

Deriving the Two Readings of English Determiner+Adjective¹

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Abstract. I distinguish two readings of the English Determiner+Adjective construction, one which refers to individuals who have the property ascribed by the adjective (*the creative are intrinsically motivated*), and one which refers to the property itself as an abstract mass (*the familiar is dangerously wonderful*). I present a wealth of new data from Web searches showing that the two readings are grammatically distinct, and both quite productive. To derive these two readings, I take inspiration from the neo-Davidsonian analysis of adjectives from Parsons (1990) and Landman (2000), suggesting that adjectives contain an argument for both an individual and a *state* – an eventuality with the mereological structure of a mass noun. For the individuated reading, I propose a type-shifter that existentially closes the state argument, leaving a predicate of individuals; for the mass reading, I propose a second type-shifter that existentially closes the individual argument, leaving a predicate of states. When adjectives are analyzed with two hooks – an individual argument and a state argument – both readings of Determiner+Adjective can be derived.

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1. Introduction

In this paper, I focus on an English construction where a determiner combines with an adjective to serve as a DP:

- (1) a. **The creative** are more likely to be intrinsically (internally) motivated
- b. **The familiar** is something dangerously wonderful

As Kester (1996), Giannakidou and Stavrou (1999) and Goes (2007) have observed, this construction actually has two readings. (1-a) represents what I'll call the *individuated* reading, since it seems to refer to a group of creative individuals. (1-b), on the other hand, exemplifies what I'll call the *mass* reading, since it seems to denote familiarity as an abstract concept.

In this paper, I first lay out the empirical properties of both readings, expanding on previous explorations. I show that the conceptual difference between the two readings is also manifested grammatically, in that the individuated reading can be used with count determiners and triggers plural agreement on the verb, whereas the mass reading is used with mass determiners and triggers singular agreement. I also demonstrate that the construction is more productive than previous work

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would indicate. It involves many different determiners, not just *the*, and it is quite productive.

Next, I suggest that previous analyses from Kester (1996), Giannakidou and Stavrou (1999), Goes (2007), and Chierchia (1998) do not capture Det+Adjective in its full diversity. Then I propose a semantic analysis in which an Adjective Phrase can combine with one of two type-shifters to derive the two readings of Det+Adjective. To preview, I suggest that adjectives have the denotation in (2), with unsaturated arguments for both an individual and a state (Davidson (1967), Parsons (1990), Landman (2000)), where a state is understood as an atomless join semilattice in the domain of eventualities (Link (1983), Baglini (2014)).

$$(2) \quad \llbracket \mathbf{adjective} \rrbracket = \lambda x \lambda s [s \preceq \mathbf{adjective-ness} \wedge \mathbf{holder}(x, s)]$$

For example, the adjective *creative* would map an individual and a state to *true* if the state is a subpart of *creative-ness/creativity* and the individual holds that state.

Next, I suggest that a type-shifter can close this state argument, leaving a predicate of individuals who hold that state. This predicate of individuals combines with a determiner to yield the individuated reading. To derive the mass reading, I propose a different type-shifter to close the individual argument and yield a predicate of states of *adjective-ness*, the abstract mass eventuality associated with the adjective. This predicate of states combines with a determiner to yield the individuated reading. This analysis ties the type-shifters to arguments that are already independently motivated in the denotation of an adjective. Thus, we can not only derive both readings of Det+Adjective, but also understand why only these two readings would be available.

I also try to relate this analysis to some broader themes. For example, I am inspired by an interesting pattern identified by Koontz-Garboden and Francez (2013) (henceforth F&KG), Baglini (2013) and Baglini (2014). Citing the classification from Dixon (1982) of property concept (PC) lexemes – words that are commonly lexicalized as adjectives in languages that have adjectives – they identify languages where these lexemes surface as mass nouns. In Ulwa, for example, PC lexemes must combine with a possessive morpheme (*ka*) to be used predicatively:

- (3) Yang as-ki-na minisih-ka.
 1SING shirt-1SING dirty-KA
 “My shirt is dirty.” Green (1999) via Koontz-Garboden and Francez (2013), their (26)

In Wolof, predication is also expressed as possession (Baglini (2013), Baglini (2014)). For example, “Awa is strong” is expressed as *Awa has strength*, parallel to *Awa has rice*.

- (4) Awa am na-∅ doole/ceeb.
 Awa have FIN-3sg strength/rice.
 “Awa is strong / Awa has rice.” Wolof; Baglini (2013): 2, her (3)–(4)

As F&KG and Baglini observe, these PC nouns behave in many ways like mass nouns – just like the mass reading of English Det+Adjective. F&KG thus analyze these PC nouns as “abstract mass substances,” so that for example *strength* characterizes all portions of this abstract property in an atom-less join semi-lattice (Link (1983)). In contrast, Baglini gives eventualities their own type in the ontology (following Davidson (1967), Parsons (1990), Kratzer (1996), Landman (2000)), and proposes that these PC mass nouns denote a special subtype of eventuality known as *states*, which behave in quite parallel ways to mass substances.

For both F&KG and Baglini, Property Concept predicates are analyzed to contain two arguments, one for the individual that the predicate is true of, and one for the portion of the abstract mass substance (F&KG) or subpart of the state (Baglini) that the individual possesses. Thus, in different ways, these researchers agree that PC predicates need to contain an additional argument reflecting the property ascribed by the adjective and giving it the lattice-theoretic structure of a mass substance. From my perspective, either of these formulations would work equally well; all that matters is that the adjective contains a second argument with a mass lattice structure. I choose to use the term *state* because there is already a body of work arguing that English adjectives contain a neo-Davidsonian state argument (e.g. Parsons (1990), Landman (2000)).

In a neo-Davidsonian framework (Davidson (1967), Kratzer (1996)), events have their own type in the ontology, and event-describing verbs contain an event argument in their semantics. For example, *kill Caesar* would be represented as:

- (5) $\lambda e[\mathbf{kill}(e) \wedge \mathbf{theme}(Caesar, e)]$

Events are considered to be a subtype of *eventualities*, an umbrella term for all sorts of happenings including processes (*flutter in the wind*), achievements (*realize Deirdre was gone*), accomplishments (*build a house*) and states (*sit, stand, be happy* – Vendler (1967), examples from Kearns (2000)).

In such a framework framework, it is not clear whether all types of eventualities should have an argument in the semantics, or only some of them. States, in particular, are handled differently by different authors, with Maienborn (2007) saying that one subtype of states has a special state argument argument while the other does not, and Parsons (1990) and Landman (2000) arguing that they all do. In this paper, I use Det+Adjective to weigh in on this debate. If adjectives have argument slots for both individuals and states, it seems plausible that a type-shifter might pick up on either one of these arguments – which is exactly what we need to derive both the individuated

and mass readings of Det+Adjective. In this way, the two readings of Det+Adjective serve as further evidence that adjectives need an additional argument in their denotation.

By weaving in these themes, I hope to not just provide an analysis of this one construction, but also to engage bigger questions about how properties are encoded linguistically.

1.1. Road map

The rest of the paper is structured as follows. In Section 2, I introduce the data on Det+Adjective, highlighting the individuated/mass distinction and showing that both readings are extremely productive. In Section 3, I review previous analyses of Det+Adjective, arguing that more needs to be said to capture the full diversity of the construction. Next, in Section 4, I claim – contrary to much literature – that the construction does not necessarily denote a kind. In Section 5, I characterize states formally, showing how they have the mass behavior needed to derive the mass reading of Det+Adjective. In Section 6, I propose a semantic analysis of both readings of Det+Adjective. Finally, I conclude in Section 7.

2. Empirical domain

In this section, I introduce the data on the English Det+Adjective construction. Using web searches, I have been able to find a wealth of new data which show that Det+Adjective is more productive than previous work might suggest, involving diverse determiners and adjectives.

As a methodological note, all of my data come from Google searches conducted between February 2013 and the time of writing. Generally I search strings in quotes. To cull the relevant readings, I sometimes choose coordinations that I think are likely to occur in the Det+Adj construction (“*the rich and the poor*”). Other times I include a verb, as in “*the familiar is*”. I have not included URLs because many of them will be inactive at the time of reading. However, using the methodology I’ve sketched, one should be able to find similar data.

2.1. Conceptual differences between the two readings

Det+Adjective has two, conceptually distinct readings. The individuated reading seems to refer to a group of individuals that have the property ascribed by the adjective. It could often be paraphrased as *adjective + people* or perhaps *adjective + ones* or *+ things*, but it crucially could *not* be paraphrased as *adjective + ness* or any other nominalizing affix:

(6) **The cranky** are free to shake their fists and tell her to get off their lawn

→ Could only be paraphrased as *cranky people*, NOT *crankiness*

In contrast, the mass reading seems to refer to the property ascribed by the adjective itself. It could be paraphrased as a nominalized form of the adjective, but it could *not* be paraphrased as *adjective + people/ones/things*:

- (7) **The cute** is perhaps the dominant aesthetic category of our late-capitalist times
→ Could be paraphrased as *cuteness*, NOT as *cute people/ones/things*

Also, it is often claimed (e.g. Kester (1996), Chierchia (1998)) that the individuated reading refers only to humans. However, this is not what I have found. For example, in (8-a), *the weak* and *the strong* refer to weak and strong insects; in (8-b), *the fittest* could pick out any sort of evolving organism from foxes to pine trees to slime mold; and in (8-c), *the shiny* indicates shiny new technological devices.

- (8) a. New Swarm Theory: **The Weak** Can Lead **the Strong** [topic: insects]
b. where fascinating creatures and pioneering scientists reveal how **the fittest** are made
c. Latest shiny thing, new tech, doesn't matter. If you don't have a goal serving both creator and user, attention is misguided. However, **the shiny** are distracting for a reason.

I conclude that Det+Adjective need not refer to humans. Rather, this comes about as a pragmatic inference, just as *runners* generally indicates human athletes but could in a certain context pick out non-humans (e.g. *greyhounds are fast runners*.)

2.2. Productivity

A given adjective can occur in either the individuated reading or the mass reading. For example, *the pretty* and *the silly* can occur in both the individuated and mass readings:

- (9) a. *Individuated*: **The pretty** are expected to achieve [article about lookism]
b. *Mass*: **The pretty** is boring. There must be strength and power.
- (10) a. *Individuated*: Quit talking sense! This is LACurbed [website], where **the silly** are bashed no matter what!
b. *Mass*: I think **the silly** is my favourite part of your books

Of course, some adjectives seem to favor one reading over another; adjectives describing human qualities (e.g. *generous, intelligent, married*) seem to prefer the individuated reading, whereas adjectives describing abstract concepts (*infinite, sublime*) seem to prefer the mass reading. But the important point is that the adjective's lexical entry does not fully determine which readings of Det+Adjective it can participate in.

Det+Adjective is also productive with both gradable and nongradable adjectives on both readings. Above, in (9)–(10) for example, I have shown that gradable adjectives participate in both readings. Below, both readings occur with the nongradable adjectives *dead, married* and *geological*:

(11) *Individuated reading*

- a. In Tacloban, **the dead** are being taken to a mass grave in a public cemetery
- b. the laity and **the married** are underrepresented in the lists of canonized saints

(12) *Mass reading*

- a. “progress” always seems to go in one direction—toward **the dead** and the dull.
- b. The form of non-linguistic expression that most closely relates to **the geological** is painting

2.3. Grammatical differences between the two readings

Next, I demonstrate that this conceptual distinction between the two readings of Det+Adjective is also manifested grammatically. The individuated reading behaves as a plural count noun, triggering plural agreement on the verb and appearing with count determiners, whereas the mass reading works like a mass noun, with singular agreement and mass determiners.

Looking first at verb agreement, we see that the individuated reading has plural agreement whereas the mass reading has singular agreement:

(13) *Individuated reading*

In truth, the lucky **are** often no more deserving that anyone else

(14) *Mass reading*

A lot of the fluffy **is** gone. This blog has gone from a modge podge of crafts, family, nonsense and special needs to mostly special needs

Turning to determiners, my web searches reveal that Det+Adjective is compatible with a wide

variety of determiners beyond just *the*. For example, both readings can occur with *some* (15-a)–(16-a) and possessive determiners (15-b)–(16-b).

(15) *Individuated reading*

- a. **Some fired** say they are so relieved to be jobless just so they can be done with that school
- b. Give me **your tired, your poor**/Your huddled masses yearning to breathe free (Emma Lazarus's poem on the Statue of Liberty)

(16) *Mass reading*

- a. Mix **some salty** with your sweets
- b. Stop! **Your nice** is infecting me!

Distinguishing the two readings, the individuated reading appears with determiners that select for *count* nouns, such as *many* and *few* (17-a)–(17-b). These determiners appear with count nouns such as *dogs* (*many/few dogs*) but not with mass nouns such as *rice* (**many/few rice*). In contrast, the mass reading appears with determiners that select for *mass* nouns, such as *much* and *little* (18-a)–(18-b). These determiners only occur with mass nouns such as *rice* (*much/little rice*) but not with count nouns such as *dogs* (**much/little dog*, on the relevant interpretation of *little*).

(17) *Individuated reading*

- a. Too **Many Rich** are Unwilling to Share
- b. How about because **few rich** are philanthropic?

(18) *Mass reading*

- a. My personal opinion is that **too much sweet** is bad for you.
- b. **A little pretty** is just what the doctor ordered!

These data further show that the individuated reading is conceptually plural and count, whereas the mass reading is conceptually mass and grammatically singular.

2.4. Modification

Finally, on both readings, Det+Adjective can be modified by degree modifiers ((19-a), (20-a)), other adverbs ((19-b), (20-b)), and adjectives ((19-c)–(20-c)).

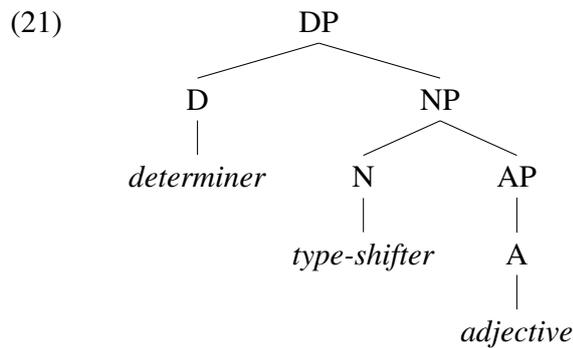
(19) *Individuated reading*

- a. The **extremely wealthy** are shifting their investment strategy away from cash
- b. I for one am actually looking forward to having my benefits cut if it means that the **happily unemployed** are made to tighten their belt too
- c. the **stylish young** are reclaiming the necktie as their own

(20) *Mass reading*

- a. the **very old** is new again
- b. **the disgustingly cute** is something to be loved
- c. you're on the upside of the healing and most of the **mean nasty** is behind you

Although I do not explore the syntax of Det+Adjective in any detail here, I think these facts suggest that Det+Adjective needs to contain a full Adjective Phrase to host the degree modifiers and adverbs (so perhaps it should be called Det+AP). This AP may need to be embedded within an NP to explain why it can also be modified by an adjective. I use the N head to house the type-shifters I propose below. Finally, the whole structure needs to be a DP to explain its syntactic distribution. Thus I assume the following structure:



To sum up this section, the Det+Adjective data pattern as follows:

Grammatical behavior of individuated, mass readings of Det+Adjective

	<i>Individuated reading</i>	<i>Mass reading</i>
<i>Intuitive meaning</i>	Individuals the adjective is true of	The property itself
<i>Productive across determiners?</i>	Yes	Yes
<i>Productive across adjectives?</i>	Yes	Yes
<i>Verb agreement</i>	Plural	Singular
<i>Determiners</i>	Count, plural	Mass, singular
<i>Adjective can be degree-modified?</i>	Yes	Yes
<i>Adjective can be modified by adverbs?</i>	Yes	Yes
<i>Adjective can be modified by adjectives?</i>	Yes	Yes

3. Previous analyses

3.1. Kester

Next, I review some previous analyses of the construction. First, Kester (1996) investigates Det+Adjective as part of a broader exploration of how empty categories are licensed in DP. She proposes that inflectional morphology is important for licensing *pro*, a non-pronounced component of DP. Since English determiners and adjectives do not inflect for gender or number, *pro* cannot be morphologically licensed and thus can only appear in quite limited contexts, deriving only the individuated reading. In contrast, the richer inflection of Dutch licenses *pro* in more contexts², giving rise to the mass reading of Dutch Det+Adjective.

On Kester's view, the only null noun in English has the default features [+human +generic +plural]. This is because the impoverished inflection of English does not license null nouns, but the default *pro* does not need to be licensed. Kester believes that default *pro* underlies Det+Adjective in English. Thus, she predicts that all instances of English Det+Adjective should refer to pluralities of humans in a generic fashion, as in *The rich are different*. It is very interesting that more richly inflected languages allow more nouns to be left implicit. However, for English Det+Adjective in particular, it seems that Kester's system does not predict the full diversity of the construction.

3.2. Giannakidou and Stavrou

Giannakidou and Stavrou (1999) (G&S) bring up Det+Adjective to distinguish it from nominal subdeletion (e.g. *You take the blue one and I'll have the red*). They focus on Greek, but discuss English too in comparison.

²See McNally and de Swart (2011) for a semantic analysis of several Dutch constructions that are reminiscent of English Det+Adjective.

For Det+Adjective, G&S note both the individuated reading (*the blind*) and the mass reading (*the unknown*). However, some of their other claims about the English data conflict with what I have found in my web searches, and some of their findings for Greek do not carry over to English. They argue that Det+Adjective is not fully productive, that it resists modification and faces language-specific lexical restrictions. In contrast, my data suggests that English Det+Adjective is extremely productive, not resistant to modification, and not subject to any lexical constraints.

Turning to the analysis, G&S analyze Det+Adjective as “a kind-denoting nominalization” (296), using the kind-forming \cap operator from Chierchia (1998). For example, *the blind* would denote the kind, BLIND PEOPLE. On their account, \cap is contributed by the definite determiner (312).

As for the mass reading, G&S say that “reference is made . . . to an abstract concept or idea” (298), and that “the items in this construction, like abstract nouns in general, should best be analyzed as mass nouns” (328). I agree and I try to incorporate this insight into my analysis. Since G&S do not explain how the mass reading is to be derived, I try to build on their analysis in this regard.

3.3. Goes

For Goes (2007), French Det+Adjective is an example of a blurry continuum between lexical categories. Whereas traditional syntax holds that every word in a sentence is labeled with a concrete lexical category – e.g. *noun, verb, adjective, preposition* – Goes suggests that these categories can be “distorted” or “converted.” According to Goes, distortions are somewhat rigid and stylistically marked, whereas conversions are flexible, productive and unmarked. He proposes many diagnostics to distinguish distortion and conversion.

Goes also notes both the individuated and the mass reading of Det+Adjective for French. According to Goes, the individuated reading of Det+Adjective may represent distortion or conversion depending on how the particular construction patterns with respect to the diagnostics he proposes. The mass reading represents distortion because it passes some of his distortion diagnostics: for example, one cannot say *ce triste* “this sad” or *beaucoup de triste* “a lot of sad.”

To sum up, Goes notes both the individuated reading and the mass reading and studies the grammatical behavior of each in great detail. His distinction between distortion and conversion is interesting because it challenges the common assumption that every word fits into exactly one lexical category in any given syntactic context. But since Goes does not provide a compositional account of the semantics, there is room to build on his proposal as well.

3.4. Chierchia

The final analysis I review comes from Chierchia (1998), who considers the individuated reading of Det+Adjective – e.g. *the rich* – as part of his inquiry into how kinds are formed across languages. He argues that this reading of Det+Adjective denotes a kind, RICH PEOPLE. In his syntactic proposal (394), the adjective modifies a null noun, Δ . Δ is syntactically plural and count. Semantically, it is “a function that applies to adjectival meanings to return something true of the totality of people having the property ascribed by the adjective,” for example turning *rich* into a characteristic function of the plural, count totality of rich people.

Having posited this structure, Chierchia returns to the main theme of his paper and asks why *the* is needed to turn Det+Adjective into a kind when English allows other NPs to be turned into kinds without a determiner, as in *Dogs are smart*. He concludes that “phonologically null items must somehow be licensed” (395), meaning that they must stand in a special syntactic relationship to some other item to be grammatically well-formed. To license the silent Δ , Chierchia argues that we need the determiner *the*.

Chierchia’s proposal is attractive because it explicitly guarantees the plural, count behavior of the individuated reading. However, since he does not mention the mass reading, I think we need a more liberal system to derive both readings of Det+Adjective in their full diversity.

To sum up this section, I have presented previous analyses of Det+Adjective and pointed out where I think we can improve. Before I turn to my own analysis, I address a theme that has come up in three of the four analyses I’ve sketched: that Det+Adjective denotes a kind or is somehow inherently generic (Kester (1996), Giannakidou and Stavrou (1999), Chierchia (1998)). In the next section, I explain why I am not convinced by this idea.

4. Kinds

Det+Adjective might seem to denote a kind because it often occurs as a subject to generic predicates – predicates that make general statements, such as *extinct* or *smart*, as opposed to episodic statements about concrete happenings, such as *be in my yard right now* or *said hello to me yesterday*. However, we also find many examples of the construction with a predicate that does not seem to be kind-selecting:

(22) *Individuated reading*

- a. Further up the street, **the wealthy** shopped, dressed in purples and greens
- b. **The young** cried and clung to their mothers

(23) *Mass reading*

- a. **The pretty** made me do it [buy a lot of stuff at a fabric store]
 b. Will probably scrap this [photo] later . . . but **the cute** made me upload it anyway.

In these contexts, it is not clear that Det+Adjective denotes a kind. Rather, it seems more plausible that Det+Adjective denotes a particular group of individuals with the property in the individuated reading (some particular wealthy people), and a particular portion of the property in the mass reading (some particular instantiation of cuteness).

As further evidence that Det+Adjective is not kind-denoting, we can look to determiners. In English, kinds can be denoted by bare nouns (*dogs are intelligent*), definite singulars (*the dog is intelligent*), and – with a slightly different meaning (Lawler (1973), Krifka (2003)) – indefinite singulars (*a dog is a mammal*). But crucially, kinds cannot be denoted by definite plurals, nor by quantifier DP's headed by *some*, *many* or *much*, nor by possessives. As we have seen, Det+Adjective can occur with all of these determiners. Since these determiners are not thought to select kinds, it seems that Det+Adjective cannot be inherently kind-denoting.

In light of these data, I argue that Det+Adjective does not necessarily denote a kind. When it *does* denote a kind, as in *the pretty are expected to achieve* or *the pretty is boring*, I suggest that the definite determiner contributes the \sqcap operator (which forms a kind) rather than the usual ι operator (which simply picks out the unique, maximal, existing individual that the description is true of). This analysis explains how *the*+Adjective can denote a kind without requiring that Det+Adjective must always do so.

5. States and adjectives

The semantic literature is conflicted over how to analyze adjectives (e.g. Kamp (1975), Klein (1980), Kennedy (1999)). Since gradable adjectives such as *tall* and *expensive* depend heavily on context, the main debate focuses on how to capture this context-sensitivity. Here, though, I assume that (gradable and nongradable) adjectives are type $\langle e, t \rangle$, just for simplicity, and instead focus on a different issue: whether adjectives ought to contain a *state* argument in their denotation. This idea extends the neo-Davidsonian analysis of events, in which events contain a special argument at logical form, to states (e.g. Parsons (1990)). Endorsing this view, Parsons gives adjectival predication the following logical form:

- (24) Brutus is clever.
 $\exists s[\mathbf{s}$ is a state of being clever \wedge $\mathbf{Subj}(s, Brutus) \wedge \mathbf{Hold}(s, now)]$

The most convincing argument for this analysis (Parsons (1990), Landman (2000)) comes from entailment patterns with modification – based on Davidson's original arguments for an event variable (Davidson (1967)). As illustrated in (25), a stative predicate with modifiers entails the same

predicate with the order of the modifiers switched ((25-b)) or with one or both of the modifiers dropped ((25-c)–(25-e)).

- (25) a. Amanda was happy in Paris on vacation.
 b. Amanda was happy on vacation in Paris.
 c. Amanda was happy in Paris.
 d. Amanda was happy on vacation.
 e. Amanda was happy.

Unless one posits that *happy* contains a state argument in its denotation, this inference pattern is difficult to capture. As Landman (2000) discusses in detail, one would have to write meaning postulates to specify that the modifiers can be reordered or eliminated while preserving truth. Moreover, these rules would have to be expanded to capture an arbitrary number of modifiers. Such meaning postulates, Landman points out, are unwieldy and ad hoc.

In contrast, if *happy* and other stative verbs contain a special *state* argument, these inferences are captured in a perspicuous manner:

- (26) $\exists s[\mathbf{happiness}(s) \wedge \mathbf{holder}(Amanda, s) \wedge \mathbf{in-Paris}(s) \wedge \mathbf{on-vacation}(s)]$

In other words: there is a state of happiness *s* and Amanda holds *s* and *s* is in Paris and *s* is on vacation. Since conjunction is associative (order doesn't matter) and entails all of the conjuncts, the inferences in (25) follow.

Zooming out, states – discussed by Aristotle and incorporated into theoretical linguistics by Lakoff (1970) – are one type of *eventuality*, an umbrella term for any linguistic characterization of something that happens or some way that things are. Whereas other types of eventualities involve endpoints (*run a mile*) or transitions (*realize something*), states do not have any inherent endpoint or transition, making them *atelic* and *homogeneous*. Moreover, whereas other types of eventualities can happen instantaneously (*realize something *for five minutes, win a race *for a minute*), states take time: *she was happy for ten years*. Thus, states are *durative*.

These ontological and grammatical properties of states are reminiscent of mass nouns. Since we have seen that the mass reading of Det+Adjective functions as a mass noun, this parallel will be important later on. For example, the state of *being happy* has no inherent beginning or end. In the same way, *water* has no inherent shape or boundary. Like states, mass nouns display the subinterval property: if *x* is water, then any subpart of *x* (down to the molecules) is also water.

To sum up, states are a type of atelic, durative, homogeneous eventuality. To put it formally, states lie in the domain of “mass eventualities” (Baglini (2014)). Mass eventualities have the same algebraic structure as mass nouns – a join semi-lattice without atoms (Link (1983)) – but inhabit the domain of eventualities rather than the domain of individuals.

A state S is a non-empty set of portions arranged in a join semi-lattice with no bottom element. Subparts of S are ordered by a relation \preceq , the “part-of” relation. Any two portions of substance can be “fused” to create a larger portion of the substance.

Next, states are homogenous, meaning that they are both divisive and cumulative (Moltmann (1991), Baglini (2014)). P is divisive if and only if, for all x and y , if $P(x)$ is true and y is a subpart of x , then $P(y)$ is true (Krifka (1989)). P is cumulative if and only if, for all x and y , if P is true of x and y , then P is true of the join of x and y . Finally, P is homogeneous if and only if it is divisive and cumulative (Moltmann (1991)).

Characterized in this way, states are given their own type in the ontology (here, type s). They are one of the basic types used to build adjectival meanings such as:

$$(27) \quad \llbracket \mathbf{happy} \rrbracket = \lambda x \lambda s [s \preceq \mathbf{happiness} \wedge \mathbf{holder}(x, s)]$$

This denotation is slightly different from the one given by Parsons (1990). Parsons would write $\mathbf{happiness}(s)$ rather than $s \preceq \mathbf{happiness}$, as I have written here. This is because Parsons does not focus on the algebraic structure of states. On the current picture, $\mathbf{happiness}$ is not a single entity but a cascade of smaller and smaller portions of the homogenous, static eventuality of $\mathbf{happiness}$, as reflected by the \preceq notation.

If states have arbitrarily small portions, then one might object that *Mary is happy* could be considered “true” even if Mary holds only a minuscule subpart of the state of happiness. To handle this context-sensitivity (discussing “portions” rather than “states,” but invoking the same issue), F&KG point out that it is extremely uncooperative, perhaps even false, to claim that one possesses a mass substance when one has too little of it to be relevant for the present purpose (Travis (1989)). To use Travis’s example, it would be uncooperative to offer coffee and then add that *There’s milk in the refrigerator* when there are only a few drops on the shelf. This pragmatic principle ensures that *Mary is happy* will not be a cooperative utterance unless Mary has a contextually significant portion of happiness.

Also, I assume that when *happy* is used predicatively, the state argument is existentially closed at the level of VP, so that *Mary is happy* means that there exists a state of happiness that Mary holds. As discussed above, this will only be a cooperative utterance if this state of happiness is significantly large. However, for Det+Adjective, the state argument need not be existentially closed, as we will see shortly.

Now that I have introduced states both intuitively and formally, I return to the main thread. As we saw earlier, the mass reading of Det+Adjective behaves like a mass noun. States, we have just seen, behave similarly to mass nouns as well. To bring us to English Det+Adjective, I propose in the next section that if we analyze adjectives with a state variable, we can explain both readings of English Det+Adjective using simple type-shifters. We can also shed light on *why* the individuated and mass readings are both available – because they each target a different argument (the individual e argument for the individuated reading, the state s argument for the mass reading) that is already available in the denotation of the adjective.

6. Analysis

When adjectives are analyzed with an individual argument and a state argument, then either of these two arguments can be closed to yield a predicate of individuals (what we need for the individuated reading) or a predicate of states (what we need for the mass reading). I assume that adjectives have the denotation given in (28-a), where an adjective takes an individual and a state and asserts that the state is a subpart of the abstract mass eventuality associated with the adjective and the individual holds that state. Using this denotation, I propose two type-shifters to yield the two readings of Det+Adjective:

- (28) a. $\llbracket \mathbf{adjective} \rrbracket = \lambda x \lambda s [s \preceq \mathbf{adjective-ness} \wedge \mathit{holder}(x, s)]$
 b. $\llbracket \mathbf{nom-indiv} \rrbracket = \lambda A_{\langle e, \langle s, t \rangle \rangle} \lambda x \exists s A(x)(s)$
 c. $\llbracket \mathbf{nom-mass} \rrbracket = \lambda A_{\langle e, \langle s, t \rangle \rangle} \lambda s \exists x A(x)(s)$

To illustrate how the individuated reading is derived, we can consider an example like *the creative are more likely to be intrinsically motivated*. Since the predicate *are more likely to be intrinsically motivated* seems like a kind-selecting predicate, we use the kind-forming denotation for *the*, \ulcorner , as opposed to the object-selecting one, ι .

First, *creative* combines with *nom-indiv* to yield a predicate of individuals for which there exists a state of creativity that the individual possesses ($\lambda x \exists s [s \preceq \mathbf{creativity} \wedge \mathbf{holder}(x, s)]$). This predicate is now type $\langle e, t \rangle$ and can combine with \ulcorner like any other predicate of individuals to yield the kind, CREATIVE INDIVIDUALS, associated with that predicate (following Chierchia (1998)). On this derivation, *the creative* picks out the maximal plurality of creative individuals in any given situation or world, which seems to capture the meaning of this construction. We still need to stipulate that this group of individuals has a cardinality greater than one, since *the creative* cannot denote a single rich person, and we still need to explain how the semantic plurality of *the creative* is manifested in plural syntactic agreement. But it seems that the correct meaning has been derived.

This meaning is consistent with the count behavior of the individuated reading. Since a plurality of individuals is grammatically count and plural, we see why the individuated reading goes with count determiners. If we assume that grammatical agreement reflects a noun's semantic plurality

– which I do not have space to justify here – then this analysis would also explain why the plural, count individuated reading triggers plural agreement on the verb.

Turning to the mass reading, we again use the denotation of adjectives given in (28-a), but this time we use the *nom-mass* type-shifter. To derive *the familiar is dangerously wonderful*, we again use the kind-creating denotation for *the* – \cap – as opposed to the object-selecting denotation, ι , because the predicate seems to be kind-selecting.

Here, we apply *nom-mass* to *familiar*. The result is a predicate characterizing all states of familiarity that are held by anyone: $\lambda s \exists x [s \preceq \mathbf{familiarity} \wedge \mathbf{holder}(x, s)]$. This predicate is now a function from states to truth values – type $\langle s, t \rangle$. If we generalize Chierchia's \cap so that it can apply to predicates of states as well as predicates of individuals, we can apply \cap to this predicate of states of cuteness and arrive at the kind FAMILIARITY, the maximal portion of familiarity in any given situation. Thus, the whole sentence seems to indicate that FAMILIARITY is dangerously wonderful, which seems to be the correct meaning. Moreover, since *the familiar* is a maximal portion of a mereological mass, we can understand why it has the grammatical behavior of other mass substances.

7. Conclusion

To conclude, I step back to tie together all the themes that I have been integrating into this study of Det+Adjective. In terms of data, my analysis captures the diverse Det+Adjective constructions that I illustrated in Section 2, predicting both readings of Det+Adjective and explaining why they differ grammatically. It correctly predicts that Det+Adjective may occur productively across adjectives and across determiners, and need not denote humans even on the individuated reading. It allows that Det+Adjective can denote a kind (in which case the kind-forming determiner *the* is used) or not (in which case it occurs with the object-selecting *the* or any other determiner). Thus, I believe this analysis captures all the data I have presented.

Next, I have tried to relate English Det+Adjective to languages with Property Concept mass nouns, such as Ulwa and Wolof. I have argued that Ulwa and Wolof provide evidence that properties can be conceptualized as abstract masses – in particular, as Baglini claims, in the domain of eventualities – and suggested that English is realizing this same possibility with the mass reading of Det+Adjective. I have used the formal machinery in the work of F&KG and Baglini to specify what states are and how they are structured algebraically, and I have argued that English adjectives have arguments for both individuals and states, but normally existentially closes the state argument, whereas Ulwa/Wolof Property Concept nouns denote states and acquire their individual argument through possessive morphology. Thus all these languages are invoking the same tools in order to express properties and predication.

Finally, I have shown one more advantage to positing state argument in the denotation of an adjective. This move allows us to posit two symmetrical type-shifters for the two readings of English

Det+Adjective. Since each type-shifter closes an argument that is already present, it is easy to see why there are not arbitrarily many adjectival type-shifters, but only the two used in Det+Adjective.

To sum up, this paper has provided a wealth of new data about an interesting, understudied construction. This relatively obscure construction has helped to shed light on some larger issues in semantics, such as how adjectives and eventualities are best represented in logical form, and more broadly, how properties are encoded across languages.

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