‘Absolute’ Adjectives in Belief Contexts

Charlie Siu
hokinsiu@gmail.com

Abstract

It is a consequence of both Kennedy and McNally’s (2005) typology of the scale structures of gradable adjectives and Kennedy’s (2007) economy principle that an object is clean just in case its degree of cleanness is maximal. So they jointly predict that the sentence ‘Both towels are clean, but the red one is cleaner than the blue one’ (Rotstein and Winter 2004) is a contradiction. Surely, one can account for the sentence’s assertability by saying that the first instance of ‘clean’ is used loosely: Since ‘clean’ pragmatically conveys the property of being close to maximally clean rather than the property of being maximally clean, the sentence as a whole conveys a consistent proposition. I challenge this semantics-pragmatics package by considering the sentence ‘Mary believes that both towels are clean but that the red one is cleaner than the blue one’. We can certainly use this sentence to attribute a coherent belief to Mary: One of its readings says that she believes that the towels are clean by a contextually salient standard (e.g. the speaker’s); the other says that she believes that the towels are clean by her own standard. I argue that Kennedy’s semantics-pragmatics package can’t deliver those readings, and propose that we drop the economy principle and account for those readings semantically by assigning to the belief sentence two distinct truth conditions. I consider two ways to deliver those truth-conditions. The first one posits world-variables in the sentence’s logical form and analyzes those truth-conditions as resulting from two binding possibilities of those variables. The second one proposes that the threshold function introduced by the phonologically null morpheme *pos* is shiftable in belief contexts.

1 Introduction

Let us assume with Kennedy (2007) that every gradable adjective denotes a measure function that maps the objects in its domain onto a set of degrees that are ordered on a scale, and that every gradable adjective in its positive form is preceded by a phonologically null morpheme (*pos* for ‘positive form’) that converts that adjective’s measure function into a property of individuals.[1] This paper focuses on the question: When are the positive forms of *maximal standard gradable adjectives* (GA_{max}) — gradable adjectives whose scales have maximal endpoints (e.g. ‘flat’, ‘certain’, and ‘clean’)[2] — true of their arguments?

We can define two views on that question. According to the absolutist view, a GA_{max} (in its positive form) is true of its argument just in case its measure function maps that argument to the maximal endpoint of its scale:[3]

(1) **The absolutist analysis of GA_{max}:**
$[\![pos\ GA_{max}]\!]^c(a) = 1$ iff $[\![GA_{max}]\!]^c(a) = max([\![GA_{max}]\!])$,
where $max([\![GA_{max}]\!])$ is the maximal endpoint of the scale of GA_{max}

Since no ordinary objects have the properties expressed by GA_{max} to the maximal degree, this view entails that simple unnegated sentences containing GA_{max} (e.g. ‘my hands are clean’) are always false. To explain their assertability, this view weakens Grice’s maxim of Quality — which says that we are required to say what we believe to be true — into a principle that says that we are only required to say what we believe to be close enough to true.[4]

According to the relativist view, a GA_{max} (in its positive form) is true of its argument just in case its measure function maps that argument to a degree that is sufficiently close

[1] We are not going to discuss the Kleinian analyses (e.g. Klein 1980, Burnett 2014) on which the basic meaning of a gradable adjective is a property of individuals rather than a measure function.

[2] Here I deliberately depart from Syrett et al.’s (2009) usage of the same term, on which GA_{max} are so called because their contextual thresholds always coincide with their scales’ maximal endpoints.

[3] For variants of this view, see Unger (1975), Lasersohn (1999), Kennedy and McNally (2005), and Kennedy (2007).

[4] For a similar move, see Klecha (2018) who weakens Quality into a principle he calls *faithfulness*, which says, roughly, that the difference between semantic content and pragmatically conveyed content should be negligible.

to the maximal endpoint of its scale, and what counts as sufficiently close varies from context to context:[5]

(2) **The relativist analysis of GA$_{max}$**:
$[\![pos\ \text{GA}_{max}]\!]^c(a) = 1$ iff $[\![\text{GA}_{max}]\!]^c(a) \approx_c max([\![\text{GA}_{max}]\!])$,
where '$x \approx_c y$' reads: x counts as sufficient close to y in context c

Since predicating a GA$_{max}$ of its argument only requires that argument to have the property expressed by that GA$_{max}$ to a sufficiently high (but possibly non-maximal) degree, this view holds that simple unnegated sentences containing GA$_{max}$ can be true, and so no departure from Quality is needed to explain their assertability.

In this paper, I defend a relativist-friendly modification to Kennedy's (2007) account of gradable adjectives, which happens to fall in the absolutist's camp. I will focus on the first example below, given by Rotstein and Winter (2004), and the result of embedding it inside belief contexts:

(3) Both towels are clean, but the red one is cleaner than the blue one.

(4) Mary believes that both towels are clean but that the red one is cleaner than the blue one.

Here is why (3) and (4) are interesting. It follows from the absolutist analysis that (3) is a contradiction because both towels must have the maximal degree of cleanness in order to be clean, but if so, the red one can't have a higher degree of cleanness than the blue one. Of course, the absolutist need not be deterred by this result because they could say that the sentence, while false, is close enough to true to be assertable. This is where (4) comes in. While it can be read as an attribution of a contradictory belief to Mary, it has two readings on which it attributes a coherent belief to her: The first attributes to her a belief whose content is based on a contextually salient standard of cleanness, such as the speaker's; the second attributes to her a belief whose content is based on her own standard of cleanness, which the speaker may not know.

These two readings, which I call the *public-standard reading* and *private-standard reading*, pose a challenge to the absolutist: If the semantic content of (3) (hereafter *the clean-cleaner sentence*) is always a contradiction, then the absolutist can't account for those readings by assigning two distinct truth conditions to (4) (hereafter *the clean-cleaner belief sentence*). It appears that their only options are the pragmatic ones, such as appealing to Lasersohn's (1999) theory of loose talk. But I argue that the pragmatic options are unlikely to work. Ultimately, I will propose that we drop the economy principle (to be discussed), which is responsible for the absolutist commitment of Kennedy's account of gradable adjectives. The major benefit of my proposal is that, since it does not hold that the clean-cleaner sentence always expresses a contradiction, it can straightforwardly account for the coherent-belief readings of the clean-cleaner belief sentence by assigning to it two distinct truth conditions.

I will provide two analyses that can plausibly generate those truth conditions (but leave the task of choosing between them to future research). Let me sketch those analyses here before we discuss them in more detail below. On both of them, the public-private ambiguity is traced to the pos-morpheme preceding the instance of 'clean' in the first conjunct of the embedded clean-cleaner sentence — that is, not to the comparative instance of 'clean' in the second conjunct of the embedded sentence. So, for simplicity, let's focus on the belief sentence below:

(S$_{Porky}$) Mary believes (that) Porky (is) *pos* clean

The first analysis posits world arguments in both the adjective 'clean' and the pos-morpheme so that both the measure function (contributed by the adjective) and the threshold (contributed by the pos-morpheme) can vary from world to world. This analysis delivers the public-standard reading of S$_{Porky}$ by having the world-variable at the pos-morpheme bound 'long distance' by a variable binder on top of that sentence, and delivers the private-standard reading of S$_{Porky}$ by having the world-variable at the pos-morpheme bound locally by a variable binder on top of the embedded sentence (i.e. Porky is clean). More concretely, it assigns the following structures and truth-conditions to S$_{Porky}$ (Note: The meaning of 'believe' asks for three inputs: a world, a proposition, and an individual; $\boldsymbol{s}^c_{clean}$ is a threshold function, given by context c, that maps a world to the threshold degree for

[5]For views in this neighborhood, see Lewis (1979), McNally (2011), Sassoon and Toledo (2011, 2011). But note that none of these accounts explicitly require that the argument of a GA$_{max}$ has the property expressed by that adjective to a near-maximal degree.

'clean' at that world; g is a variable assignment function that maps a world-variable to a world and an individual-variable to an individual):

(5) Public-standard reading:

a. LF1: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos_{w_0} clean$_{w_1}$]

b. $[\![\text{LF1}]\!]^{c,g} = \lambda w_0.\ \textbf{believes}(w_0, \lambda u.\,\textbf{clean}(\textbf{p})(u) \geq \textbf{s}^c_{clean}(w_0), \textbf{m})$

(6) Private-standard reading:

a. LF2: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos_{w_1} clean$_{w_1}$]

b. $[\![\text{LF2}]\!]^{c,g} = \lambda w_0.\ \textbf{believes}(w_0, \lambda u.\,\textbf{clean}(\textbf{p})(u) \geq \textbf{s}^c_{clean}(u), \textbf{m})$

The second analysis is mainly motivated by the concern that, on the private-standard reading, the clean-threshold(s) in the worlds compatible with Mary's beliefs should be entirely determined by her own doxastic state, rather than partially by the context via the threshold function $\textbf{s}^c_{\textbf{clean}}$ as on (6-b). To address this concern, the second analysis represents Mary's doxastic state with a set of centered worlds each of which contains (at least) a world and a threshold function, and accounts for the public-private ambiguity by introducing an optional 'monstrous' operation, such that when that operation is not turned on, the threshold function(s) is fixed by the context (resulting the public-standard reading), and when that operation is turned on, the threshold function(s) is fixed by the centered worlds compatible with Mary's beliefs (resulting the private-standard reading).

Our discussion below is structured as follows. In the next section (§2), I review Kennedy's account of gradable adjectives, trace its absolutist commitment to the economy principle, and examine some data that purport to support the truth conditions determined by the principle. After that, I distinguish between the public-standard reading and the private-standard reading of the clean-cleaner belief sentence, and present my objection to the absolutist (§3). Since Lasersohn's theory is probably the most sophisticated theory of the pragmatics of loose talk, I will then discuss why the absolutist can't account for the two coherent-belief readings of the clean-cleaner belief sentence by using his theory (§4). After that, I consider Sassoon and Toledo's (2011, 2011) account of GA$_{max}$ (§5). Their account is of particular interest because it has the potential to salvage a weakened version of the absolutist analysis, as well as to deliver the coherent-belief readings of the clean-cleaner belief sentence. The problems with Lasersohn's and Sassoon and Toledo's accounts inform my proposal (§6-8): §6 proposes how the contextual thresholds for GA$_{max}$ are determined (if not by the economy principle); §7-8 present the two analyses of the private-public ambiguity we sketched above. §9 concludes.

2 Kennedy on Gradable Adjectives and Interpretive Economy

Kennedy (2007) proposes that the meaning of a gradable adjective is a measure function that maps the objects in its domain onto a set of degrees that are ordered on a scale along a certain dimension, such as height and cleanness. For example, the meaning of 'tall' is a function that maps Porky and Esther to their heights on the tall scale. This meaning straightforwardly accounts for the truth conditions of the comparative form, such as 'Porky is taller than Esther': The sentence is true just in case Porky's height is higher than Esther's height.

According to Kennedy and McNally (2005), there are four types of adjectival scales. As we can see below, their classification is supported by the distributions of the modifiers 'slightly' and 'perfectly'. We should also notice that GA$_{max}$ (e.g. 'clean') have the second scale structure below:

(7) a. Totally open-scales ( ) :
{??slightly, ??perfectly} tall/ short, expensive/ inexpensive

b. Partially-closed scales with maximal endpoints ( ] :
{??slightly, ✓perfectly} flat, clean, dry, certain

c. Partially-closed scales with minimal endpoints [ ) :
{✓slightly, ??perfectly} bumpy, dirty, wet, uncertain

d. Totally-closed scales [ ] :
{✓slightly, ✓perfectly} transparent/ opaque

Since no theory of gradable adjectives is complete without an account of the truth conditions of the positive form, such as 'Porky is tall', crucial to Kennedy's theory is his account of how the four scale structures above determine the truth conditions of the positive form. There are two elements in his account. The first element is a mechanism that converts the measure function denoted by a gradable adjective into that adjective's positive-form meaning, which is a set. Kennedy posits a phonologically null morpheme (*pos*) whose meaning maps the measure function denoted by an adjective to that adjective's positive-form meaning. The key idea behind this conversion strategy is that the pos-morpheme introduces a contextual threshold, such that if an object's degree (e.g. its degree of tallness) measured by a certain gradable adjective (e.g. 'tall') is at least as high as that threshold, that object falls into the set denoted by the positive form of that adjective. Shown below is how the meaning of the pos-morpheme converts the measure function of 'tall' into that adjective's positive-form meaning:

(8) a. $[\![\text{tall}]\!] = \lambda x.\, \textbf{tall}(x)$, where $\textbf{tall}(x)$ is x's degree of tallness.
b. $[\![\textit{pos}]\!] = \lambda g_{\langle e,d\rangle}.\, \lambda x.\, g(x) \geq \boldsymbol{s}(g)$, where $\boldsymbol{s}$ is a contextually given function that maps a gradable adjective g to its contextual threshold $\boldsymbol{s}(g)$.
c. $[\![\textit{pos}]\!]([\![\text{tall}]\!]) = \lambda x. \textbf{tall}(x) \geq \boldsymbol{s}([\![\text{tall}]\!])$
[(a) & (b), Function Application]

As we can see in (8-b), the pos-morpheme introduces a contextually given function $\boldsymbol{s}$ that maps a gradable adjective g to its contextual threshold $\boldsymbol{s}(g)$. A natural question can be raised about how that function is chosen. The answer Kennedy proposes is that it is chosen in such a way that the objects of which a gradable adjective (in its positive form) is true 'stand out' (against the objects of which that adjective is false) in terms of the degree to which they have the property measured by that adjective (2007, p.17).[6]

Kennedy does not intend this to be the complete answer for adjectives with closed scales (e.g. 'clean', 'full') because if no additional constraints are put on the contextual threshold for 'full', then even a half-full bus can stand out in terms of its fullness when the contextual threshold is low enough — and a similar worry applies to adjectives with totally closed scales (e.g. transparent).[7] So Kennedy proposes additional constraints on the contextual thresholds for adjectives with closed scales. Those constraints and Kennedy's reduction of them to a single constraint constitute the second element of his account of the positive form.

The constraints Kennedy proposes are as follows: The contextual threshold for an adjective whose scale has a maximal endpoint (e.g. 'clean', 'full', 'transparent') is always the scale's maximal endpoint. And the contextual threshold for an adjective whose scale has a minimal endpoint (e.g. 'dirty', 'transparent') is always the degree that is minimally above the scale's minimal endpoint — call that degree *the least non-zero degree*.[8] These constraints are supposed to apply simultaneously to adjectives with totally closed scales (e.g. transparent) so that their contextual thresholds can be either their scales' maximal endpoints or their scales' least non-zero degrees. The following is the resulting truth conditions for adjectives with closed scales:

(9) a. Partially-closed scales with maximal endpoints ( ]
(e.g. flat, clean, dry, certain):
$pos(g)(x) = 1$ iff $g(x) = max(g) = \boldsymbol{s}(g)$,
where $pos(g)$ is the positive-form meaning of the adjective g, $max(g)$ is the maximal endpoint of the scale of g, and $\boldsymbol{s}(g)$ is the contextual threshold of g.
b. Partially-closed scales with minimal endpoints [ )
(e.g. bumpy, dirty, wet, uncertain):
$pos(g)(x) = 1$ iff $g(x) \geq \boldsymbol{s}(g) >_{min} min(g)$,
where $min(g)$ is the minimal endpoint of the scale of g, and '$x >_{min} y$' reads: x is minimally above y.
c. Totally-closed scales [ ]
(e.g. transparent, opaque):
$pos(g)(x) = 1$ iff $g(x) = max(g) = \boldsymbol{s}(g)$ or $g(x) \geq \boldsymbol{s}(g) >_{min} min(g)$

Since the truth conditions of these adjectives are always based either on their scales' maximal endpoints or least non-zero degrees, Kennedy calls them *absolute adjectives*. Kennedy distinguishes them from adjectives with open scales (e.g. 'tall') whose contextual thresholds can be anywhere along their scales — he calls those adjectives *relative adjectives*. But

[6] One of the motivations for the notion of *standing out* is to explain the *crisp judgment* effect, where 'the positive form cannot be felicitously used to distinguish between two objects that differ only very slightly in some gradable property' (Kennedy 2007, p.19).

[7] Kennedy (2007, pp.21-22) suggests that additional constraints are needed on the contextual thresholds for minimal standard closed-scale adjectives as well. According to him, 'The gold is impure' never requires the gold to have a degree of impurity that is higher than the least non-zero degree on the impure-scale; it only requires the gold's degree of impurity to be non-zero. See §6 for more discussion on this issue.

[8] See Kennedy (2007, p.26, example 43).

since what is at issue in this paper is whether adjectives with closed scales are absolute, we will use the more theory-neutral terms of *closed-scale adjectives* and *open-scale adjectives* in place of 'absolute adjectives' and 'relative adjectives'. We'll call closed-scale adjectives with minimal endpoints (e.g. 'dirty') *minimal standard gradable adjectives* (GA_{min}), and closed-scale adjectives with both minimal endpoints and maximal endpoints (e.g. transparent) *minimal/ maximal standard gradable adjectives* ($GA_{min/max}$).

Kennedy argues that the truth conditions of closed-scale adjectives (stated in (9)) follow from a more general principle about semantic processing, which says that participants in a discourse ought to maximize the role of the conventional meanings of the words in the sentences they use, and minimize the role of the context in computing the truth conditions of their sentences. Here is Kennedy's statement of the principle:

(10) **The Economy Principle:**
Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions. (Kennedy 2007, p.36)

At first glance, there seems to be a gap between the principle and the truth conditions of closed-scale adjectives. The conventional meanings of those adjectives are most plausibly the measure functions (and the scale structures) they encode. And the conventional meaning of *pos*, as we saw in (8-b), is only responsible for converting a measure function into a set whose membership depends on the contextually given threshold function. The crucial issue here is whether those conventional meanings ensure that when the scale of an adjective is closed, the threshold function is chosen in such a way that the resulting contextual threshold coincides with that scale's maximal endpoint (that scale's least non-zero degree) so that we obtain the truth conditions in (9). But the conventional meanings of closed-scale adjectives and of *pos* seem silent on how the threshold function should be chosen: Given that both the maximal endpoint and the least non-zero degree are points on their scales just like other degrees on their scales, it is not clear why the conventional meanings of closed-scale adjectives and of *pos* should privilege those degrees.

Perhaps some elaboration on the idea that those degrees are natural thresholds on their scales (which Kennedy calls 'natural transitions') can explain those degrees' privileged status.[9] Perhaps not. For the sake of streamlining our discussion, let's assume that the apparent gap between the economy principle and the truth conditions stated in (9) is easily bridgeable. Let's call those truth conditions *economy truth-conditions* for 'the truth conditions of closed-scale adjectives determined by the economy principle'.

Before we continue, let's make explicit why Kennedy's theory falls into the absolutist's camp: Based on Kennedy and McNally's (2005) typology, GA_{max} (e.g. 'clean') encode scales that have maximal endpoints. Although their conventional meanings (and the conventional meaning of *pos*) leave their contextual thresholds open, the economy principle guarantees that their contextual thresholds coincide with their scales' maximal endpoints so that they (in their positive forms) are true of their arguments just in case those arguments possess the properties they express to the maximal degree. This just is the absolutist analysis.

In the rest of this section, we examine some data that purport to support the economy truth-conditions.

Syrett et al. (2009) have found that, when presented with a request like the following sentence and two objects with different lengths, which have been judged to be either both long or both not long in an independent task, their adult subjects systematically interpret it as a felicitous request for the longer of the two objects.

(11) Please give me the long one.

But when the subjects are presented with a request like the following sentence and two partially-filled jars, they find the request infelicitous. They only accept the request when one jar is full and the other is about 2/3 full.

(12) Please give me the full one.

These findings appear to support the economy truth-conditions: Since the economy principle favors a maximal-standard interpretation for 'full' but puts no constraints on the contextual threshold for the open-scale adjective 'long', the subjects were unwilling to shift the contextual threshold for 'full' to the degree that marks 2/3 full, but willing to shift the contextual threshold for 'long' so that the description 'the long one' is true of

[9] Based on the idea that those degrees mark certain 'natural transitions' on their scales, Kennedy argues that those two degrees are in fact privileged by the conventional meanings of closed-scale adjectives. See Kennedy (2007, pp.31-32, p.37) for his argument, which I do not attempt to reconstruct here.

only one of the test items.

However, these findings aren't conclusive. Syrett et al. (2009, p.27) acknowledge the possibility that, had the fuller jar been closer to full without being noticeably full, the subjects would have been willing to adopt a non-maximal contextual threshold. Of course, this possibility is consistent with the economy truth conditions because the subjects' willingness to adopt a non-maximal contextual threshold can be explained in terms of the pragmatics of loose talk (Lasersohn 1999; to be discussed). But their acknowledgment suggests an alternative interpretation of their findings: Contrary to what the economy principle predicts, the contextual thresholds of GA_{max} do shift, but their shifts are more restricted than those of the contextual thresholds of open-scale adjectives.

We turn now to some (in)consistency claims that purport to support the economy truth-conditions. The following is predicted by the economy principle because if the glass is full, it is maximally full and cannot be fuller, and if the countertop is less dry than the floor, then it isn't maximally dry and is hence not dry:

(13) #My glass is FULL, but it could be fuller. (Kennedy 2007, 45a)

(14) a. The floor is drier than the countertop. (Kennedy 2007, 50a) $\vDash$
b. The countertop is not dry. (Kennedy 2007, 50b)

However, these patterns don't seem to hold generally. Rotstein and Winter's clean-cleaner sentence is a clear counterexample to both: The already clean blue towel could be cleaner; although the red towel is cleaner than the blue towel, the blue towel is clean. Other counterexamples include rice bowls, which are conventionally regarded as full if they are filled roughly up to the rims, but which can certainly be fuller, thanks to the stickiness of rice.[10][11]

The following entailment claim has also been said to lend support to the economy truth-conditions:

(15) The table is not wet $\vDash$ The table is dry. (Kennedy 2007, 47b)

This is why those truth conditions predict this entailment. 'Dry' and 'wet' share the same partially-closed scale, with the maximal endpoint of the dry-scale being identical to the minimal endpoint of the wet-scale. So if the table is not wet, its degree of wetness must coincide with the minimal endpoint of the wet-scale (identical to the maximal endpoint of the dry-scale), which means that it is dry. However, our judgment about this entailment may vary with the object referred to in the example and the context. For example, Rotstein and Winter (2004, p.265) observe that: 'in some contexts a moist towel may be deemed neither wet nor dry'. Similarly, a rag we use for general cleaning may be considered neither dirty nor clean. So this entailment doesn't seem to hold generally.

We have reviewed Kennedy's account of gradable adjectives, traced its absolutist commitment to the economy principle, and examined the extent to which the truth conditions determined by the principle are supported by experimental and linguistic evidence. We now proceed to our objection to the absolutist analysis.

3 A Challenge to the Absolutist

The absolutist analysis tends to go hand in hand with the pragmatics of loose talk because the latter fends off apparent counterexamples to the former. For example, as we just mentioned, Syrett et al. (2009, pp.28-29) explain the possibility that their adult subjects are willing to adopt a non-maximal interpretation for 'full' by suggesting that while the adjective's actual denotation is false of the fuller jar, the subjects assign to the adjective an alternative denotation, close enough to its actual denotation, that is true of the fuller jar. Kennedy and McNally (2005) give a similar explanation for the assertability of the following sentences:

(16) a. The gas tank is full, but you can still top it off. It's not completely full yet. (Kennedy and McNally 2005, 33b)
b. (There are a few people in a theatre with a lot of empty seats) The theatre is empty tonight. (Kennedy and McNally 2005, 33c)

[10] See also McNally's (2011) example of wine glasses: Wine glasses are said to be full when they are filled up to the fill-line, but they can be fuller.

[11] One may attempt to block these counterexamples by placing focal stress on the adjectives in their positive form because, as Kennedy (2007) and Unger (1975) observe, focal stress blocks the imprecise (loose) interpretations of the adjectives. However, since we can't antecedently assume that the blocked imprecise interpretations are not among the possible semantic contents of the adjectives, we can't restrict the data to sentences with focal stress placed on the adjectives in their positive form.

They suggest that although both sentences are false,[12] they are assertable because they are 'close enough to true'.

But I argue that these false-but-true-enough style explanations are unattractive and can't be relied upon to fend off counterexamples to the absolutist analysis. Consider the clean-cleaner sentence and the clean-cleaner belief sentence, which I repeat here:

(17) Both towels are clean, but the red one is cleaner than the blue one.[13]

(18) Mary believes that both towels are clean but that the red one is cleaner than the blue one.

The absolutist analysis predicts that (17) is a contradiction because since both towels must have the maximal degree of cleanness in order to be clean, the red one can't have a higher degree of cleanness than the blue one. It is true that the absolutist could say that (17) is again false but close enough to true. But notice that the result of embedding (17) in a belief context, such as (18), can be used to attribute coherent beliefs to a belief subject, and it has two coherent-belief readings (besides its contradictory-belief reading). The problem with the false-but-true-enough style explanation is that it can't account for both readings, or so I argue.

Let's distinguish between the two coherent-belief readings with the following scenarios:

(19) Mary and I are employees of a towel cleaning company where a towel counts as clean if it has been boiled and disinfected 5 times, and the cleaner a towel is the more we charge our customers for cleaning it. Mary mistakenly believes that she has cleaned the red towel 6 times and the blue towel 5 times, while in fact she has only cleaned each towel 4 times. Acting on her false belief, she tells her customer that the towels are ready for pick-up, and that she will charge him more for cleaning the red one than for cleaning the blue one. If asked by my boss why Mary acted the way she did, I could respond: She believes that both towels are clean and that the red one is cleaner. My response is apt because it conveys that Mary believes that both towels are clean by the company's (or my boss's) standard. Notice that Mary's own standard of cleanness is irrelevant to the truth value of my utterance because my utterance would still be true if Mary's own standard of cleanness were a lot higher than the company's and my boss's.

(20) Mary is absent from work today. On the TV, we see her cleaning a pig's face with the blue towel but save the red towel for herself. Mary is an animal lover, so we know that she would not have used the blue towel on the pig unless she thinks that it is clean. So the reason for her behavior must be that while she thinks that both towels are clean, she wants to save the cleaner towel for herself. I can convey this explanation by uttering (18). Unlike in the last scenario, Mary's own standard of cleanness is relevant to the truth value of my utterance because my utterance of (18) is likely to be judged false if Mary says that she doesn't really find the blue towel clean. But notice that while Mary's own standard of cleanness is relevant to the truth value (18), my utterance of (18) is acceptable even if I don't know how high that standard is.

These two readings, which I call the public-standard reading and the private-standard reading, concern how the positive forms of gradable adjectives are interpreted when they are embedded under belief contexts. While my argument focuses on GA_{max} (e.g. 'clean'), other closed-scale adjectives (e.g. 'dirty') and open-scale adjectives (e.g. tall) display the same ambiguity when they are embedded under belief contexts. For example, suppose Mary has a highly inflated standard of tallness, but she mistakenly believes that the 6'9 tall Isaiah Thomas is 6'11. Suppose as well that we are trying to look for some tall people to join our basketball team, and that 6'10 or above is tall enough for us. Since Mary believes that Isaiah is 6'11, she recommends him to us. Among ourselves, we can explain Mary's mistake by uttering 'she mistakenly believes that Isaiah is tall', even though Mary may not think to herself that Isaiah is tall. This is the public-standard reading. To get the private-standard reading, we can imagine that Mary is a very competitive person who only plays basketball with people she finds tall, and that we see from afar that she is playing basketball with someone. I can explain Mary's behavior by uttering 'she must believe that that person is tall'. The relevant standard of tallness here must be Mary's own

[12] Notice that the absolutist analysis predicts (16-a) to be not only false but also contradictory like the clean-cleaner sentence.

[13] Another example: "Andy and Baldy are definitely bald, but Andy is slightly balder by just a single hair." (Hu 2015; slightly modified).

— rather than mine or my hearer's — or I fail to explain why she is playing basketball with that person.

My hunch is that we should account for this ambiguity semantically by assigning to the belief sentences two distinct truth conditions. (We'll consider two ways to do so in §7-8.) But the absolutist can't apply this strategy to the clean-cleaner belief sentence because they are already committed to that sentence being a contradiction — and obviously we can't derive from a contradiction two distinct truth-conditions. So it seems they are only left with the pragmatic options. But I am going to show that those options are unattractive by focusing on Lasersohn's theory of pragmatic halos.

4 Pragmatic Halos

One of the goals of Lasersohn's theory is to make precise how some sentences (e.g. My hands are clean) can be false but 'close enough to true'.[14] It achieves that goal by (i) assigning to every expression both a regular (semantic) value and a *pragmatic halo* — a set of values that are of the same type as that expression's regular value but differs from it in 'pragmatically ignorable' ways; (ii) making every sentence's regular value and (pragmatic) halo compositionally derivable from the regular values and the halos of that sentence's parts; and (iii) defining a sentence that is false but close enough to true to be one that has a false regular value and a halo that contains a true value. (We'll call the values in a pragmatic halo *halo values*.)

Let's make explicit how Lasersohn's theory works by focusing on the following simple sentence:

(21) Porky (is) clean

We'll make the simplifying assumption that gradable adjectives denote properties of individuals (rather than measure functions)[15] and ignore intensionality for the moment. Let's suppose given the goals of our conversation, we find the difference between the property of being maximally clean, **clean**, and the property of being close to maximally clean, $\textbf{clean}_{\downarrow}$, to be pragmatically ignorable. The adjective 'clean', then, has the regular value **clean** and the pragmatic halo $\{\textbf{clean}, ..., \textbf{clean}_{\downarrow}\}$. Since we probably can't use the proper name 'Porky' loosely, 'Porky' has, as both its regular value and its only halo value, Porky himself (**p**). To obtain the regular value of (21) (which is the truth value TRUE if Porky is maximally clean and FALSE otherwise), we combine the regular values of 'Porky' and of 'clean'. To obtain the halo of (21), we apply each halo value of '(is) clean' to the halo value of 'Porky' and collect the results in a set.[16] (That set, in this case, is the set of truth values $\{\textbf{clean}(\textbf{p}), ..., \textbf{clean}_{\downarrow}(\textbf{p})\}$.) We say that (21) is true just in case its regular value is TRUE, and it is close enough to true just in case one of its halo values is TRUE.

Since the meaning of 'believe' is a relation between an individual and a proposition (rather than a relation between an individual an a truth value), before we consider whether the absolutist can use Lasersohn's theory to give a pragmatic explanation for the two coherent-belief readings of the clean-cleaner belief sentence, we need to upgrade sentences' regular values and halo values into intensions. Here is how we are going to do so:

Step 1: We'll continue to assume that the regular value (halo value) of a proper name is an individual (singleton of individual), but we'll upgrade other expressions' regular values and halo values into intensions. So, for example, the regular value of 'clean' is now a function from worlds to properties of individuals:

(22) $[\![\text{clean}]\!] =$
$\lambda w.\, \lambda x.\, \textbf{clean}(x)(w)$, which, for the absolutist, is identical to:
$\lambda w.\, \lambda x.\, x$ is maximally clean in w

And the pragmatic halo of 'clean' is a set of values that are of the same type as (22) but differs from it in pragmatically ignorable ways. Thanks to these upgrades, the regular value of 'Porky (is) clean' is now the proposition that Porky is maximally clean, **clean(p)** (i.e. the function that maps a world to TRUE just in case Porky is maximally clean in that world), and its halo is a set that contains **clean(p)** and may contain the propositions

[14] Another is to make precise the semantics and the pragmatics of slack regulators, such as 'perfectly' and 'exactly'. But the topic of slack regulation is beyond the scope of our discussion.

[15] This assumption is made because it simplifies the combinatorics and it avoids a potentially lengthy discussion on whether the pos-morpheme or the adjective 'clean' has a non-singleton pragmatic halo (or both).

[16] The computation of a complex expression's pragmatic halo is analogous to the computation of focus values (Rooth 1985).

that differ from **clean(p)** in pragmatically ignorable ways (i.e. the propositions that are composed out of Porky (**p**) and the halo values of 'clean' that differ from **clean** in pragmatically ignorable ways).

Step 2: Since the pragmatic halos of sentences are now sets of propositions (rather than sets of truth values), we need to modify the criteria for truth and for 'close enough to true' accordingly:

(23) **Revised criteria for truth and for 'close enough to true':**
A sentence is true in the context in which it is uttered if its regular value is true at the world of that context,[17] and it is close enough to true in that context if one of its halo values is true at the world of that context.

Step 3: We'll make two simplifying assumptions: First, we assume that only the positive form of 'clean' can have more than one halo values. That is, we assume that the halo of 'cleaner' does not expand together with that of 'clean'. (This assumption is analogous to the fact that while the threshold for the tall scale can vary across contexts, the tall scale/ the tall measure function itself is context-invariant.) Second, we assume that the meaning of 'believe' is as follows:

(24) $[\![\text{believe}]\!] = \lambda w.\lambda p_{\langle s,t\rangle}.\lambda x.\forall w'[w'R(x)(w) \rightarrow p(w') = 1]$, where '$w'R(x)(w)$' reads: w' is a logically possible world compatible with the beliefs x has at world w.

Notice that if we assume that the world variables in the metalanguage range over logically possible worlds only, whenever **believe** holds between a world, a proposition, and an individual, that proposition must be logically consistent.[18]

With these technicalities taken care of, I argue that while the absolutist might be able to use Lasersohn's theory to account for the public-standard reading of the clean-cleaner belief sentence, they can't use it to account for that sentence's private-standard reading in a satisfactory way.

Let's begin with that sentence's public-standard reading. Suppose we utter that sentence in the context described in (19), intending the public-standard reading. Suppose, as well, that $\textbf{clean}_{\downarrow}$ is the loose meaning of 'clean' that corresponds to our company's (or our boss's) standard, and that Mary does mistakenly believe that the towels are clean by our company's standard and that the red one is cleaner. Let's assume for the sake of argument that we find the difference between the property of being maximally clean, **clean**, and $\textbf{clean}_{\downarrow}$ to be pragmatically ignorable.[19] Since the regular value of the embedded clean-cleaner sentence is a contradictory proposition, which we denote as $\perp$, the regular value of the belief sentence is **believe**($\perp$)(**m**), and so the belief sentence is false in our context, contrary to intuition. But the belief sentence is close enough to true in our context because the proposition based on $\textbf{clean}_{\downarrow}$ — i.e. **believe**...($\textbf{clean}_{\downarrow}$)...(**m**) — is a member of the halo of the belief sentence, and that proposition is true at the world of our context. Since the belief sentence has a close-to-truth value (i.e. not its regular truth value) that is intuitively correct, the absolutist can reasonably argue that its intuitive truth-conditions are encoded by its halo values (though not by its regular values).

We turn now to the private-standard reading of the belief sentence. Suppose we utter that sentence in the context described in (20), intending the private-standard reading. We know that the sentence has, as its regular value, **believe**($\perp$)(**m**), and so it is again false in our context. Can the absolutist argue that the intuitive truth-conditions of the belief sentence are encoded by its halo values?

To focus on the worry that I think is most troubling for the absolutist, let us assume that the intuitive truth-conditions of the belief sentence are indeed encoded by its halos values. That is, we assume that Mary has in mind a single standard of cleanness;[20] that

[17]Here I assume that there is a one-to-one correspondence between contexts of utterance and formal (Kaplanian) contexts, each of which is a n-tuple containing at least a world coordinate.

[18]Admittedly, one may object that **believe** as defined in (24) isn't the 'real' meaning of 'believe' because we can truly report someone as having a contradictory belief. In response, if we want to account for the contradictory-belief reading of the clean-cleaner sentence, we do need to introduce a meaning of 'believe' that allows a subject to believe contradictions. But doing so will get us into the difficult topic of impossible worlds (Hintikka 1979, Halpern and Pucella 2007, Nolan 2013), which goes beyond the scope of this paper. Since we are primarily interested in the coherent-belief readings of the clean-cleaner sentence, and since, as far as I can see, the 'real' meaning of 'believe' won't help the absolutist/ halo theorist answer our challenge (§3), I think we can be contented with using **believe** as defined in (24).

[19]Since the goal of our uttering the belief sentence is to attribute a coherent-belief to Mary rather than to attribute a contradictory belief to her or to make the contradictory claim that Mary consistently believes a contradiction, it is not so clear that we must find the difference between **clean** and $\textbf{clean}_{\downarrow}$ to be pragmatically ignorable.

[20]If Mary is undecided between multiples standard of cleanness, the halo theorist may have to assign multiple

the loose meaning **clean**$_{?\%}$ corresponds to Mary's standard; and that — perhaps due to Mary's salience — the halo of 'clean' just is {**clean**, ..., **clean**$_{?\%}$} and so it tracks Mary's standard.

My worry is that even if the intuitive truth-conditions of the belief sentence are encoded by its halos values, if we are ignorant of Mary's standard (which we can be when we assert the private-standard reading), we cannot know that our utterance of that sentence conveys such truth-conditions, and so it is difficult to see how we can rationally intend to speak both truly and informatively (i.e. not unduly uninformatively) by uttering that sentence, which we clearly can.

Let me elaborate. It seems reasonable to assume that we can rationally intend to speak truthfully and informatively by uttering the belief sentence (and intending the private-standard reading). To make sure that this assumption is not overly demanding for the absolutist (who holds that the belief sentence is false),[21] let us assume that we can speak truthfully and informatively by uttering the belief sentence so long as it is close enough to true. Now, recall from §3 that a defining feature of the private-standard reading is that we need not know what Mary's standard of cleanness is. The problem for the absolutist is that if we don't know what Mary's standard is, there is no guarantee that we can speak truly and informatively by uttering the belief sentence because we don't know how much slack we should give to the meaning of 'clean': If there is too little slack, our belief sentence conveys (via its halo values) a false proposition; but if there is too much slack, our belief sentence conveys (via its halo values) a proposition that is weaker than the proposition based on **clean**$_{?\%}$.

Because of this worry, I think that the absolutist who endorses the pragmatic halo theory at least fails to account for the private-standard reading satisfactorily. While I can't consider every possible pragmatic option available to the absolutist, I hope our discussion on the halo theory helps us see that the pragmatic, false-but-true-enough style explanations cannot be easily extended to account for the intuitive truth-conditions of GA_{max} in belief contexts. With this in mind, we turn now to a semantic option, due to Sassoon and Toledo (2011, 2011), which weakens the absolutist analysis, but which has better potential to account for the intuitive truth-conditions of GA_{max} in belief contexts.

5 Local Absolutism and Granularity Shifts

Sassoon and Toledo are well aware of the challenge Rotstein and Winter's clean-cleaner sentence poses to the absolutist: They share Rotstein and Winter's judgment that the clean-cleaner sentence is perfectly natural.[22] They also argue using the following examples that the absolutist analysis of GA_{max} is problematic:[23]

(25) a. This kitchen knife is clean. (Cruse 1980)
b. This surgical instrument is clean. (Cruse 1980)

According to their judgment, the standard of cleanness relevant to the interpretation of (25-a) is lower than that of (25-b), which is impossible if the contextual threshold for 'clean' is always maximal.

To account for these data and a host of other phenomena,[24] they propose that the contextual thresholds for GA_{max} do shift across contexts, but that they shift in a way that respects the absolutist's intuition that every GA_{max} (in its positive form) requires its argument to have the property it expresses to the maximal degree. Their account is highly relevant to our challenge to the absolutist because it has the potential to salvage a weakened version of the absolutist analysis, as well as to deliver the coherent-belief readings of the clean-cleaner belief sentence. So before I propose my relativist-friendly

halos to 'clean'. But this move is likely to complicate their theory considerably.

[21] Recall that Mary in scenarios (19) and (20) doesn't have a contradictory belief.

[22] See Toledo and Sassoon (2011, pp.139-140). But they note that, if we reserve the order of the conjuncts in the clean-cleaner sentence, that sentence becomes infelicitous. They account for that fact by using the idea of granularity shifts, and the idea, which they attribute to Lewis (1979), that only an increase in the granularity of a measure function is a licensed discourse move (p.151). But note that Lewis (1979) only says that an increase in the standard of precision is easier than a decrease.

[23] This point has also been made by Rotstein and Winter (2004, pp.270-273). On their view, maximal standard gradable adjectives, which they call 'total adjectives', are context-dependent.

[24] Besides accounting for the assertability of the clean-cleaner sentence, they are concerned with accounting for the infelicity of the result of changing the order between the conjuncts in the clean-cleaner sentence, the distribution of for-phrases, the semantics of degree modifiers (e.g. completely), and the findings of Syrett at el. (2009). They also explore the connection between the absolute-relative distinction and the distinction between stage-level and individual-level predicates. So my discussion here isn't intended to be a comprehensive assessment of their account. My main concern here is whether the absolutist can use their account to answer our challenge in §3.

modifications to Kennedy's semantics-pragmatics package (§6–8), it is necessary that we explore the full potential of their account.

Their account combines two promising but conceptually distinct ideas: The first is to have the positive forms of gradable adjectives take a comparison-class argument (besides an individual-argument) and require the individual-argument of a GA_{max} to be the *local maximum* of the comparison-class argument, that is, to have a degree that is at least as high as every member in the comparison-class argument.[25] The second is to allow every gradable adjective to denote measure functions of different granularities — that is, to allow every gradable adjective to denote at least two measure functions, such that the more discriminating functions assign different degrees to objects that are assigned the same degree by the less discriminating functions.[26]

Since, as we shall see, each of these ideas has the potential to deliver both coherent-belief readings of the clean-cleaner belief sentence, and since our primary concern is whether the absolutist can account for those readings, I will tease those ideas apart and assess them one by one.

5.1 Local Absolutism

Sassoon and Toledo build their first idea on Bierwisch's observation about the contrast between the open-scale adjective 'tall' and the adjective 'industrious':

(26) All the pupils at this school are tall.

(27) All the pupils at this school are industrious.

(28) **Bierwisch's observation:**
In the interpretation of (26) other people must be taken into account, but to interpret (27) 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, p.89)

Their point of departure is to extend Bierwisch's observation (about the contrast between 'tall' and 'industrious') to the contrast between open-scale adjectives and GA_{max} (in their positive forms).[27] To implement their idea, they propose that open-scale adjectives and GA_{max} obligatorily take different kinds of comparison classes as their arguments: When deciding whether someone is tall, we look for a contextually salient comparison class of which the person is a member (e.g. people of their age), and ask whether they stand out against other members in terms of their height; this requirement is intended to capture the intuition that 'for some people to be tall there must be short people too'. But when deciding whether an object is clean, we look for a salient comparison class that comprises of that object's counterparts, and ask whether it is at least as clean as each of its counterparts; this requirement is intended to capture the intuition that 'for some people [things] to be industrious [clean] there do not need to be any lazy [dirty] ones'. Being industrious (clean), Sassoon and Toledo would say, concerns *within-individual comparison*, while being tall concerns *between-individual comparison*.

Let's now consider the formal details of their analysis of GA_{max}. (We'll set aside their analysis of open-scale adjectives and GA_{min}.) They follow Kennedy in assuming that the meaning of a GA_{max} is a measure function. But they propose that, when a GA_{max} (in its positive form) is predicated of an individual x, that adjective asks for a contextually salient comparison class whose members are x's counterparts, and it is true of x just in case x's degree on its scale is at least as high as the degree of every member of x's comparison class. We can implement this requirement by introducing a new pos-morpheme that introduces a two-place contextually given comparison-class function that maps an adjective and an individual to that individual's counterparts-based comparison class.[28] The following shows how their proposal differs from Kennedy's:

(29) **Kennedy on the positive form of 'clean':**

[25] Note that their treatment of the comparison-class argument is different from Kennedy's (2007): (a) Kennedy introduces a comparison-class argument to the comparative form rather than to the positive form, and (b) his comparison-class argument is optional rather than obligatory. See Kennedy (2007; example #26).

[26] Kennedy and McNally (2005, p.357) have suggested a similar idea.

[27] It is worth mentioning that, although Sassoon and Toledo's account of closed-scale adjectives builds on Bierwisch's observation about the contrast between 'tall' (which Bierwisch calls a 'dimensional' adjective) and 'industrious' (which Bierwisch calls an 'evaluative' adjective), 'industrious' doesn't seem to be a closed-scale adjective: Both 'slightly industrious' and 'perfectly industrious' seem to sound bad.

[28] They proposed three pos-morphemes in total: one for GA_{max}, one for GA_{min} (e.g. 'dirty'), and one for open-scale adjectives (e.g. 'tall').

a. $[\![pos]\!] = \lambda g_{\langle e,d\rangle}. \lambda x. g(x) \geq \boldsymbol{s}(g)$, where $\boldsymbol{s}$ is a contextually given function that maps a gradable adjective g to its contextual threshold $\boldsymbol{s}(g)$.
b. $[\![\text{clean}]\!] = \lambda x. \textbf{clean}(x)$, where $\textbf{clean}(x)$ is x's degree of tallness.
c. $[\![pos]\!]([\![\text{clean}]\!]) = \lambda x.\textbf{clean}(x) \geq \boldsymbol{s}([\![\text{clean}]\!])$
[(a) & (b), Function Application]

(30) **Sassoon and Toledo on the positive form of 'clean':**

a. $[\![pos]\!] = \lambda g_{\langle e,d\rangle}. \lambda x. \forall y \in \boldsymbol{c}(g, x)[g(x) \geq g(y)]$, where $\boldsymbol{c}$ is a contextually given two-place function that maps the measure function g of a GA_{max} and an individual x to a contextually salient set of possible individuals that stand in the counterpart relation to x.
b. $[\![\text{clean}]\!] = \lambda x. \textbf{clean}(x)$ [same as Kennedy's]
c. $[\![pos]\!]([\![\text{clean}]\!]) = \lambda x. \forall y \in \boldsymbol{c}([\![\text{clean}]\!], x)[\textbf{clean}(x) \geq \textbf{clean}(y)]$
[(a) & (b), Function Application]

Here is an example showing how their semantics works: To evaluate whether the sentence 'Porky is clean' is true in a context, we ask whether Porky's degree of cleanness is at least as high as the degree of cleanness of every member in the contextually salient set of Porky's counterparts. If it is, the sentence comes out true. It it isn't, the sentence comes out false. We can illustrate their proposal with a diagram like this:

(31) (◯]

The left parenthesis and the right square bracket represent the clean-scale. The circle in the middle represents the image of the comparison class under the clean measure function. So to be clean is to be at least as clean as the local maximum of the circle. Call Sassoon and Toledo's analysis *local absolutism*.[29]

We are now ready to see why local absolutism has the potential to deliver the coherent-belief readings of the clean-cleaner belief sentence, which I repeat here:

(32) Mary believes that both towels are clean but that the red one is cleaner than the blue one.

When the towels have different degrees of cleanness, and when their degrees of cleanness are higher than the maximas of their comparison classes, we obtain the public-standard reading. I assume that it is the public-standard reading, rather than the private-standard reading because the towels' comparison classes are most plausibly determined by the contextually salient standard of cleanness (e.g. the speaker's) rather than by Mary's doxastic state.

Local absolutism can also deliver the private-standard reading if we allow the towels' comparison classes to be determined by Mary's doxastic state. We can say that the private-standard reading is true just in case, for every world compatible with Mary's beliefs, the red towel's (the blue towel's) comparison class in that world is such that none of its members is cleaner than the red towel (the blue towel). We can distinguish these truth conditions from the truth conditions of the public-standard reading by using the tools I discuss in §7-8. But we will suppress the details here and focus on a problem with local absolutism.

While local absolutism can deliver both coherent-belief readings of the clean-cleaner belief sentence, it is not a fully satisfactory response to our challenge to the absolutist because its motivating idea that the truth conditions of GA_{max} (in their positive forms) always depend on comparisons between their actual arguments and those arguments' counterparts is not entirely unproblematic. To see this, suppose this is how we understand 'clean' in our conversation: We decide that how clean an object is depends solely on the quantities of germs it has per square centimeter. Let's say Porky the pig is less clean than Tom the towel by this standard. This means that Tom ought to count as clean whenever Porky does — this is what Kennedy's account would predict if we dropped the economy principle and allowed the contextual threshold of 'clean' to vary across contexts. But

[29]Their proposal is intended to be compatible with the economy principle. They suggest that the principle is responsible for the locally maximal truth conditions of GA_{max} (Toledo and Sassoon 2011, p.144). But we should notice that their economy principle is different from Kennedy's, in two ways: First, while Kennedy's requires the contextual threshold for 'clean' to always coincide with the maximal endpoint of the clean-scale (§2), theirs only requires that contextual threshold to coincide with a locally maximal degree of the clean-scale. Second, while Kennedy's forces the contextual function to be chosen in such a way that the resulting threshold for 'clean' coincides with the maximal endpoint of the clean-scale, theirs puts no restrictions on how the two-place comparison class function (introduced by their *pos*) should be chosen — because, on their account, the relevant comparison class can be anywhere along the clean-scale — and the locally maximal truth conditions are essentially encoded by the meaning of their *pos* rather than dictated by the economy principle as they argue they are (see (30-a)).

according to local absolutism, that may not be true: If Porky has been so well taken care of that he is as clean as he could possibly be, but Tom hasn't yet been boiled and disinfected and could have been cleaner, Porky can be clean without Tom being clean. The following diagrams illustrate this counter-intuitive result:

(33) (p t]

(34) (◯p ⓣ]

The first circle and the second circle in (34) represent the contextually salient comparison classes for Porky and Tom. Since Porky is at least as clean as every member in his comparison class, he is clean. But since Tom is less clean than some member in his comparison class, he is not clean, even though he is cleaner than Porky. (The counter-intuitive feel of this result gets stronger if we replace Porky in our example by an object that is in its nature to be dirty.)

One may argue that this counter-intuitive consequence can never happen because, since the counterparts Porky has in the presence of Tom are much cleaner than the counterparts he has in the absence of Tom,[30] the first circle should extend a lot farther to the right than my diagram suggests. But this reply doesn't seem to work because it is possible that Porky's counterparts, represented by the first circle on the diagram, are already on average cleaner than they would have been had Tom been absent. That is, in the absence of Tom, Porky's counterparts should be represented by an oblong that extends a lot more to the left than the first circle in (34).

Call this problem the *Porky-Tom problem* (or the problem of cross-sortal comparison). While I agree with Sassoon and Toledo that their counterpart-based reading of GA_{max} exists, GA_{max} (in their positive forms) do have a reading on which their truth conditions depend solely on comparisons between actual individuals. For example, just as we can classify objects into the clean ones and the not clean ones based on their actual germ counts alone, we can classify running and cycling routes into the flat ones and the not flat ones based on their actual elevation gains alone — 10 feet is flat but 10,000 feet isn't. It seems that by making the comparison-class argument both obligatory and counterpart-based, Sassoon and Toledo's proposal makes it very difficult to account for that reading.[31]

5.2 Granularity Shift

We turn now to Sassoon and Toledo's idea that each gradable adjective can be associated with measure functions of different granularities. This idea is supported by various everyday examples: Due to the limits of our perceptual power, we normally treat glasses of water which look indistinguishable to us as equally full, even though, with appropriate measurement tools and enough time, we are able to make finer distinctions among the same glasses. Also, we often count containers that are filled up to certain conventionally recognized levels as full for practical purposes. For example, a bowl that is filled with rice

[30] Toledo and Sassoon (2011) propose that the comparison class is determined primarily by the object of which the adjective is predicated, but that it can be affected by other salient actual objects:

(i) a. 'Both types of comparison classes [i.e. those of relative adjectives and absolute adjectives] are subject to contextual considerations. *The classes are determined first and foremost based on the individual of which the adjective is predicated* while at the same time context sensitivity comes into play through the individuals comprising the comparison class.' (p.142, emphasis mine)

b. 'Other cups in the extensional context which are full to an unusual degree may affect the comparison class by increasing the salience of counterparts of the actual cup which are full to unusual degrees.' (p.143)

The crucial issue here is how exactly the object of which a GA_{max} is predicated and other salient actual objects jointly determine the object's comparison class. We can't fully solve the Porky-Tom problem without knowing how exactly the presence of Tom affects Porky's comparison class.

[31] Kennedy's account of the comparison-class argument — which makes that argument optional rather than obligatory — can account for both the counterpart-based reading of 'clean' and the non-counterpart-based reading. If we are interested in whether Porky/ Tom stands out against his counterparts in terms of his cleanness, we can use the following typeshifting principle to create a comparison class argument slot in 'clean', and saturate it with Porky's/ Tom's set of counterparts:

(i) For any gradable adjective with meaning $[\![A]\!]$, it can be typeshifted into the following meaning: $[\![A']\!] = \lambda f_{\langle e,t \rangle}[\lambda x[f(x).[\![A]\!](x)]]$ (Kennedy 2007, p.16)

Since the clean-function restricted to the set of Porky's counterparts is distinct from the clean-function restricted to the set of Tom's counterparts, it is possible that the first clean-function's contextual threshold is lower than the second clean-function's.

Suppose we are interested in whether Porky/ Tom is clean by the germ-count standard. We do not need to use the typeshifting rule (i). We simply have Porky/ Tom combine with **pos clean** so that we obtain TRUE if Porky's/ Tom's actual degree of cleanness is at least as high as the contextual threshold for 'clean' and FALSE otherwise.

roughly up to its rim is already full. A bowl with even more rice is usually considered full just the same. Sassoon and Toledo (2011) helpfully describe cases like these as exhibiting a 'ceiling effect'.

As before, we are primarily interested in whether their idea answers our challenge to the absolutist. Consider our belief sentence:

(35) Mary believes that both towels are clean but that the red one is cleaner than the blue one.

Their idea — call it *granularity shift* — looks initially promising. We can obtain a coherent-belief reading when the first instance of 'clean' denotes a measure function whose granularity is lower than that of the clean-function denoted by the second instance; the idea is that since the two instances of 'clean' denote two distinct measure functions, it is consistent that the second measure function maps the towels to two different degrees while the towels are mapped to the same (maximal) degree by the first measure function. Perhaps we can also distinguish between the public-standard reading and the private-standard reading by distinguishing between the contextually salient granularities and the pairs of granularities compatible with Mary's beliefs (but how this idea can be implemented is beyond my expertise).

While initially promising, granularity shift predicts that the following contradiction is consistent:

(36) #Both towels are clean, but the red one is cleaner than the blue one and so the blue one is not clean.

The reason is that since the granularity of the clean-function can increase as we go from the first conjunct to the second conjunct, the third instance of 'clean' can denote a different function from the first instance. This means that 'both towels are clean' and 'the blue one is not clean' can be true at the same time. So granularity shift seems to deprive us of the most straightforward explanation for the unacceptability of (36): It is a contradiction.[32]

The worry here isn't just about individual sentences such as (36). It is the more general one that we are not entitled to granularity shifts unless we have an account of when those shifts are triggered and when they are prohibited. Without such an account, we are unable to explain why while 'Porky is clean and not clean' ought to be contradictory,[33] Rotstein and Winter's clean-cleaner sentence isn't. So granularity shift alone can't answer our challenge to the absolutist.

We have now evaluated both a pragmatic and a semantic response to our challenge to the absolutist. In the next three sections, we develop a relativist-friendly modification to Kennedy's account of gradable adjectives. The next section discusses how the contextual thresholds for GA_{max} are determined (if not by the economy principle). §7-8 provide two plausible analyses of the private-public ambiguity.

6 The Limit of Pragmatic Slack

In §2, we traced the absolutist commitment of Kennedy's account to the economy principle. Recall the benefits of having that principle as part of Kennedy's account: The principle prevents GA_{max} from having an overly weak truth-condition (e.g. the possibility that a half-full bus counts as full) and explains Syrett et al.'s (2009) findings about gradable adjectives in definite descriptions. But we discussed that Syrett et al.'s findings are compatible with the hypothesis that the contextual thresholds of GA_{max} do shift but do so in a more restricted way than those of open-scale adjectives. This section attempts to develop that hypothesis further and explain, without resorting to the economy principle, why GA_{max} do not have an overly weak truth-condition.

The main idea we need is already a part of Lasersohn's theory: We speak loosely, but we can only speak *a little bit* loosely.[34] But our point of departure is that we can speak loosely without asserting a falsehood or a contradiction.[35]

[32]It won't do to say that the granularity of the third clean-function decreases to a level that matches the first clean-function's because Toledo and Sassoon (2011) hold that only an increase in granularity is a licensed discourse move (p.151).

[33]But see Burnett (2014) which allows some contradictions to be true.

[34]Lasersohn (1999) says explicitly that the amount of pragmatic slack allowed in a context has to be small: 'When extreme precision is not required, people accept utterances that deviate in minor ways from the truth' (p.525). I think that it is worth exploring why the amount of pragmatic slack has to be small.

[35]For discussions that analyze loose sentences as expressing literal truths, see Lewis (1979), Krifka (2007), and Sauerland and Stateva (2011).

Let me elaborate. Consider Kennedy's account without the economy principle. The possible interpretations of the positive form of a GA_{max} range from the strictest and the most informative[36] endpoint-oriented interpretation to the very loose and very uninformative interpretations on which almost every object counts as having the property expressed by that adjective. The strictest interpretation is most preferred based on the consideration of informativity maximalization alone.[37] But since that interpretation is false of every ordinary object,[38] and since we ought to speak truly (by Quality), there is a pressure to speak loosely by adopting a lower threshold so that we can speak both truly and informatively. Of course, when speaking loosely, we ought not speak too loosely because if the contextual threshold is too low, we lose informativity without any gain in Quality. So there is a limit to how loosely we can speak; I propose that it is that limit, rather than the economy principle, that constrains how the contextual thresholds for GA_{max} are chosen.

Given a GA_{max} uttered in a certain context, we are going to represent the maximal amount of pragmatic slack that can be tolerated for that adjective in that context by a threshold degree on that adjective's scale. The idea is that the more slack is tolerated, the farther away that degree is from the maximal endpoint of that adjective's scale. Call that degree *the limit of pragmatic slack (l)*.

Let me state how our proposal differs from the economy truth conditions (9). The threshold for a GA_{max} relative to a context is now that adjective's limit of pragmatic slack rather than the maximal endpoint of that adjective's scale. The same is true for $GA_{min/max}$ (e.g. 'transparent') when the near-maximal-endpoint or the maximal-endpoint interpretation is intended. The case for GA_{min} (e.g. 'dirty') and for the near-minimal-endpoint interpretation of $GA_{min/max}$ is slightly more complicated. To illustrate, let's focus on 'dirty'. Since the economy principle is not a part of our proposal, the adjective's contextual threshold no longer always coincides with the least non-zero degree of the dirty-scale. This means that the dirty-threshold may coincide with the minimal endpoint of the dirty-scale (i.e. the degree representing the complete absence of dirt). Clearly, we need to block that possibility because an object having a zero degree of dirtiness is never dirty. So we have no choice but to introduce a new pos-morpheme, $pos_>$, which uses the strictly-greater-than ($>$) relation instead of the greater-than-or-equal-to relation ($\geq$):

(37) a. Kennedy's *pos*:
$[\![pos_{\geq}]\!] = \lambda g_{\langle e,d\rangle}.\lambda x.\, g(x) \geq \boldsymbol{s}(g)$
b. The new *pos*:
$[\![pos_{>}]\!] = \lambda g_{\langle e,d\rangle}.\lambda x.\, g(x) > \boldsymbol{s}(g)$

To avoid unwanted truth-conditions, we will also (i) require 'dirty' and other GA_{min} to combine with the new pos-morpheme (i.e. $pos_>$) instead of Kennedy's (i.e. $pos_{\geq}$); (ii) require GA_{max} (e.g. 'clean') to combine with $pos_{\geq}$ instead of $pos_>$; and (iii) allow $GA_{min/max}$ (e.g. 'transparent') to combine with either $pos_>$ (when the near-minimal-endpoint reading is intended) or $pos_{\geq}$ (when the maximal-endpoint or near-maximal-endpoint reading is intended).[39]

The following summarizes our proposed modifications:

(38) a. Partially-closed scales with maximal endpoints ( ]
(e.g. flat, clean, dry, certain):
$pos(g)(x) = 1$ iff $g(x) \geq \boldsymbol{s}(g) \geq l_g$,
where $\boldsymbol{s}(g)$ is the contextual threshold, and l_g is the limit of pragmatic slack for g.
(Note: the value of l_g may vary from context to context)
b. Partially-closed scales with minimal endpoints [ )

[36] I define the informativeness of a given interpretation of the positive form of a GA_{max} in terms of set membership (or entailment). For any GA_{max}, for any contextual thresholds t_1 and t_2, if the positive-form denotation of GA_{max} based on t_1 is a subset of that based on t_2, then the denotation based on t_1 is more informative than that based on t_2.

[37] It is also possible that it is most preferred because it is mutually salient to the interlocutors (Potts 2008).

[38] That interpretation is typically not relevant to the goals of our conversation as well. Relevance is likely to affect how the contextual thresholds for GA_{max} are chosen. But, for simplicity, I focus on the tradeoff between Quality and informativity maximalization.

[39] A somewhat radical way to avoid these admittedly inelegant stipulations and save the hypothesis that there is only a single pos-morpheme is to strike out the degree on the dirty-scale that represents the complete absence of dirt, making the dirty-scale open at both ends (see Rotstein and Winter (2004) for a similar proposal). On this proposal, perfectly clean objects, together with objects to which the concept of dirtiness does not apply (e.g. the number 2), are not mapped to any degree on the dirty scale. But this proposal has two drawbacks. First, it cannot account for the intuitive difference between a perfectly clean object being not dirty and the number 2 being not dirty. While the former is perfectly natural, the latter seems to involve a category mistake. Second, by holding that the dirty-scale is open just like the tall-scale, it can't explain the contrast between 'slightly dirty' and '#slightly tall' in terms of the difference in structure between the dirty-scale and the tall-scale.

(e.g. bumpy, dirty, wet, uncertain):
$pos(g)(x) = 1$ iff $g(x) \geq \mathbf{s}(g) > min(g)$,
where $min(g)$ is the minimal endpoint of the scale of g.[40]

c. Totally-closed scales [ ]
(e.g. transparent, opaque):
$pos(g)(x) = 1$ iff $g(x) \geq \mathbf{s}(g) \geq l$ or $g(x) \geq \mathbf{s}(g) > min(g)$[41]

One may object that my proposal assigns an overly strong truth condition to adjectives whose scales have minimal endpoints (e.g. 'dirty', 'transparent') because their contextual thresholds can now be any degree higher than their scales' minimal endpoints, rather than just their scales' least non-zero degrees. They may support their objection with Kennedy and McNally's observation that the following sentences are unacceptable:

(39) a. #My hands are not wet, but there is some water on them. (Kennedy and McNally 2005, 36a)
b. #The door isn't open, but it is ajar. (Kennedy and McNally 2005, 36b)

They may argue that if the contextual threshold of 'wet' can be anywhere along its scale just as I claim, then it ought to be possible that the hands are not wet enough to count as wet despite their having non-zero degrees of wetness, which is contrary to what (39-a) seems to suggest. They can easily run a similar objection based on (39-b).

But we should note some similarity between these examples and an entailment claim we discussed in §2, which I repeat here:

(40) The table is not wet $\vDash$ The table is dry. (Kennedy 2007, 47b)

I argued that this entailment doesn't always hold because there are examples where an object is not wet without having a zero degree of wetness (e.g. moist towels). So the badness of (39-a) may not be due to the fact that the truth of 'my hands are not wet' is always incompatible with my hands having a non-zero degree of wetness. (My hands do currently have some moisture on them but they are certainly not wet.) It may be due to the fact that the second conjunct, together with 'but', conveys that the hands' degrees of wetness are already higher than the relevant (non-minimal) contextual threshold for 'wet'. A similar explanation may apply to the badness of (39-b).

A consideration in favor of my proposal is that adjectives such as 'dirty' and 'transparent' (and negated GA_{max} such as 'not clean') can now receive a more informative interpretation than they do on Kennedy's account. When we say that coal is dirty (not clean),[42] we typically don't mean that it is not maximally clean, which is certainly true but highly uninformative. Rather, we mean that its degree of dirtiness (cleanness) is above (lower than) a salient non-minimal (non-maximal) standard, such as the average degree of dirtiness (cleanness) of the available sources of energy. My proposal delivers this more informative interpretation for free because the contextual threshold can be higher than the dirty-scale's least non-zero degree (lower than the clean-scale's maximal endpoint).[43]

Before we leave this section, let's reiterate how our account of the contextual thresholds of GA_{max} differs from Kennedy's and make explicit its key consequence. On our account, the reason why GA_{max} do not have an overly weak truth condition (e.g. a half-full bus can never count as full) is not because of the economy principle but because of the tradeoff between informativity maximalization and Quality. Since the contextual thresholds of GA_{max} need not be maximal, we do not analyze the clean-cleaner sentence as a contradiction. This means that we can use one of the semantic analyses below to account for the public-private ambiguity of the clean-cleaner belief sentence.

[40] For simplicity, we assume that the thresholds of these adjectives are unrelated to those of their antonyms.

[41] The second disjunct here allows the possibility that $g(x) = max(g) \geq \mathbf{s}(g) > min(g)$. This doesn't seem to be problematic because we can imagine that a minimally transparent glass gradually becomes more transparent, and eventually becomes maximally transparent. So I am not going to block this possibility by introducing a pos-morpheme dedicated to adjectives with totally-closed scales.

[42] Carter (2017) helpfully points that when numerical expressions (e.g. 14 million) are embedded in negation contexts (e.g. I don't have 14 million books), an increase in their imprecision results in a stronger (i.e. more informative) proposition, and that Lasersohn's theory, which only targets imprecision phenomena where the imprecise content is weaker than the precise content, cannot be easily extended to account for such strengthening. His insight applies to GA_{max} in negation contexts as well.

[43] My proposal on 'dirty' is more similar to Rotstein and Winter's (2004) than it is to Kennedy's. According to Rotstein and Winter, like maximal standard gradable adjectives, minimal standard gradable adjectives, which they call 'partial adjectives', are context-dependent. For example, the denotation of 'dirty' in its positive form is a set of points on its scale that represent levels of dirtiness that are higher than that represented by its context-dependent *standard value*, which can be anywhere along its scale.

7 World Variables and Binding Ambiguities

7.1 The basic idea

The basic idea of the analysis: We posit a world argument not only in every predicate but also in the pos-morpheme ($pos_{\geq}$). The public-private ambiguity will be analyzed as arising from the binding possibilities of the world-variables in the first conjunct of the embedded clean-cleaner sentence.[44] Since nothing interesting occurs in the second conjunct of the embedded clean-cleaner sentence, we'll focus on the simpler belief sentence S_{Porky} below. We'll derive its public-standard reading by having the world-variable at the pos-morpheme bound 'long distance' by a variable binder at its top, and deliver its private-standard reading by having the world-variable at the pos-morpheme bound locally by a variable binder on top of 'Porky is clean':

(41) Public-standard reading:

a. LF1: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos_{w_0} clean$_{w_1}$]

b. $[\![\text{LF1}]\!]^{c,g} = \lambda w_0.\ \textbf{believes}(w_0, \lambda u.\ \textbf{clean}(\textbf{p})(u) \geq \boldsymbol{s}^c_{clean}(w_0), \textbf{m})$

(42) Private-standard reading:

a. LF2: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos_{w_1} clean$_{w_1}$]

b. $[\![\text{LF2}]\!]^{c,g} = \lambda w_0.\ \textbf{believes}(w_0, \lambda u.\ \textbf{clean}(\textbf{p})(u) \geq \boldsymbol{s}^c_{clean}(u), \textbf{m})$

So analyzed, the public-standard reading of S_{Porky} is true at the world w of a context just in case, for every world compatible with the beliefs of Mary at w, Porky's degree of cleanness at that world is at least as high as the (potentially non-maximal) threshold degree for 'clean' at w; the private-standard reading of S_{Porky} is true at the world w of a context just in case, for every world compatible with the beliefs of Mary at w, Porky's degree of cleanness at that world is at least as high as the (potentially non-maximal) threshold degree for 'clean' at that world.

Below, we'll first make explicit the lexical entries and the composition rules needed for this analysis; after that, we'll discuss two potential costs of this analysis.

7.2 Lexical entries and composition rules

The pos-morpheme has the meaning below:

(43) $[\![pos_{\geq}]\!]^{\langle \boldsymbol{s}^c_{clean}, \boldsymbol{s}^c_{tall}, \ldots \rangle, g} = \lambda w.\ \lambda G_{\langle e,d \rangle}.\ \lambda x.\ G(x) \geq \boldsymbol{s}^c_G(w)$

A remark on the threshold function $\boldsymbol{s}^c_G$ is in order. Unlike the threshold function on Kennedy's account (see (8-b)), which maps an adjectival meaning to a threshold degree, ours maps a world to a threshold degree. To allow for the possibility that different adjectives have different threshold degrees in the same context, we represent a context as a sequence of threshold functions each of which is dedicated to a single gradable adjective.[45]

Having made clear how we represent a context, from now on, we notate the meaning of the pos-morpheme in the more reader-friendly way below:

(44) $[\![pos_{\geq}]\!]^{c,g} = \lambda w.\ \lambda G_{\langle e,d \rangle}.\ \lambda x.\ G(x) \geq \boldsymbol{s}^c_G(w)$

The meaning of 'clean' is as follows (which shouldn't be surprising):

(45) $[\![\text{clean}]\!]^{c,g} = \lambda w.\ \lambda x.\ \textbf{clean}(x)(w) = \lambda w.\ \lambda x.\ x$'s degree of cleanness in w

The idea here is simply that an object can have different degrees of cleanness in different worlds — or alternatively, that the clean measure function can vary from world to world.

The meanings of 'Mary' and 'Porky' are Mary (**m**) and Porky (**p**). And the meaning of 'believe' is the one stated in (24); I restate here for the reader's convenience:

(46) $[\![\text{believe}]\!]^{c,g} = \lambda w.\ \lambda p_{\langle s,t \rangle}.\ \lambda x.\ \forall w'[w' R(x)(w) \rightarrow p(w') = 1]$,
where '$w' R(x)(w)$' reads: w' is a (logically) possible world compatible with the beliefs x has at world w.

[44] As an anonymous reviewer points out, such binding ambiguities are standard fare in semantics and have been exploited in the analyses of Russell's Ambiguity (e.g. 'I thought your yacht was larger than it is' (Russell 1905)), and of the ambiguities of determiner phrases (DPs) in modal contexts (Heim 2000; Percus 2000; von Fintel and Heim 2011, Ch. 8). I wish to thank the reviewer for suggesting to me the analysis considered here and its connection with previous work.

[45] Here we complicate the context-representation so as to simplify the threshold function. This move is inspired by Lassiter and Goodman (2017, example 24).

So much for the lexical entries. The only compositional rules we need are Function Application and Lambda Abstraction; the latter is stated below:

(47) **Lambda Abstraction:**
$[\![\lambda w_i \alpha]\!]^{c,g} = \lambda u \in W.[\![\alpha]\!]^{c,g[w_i \to u]}$,
where W is the set of worlds and $g[w_i \to u]$ is just like g expect that it maps w_i to u.

By using these lexical entries and composition rules, we can compute the truth-conditions of LF1 in the following way (The computations for LF2 are similar. The reader can skip ahead without much loss):

(48) a. $[\![pos_{\geq}\ w_0]\!]^{c,g} = \lambda G.\,\lambda x.\, G(x) \geq \mathbf{s}^c_G(g(w_0))$
[*pos* & variable, Function Application]

b. $[\![\text{clean } w_1]\!]^{c,g} = \lambda x.\, \mathbf{clean}(x)(g(w_1))$
[clean & variable, Function Application]

c. $[\![\text{believe } w_0]\!]^{c,g}$
$= \lambda p_{\langle s,t\rangle}.\,\lambda x.\,\forall w'[w' R(x)(g(w_0)) \to p(w') = 1]$
[believe & variable, Function Application]
$= \lambda p_{\langle s,t\rangle}.\,\lambda x.\,\forall w' R(x)(g(w_0))[p(w') = 1]$
[notation simplified for readability]

d. $[\![pos_{\geq}\ w_0 \text{ clean } w_1]\!]^{c,g} = \lambda x.\, \mathbf{clean}(x)(g(w_1)) \geq \mathbf{s}^c_{clean}(g(w_0))$
[(a) & (b), Function Application]

e. $[\![\text{Porky pos } w_0 \text{ clean } w_1]\!]^{c,g} = \mathbf{clean}(\mathbf{p})(g(w_1)) \geq \mathbf{s}^c_{clean}(g(w_0))$
[(d) & Porky, Function Application]

f. $[\![\lambda w_1 \text{ Porky pos } w_0 \text{ clean } w_1]\!]^{c,g}$
$= \lambda u \in W.\, \mathbf{clean}(\mathbf{p})(u) \geq \mathbf{s}^c_{clean}(g(w_0))$
[Lambda Abstraction on (e)]

g. $[\![\text{believe } w_0\ \lambda w_1 \text{ Porky pos } w_0 \text{ clean } w_1]\!]^{c,g}$
$= \lambda x.\,\forall w' R(x)(g(w_0))[\mathbf{clean}(\mathbf{p})(w') \geq \mathbf{s}^c_{clean}(g(w_0))]$
[(c) & (f), Function Application]

h. $[\![\text{Mary believe } w_0\ \lambda w_1 \text{ Porky pos } w_0 \text{ clean } w_1]\!]^{c,g}$
$= \forall w' R(\mathbf{m})(g(w_0))[\mathbf{clean}(\mathbf{p})(w') \geq \mathbf{s}^c_{clean}(g(w_0))]$
[(g) & Mary, Function Application]

i. $[\![\lambda w_0 \text{ Mary believe } w_0\ \lambda w_1 \text{ Porky pos } w_0 \text{ clean } w_1]\!]^{c,g}$
$= \lambda u \in W.\,\forall w' R(\mathbf{m})(u)[\mathbf{clean}(\mathbf{p})(w') \geq \mathbf{s}^c_{clean}(u)]$
[Lambda Abstraction on (h)]

7.3 Two potential costs

We turn now to two issues with this analysis that I can't resolve in this paper. The first is an overgeneration worry: While LF1 and LF2 deliver respectively the public-standing reading and the private-standard reading of S_{Porky}, the following LFs deliver for that sentence truth-conditions that are intuitively incorrect.

(49) a. LF3: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos$_{w_0}$ clean$_{w_0}$]

b. $[\![\text{LF3}]\!]^{c,g} = \lambda w_0.\ \mathbf{believes}(w_0, \lambda u.\, \mathbf{clean}(\mathbf{p})(w_0) \geq \mathbf{s}^c_{clean}(w_0), \mathbf{m})$

(50) a. LF4: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos$_{w_1}$ clean$_{w_0}$]

b. $[\![\text{LF4}]\!]^{c,g} = \lambda w_0.\ \mathbf{believes}(w_0, \lambda u.\, \mathbf{clean}(\mathbf{p})(w_0) \geq \mathbf{s}^c_{clean}(u), \mathbf{m})$

LF3 and LF4 result in very strange belief attributions. LF3 attributes to Mary a belief whose content is either true in every world (if Porky's degree of cleanness in the world of the context is at least as high as the clean-threshold in that world, i.e. Porky is clean) or false in every world (if Porky is not clean). LF4 is true at the world of a context, $w_@$, just in case for every world w_m compatible with Mary's beliefs at $w_@$, Porky's degree of cleanness in $w_@$ is at least as high as the clean-threshold at w_m. This means that it predicts S_{Porky} to be true when Porky's degree of cleanness in the actual world is maximal but his degree of cleanness at each of Mary's belief world is below the clean-threshold at that same world. But if that scenario obtains, we should judge S_{Porky} to be false.

So, for this analysis to be fully satisfactory, we need an independently motivated principle or a binding theory that blocks LF3 and LF4 while retaining LF1 and LF2. But I am not able to supply such principle or theory here.

The second issue is the analogue of our objection to the absolutist's attempt to use Lasersohn's theory of pragmatic halos to account for the private-standard reading of the clean-cleaner sentence. Recall that our objection is essentially that if we don't know what Mary's standard of cleanness is, we can't make sure that the halo is of the right size to represent Mary's standard of cleanness, which means that we can't rationally intend to speak both truthfully and informatively by uttering the belief sentence. But our analysis of the private-standard reading (repeated below) runs into a similar sort of problem.

(51) Private-standard reading:

a. LF2: λw_0 Mary believes$_{w_0}$ [λw_1 Porky pos_{w_1} clean$_{w_1}$]

b. $[\![\text{LF2}]\!]^{c,g} = \lambda w_0.\ \textbf{believes}(w_0, \lambda u.\textbf{clean}(\textbf{p})(u) \geq \boldsymbol{s}^c_{clean}(u), \textbf{m})$

Notice that, like the pragmatic halo for 'clean', the threshold function $\boldsymbol{s}^c_{clean}$ is given by the context, and it can vary from context to context depending on how much slack the interlocutors give to the meaning of 'clean'. Assume, for simplicity, that Mary has in mind a single standard of cleanness and that it corresponds to the degree $\boldsymbol{d}_?$ on the clean-scale. If we don't know what Mary's standard is, it seems we are in no position to know that $\boldsymbol{s}^c_{clean}$ maps every world compatible with Mary's belief to a degree that is equal to or lower than $\boldsymbol{d}_?$ so that we speak truly, but not so low that we speak unduly uninformatively.

The analysis we discuss in the next section addresses the issue we just discussed by requiring the clean-threshold(s) be either fixed entirely by Mary's doxastic state (when the private-standard reading is intended) or fixed entirely by the context (when the public-standard reading is intended). As we shall see, that analysis avoids unwanted truth-conditions as well.

8 The Character of the Positive Form

8.1 The basic idea

The basic idea behind the analysis considered here is to liken the threshold function for a gradable adjective to the value of a shiftable indexical, which can shift under some modal contexts (Schlenker 2003; Anand 2006): When the threshold function is not shifted, it is fixed by the context alone, and we get the public-standard reading. When it is, it is fixed by the doxastic state of the belief subject alone, and we get the private-standard reading.

To begin, let's review the tool of double-indexing (Kaplan 1989). Consider the sentence 'I am Ann' uttered by Ann and Bob:

(52) a. Ann: I am Ann.

b. Bob: I am Ann.

Following Kaplan, we assume that the sentence has two kinds of meaning: the meaning of the sentence's type (i.e. character), and the meanings of its tokens uttered by different speakers (i.e. contents). The meaning of the sentence's type is the same regardless of who uses it. But the meaning of Ann's token is different from that of Bob's because Ann's is true just in case Ann is Ann, and Bob's is true just in case Bob is Ann.

Also following Kaplan, we assume that a sentence's character determines its possible contents. To make this determination relation precise, let's introduce two kinds of abstract objects: *formal contexts* and *circumstances of evaluation*. Formal contexts are representations of the physical circumstances in which a sentence is uttered. And circumstances of evaluation are representations of the actual or possible situations in which a proposition is evaluated for its truth value. For simplicity, I assume that the relations between formal contexts and contexts and between circumstances of evaluation and situations are one-to-one,[46] and that both formal contexts and circumstances of evaluation are individual-world pairs, such as ⟨Ann, the actual world⟩ and ⟨Bob, world XYZ⟩,[47][48] where the individual (world) is the speaker (world) of a context or a situation.

[46]This assumption isn't essential to my account. We should also note that some authors don't endorse a one-to-one correspondence between formal contexts and contexts of utterance. For example, Lasersohn (2005) proposes that each formal context has a judge coordinate, and that sentences are evaluated for their truth values at world-time-judge triples. But he makes it explicit that there need not be a one-to-one correspondence between formal contexts and contexts of utterance (pp.668-669) because such correspondence entails that there is a fact of the matter as to who the judge at a certain context of utterance is, and therefore that there is a fact of the matter as to whether 'Licorice is tasty' is true at a certain context of utterance, which defeats the motivation for his relativist semantics. I borrow the term 'formal context' from his discussion.

[47]Here I depart from Kaplan's (1989) version of double-indexing; for him, formal contexts are agent-time-position-world 4-tuples, and circumstances of evaluation are world-time pairs. But see Zimmermann (2013) and Anand (2006) who assume that formal contexts are structurally identical to circumstances of evaluation.

[48]I set aside the issue whether every formal context has to be *proper* in Kaplan's (1989, p.509, p.544) sense: For every formal context c, the agent of c exists and is located at the position of c in the world of c at the time of c. For simplicity, I allow improper formal contexts. See Predelli (1998a, 1998b) for relevant discussions on this issue.

With formal contexts and circumstances of evaluation in place, we are now ready to say how the character of 'I am Ann' determines its contents. Ann's context is represented by the formal context ⟨Ann, Ann's world⟩. The individual in that formal context (i.e. Ann) fixes the content of 'I' so that 'I am Ann', in Ann's context, expresses a content that is true just in case Ann is Ann. We'll identify this content with the set of circumstances of evaluation in which Ann is Ann (i.e. the entire set of circumstances of evaluation). Similarly, 'I am Ann', in Bob's context, expresses a content that's identical to the set of circumstances of evaluation in which Bob is Ann (i.e. the empty set). We'll define the character of 'I am Ann' to be the function that maps the formal context ⟨Ann, Ann's world⟩ (⟨Bob, Bob's world⟩) to the set of circumstances of evaluation in which Ann is Ann (the set of circumstances of evaluation in which Bob is Ann). So the character of 'I am Ann' determines its contents in the precise sense that its contents are the members of its codomain.

The following is a finite snapshot of the character of 'I am Ann':

(53)

	i_1	i_2
c_1	a=a (TRUE)	a=a (TRUE)
c_2	b=a (FALSE)	b=a (FALSE)

c_1 and c_2 are the formal contexts representing Ann's context and Bob's respectively. i_1 and i_2 are copies of c_1 and c_2, but they play the role of representing the situations at which a proposition is evaluated for its truth value. The row at c_1 — or, more precisely, the set of circumstances of evaluation at which Ann is Ann (i.e. a=a) — is the content of Ann's utterance of 'I am Ann'. Likewise for the row at c_2. We'll refer to these contents as *horizontal propositions*. The proposition going from the top left-hand corner to the bottom right-hand corner is called the *diagonal proposition*; it has the nice property that its truth value at a circumstance of evaluation depends on that circumstance's individual coordinate (notice that it is true at i_1 but false at i_2). The concepts of horizontal proposition and of diagonal proposition will come in handy when we distinguish between the public-standard reading and the private-standard reading.

I now motivate a modest extension of the double-indexing framework. Consider:

(54) a. Pet owner: Porky is clean.
b. Butcher: Porky is clean.

Since the pos-morpheme preceding 'clean' introduces a threshold function, and since, with the substitution of the limit of pragmatic slack for the economy principle, the clean-threshold can be anywhere between the limit value l and the maximal endpoint of the clean-scale, the proposition expressed by the pet owner's utterance of 'Porky is clean' can be based on a higher contextual threshold than the proposition expressed by the butcher's utterance of the same sentence. We can think of these propositions as two possible contents of the character of 'Porky is clean', a finite snapshot of which is given below:

(55)

	i_1	i_2
c_1(Pet owner)	$\textbf{clean}(c_1)(i_1)(\mathbf{p}) \geq 0.9$	$\textbf{clean}(c_1)(i_2)(\mathbf{p}) \geq 0.9$
c_2(Butcher)	$\textbf{clean}(c_2)(i_1)(\mathbf{p}) \geq 0.7$	$\textbf{clean}(c_2)(i_2)(\mathbf{p}) \geq 0.7$

Here I assume that 'clean' has a constant character, that is, its intension does not vary from context to context.[49] The intension of 'clean' is always the function that maps a circumstance of evaluation and an object to that object's degree of cleanness at (the world of) that circumstance. So the context-dependence of the positive form of 'clean' is due solely to the threshold function introduced by the pos-morpheme.

We now extend each formal context and each circumstance of evaluation with a possible threshold function that maps the character of a gradable adjective to a threshold degree. (Notice that, unlike the threshold function we used in the previous analysis, which asks for a possible world, the threshold function we use here asks for an adjectival character.) For example, the threshold function at formal context c_1 just is that context's threshold function coordinate, and it maps the character of 'clean' to the clean-threshold at c_1 (i.e. 0.9). (Note that the numerical values are merely illustrative. I do not identify the degrees on adjectival scales with numbers.)

Since the speaker coordinates in the formal contexts and the circumstances of evaluation will raise a (solvable) technical issue that is irrelevant to the main idea of my proposal, let's assume temporarily that both formal contexts and circumstances of evaluation are function-world pairs, rather than function-individual-world triples. (We'll discuss how

[49] I am going to ignore complications such as granularity shifts (§5.2).

we can put the speaker coordinate back into the formal contexts and the circumstances of evaluation in §8.2.)

The main motivation for this extension of the double-indexing framework is that we can now derive the public-standard reading and the private-standard reading of the clean-cleaner belief sentence from the horizontal and the diagonal propositions of the character of the embedded clean-cleaner sentence.

To see how we can account for the public-private ambiguity, we consider S_{Porky} (i.e. 'Mary believes that Porky is clean') uttered in the pet owner's context (i.e. c_1). We can obtain its public-standard reading by having 'believe' take as inputs Mary and the horizontal proposition of 'Porky is clean' at the pet owner's context. The resulting proposition is true at a circumstance of evaluation i just in case Porky's degree of cleanness at every circumstance of evaluation i' compatible with Mary's beliefs at i is at least as high as 0.9.

We can obtain the private-standard reading of S_{Porky} by having 'believe' take as inputs Mary and the diagonal proposition of 'Porky is clean'. The resulting proposition is true at a circumstance of evaluation i just in case, for every circumstance of evaluation i' compatible with Mary's beliefs at i, Porky's degree of cleanness at i' is at least as high as the threshold value determined by i'.

In the rest of this section, we make explicit the lexical entries and the compositional rules before we compare this analysis with the previous one.

8.2 Lexical entries and composition rules

Our goal in this subsection is to introduce the lexical entries and the compositional rules we need for this analysis. Along the way, we discuss how we can drop our assumption that the speaker is not a coordinate of the formal contexts and the circumstances of evaluation.

Some helpful notations: We'll notate the threshold function coordinate of a formal context c as $\boldsymbol{s}(c)$. Similarly, we'll notate the threshold function coordinate of a circumstance of evaluation i as $\boldsymbol{s}(i)$.

The following is the lexical entries we need:

(56) **Lexical entries:**

a. $[\![pos_{\geq}]\!]^{c,i} = \lambda g_{\langle ci,ed \rangle}. \lambda x. g(c)(i)(x) \geq \boldsymbol{s}(c)(g)$,
where $\boldsymbol{s}(c)$ is the threshold function of c, and $\boldsymbol{s}(c)(g)$ is a degree on the scale of g that is as least as high as the limit of pragmatic slack for g at c.

b. $[\![\text{clean}]\!]^{c,i}$
$= \lambda x. \textbf{clean}(c)(i)(x)$
$= x$'s degree of cleanness at circumstance of evaluation i.
(Note: 'clean' has a constant character)

c. $[\![\text{believe}]\!]^{c,i} = \lambda p_{\langle i,t \rangle}. \lambda x. \forall i'[i'R(x)(i) \rightarrow p(i') = 1]$, where '$i'R(x)(i)$' reads: circumstance of evaluation i' is compatible with the beliefs of individual x at circumstance of evaluation i.

d. $[\![\text{Mary}]\!]^{c,i} = \textbf{m}$ (Likewise for 'Porky')

A brief comment about these meanings is in order: $\textbf{pos}_{\geq}$ is the only meaning that has a non-constant character; it has a non-constant character because it provides an adjective with different thresholds in different contexts. The content of 'believe' is just like **believe** stated in (24), except that the worlds compatible with a subject's beliefs are now centered worlds which contain (at least) a world and a threshold function.

Our system has two composition rules. The first is a type-sensitive function application rule:

(57) **Type-sensitive Function Application (F.A.)**

a. *Extension F.A.:*
If α is of type $\langle c, \langle i, \langle \theta, \gamma \rangle \rangle \rangle$ and β is of type $\langle c, \langle i, \theta \rangle \rangle$,
then $[\![\alpha\beta]\!]^{c,i} = [\![\alpha]\!]^{c,i}([\![\beta]\!]^{c,i})$

b. *Intension F.A.:*
If α is of type $\langle c, \langle i, \langle i\theta, \gamma \rangle \rangle \rangle$ and β is of type $\langle c, \langle i, \theta \rangle \rangle$,
then $[\![\alpha\beta]\!]^{c,i} = [\![\alpha]\!]^{c,i}(\lambda i. [\![\beta]\!]^{c,i})$

c. *Character F.A.:*
If α is of type $\langle c, \langle i, \langle ci\theta, \gamma \rangle \rangle \rangle$ and β is of type $\langle c, \langle i, \theta \rangle \rangle$,
then $[\![\alpha\beta]\!]^{c,i} = [\![\alpha]\!]^{c,i}(\lambda c. \lambda i. [\![\beta]\!]^{c,i})$

The second is the typeshifting rule that 'diagonalizes' the character of 'Porky is clean':[50]

[50]Here is a potential overgeneration worry: Consider sentences of the form 'Mary believes that S_1 and S_2',

(58) **Diagonalization along threshold function:**
If E is a sentence with character χ, then $\triangle E$ has the character $\triangle\chi = \lambda c.\, \lambda i.\, \chi(c[\boldsymbol{s}(i)])(i)$, where $c[\boldsymbol{s}(i)]$ is just like c except that its threshold function is replaced by that of i.

Here I borrow Anand's (2006, p.110) very useful idea that the diagonalization operation can target specific coordinate(s) of the formal contexts and the circumstances of evaluation.[51] Suppose we put the speaker coordinates back into our formal contexts and circumstances of evaluation. Here is one way to see what the rule does. Let's suppose that 'Porky is clean and I am a pet owner' is uttered by Ann the pet owner at c_1. The operation extracts from the character of that sentence a proposition whose truth value at a circumstance of evaluation depends on the threshold value of 'clean' at that circumstance and on whether Ann — rather than that circumstance's speaker — is a pet owner in the world of that circumstance. Let's call that proposition *the diagonal proposition anchored to (the speaker and the world of)* c_1. The operation then substitutes that proposition for the horizontal proposition of the sentence's character at c_1. Since there is nothing special about c_1, the operation does the same thing for every arbitrary formal context c, that is, it substitutes the diagonal proposition anchored to c for the horizontal proposition of 'Porky is clean and I am a pet owner' at c.

To see the need for this rule, suppose Ann utters in c_1 'Mary believes that Porky is clean and I am a pet owner', intending the private-standard reading. The desired interpretation of Ann's utterance can be paraphrased into 'Mary believes that Porky is clean by her own standard and Ann is a pet owner'. We can obtain this interpretation by simply having 'believe' take as inputs Mary and the diagonal proposition anchored to c_1. If we combine 'believe' with the plain diagonal proposition of 'Porky is clean and I am a pet owner', we'll get the odd reading on which the content of 'I' varies across Mary's (centered) belief worlds. This is why we need a diagonalization operation that targets the threshold function only.

By using the lexical entries, the function application rule, and the diagonalization rule above, we can derive the public-standard reading and the private-standard reading of S_{Porky} in the following way (The reader can skip ahead without much loss):

(59) The public-standard reading:

a. $[\![\textit{pos}\text{ clean}]\!]^{c,i}$
$= [\![\textit{pos}_{\geq}]\!]^{c,i}(\lambda c.\, \lambda i.\, [\![\text{clean}]\!]^{c,i}) = \lambda x.\, \textbf{clean}(c)(i)(x) \geq \boldsymbol{s}(c)([\![\text{clean}]\!])$
(Note: We can write $\lambda c.\, \lambda i.\, [\![\text{clean}]\!]^{c,i}$ as $[\![\text{clean}]\!]$.)
[*pos* & clean, Character F.A.]

b. $[\![\text{Porky } \textit{pos}\text{ clean}]\!]^{c,i}$
$= [\![\textit{pos}\text{ clean}]\!]^{c,i}([\![\text{Porky}]\!]^{c,i}) = \textbf{clean}(c)(i)(\mathbf{p}) \geq \boldsymbol{s}(c)([\![\text{clean}]\!])$
[(a) & Porky, Extension F.A.]

c. $[\![\text{Mary believes Porky } \textit{pos}\text{ clean}]\!]^{c,i}$
$= [\![\text{believe}]\!]^{c,i}(\lambda i.\, [\![\text{Porky } \textit{pos}\text{ clean}]\!]^{c,i})([\![\text{Mary}]\!]^{c,i})$
$= \lambda x.\, \forall i'[i'R(x)(i) \rightarrow \textbf{clean}(c)(i')(\mathbf{p}) \geq \boldsymbol{s}(c)([\![\text{clean}]\!])]([\![\text{Mary}]\!]^{c,i})$
[(b) & believe, Intension F.A.]
$= \forall i'[i'R(\mathbf{m})(i) \rightarrow \textbf{clean}(c)(i')(\mathbf{p}) \geq \boldsymbol{s}(c)([\![\text{clean}]\!])]$
[Extension F.A.]

(60) The private-standard reading:

a. $[\![\triangle(\text{Porky } \textit{pos}\text{ clean})]\!]^{c,i}$
$= \textbf{clean}(c[\boldsymbol{s}(i)])(i)(\mathbf{p}) \geq \boldsymbol{s}(c[\boldsymbol{s}(i)])([\![\text{clean}]\!])$
[Diagonalization (58) on (59-b)]
$= \textbf{clean}(c)(i)(\mathbf{p}) \geq \boldsymbol{s}(c[\boldsymbol{s}(i)])([\![\text{clean}]\!])$
['clean' has a constant character]

---

where both S_1 and S_2 contain gradable adjectives (in their positive forms). If the typeshifting rule targets sentences, then it predicts mixed readings where the positive forms in S_1 are shifted and those in S_2 are not shifted, and vice versa. In case we want to block such mixed readings, we can modify the lexical meaning of 'believe' and typeshift 'believe' instead of sentences ($\triangle$ refers to the diagonalization operation stated in (58)):

(i) $[\![\text{believe}]\!]^{c,i} = \lambda p_{\langle c,it\rangle}.\, \lambda x.\, \forall i'[i'R(x)(i) \rightarrow p(c)(i') = 1]$

(ii) $[\![\text{believe}_{typeshifted}]\!]^{c,i}$
$= \lambda p_{\langle c,it\rangle}.\, \lambda x.\, [\![\text{believe}]\!](\triangle p)(x)$
$= \lambda p_{\langle c,it\rangle}.\, \lambda x.\, \forall i'[i'R(x)(i) \rightarrow \triangle p(c)(i') = 1]$

[51] To account for the phenomenon in Amharic that 'John says that I am a hero' has a *de se* reading on which 'I' denotes John, and that the denotations of other indexicals never shift under a say-context, Anand (2006) proposes a diagonalization operation that targets the speaker coordinate.

$= \textbf{clean}(c)(i)(\mathbf{p}) \geq \boldsymbol{s}(i)(\llbracket \text{clean} \rrbracket)$
[The threshold function of $c[\boldsymbol{s}(i)]$ is identical to that of i]

b. $\llbracket$Mary believes $\triangle$(Porky *pos* clean)$\rrbracket^{c,i}$
$= \llbracket \text{believe} \rrbracket^{c,i}(\lambda i. \llbracket \triangle(\text{Porky } pos \text{ clean}) \rrbracket^{c,i})(\llbracket \text{Mary} \rrbracket^{c,i})$
$= \lambda x. \forall i'[i'R(x)(i) \rightarrow \textbf{clean}(c)(i')(\mathbf{p}) \geq \boldsymbol{s}(i')(\llbracket \text{clean} \rrbracket)](\llbracket \text{Mary} \rrbracket^{c,i})$
[(a) & believe, Intension F.A.]
$= \forall i'[i'R(\mathbf{m})(i) \rightarrow \textbf{clean}(c)(i')(\mathbf{p}) \geq \boldsymbol{s}(i')(\llbracket \text{clean} \rrbracket)]$
[Extension F.A.]

We can verify that the public-standard reading (59-c) is true at formal context c and circumstance of evaluation i just in case Porky's degree of cleanness at every circumstance of evaluation (or centered world) i' compatible with Mary's beliefs at i is at least as high as the threshold value for 'clean' at c, i.e. $\boldsymbol{s}(c)(\llbracket clean \rrbracket)$, and that the private-standard reading (60-b) is true at formal context c and circumstance of evaluation i just in case, for every circumstance of evaluation (or centered world) i' compatible with Mary's beliefs at i, Porky's degree of cleanness at i' is at least as high as the threshold value for 'clean' at i', i.e. $\boldsymbol{s}(i')(\llbracket clean \rrbracket)$.

8.3 Comparison with the previous analysis

It is easy to see why the present account avoids unwanted truth-conditions. There are only two ways to interpret S_{Porky}: Either we diagonalize on the embedded sentence (i.e. Porky is clean) and get the private-standard reading, or we don't and get the public-standard reading.

The present analysis is also not vulnerable to the analogue of our objection to the theory of pragmatic halo. On this analysis, when the private-standard reading is asserted, the clean-threshold-function(s) is determined solely by the doxastic state of the belief subject (which we represent as a set of centered worlds each of which contains a threshold function as one of its coordinates). Since the context does not determine any clean-threshold, the issue whether it determines a clean-threshold(s) that matches with the clean-standard(s) of the belief subject does not arise.

The present analysis looks promising. But one may worry that the diagonalization operation it uses violates Kaplan's famous prohibition against monsters. The main motivation of Kaplan's prohibition is that the content of an expression should always be a function of its parts' contents, which can't be true if there are operations that require the content of an expression to be computed based on one of its parts' character.[52] Kaplan calls those operations 'monsters'. My account of the private-standard reading violates Kaplan's ban because the content of S_{Porky} is computed based on the diagonal proposition of 'Porky is clean', which we can't obtain without operating on the character of 'Porky is clean'.

I do not have the space to respond to this worry here because the issue whether there are sufficiently strong empirical and theoretical reasons to uphold Kaplan's ban is complex.[53] So a full evaluation of the costs of this analysis must be left for future work.

9 Conclusion

This paper posed a challenge to the absolutist analysis of maximal standard gradable adjectives (GA_{max}), on which GA_{max} require their arguments to have the maximal degree of the properties they express. We saw that the result of embedding Rotstein and Winter's belief sentence inside a belief context has two coherent-belief readings besides the contradictory-belief reading; that the absolutist can't use Lasersohn's theory of pragmatic halos to account for both readings satisfactorily; and that if the absolutist uses Sassoon and Toledo's local absolutism and granularity shift to account for those readings, they face the Porky-Tom problem and are hard-pressed to provide the licensing conditions for granularity shifts. I showed that we can plausibly account for the coherent-belief readings by adopting Kennedy and McNally's typology of the scale structures of gradable adjectives; holding that the contextual thresholds for GA_{nax} are not determined by the economy principle but by the tradeoff between informativity maximalization and Quality; and adopting either the world-variable-based analysis we considered in §7 or the monstrous analysis we just considered.

[52] See Zimmermann (2013) and Rabern (2013) for helpful definitions of Kaplan's ban against monsters.

[53] For relevant discussions, see Kaplan (1989), Lewis (1980), Schlenker (2003), Anand and Nevins (2004), Anand (2006), Ninan (2010), Santorio (2012), Zimmermann (2013), Rabern (2013), Stalnaker (2014), Rabern and Ball (2017), Santorio (2019).

I have not considered all the data that could be used to support the truth conditions determined by the economy principle. For example, McNally (2011) reports that for-phrases and compared-to phrases typically can't be used to modify GA_{max}. She points out that the economy principle provides a straightforward explanation for that phenomenon: Since the contextual threshold is always endpoint-oriented, information about which comparison classes are contextually salient can't have any effect on the interpretations of GA_{max}. Whether we can explain that phenomenon without using the economy principle is an issue that must be explored in future research.[54]

References

Anand, P. (2006). *De de se*. PhD Dissertation, MIT.

Anand, P. and Nevins, A. (2004). Shifty Operators in Changing Contexts. In *Semantics and Linguistic Theory*, volume 14, pages 20–37. https://doi.org/10.3765/salt.v14i0.2913.

Bierwisch, M. (1989). The Semantics of Gradation. In Bierwisch, M. and Lang, E., editors, *Dimensional Adjectives*, pages 71–261. Berlin: Springer.

Burnett, H. (2014). A Delineation Solution to the Puzzles of Absolute Adjectives. *Linguistics and Philosophy*, 37(1):1–39.

Carter, S. (2017). Loose talk, negation and commutativity: A hybrid static-dynamic theory. In *Proceedings of Sinn und Bedeutung 21*, pages 267–282. https://ojs.ub.uni-konstanz.de/sub/index.php/sub/article/view/137.

Cruse, D. A. (1980). *Antonyms and Gradable Complementaries*, pages 14–25. Bonn: Bourvier.

Halpern, J. Y. and Pucella, R. (2007). Dealing with logical omniscience. In *Proceedings of the 11th Conference on Theoretical Aspects of Rationality and Knowledge (TARK '07)*, pages 169–176. New York: Association for Computing Machinery. https://doi.org/10.1145/1324249.1324273.

Heim, I. (2000). Degree Operators and Scope. In *Semantics and Linguistic Theory*, volume 10, pages 40–64.

Hintikka, J. (1979). Impossible possible worlds vindicated. In *Game-theoretical semantics*, pages 367–379. Springer.

Hu, I. J. (2015). *Epistemicism*. PhD dissertation, University of Texas.

Kaplan, D. (1989). Demonstratives: An Essay on the Semantics, Logic, Metaphysics, and Epistemology of Demonstratives and Other Indexicals. In *Themes from Kaplan*, pages 481–563. Oxford University Press.

Kennedy, C. (2007). Vagueness and Grammar: The Semantics of Relative and Absolute Gradable Adjectives. *Linguistics and Philosophy*, 30(1):1–45.

Kennedy, C. and McNally, L. (2005). Scale Structure, Degree Modification, and the Semantics of Gradable Predicates. *Language*, pages 345–381.

Klecha, P. (2018). On unidirectionality in precisification. *Linguistics and Philosophy*, 41(1):87–124.

Klein, E. (1980). A Semantics for Positive and Comparative Adjectives. *Linguistics and Philosophy*, 4(1):1–45.

Krifka, M. (2007). Approximate Interpretation of Number Words: A Case for Strategic Communication. In Bouma, G., Krämer, I., and Zwarts, J., editors, *Cognitive Foundations of Communication*, pages 111–126. Koninklijke Nederlandse Akademie van Wetenschapen.

Lasersohn, P. (1999). Pragmatic Halos. *Language*, pages 522–551.

Lasersohn, P. (2005). Context Dependence, Disagreement, and Predicates of Personal Taste. *Linguistics and Philosophy*, 28(6):643–686.

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Lassiter, D. and Goodman, N. D. (2017). Adjectival vagueness in a bayesian model of interpretation. *Synthese*, 194(10):3801–3836.

Lewis, D. (1979). Scorekeeping in a Language Game. *Journal of Philosophical Logic*, 8(1):339–359.

Lewis, D. (1980). Index, Context, and Content. In Kanger, S. and Ohman, S., editors, *Philosophy and Grammar*, pages 79–100. Springer.

McNally, L. (2011). The relative role of property type and scale structure in explaining the behavior of gradable adjectives. In Nouven, R., van Rooij, R., Sauerland, U., and Schmitz, H., editors, *Vagueness in communication. VIC 2009. Revised selected papers*, pages 151–168. Berlin: Springer.

Ninan, D. (2010). De Se Attitudes: Ascription and Communication. *Philosophy Compass*, 5(7):551–567.

Nolan, D. P. (2013). Impossible worlds. *Philosophy Compass*, 8(4):360–372.

Percus, O. (2000). Constraints on some other variables in syntax. *Natural language semantics*, 8(3):173–229.

Potts, C. (2008). Interpretive economy, schelling points, and evolutionary stability. Manuscript, University of Massachusetts at Amherst.

Predelli, S. (1998a). I am not here now. *Analysis*, 58(2):107–115.

Predelli, S. (1998b). Utterance, Interpretation and the Logic of Indexicals. *Mind & Language*, 13(3):400–414.

Rabern, B. (2013). Monsters in Kaplan's Logic of Demonstratives. *Philosophical Studies*, 164(2):393–404.

Rabern, B. and Ball, D. (2017). Monsters and the theoretical role of context. *Philosophy and Phenomenological Research*, 98(2):392–416.

Rooth, M. (1985). *Association with Focus*. PhD dissertation, University of Massachusetts at Amherst.

Rotstein, C. and Winter, Y. (2004). Total Adjectives vs. Partial Adjectives: Scale Structure and Higher-order Modifiers. *Natural language Semantics*, 12(3):259–288.

Russell, B. (1905). On Denoting. *Mind*, 14(56):479–493.

Santorio, P. (2012). Reference and Monstrosity. *Philosophical Review*, 121(3):359–406.

Santorio, P. (2019). Context-free semantics. *Oxford studies in philosophy of language*, 1:208–239.

Sassoon, G. and Toledo, A. (2011). Absolute and relative adjectives and their comparison classes. Manuscript, University of Amsterdam, Utrecht University.

Sauerland, U. and Stateva, P. (2011). Two Types of Vagueness. In *Vagueness and Language Use*, pages 121–145. Springer.

Schlenker, P. (2003). A Plea for Monsters. *Linguistics and Philosophy*, 26(1):29–120.

Stalnaker, R. (2014). *Context*. Oxford University Press.

Syrett, K., Kennedy, C., and Lidz, J. (2009). Meaning and Context in Children's Understanding of Gradable Adjectives. *Journal of Semantics*, 27(1):1–35.

Toledo, A. and Sassoon, G. W. (2011). Absolute vs. Relative Adjectives-variance within vs. between Individuals. In *Semantics and Linguistic Theory*, volume 21, pages 135–154. https://doi.org/10.3765/salt.v21i0.2587.

Unger, P. (1975). *Ignorance: A Case for Scepticism*. Oxford: Clarendon Press.

Von Fintel, K. and Heim, I. (2011). *Notes on intensional semantics*. Manuscript, MIT.

Zimmermann, E. (2013). Context dependence. In Maienborn, C., von Heusinger, K., and Portner, P., editors, *Semantics: An international handbook of natural language meaning*, volume 3, pages 2360–2406. de Gruyter Mouton.