, both neither tall nor full. On our analysis, the perceived acceptability of referring to the taller glass as *the tall one* and unacceptability of referring to the fuller glass as *the full one* is attributable to the different type of comparison class evoked by these adjectives.

In the case of *tall*, the taller of the two glasses counts as tall since the comparison class of *tall* is constructed locally as $\{g_1,g_2\}$. By contrast, in the case of *full*, $\{g_1,g_2\}$ is not a proper comparison class; rather, a counterpart class is constructed separately for each glass, which includes a counterpart filled to the maximum capacity. This precludes the designation of either of the two actual glasses as *full*.

2.4.4 Standard Shifts for Absolute Adjectives

The proposed analysis predicts standard-shift effects, as it posits that the composition of a counterpart comparison class depends on the individual an adjective is predicated of in a given context. Thus, the maximum standard of *cleanliness* for a kitchen knife must be different from that for a surgical instrument. On our analysis, the counterpart comparison class for *clean* predicated of a kitchen knife contains that same kitchen knife manifesting different levels of cleanliness, while the counterpart comparison class for a surgical instrument contains only different instantiations of that same surgical instrument. The latter, are normally sterilized, thus cleaner than the former. Thus, since surgical implements are usually sterile, the standard of cleanliness for a surgical instrument must be higher than for a kitchen knife.

By the same token, the possible minimum and maximum value for different individuals in the same index may also be different. Thus, a wine glass filled up to the middle may count as *full*, while a tea cup filled to two-thirds is perceived as *not full*. [11] This data speaks against absolute scale-maxima and in favor of comparison-class

11 Wine glasses fuller than half of their capacity are ignorable (formally, they are mapped to the same degree as glasses which are exactly half full, because they exceed the local maximum). However, not all tea cups fuller than half of their capacity are ignorable: Tea cups filled to three quarters of their

maxima. The maximum among counterparts in a class may be different for different individuals.

2.5 Absolute Adjectives in Various Constructions

2.5.1 The Comparative Form

The analysis described above predicts two readings for the comparative form of absolute adjectives:

(29) *x is A-er then y*

a. Direct comparison of degrees: in this reading, the truth conditions assigned to the construction are given by: $f(A,w)(x) > f(A,w)(y)$.

b. Indirect comparison of the degrees of x and y relative to the degrees of their respective counterparts: in this reading, the truth conditions assigned to the construction posit that the degree A assigns to x, $f(A,w)(x)$, compared to the degrees of x's counterparts, is grater than the degree A assigns to y, $f(A,w)(y)$, compared to the degrees of y's counterparts.

Examples of these two readings are as follows:

(30) *x is dirtier than y*:

a. The amount of dirt on x is greater than the amount of dirt on y ($f(dirty,w)(x) > f(dirty,w)(y)$)

b. The amount of dirt on x compared to x's counterparts is greater than the amount of dirt on y compared to y's counterparts.

(31) *In Italy, a completely full Espresso cup is less full than a half-full tea cup*:

a. The amount of liquid in an Espresso cup is lower than the amount of liquid in a half-full tea cup ($f(full,w)(espressocup) > f(full,w)(teacup)$).

b. The amount of liquid in a completely full Espresso cup relative to its counterparts (i.e. the same Espresso cup filled up to different levels) is lower than the amount of liquid in a half-full tea cup relative to its counterparts (i.e. the same tea cup filled up to different levels).

According to the first reading, the sentence is intuitively *true* since an Espresso cup is usually less than half the size of a tea cup, and in any normal circumstances it is clearly not filled up to the top (in Italy, at least). According to the second reading, this sentence is *false* because there is no fuller counterpart for the Espresso

capacity are normally relevant (formally they are mapped to a higher degree than tea cups filled to half of their capacity).

cup, while there are many fuller counterparts for the half-full tea cup (including, for example, the same tea cup when it is completely full). Therefore, when each individual is compared to its counterparts, the full Espresso cup is fuller than the half-full tea cup, although the amount of liquid it holds is probably lower.

The fact that this sentence is somewhat funny suggests that the second reading is available and the fact that it is false is responsible for the funny and strange flavor of the sentence. Other cases in point include examples such as:

(32) I am completely uninterested and Jane is even more uninterested.

McNally & Kennedy (2001) present this example as a problem for an absolute-maximum analysis. The account we propose captures such examples without difficulty. The comparison class consisting of counterparts of the speaker in the given example, even when widened so as to include situations of extreme lack of interest (cf. the analysis of *completely* discussed in the next section), seems to have a maximum that is lower than that of the comparison class consisting of the set of counterparts of Jane.

The intuition behind the second reading can be formulated in different ways:

1. Based on normalized measure functions of density, as proposed by Toledo (2011): The degree of each individual (x and y) represents the actual level to which it manifests the property denoted by the adjective, normalized by the maximum and minimum levels among its counterparts. In this formulation, the truth conditions of the comparative form postulate that the normalized degree of x is higher than the normalized degree of y.
2. Based on analyses of comparatives as quantifying over degree modifiers, as proposed by McConnell-Ginet (1973), Klein (1980) and Doetjes (2010): In this formulation, the truth conditions of the comparative form postulate the existence of a degree predicate that holds of x but not of y:
$\exists M \in \{very, pretty, fairly, ...\}.M(A)(x)\&\neg M(A)(y)$.

Arguably, modifiers such as *very*, *pretty*, *fairly*, and so on can operate on counterpart comparison classes, yielding a within-individual interpretation for both x and y. Such an interpretation of degree modifiers is a necessary ingredient of an analysis along the lines in (2) for the second of the two readings discussed above. Let us now elaborate on this point.

2.5.2 Degree Modifiers

This section lays out an analysis of the semantics of degree modifiers, which is inspired by Klein (1980) and Kadmon & Landman (1993), as well as discussions with Yael Greenberg (p.c.)

Syntactically, a degree modifier *M* takes an adjective *A* as an argument and returns a new adjective *M A*. Semantically, we propose that degree modifiers such as *completely*, *slightly*, and *very* function as either wideners or restrictors of the comparison class evoked in the interpretation of a gradable adjective. The comparison class widens in an intuitive sense when the set of relevant (unignorable) entities widens. Formally, they select a new degree function, one that encodes finer-grained (or less fine grained) distinctions between entities. As a result the comparison class highlights a wider (or narrower) set of degrees.

Maximizers and Minimizers We analyze maximizers (e.g. *perfectly*, *completely*, etc.) and minimizers (e.g. *slightly*, *somewhat*, etc.) as functions that widen the comparison class of their adjectival argument to include entities that normally count as irrelevant due to pragmatic factors. They do that by resorting to finer grained degree functions. This is formalized in (33):

(33) *Maximizers and Minimizers:*
For any adjective A, entity x$\in$D$_x$, and index w$\in$D$_w$:
f(A,w) $\subset$ f(slightly A,w) $\subset$ f(completely A,w).[12]

In addition, arguably, f(completely A,w) is as fine grained as can be (it is a maximal element under '$\subset$').

For example, a living room with some dust grains under the coffee table is intuitively considered as *clean* but not as *perfectly clean*. At the same time, it can be described as *slightly dirty*, but not as *dirty*. Why?

Intuitively, the default comparison class for *clean* and *dirty* when predicated of a living room does not contain a perfectly dust-free counterpart of this room (cf. Kadmon and Landman's 1993 discussion of ignorable entities in the context of an analysis of the modifier *any*). Along the lines of Kadmon & Landman (1993), we argue that the insertion of *perfectly* and *slightly* widens the comparison class to include cleaner (less dirty) counterparts. Consequently, it precludes the room from being the cleanest room in its counterpart comparison class. As a result, the room is assessed neither as *completely clean* nor as *dirty*.

Formally, we represent the fact that we normally ignore dust-free counterparts by means of a degree function, f(clean,w), which maps an individual, e.g., a room with some dust grains under the table, x_w, and its dust free counterpart x_v, to the same degree, f(clean,w)(x_w) = f(clean,w)(x_v); i.e. there is a ceiling effect: we consider the room to be as clean as it can be. However, an expression like *completely* employs a

12 As mentioned in the section concerning the representation of contextually ignorable entities, rather than manipulating the degree function, we can directly manipulate the comparison class, by postulating the following constraint: C(A,x,w) $\subset$ C(slightly A,x,w) $\subset$ C(completely A,x,w).

finer grained function, f(completely clean,w), which differentiates between the two counterparts: f(completely clean,w)(x_w) < f(completely clean,w)(x_v).

The upshot of analyzing maximizers and minimizers as wideners of comparison classes is that it captures patterns of inference between positive forms of adjectives with and without a modifier, such as those illustrated in (34) and (35):

(34) Total Adjectives:

a. Completely full → full

b. Perfectly clean → clean

(35) Partial Adjectives:

a. Wet → Somewhat wet

b. Dirty → Slightly dirty

Let us explain how these inference patterns obtain.

Modifying a total adjective with a maximizer results in a stronger interpretation. On our analysis, the reason for this is straightforward by virtue of the fact that the truth condition of the positive form of total adjectives are based on universal quantification over entities in the comparison class. Generally, widening the domain of a universal quantifier strengthens the resulting universal statement.

(36) If $[\![P_1]\!]_w \subset [\![P_2]\!]_w$ then if $\forall x(P_2(x) \rightarrow Q(x))$ is true in w, also $\forall x(P_1(x) \rightarrow Q(x))$ is true in w, but not necessarily vice versa.

This is the case because the truth conditions of the universal statement with the widened domain P_2 require more individuals to verify the quantification scope (to fall under Q). Returning to *completely full*, the maximizer *completely* widens the comparison class to include individuals that are full to an abnormally high degree, including ones full to the top - which normally count as irrelevant, and are therefore ignored. Since the comparison class is widened, the truth conditions of the positive form require that a full individual x be fuller than each member of a larger set of individuals. Thus, on an analysis whereby modification by a maximizer results in widening of the comparison class, statements of the form Completely(full)(x) are predicted to entail statements of the form Full(x):

(37) POS(completely full,w) ⇔
$\lambda x \in D_x$. $\forall y \in C$(completely full,x,w): f(completely full,w)(x) ≥ f(completely full,w)(y) ⇔
$\lambda x \in D_x$. $\forall y \in C$(full,x,w): f(completely full,w)(x) ≥ f(completely full,w)(y).

Domain widening is created by virtue of the fact that f(completely full,w) is finer grained than f(full,w); it maps some entities to a degree higher than that of entities

that are normally considered to be full (i.e. that are full to the default-maximum degree). Consequently, POS(completely full,w) $\subset$ POS(full,w), and hence: completely full $\Rightarrow$ full.

By contrast, following the same reasoning, modifying a partial adjective with a minimizer results in a weaker interpretation. The truth condition of the positive form of partial adjectives involves existential quantification over entities in the comparison class. Widening the domain of an existential quantifier weakens the resulting existential statement:

(38) If $[\![P_1]\!]_w \subset [\![P_2]\!]_w$ then if $\exists x(P_1(x)\&Q(x))$ is true in w, also $\exists x(P_2(x)\&Q(x))$ is true in w, but not necessarily vice versa.

This is the case because the truth conditions of the existential statement with the widened domain P_2 allow for more individuals to verify the scope (fall under Q). Returning to *slightly dirty*, the minimizer *slightly* widens the comparison class to include individuals that are dirty to an abnormally low degree, including ones with slight amounts of dirt, which normally count as irrelevant, and are therefore ignored. Since the comparison class is widened, the truth conditions allow a dirty individual x to be dirtier than each member of a larger set of individuals. Thus, on an analysis whereby modification by a minimizer results in widening of the comparison class, statements of the form Slightly(dirty)(x) are predicted to be entailed by statements of the form Dirty(x):

(39) POS(slightly dirty,w) $\Leftrightarrow$
$\lambda x \in D_x$. $\exists y \in C$(slightly dirty,x,w), f(slightly dirty,w)(x) > f(slightly dirty,w)(y)
$\Leftrightarrow$
$\lambda x \in D_x$. $\exists y \in C$(dirty,x,w), f(slightly dirty,w)(x) > f(slightly dirty,w)(y).

Again, domain widening is created by virtue of the fact that f(slightly dirty,w) is finer grained than f(dirty,w); it maps some entities to a degree lower than that of entities that are normally considered to be dirty (i.e. that are dirty to the default-minimum degree). Consequently, POS(dirty,w) $\subset$ POS(slightly dirty,w), and hence: dirty $\Rightarrow$ slightly dirty.[13]

Let us examine some direct results of this analysis. Consider the sentence *The glass is full, but not completely full*. Why isn't this statement perceived as contradictory? The interpretation of maximizers like *completely* can be seen as referencing a 'complete' set of counterparts, meaning that no x can possibly be *A*-er (e.g., fuller). When describing the glass as 'completely full' we take into account any previously ignored distinctions, so as to pick only the absolutely fullest entities.

13 Notice that this analysis predicts that with total adjectives *slightly* strengthens the interpretation, but not as much as *completely* does; i.e. from (33), it follows that *completely full* $\Rightarrow$ *slightly full* $\Rightarrow$ *full*. For an empirical justification of these results see Rotstein & Winter (2004) and Sassoon (2011).

Thus, while *full* is a maximum standard adjective, it is still weaker than *completely full*, because the comparison class of the former is intuitively a subset of that of the latter. Formally, the latter highlights a wider set of degrees on the adjective's scale. Thus, a glass x may be maximally full relative to f(full,w), but not relative to f(completely full,w).

Moreover, this analysis has the advantage of capturing both the intuitions in Rotstein & Winter (2004) about the naturalness of examples where an object is described as P but not completely P (with P being a total adjective), and the intuitions in Kennedy & McNally (2005) about the oddness of other examples of this kind, as illustrated below.

(40) a. The glass is full, but you can still top it off. It's not completely full yet.

b. ?The gas tank is empty, but there are still a few drops left. It's not completely empty yet.

The difference illustrated by minimal pairs such as (40a) vs. (40b) appears to hinge on the salience of absolute-scale maxima. On the whole, extreme degrees of fullness (e.g. a glass filled up to the very top) are all in all rarely salient, and are therefore perceived as abnormal (ignorable), whereas extreme degrees of emptiness (of e.g., glasses or gas tanks) are more salient and hence regarded as normal, so they can't be ignored.

Additionally, local maxima and shifts between default and finer grained comparison classes explain the data in (13), repeated below.

(41) a. Both towels are clean, but the red one is cleaner than the blue one (Rotstein & Winter 2004).

b. #The red towel is cleaner than the blue one, but both are clean (Kennedy & McNally 2005).

It is well known that the precision standard employed by speakers in a context can shift smoothly from lower to higher degrees of precision, but not vice versa (Lewis 1979). For example, the statement in (41a) is not contradictory and in fact perfectly natural, because as cooperative discourse participants, we start out by accommodating a relatively low level of precision, meaning that fine grained distinctions in cleanliness between towels are ignored - so the two towels can be described as clean. As a second stage we shift to a finer grained precision level. This is, as Lewis observed, a licensed discourse move. The purpose is to differentiate between the two given towels so as to render the comparative relation *cleaner* true of the towels. In this way, the two conjuncts of (41a) can be interpreted as true.

By contrast, in considering (41b), we start out with a precision level high enough to render the comparative true, and then aim to shift to a lower standard of precision

- one that will render both towels clean. This shift requires us to ignore the fine grained distinction in cleanliness that render the blue towel less than maximally clean. Such a shift, however, as observed by Lewis, is not a licensed discourse move. The second conjunct is interpreted against the context created by the first conjunct, which makes a higher degree salient, thereby rendering the blue towel not maximally clean, and therefore not clean.[14]

Syrett, Kennedy & Lidz (2010) report experimental findings supporting the above proposal, whereby the serial order in which speakers consider entities matters. It turns out that, when a pair exemplifying the maximal standard of a total adjective A_T appears earlier in an experiment, children are significantly more likely to reject a request for 'the A_T one' of a pair without a maximal member. This finding is consistent with the view that they treat the contextual maximum as a local standard, unless a higher degree is salient in the context.

Boosters Earlier in this paper we have shown that an analysis of absolute adjectives with counterpart comparison classes helps accounting for a variety of facts. In addition, this analysis opens up the possibility of applying Klein's analysis of boosters, such as *very* and *rather*), to absolute adjectives. According to Klein (1980), boosters are functions that restrict the comparison class of an adjective to include only entities that meet certain conditions. In this section we attempt to generalize Klein's analysis to capture the use of boosters like *very* with counterpart comparison classes, and we call for future research of the consequences of the generalized analysis.

Let us examine the effect of *very* on each type of comparison class. According to Klein (1980), in comparison classes comprising of extensional categories (as in *tall*), the modifier replaces the normal comparison class in the context with a restricted subset of it, which only includes those individuals that are tall under normal circumstances, i.e. given the normal comparison class for that context. For example, *John is very tall* is true if and only if John exceeds the standard of membership of *tall*, i.e., John's height stands out, even among the tallies. This analysis predicts the fact that *John is very tall* asymmetrically entails that *John is tall*.

This analysis can be incorporated into ours in the following way:

(42) *Boosters:*
For any adjective A, entity $x \in D_x$, and index $w \in D_w$:
a. $C(\text{very A},x,w) = \lambda y \in C(A,x,w).\ y \in POS(A,w)$
b. $f(A,w) \subseteq f(\text{very A},w) \subset f(\text{completely A},w)$.

14 Notice that the use of *completely full* makes salient extreme degrees; however, the proposed semantics tells us that *full* is a weaker expression, thus its standard of membership need not be updated so as to accommodate these extreme, completely full degrees.

Consider now comparison classes comprising of counterparts. On a Kleinean analysis, the modifier *very* replaces them with restricted subsets. This results in a different effect for each type of absolute adjective.

In partial adjectives, only counterparts that exceed the minimum degree in the default class are considered. Due to the existential quantification in the truth conditions of positive forms of partial adjectives, for an individual to be described as very A_P (e.g. *very dirty*), it has to exceed the minimum in a comparison class consisting of its dirty counterparts. Hence, modification by comparison class restrictors strengthen the existential statements comprised by positive forms of partial adjectives. This is evident from inference patterns such as: *very dirty* $\rightarrow$ *dirty*; *very bent* $\rightarrow$ *bent*, etc.

The Kleinean analysis works well so far, but we still have to face the main challenge - namely modification of total adjectives. Due to the universal quantification in the truth conditions of positive forms of total adjectives, for an individual to be described as very A_T (e.g. *very full*), it has to reach the maximum degree in the booster's comparison class, which consists of its full counterparts:

(43) POS(very full,w) $\Leftrightarrow$
λx$\in D_x$, $\forall$y$\in$C(very full,x,w): f(very full,w)(x) $\geq$ f(very full,w)(y) $\Leftrightarrow$
λx$\in D_x$, $\forall$y$\in$C(full,x,w) $\cap$ POS(full,w): f(very full,w)(x) $\geq$ f(very full,w)(y)
$\Leftrightarrow$
λx$\in D_x$,$\forall$y[$\forall$z$\in$C(full,y,w), f(full,w)(y) $\geq$ f(full,w)(z)]: f(very full,w)(x) $\geq$ f(very full,w)(y).

In total adjectives, only counterparts that reach the maximum degree in the default class are considered to be instances of the positive denotation of the adjective. Thus, on the face of it, the analysis seems to wrongly predict there to be only one degree within the comparison class of *very* A_T of a total adjective A_T. For this analysis to work, we have to explain how a comparison class employed by a booster comes to encode more fine grained distinctions than we normally consider (although not as many distinctions as evoked by maximizers).

Naturally, fine grained differences between counterparts in a booster's comparison class exist, but are normally ignored. Following Kamp & Partee (1995), we propose that a pragmatic *non-vacuity principle* is at work, according to which speakers should always aim towards interpretations of predicates in which neither the positive nor the negative denotation is empty. We propose that this principle triggers a shift from a given precision level (represented by the degree function of the adjective A which is modified by *very*) towards a finer grained precision level, represented by the degree function of *very A*. Since f(very A,w) of a total A is finer grained than f(A,w), it can highlight several different degrees within the comparison class, so some of them can be considered very A and others not very A.

Thus, for any x and w, the comparison class C(very full,x,w) is a proper subset

of the comparison class employed normally, and the degree function f(very full,w) is finer grained that the one employed normally, but not as fine grained as the function employed by maximizers. This last stipulation is important to derive the intuition whereby *very full* implies *not completely full*. This stipulation is further supported by the fact that even repeated use of *very*, as in *very very full*, *very, very, very full*, and so on, still implies *not completely full*.

The question of whether *very full* implies *full* or not is more delicate. The answer is - it depends. The present analysis predicts that the denotation of *very full* is a proper subset of the denotation of *full* under weak, default interpretations (whereby *full* conveys less than *completely full*), and is a proper superset of the denotation of *full* under strict interpretations (whereby *full* conveys *completely full*).

By weak, default interpretations we mean the interpretation of *full* prior to the application of *very*, i.e. relative to C(full,x,w), for any x,w. By strong interpretations, we mean the interpretation of *full* against a complete comparison class, which may be salient in certain contexts. For example, we normally cannot say about a restaurant that it is very full but not full, or about a movie theater that it is very full but not full, except if we interpret *full* strictly, namely as conveying *completely full*. We think it is this complex situation that is responsible for the unclear and variable judgments speaker have about whether very P is P in total adjectives, which the proposed analysis is fine grained enough to capture.

Finally, we would like to draw an analogy between the analysis of, e.g., *very full* as mediated by universal quantification, and analyses of generic statements as mediated by universal quantification. Statements such as *birds fly* or *a cat hunts mice* convey generalizations over birds and cats, albeit weak generalizations.

First, they allow exceptions; e.g., ostriches are birds which do not fly; domestic cats often prefer eating commercial products for cats, etc. These statements merely convey that most birds fly, in particular, normal birds in normal circumstances fly (Carlson 1977). This interpretation can be modeled by means of universal quantification over a vague domain (Kadmon & Landman 1993). Since the domain is underspecified, speakers always have the right to argue that their statements were not "about ostriches", or not "about domestic cats". Second, since the domain is vague, modifiers of universal quantifiers such as *almost* are not licensed (ibid).

We propose that, similarly, modification of total adjectives by boosters results in universal quantification over a vague domain. In the case of absolute adjectives such as, e.g., *full* and *clean*, interpretation is constrained by variance within individuals, e.g., degrees to which a given wine glass or a given tea cup is normally filled; degrees of cleanliness of a given room in normal circumstances, etc. Experience with past temporal stages of individuals give rise to defaults concerning what is normal for a given individual.

At the same time, a direct consequence of this situation is that modification by

boosters, which highlights abnormal degrees, is vague. It relates to entities which are normally ignorable, due to degrees that fall outside the normative range. Naturally, such entities are rarer and/or more often ignorable. Hence, it is less likely that solid conventions about what is normal of, e.g. *very full* or *very empty* will arise. Thus, different degrees are equally likely to count as the maximum-standard of *very full/ empty*, and speakers always have the right to change their mind concerning the degree they may call *very full*.

Finally, due to this vagueness, modification by *almost* is impossible (cf. the felicity contrast between *almost full* and #*almost very full*). By contrast, as observed by McNally (2011: 6), the use of boosters like *very* facilitates the licensing of for-phrases with absolute adjectives, as the following examples illustrate:

(44) a. For a Friday, the dentist's schedule is very full.

b. For a student who has just moved here, she is very familiar with the class routines and her teachers' expectations. In fact, she's completely familiar with them.

This observation meshes well with an analysis of boosters as domain restrictors that shift the standard from the normative or default maximum towards a more ad-hoc contextual interpretation, thereby providing a rationale for the use of explicit cues as to what the new standard can or can't be. Notice also that in (44b) the for-phrase highlights an extensional category. This option is rare but exists. We have to leave this as a problem for future research, but would like to suggest one speculation in defense of our analysis. Possibly, in the absence of a default membership standard, counterpart set and level of precision, variability across different students in the index of evaluation is employed to indirectly help building a counterpart set for the given student the sentence relates to.

To summarize, we defended an analysis of degree modifiers as restrictors or wideners of comparison classes. This analysis captures the hard core data about inference patterns of modifiers with relative, total and partial adjectives. It does so by means of a uniform semantic interpretation, with no resort to repair strategies or ambiguity such as those used by, for instance, Unger (1975).[15] Future research will determine whether this is a fully satisfying account or not, in particular with respect to the use of boosters with total adjectives.

The given semantic analysis of degree modifiers rests heavily on the assumption that degree modifiers can operate on counterpart comparison classes. Evidence for

15 Unger has to stipulate that, for example, *rather full* is reinterpreted roughly as *rather close to being full*, and similar stipulations for other degree modifiers, to account for the different inference patterns that arise with different adjective types. By contrast, the analysis presented here captures the inference patterns with different types of adjectives by means of a single, unified interpretation for each modifier.

this assumption comes from experiments reported in McNabb (2011), to which we now turn. These experiments indirectly support an analysis of boosters as operations on the counterpart comparison class of partial and total adjectives, by showing that the effect of distinct individuals in the index of evaluation on the interpretation of such adjectives with and without *very* is limited.

2.6 Experimental Evidence

The basic assumptions underlying the typology of comparison classes that we propose and the analysis of degree modifiers outlined above is supported by the experiments reported in McNabb (2011).

A series of tasks focused on adjectives from one of the three different classes: partial (e.g. *bent*), total (e.g. *empty*) and relative (e.g. *tall*). In each task, subjects were exposed to a set of individuals manifesting a given adjectival property to different extents. One of the individuals was circled, and subjects were asked to select all the possible descriptions that intuitively apply to that individual form a list of descriptions containing, among other things, the positive form, and modified forms of the adjective in question (e.g. *very tall, very very tall*, etc.) The experiments test whether the set of distinct individuals present in the context of utterance has an effect on the interpretation of different types of adjectives, with and without modification.

Tasks involving relative, but not absolute adjectives, resulted in statistically significant differences between contexts, when the adjectives occurred with and without modification. This suggests that the interpretation of absolute adjectives in the positive form and when modified by *very* is not (or is less systematically) affected by distinct individuals in the context. The truth-conditions are assigned only on the basis of the degree to which the circled individual manifests the property denoted by the adjective. The opposite holds true of relative adjectives. Their interpretation is affected by the presence of other individuals in the context and consequently the level to which they manifest the given property.

We take this result as supporting evidence for two of our proposals:

(45) Support from McNabb's data:

a. Absolute adjectives are by default interpreted relative to a counterpart comparison class (excluding other individuals present in the context). Relative adjectives, by contrast, employ an extensional category comparison class.

b. Modifiers can operate on counterpart comparison classes and preserve an absolute interpretation by widening or restricting the set of relevant counterparts.

Future research should determine how general these results are across different adjectives, contexts and types of task.[16]

The next section focuses on explaining how the comparison class typology arises, and how a type of comparison class is associated with the interpretation of a given adjective and argument.

3 Transient versus Enduring Properties

On the proposal this paper explores, when modifying their arguments, adjectives are associated with either a counterpart class or an extensional class. Economy dictates that, regardless of class type, if an endpoint exists in a contextual comparison class, then interpretation is absolute. Otherwise, interpretation is relative. On top of this, a grammaticalization principle creates conventions concerning default standard types based on generalizations over different contexts of use.

Remaining questions, then, are - which comparison class is typical of which adjectives? and relatedly, how does a particular argument of an adjective affect the selection of a comparison class? For example, why is it that in language after language, tall, old and expensive classify as relative, while dirty-clean and full-empty classify as absolute? And why do some adjectives have both a relative and an absolute reading? e.g., healthy can relate to general health conditions (values on medical tests such as blood pressure, cholesterol and sugar, healthy life style, and so on), in which case it has a relative interpretation (one cannot be *completely healthy* in this sense). However, healthy can also relate to transient health conditions, such as (not) having a passing cold, in which case interpretation is absolute (one can easily be *completely healthy* in this sense).

These questions are the focus of the next section, which presents the last component of our proposal.

3.1 Which type of comparison class is characteristic of which type of adjective? – Predictive factors

The choice between a counterpart class and an extensional class is affected by a number of relevant, inter-connected parameters. The central factor affecting this choice is the availability (or absence) of variance, and hence encoded information

16 A more recent unpublished experiment by McNabb, in which the task was to select the best possible description of a circled entity in a context, resulted in a different pattern. All in all, partial adjectives were more significantly affected by context, but total ones were not. We think that there are various plausible ways to explain the results. We hope future experimental research will address the different possibilities. We thank Yaron McNabb for sharing his results with us and for discussing possible accounts.

about value distribution, within the same individual or between different individuals.

Let us elaborate on this point. This factor pertains to whether the scalar property associated with an adjective assigns to the individuals the adjective is typically predicated of values which are relatively transient or relatively enduring, i.e. stage-level vs. individual level property values, cf. Carlson (1977); McNally (1994); Kratzer (1995); Marin & McNally (2005); and Kertz (2006). In stage-level properties, whereby an individual's value is transient (varies across indices), there is variance within an individual, while in individual level properties, whereby an individual's value is enduring there is no sufficient variance within individuals.

For example, it makes no sense to compare the height of an individual x to itself, because the height of most individuals is relatively stable. There is no variance within an individual. However, there is plenty of variance in the population. We all have encoded information about averages in populations - normative heights of men, women, boys and girls at different ages, normative heights at different countries (Dutch people are by and large taller than, for instance, Indian people), normative heights of buildings on different areas, etc. Given the availability of such height distributions in extensional categories, adjectives like *tall* naturally select extensional categories as comparison classes.

A correlated characteristic is the existence of unit-based measurement conventions, such as those associated with *tall, heavy, fat, warm, healthy with respect to blood pressure*, and so on. Such measurements provide information about variance within populations (extensional categories), while it is impossible to employ a precise measurement convention for counterparts. And indeed, relative interpretations are characteristic of adjectives which relate to precise measurement conventions.

By contrast, the value of entities in absolute adjectives are typically stage level (vary considerably across indices), as typical examples from the absolute-relative literature exemplify, including, for instance, *dirty, clean, full, empty, sick, healthy, wet, dry, hungry, angry*, and *open*. A given door is wide open at one moment, slightly closed at another, and so on. Speakers experience variable stages of the door in different degrees of open-ness. Hence, *open* is a stage-level adjective, and, in correlation, is likely to be interpreted relative to a counterpart set (a set of stages).

This set is likely to be highly constrained by the limits of the variance which is possible for, e.g., a given door, as well as by the limits of the variance which is conceived as normal for that door. Thus, those limits are likely to function as standards, meaning that we end up with an absolute interpretation.

The correlation between absolute interpretations and stage level ones can be traced back to Kennedy and McNally's (2005) observation that scales of deverbal adjectives like *full* and *empty* depend on sub-stages of an event denoted by the respective verbs, e.g. stages of filling or emptying events of the object the adjectives are predicated of.

Finally, the interpretation of many adjectives is context dependent, in the sense that they can pick either a stage-level or an individual-level property, and their classification is contingent on the subject of predication (e.g. *healthy* and *sick'*). General health conditions are relatively stable within individuals, and relate to precise medical conventions of measurement; thus such interpretations of healthy and sick are relative. By contrast, variable health conditions, such as a cold, which is normally a temporary state, allow for comparison based on within individual variance, and hence call for a counterpart set interpretation, which correlates with absoluteness.

This duality has consequences on inferences. For example, compare an utterance of a statement such as *Bill is healthier than he was yesterday* to a statement such as *Bill is healthier than he has been for years*. Given the former, we naturally draw the inference that Bill was not healthy yesterday; given the latter, we are not as certain as to whether Bill has always been healthy or not. The statement is compatible with him always being healthy, and now being even healthier.

We will not delve deeply into the question of what is the correct analysis of the stage-individual distinction. Notice however that a representation of this distinction requires a representation of the distinction between stage-level and individual-level states, which means, more generally, a representation of event structure.

This structure includes a domain of eventualities D_e, which can be seen as primitive objects structured by a part relation (e.g., the eventuality denoted by *John run 5 miles and lifted weights* has a subpart of John running 5 miles and a subpart of John lifting weights, cf. Link (1987) and Krifka (1989). A homomorphism T maps eventualities e onto their run times T(e). A predicate with n arguments is translated into a predicate of arity n$\dot{+}$1, s.t. $[\![P_n]\!] = \lambda e \in D_e\ \lambda x_1 \in D_x, ..., \lambda x_n \in D_x.\ P_n(e, x_1, ..., x_n)$. For example, the sentence *J*ohn is drunk is translated to "drunk(s,j)", and is interpreted as true or false at stages (world-time pairs).

Within this framework, we have to distinguish between different types of eventualities, in particular stative and non-stative ones. Adjectives as well as some verbs are considered to denote states. Rothstein (2004) illustrates this distinction as follows. We cannot say that John ran (an activity) is true at an instant, but only at an interval, but if John believed in the afterlife (a state) till the age of twenty-five, the sentence John believed in the afterlife was true at any instant during that interval. So stative eventualities are homogeneous down to instants. Every subinterval (and in particular every instant) of an Interval where a state is true is also an interval where the same state is true.

Moreover, within the set of states, the stage-individual distinction can be characterized as follows. Individual-, but not stage-level predicates are associated with a default inference of indefinite temporal persistence. If an eventuality is going on at time t and you have no information that it is not going on at some later/earlier

time t', then infer that it is going on at that later/earlier time t' as well, e.g. *John is drunk* relates to a bounded state while *John is tall* relates to a persistent state, cf. Condoravdi (1992: 9), and McNally (1994).

To summarize, in this section we proposed the following generalization:

(46) An adjective *A* selects a counterpart comparison class if and only if the property *A* denotes is transient (S-level) in typical arguments of *A*.

Based on the analysis we outlined in section 2 of this paper, our theory predicts that an adjective that selects a counterpart comparison class is more likely to have a comparison class with endpoints, and therefore, an absolute interpretation. Therefore, together with the above generalization, we derive the prediction that the stage-individual distinction correlates with the absolute-relative distinction:

(47) Predictions:

a. An adjective that denotes transient properties is likely to have an absolute interpretation.

b. An adjective that denotes enduring properties is likely to have a relative interpretation.

The proposal in (46) is advantageous in that it explains a variety of facts. Significantly, the stage-individual distinction is marked by natural languages in a large variety of ways, meaning that if our proposal is on the right track, a comparison class type should be easily identified by speakers, and so the status of an adjective as absolute or relative should also be easily captured for the various types of arguments a given adjective can take. The next section presents empirical support to this proposal.

3.2 Empirical support

For verbal and adjectival predicates, many diagnostics have been proposed to distinguish stage-level predicates from individual-level ones. We will focus mainly on tests that work well for adjectives, and show that the proposal works well for most of the examples prevalent in the literature on absolute vs. relative adjectives.

First and foremost, only stage-level predicates can be embedded under temporal quantifiers such as *every time*, or be modified by temporal adverbs of quantification such as *often* (Kratzer 1995). Thus, the thesis whereby the stage-individual distinction determines the type of comparison class, and hence correlates with the status of an adjective as absolute or relative, predicts that adverbs of quantification should be licensed significantly more often with absolute adjectives, than with relative ones.

Considering the list of prevalent examples in the literature of absolute vs. relative adjectives, this prediction is born out, as illustrated below. Positive forms of absolute

adjectives with a definite noun phrase as an argument can easily be embedded under quantifiers such as, for example, "every time" and "when". When the adjective is relative, this is hardly possible.

(48) Embedding under temporal quantifiers is possible with absolute adjectives

a. Every time my dog is sick/ your box is full/ our window is open/closed

b. Every time this countertop is wet/dry/ this student is late/ this train is early

c. When my child is sick/ your bag is empty/ that shelf is dirty/ that officer is calm/ nervous

(49) Embedding under temporal quantifiers is not possible with relative adjectives

a. #Every time his son is tall/ this table is short/ this leaving room is wide/narrow

b. #Every time their swimming pool is deep/ shallow/ that sofa is beautiful/ ugly

c. #When this cake is expensive/ when this car is inexpensive/ When your mother is young/ old

Similarly, positive forms of absolute adjectives with a definite noun phrase as an argument can easily be modified by adverbs of quantification such as, "once", "often" and "rarely". When the adjective is relative, this modification is not as easy.

(50) Adverbs of quantification can modify absolute adjectives

a. Once healthy, my child can go to school

b. Once full, your box can be sent away

c. Once open, the window can be cleaned

d. Once dry, this countertop can be dusted

e. This countertop is rarely wet/ clean

f. That officer is rarely calm/ sick/ late

g. Your bag is rarely empty

h. Our window is rarely closed/ dirty

(51) Adverbs of quantification cannot modify relative adjectives

a. #Once short, this table cannot help us

b. #Once wide, this path can serve as a road

c. #Once narrow, this leaving room can be cozy

d. #Once deep, their swimming pool can be dangerous

e. #Once beautiful, that sofa can arrive to our home

f. #His son is rarely small/ tall

g. #This path is rarely narrow/ wide

h. #That sofa is rarely ugly/ inexpensive

i. #Your uncle is rarely young/ old[17]

Secondly, only stage-level predicates can occur as secondary predicates cf. Levin & Rappaport Hovav (1991), Kertz (2006) and Marin & McNally (2005). Thus, the thesis we examine predicts that absolute adjectives will be licensed as secondary predicates significantly more often than relative ones.

Considering the list of prevalent examples in the literature of absolute vs. relative adjectives, this prediction seems to be born out, as illustrated below. Constructions with a definite subject and a predicate can easily license a secondary predicate which is an absolute adjective, but not one which is a relative adjective.

(52) Absolute adjectives can occur as secondary predicate

a. Paul arrived home sick/ drunk/ nervous/ calm

b. My child arrived home healthy

c. Your bag arrived at my house empty/ full

d. This train arrived to this station late/ early

e. Bill took a picture of our window open/ our door closed/ this floor wet/ this countertop dry

f. That vase arrived at my house dirty

g. I want to see you with your hands clean

h. Pierre, wet/drunk, arrived home late

(53) Relative adjectives cannot easily occur as secondary predicate

a. #His son arrived home small/ fat/ intelligent

b. #This rope arrived at my house long

c. #This table arrived at my house short/ inexpensive

d. #Bill took a picture of this path wide /this leaving room narrow

e. #Bill took a picture of their lake shallow/ their swimming pool deep

f. #That sofa arrived at my house beautiful/ ugly

g. #Pierre, tall/ old, arrived home late

17 Similarly, only stage-level predicates should be modified by spatio-temporal modifiers, as in, for example, *X is sometimes A, A in the car/ All the way from Lubbock to Marfa, x was A/ A after dinner/ A on Sundays/ for a Sunday*, etc. We are not sure whether all these tests are equally effective.

h. #I want to see you with your hands heavy

i. #Your mother arrived at my house young/ old[18]

Thirdly, only stage-level predicates can occur in small clauses embedded under direct perception verbs (as in "I saw x A"); by contrast only individual level predicates occur in in small clauses which are embedded under evaluative verbs (as in "I consider x A"); cf. Carlson (1977); McNally (1994); Kratzer (1995); Marin & McNally (2005); and Kertz (2006). Thus, our thesis predicts that absolute adjectives will be licensed under direct perception verbs more easily than relative adjectives, but relative ones will be licensed under evaluative verbs more easily than absolute ones.

Considering the list of prevalent examples in the literature, the first prediction seems to be born out, as illustrated below. As for the second one, we think the contrast between relative and absolute adjectives is not as considerable as expected. This is because absolute adjectives are context dependent as well, which means that there is room for speaker's evaluations to be relevant. Thus, embedding under 'consider' is not a perfect test for our purposes, but embedding under 'saw' is an efficient test.

(54) Embedding absolute adjectives under direct perception verbs is perfectly natural

a. They also saw my child healthy/ this countertop dry/ wet/ your box empty/full/ our window open/ closed

b. She also saw that mirror dirty/ clean/ this student late/ this train early/ that manager nervous

(55) Embedding relative adjectives under direct perception verbs is not possible

18 Notice, however, that this test may fail with individual level predicates, if the main predicate marks the beginning or end of application of the secondary individual level predicate. For example, *They left the Army fervent non-interventionists* implicates that their leaving the army marks the relevant boundary of the end of their advocacy of interventionism (McNally 1994). Thus, the examples above improve if given an interpretation whereby the sentence relates to a particular singular event of shift in the value of the property the relative adjective denotes.

We will not discuss the coda of there constructions, as in *There are /were students sick/#intelligent*, because we think the constraints on occurrence in this position are too strict for it to serve as a good indication of either the stage-individual distinction, or the comparison type, cf. *#there are/ were glasses clean/ dirty/ full/ empty/ expensive*.

Furthermore, Carlson argues that bare plurals as in "Xs are A" are necessarily interpreted as generic in individual level predicates, but allow existential reading in stage-level predicates: *American men/cars are expensive/ long/ heavy/ intelligent/ fat/ smart* (#existential) vs. *American men/ cars are dirty/ clean/ sick/ wet/ dry/ full/ empty/ eager to buy foreign goods* (existential/ generic).

a. #She also saw his daughter small/tall/ this table short/long/ this living room narrow/wide/ their lake shallow/ deep/

b. #We also sawthat dress ugly/ beautiful/ this car expensive/ inexpensive/ your mother young/old/

(56) Embedding relative adjectives under evaluative verbs is slightly more natural than absolute adjectives

a. She also considers his daughter small/tall/ this rope short/ this living room narrow / their swimming pool shallow

b. They also consider that dress ugly/ this cake expensive/ your mother young/ this table long/ this path wide/ that sofa beautiful

c. ?They also consider this floor dry/ wet/ that shelf dirty/clean/ that manager calm/ your box empty/full

d. ?She also considers our window open/closed/ my dog sick/healthy/ this student late/early

Fourthly, the use of past tense of individual level predicates often implies that a significant amount of time has passed since the related event occurred, or that, in the meantime, the subject of predication ceased to exist ("life time effects"). These kind of implications do not characterize stage level predicates.

This pattern seems to generalize to the relative-absolute distinction. This can be illustrated by asking "How much time passed since x was A", for absolute and relative adjectives *A*. The expected answer is *little* with the former (cf. *My child was sick/ healthy, Your bag was empty/ full, our door was open/ closed, this floor was wet/dry*, etc.), and *a lot* with the latter (including often life time effects, cf. *My dog was tall/ short/ fat/ thin, The table was heavy/ wide/ narrow, That sofa was ugly, Your mother was old.*, etc.)

However, here again, particular points in which, e.g., a table is widened or a rope shortens, may eliminate the life time effects. This is the case for individual-level predicate generally, thus, is not speaking against our particular thesis. It is always important to bear in mind that the stage individual distinction relates to properties that are relatively stable vs. relatively instable, not to properties that are completely so.

Then again, certain adjectives, truly violate the generalization whereby there is a connection between non-endurance of a property and its absoluteness; for example *opaque* and *transparent* are absolute adjectives (e.g. they licence maximizers and minimizers), but they seem to denote stable properties of their typical arguments:

(57) Absolute adjectives that do not license temporal adverbs of quantification

a. #Every time her glass is opaque, she can't see how much coffee is left

b. #Every time the window is transparent, I enjoy the view

c. #Her glass is rarely opaque

d. #Her vase is rarely transparent

Indeed, these adjectives are intuitively interpreted relative to an extensional category as a comparison. However, these categories differ from, e.g. categories exemplifying height regularities, in that they nonetheless highlight endpoints. Individuals exemplifying minimum and maximum opaqueness and transparency exist and are salient in many contexts. For that reason, by economy, the endpoints function as standards of membership, and the adjectives classify as absolute.

Is this type of adjectives indeed exceptional, as the analyses we propose in this section suggests? We wish to end this paper with a brief report of an experiment that addresses this question (Sassoon 2011).

3.3 Experimental results

Given our proposal, we predict that an absolute adjective will have a higher acceptability rating than a relative adjective in the context of modification by or embedding under stage-level markers such as *rarely* and *saw*. We also predict that an absolute adjective A will have higher acceptability ratings than a relative adjective B with either *completely* (if A is upper closed) or *slightly* (if A is lower closed), or both (if A is doubly closed). Thus, we predict that the maximum acceptability value within the two contexts (*completely* and *slightly*) will be higher for absolute adjectives than for relative ones. Last, but not least, we predict a significant correlation between acceptability ratings with *completely* and *slightly* and with *rarely* and *saw*; in particular we predict there to be a correlation between adjectives' maximum value in the two absoluteness conditions (*completely* and *slightly*), and their value in each of the two stage-individual conditions (*Rarely* and *saw*).

Sassoon's (2011) study focused on 30 adjectives that are prominent in the literature on relative and absolute adjectives. Twenty five participants were assigned to one of two counterbalanced lists of sentences with these adjectives, such as *my child is rarely sick/ tall; we also saw your child sick/ tall; our child is completely/ slightly/ extremely sick/ tall*, etc. The participants were asked to rate each sentence by placing a cross on a scaled line, from 1 (makes no sense) to 7 (makes perfect sense).

All of the above mentioned predictions were born out. In particular, felicity judgments of sentences with stage-level markers (*rarely* and *saw*) were significantly higher for the absolute than for the relative adjectives. Moreover, a significant positive correlation was found between the felicity of the given stage-level markers and absolute modifiers (*completely* and *slightly*), and a significant negative correlation was found between the felicity of the given stage-level markers and a relative

modifier (*extremely*).[19]

To further validate the generality of our hypotheses, these results have to be replicated with a randomly selected set of adjectives, as well as additional markers of the stage-individual distinction, and of the absolute-relative distinction. The questions can also be addressed by means of corpora studies of usage of stage-level modifiers with relative and absolute adjectives. At the same time, future investigation of 'exceptional' adjectives (such as *opaque* and *transparent*) is required to reveal the conditions under which a mismatch between stage-level and absoluteness occurs.

Additional experimental data by Foppolo & Panzeri (2011) support the view that absolute and relative adjectives alike are sensitive to context, as well as to value distributions within sets that go beyond the individuals in the immediate context. Also, the data supports sensitivity to different types of comparison classes.

For example, participants in Foppolo and Panzeri's experiment did not hand the bigger ant of two exceptionally big ants upon a request for *the big one*. We see that in this case size distribution among the extensional category of ants is relevant. In comparison with other concrete ants both of the presented ants are big, so the uniqueness requirement of the definite description is violated.

With respect to absolute adjectives, this experiment has found that differences exist depending on the object an adjective is predicated of. For example, as expected, subjects would call the straighter of two bent metal sticks *bent*, rather than *straight*, and subject would not hand it upon a request for *the straight one*. This finding is consistent with the view that the stick compares to how it can be, not to the second stick.

By contrast, subjects call the straighter of two bananas *straight*, and accordingly, hand it upon a request for *the straight one*. This piece of data is consistent with the view that, since bananas (unlike metal sticks) are permanently bent, straight is an individual level scalar property with respect to bananas. Thus, subjects compare to other bananas, and the given one is indeed relatively straight, perhaps even as straight as you ever get for an actual banana. This finding can also be explained by means of comparison with counterparts. However, tests of endurance of the property align with the first account, not its alternative. For example, the felicity of *this metal stick is rarely bent/ straight* contrasts with the oddness of *this banana is rarely bent/ straight*. This suggests a stage vs. individual level classification, respectively.

19 Supposing that the data is ordinal, it was analyzed using non parametric analyses of variance - the Mann–Whitney–Wilcoxon test and the Spearman rank-order correlation. After the application of a Bonferroni correction, all the results were significant with $p < 0.01$.

4 Conclusions

To conclude, we proposed that all gradable adjectives are interpreted relative to a comparison class (c.f. van Rooij to appear). We further argued that it is the nature of the comparison class that constitutes a core semantic difference between different subclasses of adjectives (c.f. Bierwisch 1989). We observed that counterpart comparison classes tend to be closed (include an endpoint), while extensional-category comparison classes tend to be open. We argued that, as a consequence of the workings of an economy principle (c.f. Kennedy 2007) the result is that counterpart comparison classes tend to yield absolute interpretations, while extensional-category comparison classes, tend to yield relative interpretations.

Moreover, we have moved away from the notion of semantically determined fixed scales (Kennedy 2007) and comparison classes (van Rooij to appear), suggesting instead that comparison classes are context dependent, but distinct for absolute and relative adjectives. The role of a comparison class is to highlight the degrees on an adjective's scale that are relevant for assigning truth conditions in a context.

The strength of an analysis with two types of context dependent comparison classes – counterpart set and extensional-category – is twofold.

Such an analysis captures context effects – in particular, standard-shift effects – in absolute adjectives, by means of the context sensitivity of their comparison class. At the same time, this analysis straightforwardly captures cases of apparent lack of context sensitivity in the interpretation of absolute adjectives, e.g., certain intuitive inference patterns, the non-licensing of extensional-category for-phrases, and the puzzle of the two glasses. These cases are explained by means of insensitivity to the extensional context, due to interpretation relative to a counterpart set. With respect to relative adjectives, the analysis renders unnecessary the stipulation of a necessarily lower-open semantic scale (Kennedy 2007), since midpoint standards are derived from the nature of the comparison classes. All considered, this analysis explains a large set of facts, which, to the best of our knowledge and understanding, is not captured as a whole by any previous analysis.

Furthermore, we have complemented this analysis of adjectives with an analysis of degree modifiers in terms of functions that either widen or restrict default adjectival comparison classes. Degree modification often strengthens the interpretation of total adjectives, but weakens the interpretation of partial adjectives (Unger 1975; Kennedy and McNally 2005). Since widening of comparison classes has precisely this effect on total and partial interpretations, it is a very useful means of accounting for the given inference patterns. Moreover, within an analysis of adjectives in terms of comparison classes, a Kleinean analysis of boosters can hold of both relative and absolute adjectives. We have highlighted some desirable results of this new possibility. In particular, it correctly predicts the fact that interpretations of absolute

adjectives modified by boosters are more vague and context dependent.[20]

Finally, we discussed the foundations of the proposed typology of comparison classes. We have shown that the distinction between stage-level and individual-level predicates gives rise to the two types of comparison class. Adjectival measurements that encode highly variable ('stage level') values of entities, give rise to an interpretation based on within-individual comparisons, namely an interpretation relative to a counterpart comparison class. By contrast adjectival measurements that encode relatively stable ('individual level') values of entities, give rise to an interpretation based on between-individual comparisons, namely an interpretation relative to an extensional category comparison class.

The analysis presented in this paper is directly amenable to experimental investigation. A preliminary study of prominent examples in the literature on absolute versus relative adjectives supports the hypothesized connection between stage vs. individual level properties and absolute vs. relative interpretations (Sassoon 2011). Future research should determine the generality of this correlation, by studying randomly selected examples of adjectives. Additional question for the future is whether there exist additional types of comparison classes, i.e. whether comparison classes of particular sub-classes of adjectives (for instance, epistemic modals, taste adjectives, and so on) exhibit special properties. Our understanding of gradable adjectives can considerably profit from such an investigation.

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20 A central theoretical question that arise is whether this analysis allows for the possibility of dispensing with degrees entirely, and doing everything with comparison classes of the relevant sort (a la Klein 1980 and more recently, van Rooij to appear). This paper presents the analysis in terms of a degree semantics, but this does not play a crucial role. In previous analyses of the absolute/relative distinction, which is based on scale-structure, a degree semantics is obviously crucial. If the same or better results can be obtained using comparison classes, then maybe we don't need degrees after all. While this could be a very significant result, we do not see how this analysis strengthens any one of the given approaches. Non-Degree approaches still need degrees for measure phrases and numerals. So the question is whether we want degrees also in other cases, such as the comparative and the positive form. One can capture many facts about the latter without degrees, but then one must assign two interpretations to, for instance, the comparative morpheme, one which involves no degrees, and one which does. The latter is required to account for measure phrase modification, as in, for example, "2 meters taller". For further discussion we refer the reader to van Rooij to appear.

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