

# Alternating Adjectives

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## 1 Introduction: A Curious Phenomenon

Empirically, this paper contributes to the research on adjectival semantics by describing an interesting small puzzle in the semantics of English adjectives which alternate in a particular way. The alternation is exemplified in (1) below.

(1) a. The happy/sad man ran home on hearing the news.  
The happy/sad news caused the woman to run home immediately.  
b. The curious man looked at the painting carefully.  
The curious painting attracted many stares.  
c. The suspicious detective examined the stain on the floor.  
The suspicious stain on the floor attracted the attention of the detective.  
d. He is a man comfortable in his own skin.  
This comfortable sheepskin can be worn as a warm jacket.

I will argue that this is a genuine alternation, and not simply vagueness, and moreover that the current distinctions offered in the literature with respect to types of adjective do not give us a handle on the pattern shown here in a satisfying way. Instead, I will argue that the alternation can be best understood via a distinction that is well known in the *verbal* domain, namely causation.

In brief, I will claim that the existence of this alternation shows that within simple property ascriptions (of which adjectival predication is a prototypical expression) a distinction is made between HOLDERS of properties simpliciter, and HOLDERS of *causalational*-properties. Thus, in analysing this adjectival puzzle as a parallel to verbal diathesis, I also hope to contribute something to the debate on the similarities and differences between states and dynamic events.

The structure of the paper is as follows. In section 2, I give some background on what is known about the syntax and semantics of the argument structure of adjectives in English. In section 3, I evaluate the data puzzle from English with respect to this background, and argue that it is not a case of vagueness or homonymy, but a genuine systematic alternation and has a parallel in the formation of adjectival participles based on psych verbs. I give a semantic characterization of the alternation under consideration here in these terms. In section 4, I argue that the patterns and their characterization that has emerged from the investigation so far makes most sense if causativization is the primary process at work in creating the alternation in the adjectival domain. In the concluding section, I discuss what consequences this characterization has for theories of semantic decomposition and argument structure more generally.

## 2 The Argument Structure of Adjectives

The phenomenon I will be looking at involves the behaviour of a certain group of adjectives. It is thus important to establish at the outset what we know about the syntax and semantics of adjectival predication. Adjectives in predicate position form stative predication with the help of the copula *be*. They sometimes select for complements, as in (2-b), but they are more usually intransitive as in (2-a) with a single externalized argument.<sup>1</sup>

(2) a. The boy is tall.  
b. The boy is envious of his sister.

Baker (2003) argues that the deep difference between adjectives and verbs is that verbs project their own specifier, while adjectives always need some kind of functional ‘help’ to do so. The upshot of this line of thinking is that the external argument of the Adjective is not generated internal to the AP (as in Stowell 1983), but is merged external to the AP via some functional head (Baker 2003, Bowers 1993, Meltzer-Asscher 2011). It is also true however that much recent work in the constructivist Distributed Morphology (DM) tradition considers that *all* arguments are introduced by functional heads, so that this property of adjectives does not distinguish it from any other verbal projection. This is unfortunate, although the distinction can possibly be recast in some other way. It certainly needs to be acknowledged that there are deep syntactic differences between the ways in which adjectives and verbs combine with their arguments, which any theory needs to express.

One purely conceptual argument for the difference comes from the fact that the argument of adjectives is not in practice obligatory, as seen clearly in the attributive use (3-a), and from the fact that in many languages adjectives need ‘help’ to construct actual predication with an overt subject (3-b), even in languages where one can show that tense inflection is handled by some independent element (Baker 2003).

(3) a. The tall boy. *attributive*  
b. The boy \*(is) tall. *predicative*

There are also compelling empirical arguments from coordination and movement, that the externalized argument of an adjective is not part of the minimal AP, in contradistinction to verbs. The following argument comes from Meltzer-Asscher (2011).

Consider the examples in (4) where a common subject is applied to the two conjoined VPs in (4-a), and the two conjoined APs in (4-b), presumably by some kind of Across the Board Movement (ATB).

(4) a. The girls will[ [VP *t* write a book] and [VP be awarded *t* a prize for it]]  
b. The prices are [?AP [ high] and [likely *t* to get higher]]

While (4-b) is indeed grammatical, showing a position for the external argument of the adjective, it is not clear what is being conjoined, a minimal AP or something larger. If we use a degree modifier such as *very* to mark the left edge of AP, something rather striking happens. The interpretation corresponding to conjoined APs under a common degree

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<sup>1</sup>English stative verbs on the other hand tend to be transitive. Baker (2003) notes that while most languages of the world straightforwardly seem to possess a category that could be labelled Adjective, it is sometimes the case that this function is taken over by intransitive stative verbs.

modifier is completely absent, and only the larger coordination is possible (5). Contrast this with the verbal coordinations under the manner adverb in (6).<sup>2</sup>

- (5) a. The book is [ [very interesting] and [likely *t* to sell well.] ]
- b. \*The book is [very [ [interesting] and [likely *t* to sell well.] ]]
- (6) The girls will quickly [ [ *t* write a book] and [be awarded *t* a prize for it]]

Meltzer-Asscher (2011) interprets this as indicating that the subject originates in a position outside AP, and that successful ATB requires a full PredP. This conclusion is also consistent with the position of floating quantifiers in AP predication. Crucially a floated quantifier from subject position is grammatical outside the degree modifier *very*, but not within the AP itself.

- (7) a. The films were all (very) interesting.
- b. \*The films were very all interesting.

Once again the crucial minimal comparison can be made to a VP and a manner adverb.

- (8) The bars have slowly all become very similar.

I take the distributional evidence to suggest that that the single externalized argument of an Adjective must be added via an external functional head. I wish to remain neutral for now about what head that is, specifically, and neutral with respect to the claims of neodavidsonianism more generally (e.g. Kratzer 1996). If one does believe that the external argument, or even all arguments of a verb are introduced by separate functional heads, then these functional heads must be more integrated with their respective V than they are in the case of A. I take seriously, therefore, the surface differences in obligatoriness and the distributional facts from Meltzer-Asscher.

Semantically, we know that adjectives express simple stative predication. Since there is only one argument, it becomes the ‘subject’ and there is no issue for linking theory in the classical sense. But the question still remains: are there any differences in the ‘thematic role’ assigned to that single position across different adjective types? The question is whether the single externalized position corresponding to the argument of the adjective shows any linguistically relevant thematic distinctions.

In the next few subsections, I discuss some of the proposals for linguistic distinctions within adjectival role types that have been proposed in the literature.

## 2.1 Unergative vs. Unaccusative Adjectives?

Parallel to the unaccusative vs. unergative distinction within verbs, is there a difference between adjectival forms which predicate a property over an ‘internal’ argument and those which predicate a property over an ‘external’ argument? Or does the difference

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<sup>2</sup>An anonymous reviewer points out examples like *This book is hardly interesting or deep*. where the adverb *hardly* appears to scope over both conjuncts. This does appear to be the correct reading. However, the structure corresponding to this example is unclear. It is unclear what the height of attachment of *hardly* is here, especially in the light of its uses as a VP modifier, and the polarity switch required from *and* to *or*. Also, note that *hardly* can cooccur with *very* to give *This book is hardly interesting or very deep*. The structure of these examples is not well understood and is beyond the scope of this paper. However, the point of the example with *very* is that the latter adverb is more prototypically and exclusively an AP-internal adverb, used in this test for marking the left edge of AP.

simply get neutralized and become irrelevant once a static monovalent property predication is produced. Indeed, there have been some claims in the literature that adjectival predication must be divided into those which are more ergative, or unaccusative-like, and those that are unergative (Cinque 1990, Bennis 2004).

In Cinque (1990), the following adjectives in Italian are argued to be ‘ergative’, based on the results of a battery of tests: *noto*-‘well-known’, *chiaro*-‘clear’, *certo*-‘certain’, *sicuro*-‘sure’, *oscuro*-‘obscure’, *probabile*-‘likely’, *prevedibile*-‘foreseeable’, *gradito*-‘welcome’, *implicito*-‘implicit’, *esplicito*-‘explicit’, *evidente*-‘obvious’, *ovvio*-‘obvious’. While it is clear that these tests do isolate a particular subclass of adjectives, it is not clear whether it actually is a clear analogue to the unaccusative/unergative distinction. Rather, what seems to characterize these adjectives is that they all seem to be speaker-oriented epistemic evaluations of whole propositions. The immediate suspects for a class of ergative adjectives would have been the adjectival passive participles, but these do not pattern as unaccusative/ergative by the Cinque (or Bennis) diagnostics. In fact, Meltzer-Asscher (2011) argues that the correct semantic generalization for this class of adjectives in Italian and Dutch (and indeed also Hebrew and English) is that they all denote *properties of propositions*.<sup>3</sup>

The adjectives that have been claimed to be ergative, then, turn out to be those that select syntactically for finite complements. This is consistent with the idea that true propositional meanings need to be anchored with respect to the utterance context (cf. Adger 2007, Bianchi 2003). We can also see that the so-called ergative adjectives are the ones that can take DPs that denote propositions as subjects, but not DPs that denote simple or complex events, as shown in (9) (data from Meltzer-Asscher 2011).

- (9)    a. The claim was obvious.
- b. \*The examination of the students was clear.
- c. ??The trip was obvious.

Contrast this with ‘unergative’ adjectives taking clausal complements, such as *good*, *dangerous*, *funny*, *interesting* etc. These adjectives express subjective judgements regarding an event (or object), rather than judgements about the truth of a proposition (see also Léger 2010, cited in Meltzer-Asscher 2011).

- (10)    a. It is interesting to play the piano.
- b. That book is interesting.
- c. The examination of the students was long but interesting.

It turns out that the class isolated by Cinque is indeed special, but it is plausibly due to the fact that these are adjectives that express properties of propositions and propositions uniquely can never be externalized. This at least is the claim in Meltzer-Asscher (2011). As far as the argument structure of adjectives is considered, the single ‘external?’ argument can correspond to any possible thematic relation consistent with the holding of a static property by an entity.

Cinque’s story is that obligatory externalization is a result of category conversion. Only underived adjectives can end up with internal arguments. Adjectives derived from

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<sup>3</sup>Note that this is not equivalent to taking a clausal complement, since it is generally understood that clausal complements of various kinds can denote different sorts of semantic entities. For example Asher (2000) and Hegarty (2003) argue that clauses can denote events, propositions, situations and facts. So only a subset of these clausal selecting predicates semantically select for propositions.

verbs always externalize. However, this view is disproved quite conclusively by Meltzer-Asscher (2011).

To summarize, then, while there seems to be good evidence that there is a distinction here, it is not clear that the notion of ‘ergative’ adjective corresponds in any meaningful *semantic* sense to unaccusative verbs.

## 2.2 The Psychological Dimension

Another important distinction that potentially affects the argument structure of the adjectival category is the difference between adjectives that predicate a mental state of their HOLDER argument (psych-adjectives), and those which predicate a simple non-mental property. Landau (1999) has distinguished between these two types of adjectives arguing that psych adjectives are dyadic in their argument structure and still contain a role for the TARGET/SUBJECT-MATTER, (in the terms of Pesetsky 1995). On this view, adjectives which simply ascribe a property to a concrete object, are not dyadic in this way.

(11) *Semantic Selection:*

- a. A psych -adjective denotes a two-place relations between an individual (EXPERIENCER) and an eventuality (TARGET/SUBJECT-MATTER)  
 $A_p (< DP_e, CP_{<s,t>} >)$
- b. A non-psych adjective denotes a one-place property of an individual THEME. That property in turn can be modified by a predicative infinitival.  
 $A_m (DP_e) \dots$  (from Landau 1999)

(12) a. John is angry  
b. The book is long.

Psych adjectives have particular properties, and can be distinguished by their selectional behaviour, as shown in Landau (1999).

(13) a. John was happy. vs. The box is heavy.  
b. John was happy that Bill left. vs. \*The box is heavy that Bill left  
c. Mary was happy to leave. vs. \*The box is \*(too) heavy \*(for us) to leave (?it).

Landau expresses the argument structure of psych adjectives of this type as follows: in addition to an experiencer argument (the HOLDER of the emotional state), there is a subject matter or target material that seems to be part of the argument structure here, even of the underived adjective.

According to Landau (1999) a predicate is psychological if and only if it follows from the truth of the minimal proposition in which it occurs that some argument of the predicate is an EXPERIENCER, i.e. an individual in a certain mental state. It turns out that adjectives that describe a psychological property of individuals can take a propositional clause as an argument, one which denotes the target or subject-matter of the psychological state. This will be important in what follows, and I will end up using the term STIMULUS for this kind of argument.

## 2.3 The Evaluative Dimension

We have seen that Landau proposes that there is an ‘extra’ argument position for psych adjectives for the STIMULUS of an experienced mental state. However, we could turn this distinction on its head and note the converse property of non-psych adjectives which often have an implicit position for a subjective evaluator of experiencer for the non-psych property in question. Some non-psych adjectives indeed are famous for *only* being truly asserted with respect to a judge (Stephenson 2007).

(14) a. This soup is tasty.  
b. That game was fun!

Since descriptive adjectives describe perceptible properties of objects, arguably even so-called ‘objective’ properties are relativizable to a judger in this way.

(15) a. That box is heavy (for me).  
b. This dress is big (for me).

I suggest that ‘judges’ in this sense often semantically subsume the EXPERIENCER role type. In the case of *beautiful* there is an implicit EXPERIENCER (often anchored to the speaker as ‘judge’), but in the case of *happy* it is the subjective property of the experiencer that is being reported, but there is an implicit STIMULUS.

Notice that evaluative adjectives can be quite flexible in their expression. There is also nice metonymic slippage one should note in (16), between the subject matter and the possessor of that subject matter (John vs. his opinions). Both can be called surprising in the same context. The same thing can be expressed using a CP description of 'fact'. These nevertheless should all be considered subtypes of the STIMULUS role type.

(16) a. John turned out to be quite a surprising guy!  
b. John's opinions were surprising (to us).  
c. It was surprising (to us) that John held the opinions that he did.

## 2.4 Taking Stock

Adjectives construct simple stative predication with an external argument. The external argument is introduced by higher functional material, but some distinctions in the role of that external argument can be detected in the types of optional complements they take, and in the degree of subjectivity of the property ascription. In general, all adjectival structures seem to express a stative property and have a single external argument.

Figure 1: General Adjectival Syn/Sem Structure

**Syntax :** AP Subject  
**SEMANTICS:** PROPERTY HOLDER

However, this is not to say that adjectives do not have different semantic subtypes. Putting aside the propositional adjectives, we can isolate differences between adjectives that denote properties of external objects (i.e. ‘external’ to the cognizer, whether concrete or abstract) which require an implicit ‘judge’, and more internal psychological properties which are properties of the ‘cognizers’ or experiencers themselves (like *happy*, or

*surprised*). Cognizers are of necessity animate, but the ‘cognized’ in this sense can be inanimate, abstract, or even other animate experiencers. While one can use the label HOLDER maximally generally for the external argument of any adjectival static property predication, and will use the more specific term EXPERIENCER for animates whose internal states are being described. Finally, I will use the term FIGURE specifically for ‘external objects’— entities that are individuated by cognizers— and whose properties are also described with adjectives.<sup>4</sup> Within the properties of cognized objects, one can further make a distinction (although it might be a fluid and flexible one) between objective properties that are assumed to be independent of an individual experiencer (like *wooden*, or *big*), and more subjective properties that necessarily take into account the effect they have on a particular perceiver or judge (like *tasty*, or *surprising*). I summarize this in the table below.<sup>5</sup>

Figure 2: Adjectival Argument Structure Types

Type	Property State	Specific Role
(i) Objective	Objective Quality (physical or abstract)	FIGURE
(ii) Evaluative	Subjective Quality	FIGURE (implicit PERCEIVER/JUDGE)
(iii) Psych	Internal State	EXPERIENCER (implicit STIMULUS)

Below, I have collected a few examples of simple adjectival predication exemplifying the above categories for convenience.

(17) (a) The book is heavy. *physical property, implicit perceiver*  
 (b) John is tall. *physical property, implicit perceiver*  
 (c) The claim was obvious. *abstract property, implicit epistemic judge*  
 (d) That snake is dangerous. *evaluative, implicit judge*  
 (e) The book is interesting. *evaluative, implicit judge*  
 (f) This sandwich is tasty. *evaluative, implicit experiencer*  
 (g) John is happy. *psychological*  
 (h) John is surprised. *psychological*

So, independently, there seems to be good evidence that we can describe different ‘types’ of adjectives along a number of different dimensions that affect argument structure. But how do these distinctions then relate to the alternation that I started the paper with? I turn to this question next.

### 3 The Stimulus-Experiencer Adjectival Alternation

Let us return to our original examples. The two meanings available to the adjectives in question seem to be evaluative and psychological respectively. Put in terms of ‘role’

<sup>4</sup>The term comes from Talmy and is prototypically associated with an entity which is spatially located with respect to a GROUND, but I use it here more generally to label any ‘external object’ subject to cognizance, which is the subject of predication of a static property.

<sup>5</sup>The phenomenon of gradability in adjectives also has a rich and important literature. I will assume however that the distinction between gradable and non-gradable, and the issue of vague or contextual standards, are orthogonal to the internal vs. external division being highlighted here with respect to cognizer and cognized.

types, the external argument in the evaluative reading is some kind of STIMULUS of the emotion described by the adjective in question, while in the psychological reading, the external argument bears the role of the EXPERIENCER of the emotion described by the adjective.

I repeat the original examples below. The [a] examples show the EXPERIENCER reading, and the [b] examples show the STIMULUS reading.

- (18) a. The happy/sad man ran home on hearing the news. EXPERIENCER
- b. The happy/sad news caused the woman to run home immediately. STIMULUS
- (19) a. The curious man looked at the painting carefully. EXPERIENCER
- b. The curious painting attracted many stares. STIMULUS
- (20) a. The suspicious detective examined the stain on the floor. EXPERIENCER
- b. The suspicious stain on the floor attracted the attention of the detective. STIMULUS
- (21) a. He is a man comfortable in his own skin. EXPERIENCER
- b. This comfortable sheepskin can be worn as a warm jacket. STIMULUS

Importantly, this is not a systematic coercion that is always possible for any adjective, since there are adjectives describing emotional states ( I found just a few) that do *not* allow the STIMULUS reading.

- (22) a. \*The angry news article was impossible to keep silent about.
- b. The sad news article was impossible to keep silent about.

Moreover, these adjectives are not just vague in some sense. This is a genuine ambiguity, where the difference in reading corresponds to different selectional properties. Not surprisingly, the EXPERIENCER reading of *curious* allows for the selection of an infinitival expressing the target of emotion as in Faraci (1974) Landau (1999), but the STIMULUS reading of *curious* does not.

- (23) a. \*Mary was curious [ OP<sub>i</sub> [for John to see t<sub>i</sub> ]]
- b. The movie<sub>i</sub> was quite curious [OP<sub>i</sub> [PRO<sub>gen</sub> to watch t<sub>i</sub> ]]

The alternation is not random. If Landau is right in his analysis of psychological adjectives as containing both EXPERIENCER and TARGET/SUBJECT-MATTER roles, we seem to be dealing with a situation where some adjectives are free to ‘choose’ which of those roles it externalizes as the main predicational subject.

However, the presence of two roles in the meaning of an adjective is not sufficient. The particular role types seem to be important too. As we have seen, adjectives of the Evaluative type discussed above have been argued to contain an implicit ‘judge’ role, but as far as I can tell never allow a version of the adjective where the ‘judge’ is externalized.

- (24) a. The game was fun (for the child).  
      The fun child played all day.
- b. The soup was tasty (for/to the guests). \*The tasty guests ate their fill.

Compare this with the successful versions of the above built from our alternating adjectives.

(25) a. The news was sad (for the child) The sad child started to cry.  
 b. The chairs were comfortable (for the guests). The comfortable guests stayed for a whole two hours without budging.

The adjectives that I have isolated as alternating in this sense are those that are usually considered to belong to the class of psychological adjectives, suggesting that their EXPERIENCER usage is basic, although as we have seen, not all psychological adjectives alternate (cf. the case of *angry*). While *sad* and *curious* feel more basic in the EXPERIENCER use, *comfortable* seems more basic in its STIMULUS use. But intuition is not necessarily reliable here, and we would prefer to have a clear linguistic diagnostic or correlate for which meaning is basic. But whatever the direction of derivation, if any, the generalization seems to be that all of the alternations involve EXPERIENCER arguments vs. TARGET/SUBJECT-MATTER (what I have been calling STIMULUS), and not FIGURE vs. JUDGE.

Adjectives of course are very particular in that they have a single argument position expressed obligatorily in the syntax. Once we turn to the verbal domain, there is a large class of stative verbs in English which possess precisely these two roles— EXPERIENCER and STIMULUS— that I have argued here best describes the adjectival alternation. I am talking of course here about stative psychological verbs.

(26) a. John fears nightmares. Subject Experiencer Verb  
 b. Nightmares frighten John. Object Experiencer Verb

### 3.1 A Parallel-Derived Adjectives from Object Experiencer Verbs

Interestingly, Object Experiencer verbs (henceforth OE verbs) give rise to participial forms that feed adjective formation. One might think that Subject Experiencer verbs would be ideal sources for derived adjectives, but the participles they give rise to do not seem to produce nice adjectives in *-ing* in a systematic fashion.

(27) a. The \*very fearing boy ...  
 b. The \*very hating boy ...  
 c. The \*very liking boy ...  
 d. The very loving boy ...

Object experiencer verbs on the other hand (cf. Belletti and Rizzi 1988, Landau 2005) like *amaze*, *fascinate*, *interest*, *please*, *frighten* etc. are different. As is often noted in the literature, they often have a dynamic version alongside their more stative one.

(28) a. Horror movies frighten John.  
 b. The tiger frightened John (by jumping out at him from behind a bush).

But more interestingly, OE verbs are the source of adjectival participles in *-ing* with great regularity, where they seem to have the uncomplicated external distribution of a gradable adjective.<sup>6</sup>

<sup>6</sup>There are a number of diagnostics one might use to pick out genuine adjectival participles in English, apart from the ability to appear in prenominal position (which is actually a rather more generous criterion). These diagnostics include: (i) ability to appear as the complement of *seem* (Wasow 1977, Levin and Rappaport Hovav 1995); (ii) ability to form adverbs in *-ly* (Emonds 1991, Brekke 1988) (iii) ability to form adjectives via *un-* prefixation (Wasow 1977). In fact, it turns out that OE verbs form

(29) a. The very frightening monster jumped out from behind the door.  
 b. The monster seems frightening to me.  
 c. I consider that monster frightening.

The pattern can be found with nearly all the OE verbs one can think of:

(30) This movie is *very interesting, depressing, fascinating, pleasing, amazing, surprising, revolting, disgusting*

While Belletti and Rizzi (1988) took object experiencer psych verbs to be in some sense unaccusative, this view has been criticized in the literature (Pesetsky 1995, Grimshaw 1990). Bennis (2004) argues that OE psych verbs are an intermediate category that he calls complex ergatives— they possess a little v (and hence accusative case), but their subject argument is in some sense THEME-like. From our perspective here, it is striking that the adjectives in *-ing* derived from OE verbs are similar in meaning to the evaluative adjectives in our typology— they describe the properties of a FIGURE, but those properties are crucially related to the effect they have on an EXPERIENCER.

*-ed*-participles can also feed adjective formation. And here, we find once again that OE verbs produce a large number of ‘adjectival’ passive readings in the sense of Wasow 1977.<sup>7</sup>

(31) John is *very interested, depressed, pleased, fascinated, disgusted, amazed, surprised*.

Interestingly, these participles in *-ed* from OE verbs are the psychological adjective meaning of our alternating class, corresponding to the evaluative meaning in *-ing*.

If you make a participle in *-ing*, the resulting participle must modify the *subject* of the corresponding verb.<sup>8</sup> Alternatively, if you make a participle ending in *-ed/en*, the resulting participle must modify the internal (THEME) argument of the corresponding verb. So, it is not surprising that the participles formed from a verb with EXPERIENCER internal arguments and STIMULUS role Subject would give rise to predication over the EXPERIENCER and STIMULUS roles respectively with *-ed* and *-ing*. The more interesting fact is that these feed adjectival constructions specifically, and not just verbal participles or nonfinite clauses. Because the *frightened/frightening* pairing corresponds to our alternating adjectives so well, it is also worth looking more closely at the semantics of these forms in relation to the *frighten* verbal root to get a semantic insight into the alternation.<sup>9</sup>

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adjectival *-ing* participles almost without exception. Brekke (1988) even goes to far as to state an EXPERIENCER constraint on the formation of derived adjectives in *-ing*, although this is probably too strong. Meltzer-Asscher (2010) argues that stativity of the base verb is what is most diagnostic of a participle in *-ing* having the behaviour of an adjective according to the most restrictive tests. As we have seen however, *fear*-type verbs in *-ing* does not always create good adjectives.

<sup>7</sup>Wasow famously argued that adjectival passives were formed in the lexicon and that verbal passives were formed in the syntax. I do not necessarily agree that this is the best way to capture the differences (see Bruening 2014 for critique and discussion), but I do acknowledge the fact that some participles in *-ed* show up very easily in distributional contexts that are shared with underived adjectives. I am interested here in the fact that OE verbs produce quite a lot of these ‘adjectival’ *-ed* participles.

<sup>8</sup>The subject orientation of participles in *-ing* vs. internal argument orientation of participles in *-ed* is a very strong generalization in English, whether or not the participles so formed have been classified as verbal or adjectival.

<sup>9</sup>To reiterate, notice that in principle, the Subject Experiencer verbs like *fear* have the ‘same’ roles as the stative reading of OE verbs, and so could easily have been the verb class to produce derived adjectival pairs that match our alternation (with *-ing* corresponding to the psychological reading and

To repeat, in the case of an OE verb like *frighten* with a STIMULUS subject and an EXPERIENCER object, the effect of participle formation is to create an adjective that predicates over a STIMULUS in the case of the *-ing* form, and an adjective that predicates over an EXPERIENCER in the case of the *-ED* form.

(32) a. The tiger frightened the man. STIMULUS (evaluative)  
b. The frightening tiger EXPERIENCER (psych)  
c. The frightened man.

*Frightening* -type adjectives are built from abstracting over the highest argument position of the verb. The internal argument seems to be bound off by being interpreted generically. Thus the property expressed by such adjectives is that of being the ‘stimulus’ or ‘cause’ of the ‘fear’ emotional experience for ‘people in general’. I give denotations for the verb *frighten* and the related adjectives in *-ing* in (33).

(33) a.  $[[\text{frighten}]] = \lambda x \lambda y \lambda s [\text{Fright}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$   
b.  $[[\text{frightening}]] = \lambda y \lambda s \text{GEN}_x [\text{Fright}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$

*Frightened* -type adjectives are built from abstracting over the internal argument position of the verb and reifying the property of possessing a particular emotional state, here ‘fright’. In binding off the external argument here, it seems wrong to invoke a GEN operator as we did in the case of the *Frightening* case above. Instead, we seem to need some sort of existential binding of the stimulus role in this case.<sup>10</sup>

(34) a.  $[[\text{frighten}]] = \lambda x \lambda y \lambda s [\text{Fright}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$   
b.  $[[\text{frightened}]] = \lambda x \lambda s \exists y [\text{Fright}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$

So, clearly, states like *Fright* have bivalent argument structures, which are targeted by different participial morphology to create derived adjectives embodying intransitive property predication. We can describe this, as we have done, in terms of STIMULUS argument vs. EXPERIENCER argument adjectives.

If we were to carry over this semantics to the alternating adjectives under consideration, we could start out with an argument structure containing two semantic roles, and argue that some morphologically zero alternation in English allows the construction of two types of adjective (*CURIOS<sub>eval</sub>* and *CURIOS<sub>psych</sub>*) corresponding to the evaluative and psychological meanings respectively. The derivation would be forced by the fact that adjectives only allow one open argument position for predication, so one of the two varieties, (35-b) or (35-c) would have to be chosen for insertion into the syntactic

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*-ed* corresponding to the evaluative. But the class does not behave this way. The participles formed from SE verbs are inserted into pure adjectival contexts much less consistently, and do not give rise to alternations with the matching readings. We will come back to why this might be so later on the paper.

<sup>10</sup>Note that in the literature, target state participles with adjectival distribution are claimed not to strictly require the existence of an actual event of the relevant type to justify the truth of an participle in *-en/ed* (see Embick 2004). I concur with the judgement for participles like *closed*, but we are dealing here with static eventualities, where culmination is not an issue. In the representations above, I leave the stative eventuality variable untouched in both the verbal stative and the participle. However, it seems to me that the existence of some abstract or general external stimulus is needed for the state of being frightened to exist at all, so I will existentially bind the argument position. The important thing here is that the two ways of ‘getting rid of’ the extraneous argument are different semantically, and in this case could not be captured by binding by a generic operator.

derivation.

- (35) a.  $[[ \text{curious} ]] = \lambda x \lambda y \lambda s [\text{Curiosity}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$
- b.  $[[ \text{curious}_{\text{eval}} ]] = \lambda y \lambda s \text{GEN}_x [\text{Curiosity}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$
- c.  $[[ \text{curious}_{\text{psych}} ]] = \lambda x \lambda s \exists y [\text{Curiosity}(s) \ \& \ \text{EXPERIENCER}(s, x) \ \& \ \text{STIMULUS}(s, y)]$

Strikingly, the way the OE verb participle is built pins down the meaning of the derived adjective rigidly: even though both *frightening* and *frightened* in English behave on the outside for all intents and purposes like pure ‘lexical’ adjectives (cf. Wasow 1977), I could find no forms in *-ed/en* that alternated in the ‘curious’ way.

- (36) a. The frightened man ran home on hearing the news.
- b. \*The frightened news caused the woman to run home immediately.
- (37) a. The fascinated man looked at the painting carefully.
- b. \*The fascinated painting attracted many stares.

Presumably, an evaluative alternant of *frightened* or *fascinated* is blocked by *frightening* and *fascinating* respectively.

- (38) a. The frightening news called the woman to run home immediately.
- b. The fascinating painting attracted many stares.

Expletive constructions can be made from *frightening*-type adjectives, but not from *frightened* type adjectives, confirming that they belong in the evaluative camp and not the psych camp of adjectives, according to the classifications proposed in the literature.

- (39) a. The movie is frightening.
- b. It is frightening to watch that movie.
- (40) a. The boy is frightened.
- b. \*It is frightened of the boy/by the boy.

This is fine as far as it goes, but certain mysteries remain. What we have achieved so far is that we have related the alternation to a class of adjectives that does seem to have a morphological reflex, and where the pair is unified by virtue of being related to the same verbal root for a large and robust class of verbs in English. We have related our alternation to an independently attested, morphologically signalled alternation in the verbal domain.

## 4 Motivating Causation as Driver of the Alternation

Even though we have discovered a parallel, the following questions remain: (i) why is there a difference between the two types of adjectives in terms of how the ‘other’ argument is bound off (generically for the evaluative A, and existentially for the psych A)? (ii) why do Subject Experiencer verbs not give rise to alternating adjective participle pairs the way Object Experiencer verbs do? (iii) why do adjective meanings that involve a ‘judge’ or a passive ‘perceiver’ do not alternate, whereas those which have an experiencer do? I think that the asymmetries noted here are related, and I think that the solution lies in the factor of ‘causation’ (and its flipside, affectedness’).

Concerning (ii), it has long been noticed that there are differences between the classes of Subject Experiencer verbs and Object Experiencer verbs apart from the different alignment of the EXPERIENCER participant. First of all OE verbs always have a dynamic alternant in English, and secondly, even in their stative incarnation, they seem to involve a notion of causation not found in the SE verbs. This is the conclusion reached independently by Arad (1999), who asserts that both the dynamic and stative versions of object experiencer verbs involve the abstract notion of ‘causation’ :

“ On the non-stative reading, the agent/causer brings about a mental state which now holds independently of them. On the stative reading the stimulus has to accompany the mental state constantly for it to hold. ” pg. 3

For Arad (1999), while the object experiencer verb (such as ‘frighten’) in its stative version involves a cause head, the subject experiencer verb ‘fear’ corresponding to it does not. ‘Frighten’ verbs are therefore special, and she dubs the underlying stative experience that is abstractly input to either the simple stative property, or the property of the thing *causing* the state, as ‘amphibious states’. In the dynamic incarnation of OE verbs, van Voorst (1992) argued that it is more important to see the object of an OE verbs as an aspectually affected argument than as an experiencer, essentially corresponding to the same intuition. If the adjective alternation under discussion in this paper corresponds to participles from OE verbs but not SE verbs, it is plausible to suppose that causativization is part of what makes the alternation possible.

The analysis of OE verbs as expressing generalized causational relationships whether stative or dynamic, argues that STIMULUS and EXPERIENCER actually represent a kind of stative causation within the psychological domain. If we classify OE verbs as Caused-State verbs, then the representations given above in terms of EXPERIENCER and STIMULUS would be rewritten more meaningfully as (41).

$$(41) \quad [[ \text{frighten} ]] = \lambda y \lambda x \lambda s [\text{Fright}(s) \& \text{EXPERIENCER}(s, x) \& \text{CAUSE}(s, y)]$$

While Subject Experiencer verbs would have the representation in (42).

$$(42) \quad [[ \text{fear} ]] = \lambda y \lambda x \lambda s [\text{Fear}(s) \& \text{EXPERIENCER}(s, y) \& \text{SUBJECT-MATTER}(s, y)]$$

The above representations deny that STIMULUS is a unified notion. In *frighten*, the CAUSE is the external argument and the EXPERIENCER is the holder of the caused state which is hierarchically embedded; with *fear*, the EXPERIENCER is the external argument and the lower argument is presented as inert subject matter. Thus, the way the state is presented correlates with the alignment of the arguments in a straightforward way and shows that causational framing is important to argument alignment with the syntax. The causational analysis opens up the possibility of understanding why it is that OE verbs and not SE verbs live a double life as dynamic causational verbs. Causational meaning is the core, and stative or dynamic versions result from the way these event structures are mapped to a time line.

The fact that the alternating adjectives match up with the participles formed from *frighten* and not from *fear* suggests that the alternants in the adjectival domain too are related by static causation: the adjectival meaning alternates between expressing the state held by the experiencer, and the property of generically causing such states in experiencers.

$$(43) \quad \text{a. } [[ \text{Curious}_{\text{psych}} ]] = \lambda x \lambda s [\text{Curiosity}(s) \& \text{EXPERIENCER}(s, x)]$$

$$b. [[ \text{Curious}_{\text{eval}} ]] = \lambda y \lambda s \text{GEN}_x [\text{Curiosity}(s) \& \text{EXPERIENCER}(s, x) \& \text{CAUSE}(s, y)]$$

Returning to the first two of our three questions above: (i) why is there a difference between the two types of adjectives in terms of how the ‘other’ argument is bound off (generically for the evaluative A, and existentially for the psych A)? (ii) why do Subject Experiencer verbs not give rise to alternating adjective participle pairs the way Object Experiencer verbs do? As far as the second question is concerned, I have argued that SE verbs do not give rise to pairs that match up with our alternating adjectives because they do not directly encode causation, and alternating adjectives do.

Concerning question (i), it is important to think about what makes these verbs so suitable for ‘pure’ adjective formation. Verbal meaning can be input to participialization as we have seen, to derive a form that contains only one ‘argument’ position. In the semantic representations I have given, the *-ing* participle requires generic binding of the internal EXPERIENCER argument, while the *-ed* participle seems to involve existential binding of the higher STIMULUS role. While the deep source of this asymmetry is not the focus of this short paper, it does seem to be the case that under *-ing* participle formation where the highest argument is being abstracted over, the internal argument is always generically bound. It is possible to think that this has to do with the fact that the internal argument bears a specific role, i.e. in this case the EXPERIENCER, but I think the generalization is more likely to be the fact that the argument being ‘eliminated’ is *internal*. Note that in the sporadic cases where SE verbs give rise to derived adjectives in *-ing*, such as *loving*, the internal argument is also generically bound even though in this case it corresponds to the STIMULUS role. With the *en/ed* participle, which is independently known to target the internal argument, the argument to be eliminated is the external one. There are many reasons to think that this should be different, or easier, given the many researchers who argue for the severing of the external argument from a verb’s argument structure (after Kratzer 1996). I have represented this as existential binding, but in the case of adjetivalization it may even be radically absent. It is certainly a different target for elimination and seems to require a different semantic strategy. In short, I would argue that the removal of the ‘other’ argument in the derivation of adjectives from participles is directly correlated with height in the hierarchical argument structure. The fact that alternating adjectives also seem to have this asymmetry argues that in the underived case as well, the STIMULUS/CAUSE argument is ‘higher’ in the argument structure than the EXPERIENCER, since the latter seems to be generically interpreted in the evaluative meaning.

Participle formation is free and productive and produces nonfinite verbal phrases, but there must be something special about the internal EXPERIENCER role when it comes to the ease and ubiquity with which true adjetival participles can be constructed via the *-ing* participle with precisely these verbs. It has already been noted in the literature that it is a very special class of stative verbs that gives rise to true non-argument taking stative adjectives in *-ing*. Brekke (1988) claimed that the generalization had to do with verbs that had experiencer objects. However, as Meltzer-Asscher (2010) points out, this undergenerates and does not account for *-ing* adjectives from verbs of light emission (*shining*), or a whole class of others like *loving* and *telling* and *revealing*. In fact, I think the true generalization is the following.

(44) **Stative Adjective in *-ing* Generalization:**

The input verbal meaning must describe the property of the external argument that *could generally affect a sentient experiencer in a particular way* (psycholog-

ically, epistemically or even perceptually).

Under precisely these conditions, the internal experiencer argument (when it exists) can simply be reanalysed as the subjective evaluation component, judge component of the stimulus property, allowing conversion into a simple monadic evaluative adjective.

The specialness of the OE verbs is thus that the extraneous internal argument in the *-ing* forms can be semantically reinterpreted as a contextual ‘evaluator’ or ‘judger’ parameter, without doing violence to the original verbal meaning. Whether this is a matter of a productive derivation or simply the description of a typical semantic drift is not our specific concern here. The purpose of this section has been to show that a verbal alternation that can plausibly be described in terms of causational substructure gives rise to the exactly the kinds of adjectival pairs as we find in our puzzle alternating adjectives. In the case of adjectives derived from OE verbs, the adjectives have different derivational endings, in the case of our alternating adjectives the same form is used.

My informal suggestion then is that alternating adjectives are possible precisely under the conditions where the primary meaning of the adjective is the psychological state of an experiencer. In such cases, a derived (subjective) evaluative adjective can be built describing an entity which has the property of triggering/causing such experiences.

### Alternating Adjectives

An underived adjective with the basic meaning in (A):

A.  $[[ \text{Adj}_{\text{psych}} ]] = \lambda x \lambda s [\text{State}(s) \ \& \ \text{Experiencer}(s, x)]$

can get a derived meaning in B:

B.  $[[ \text{Adj}_{\text{eval}} ]] = \lambda x \lambda s [\text{State}(s) \ \& \ \text{Cause}(s, x)]$  (with experiencer as implicit judge)

Further, the reason that the derivation goes in this direction, and that evaluative adjectives such as *tasty* do not have a psych alternant, is that there is a productive process of *causativization* that languages make use of to create derived meanings. The psych alternant of a basically evaluative adjective could not be derived from the latter by causativization since the meaning relationship does not go in that direction, whereas the evaluative property can be related to a psychological property by precisely this. So, finally, we have an answer to the third of our questions at the start of this section, the question of why adjectives with a ‘judge’ do not alternate in the same way as *curious* or *sad*. We account for it by saying that these adjectives have the evaluative meaning as basic, and that being able to ‘judge’ a property is not as specific as being affected by it (affected experiencers make good judges, but not necessarily the other way around).

## 5 Conclusion

I have concluded that the STIMULUS EXPERIENCER pair of roles forms the basis of two kinds of adjectives in English depending on whether the STIMULUS or the EXPERIENCER is the one who holds the property. Our puzzle adjectives *alternate* between the two readings. Further, as I have argued in the previous section, there are some reasons to think that the relationship between these two roles is some kind of stative version of causation, with the STIMULUS reading of the adjective being derived from the Psych EXPERIENCER reading.

Within English, the causative-inchoative alternation is famous for its ubiquity, and

in particular for the fact that the alternation itself is not mediated by overt morphology (*The window broke.* vs. *Elina broke the window.*). Thus, causativity plays a prominent role in verbal diathesis when it comes to dynamic events, and it underpins many distinctions made within argument structure (Levin and Rappaport Hovav 2005). In this paper, I have investigated a class of adjectives that seems to alternate between two quite distinct meanings. I have argued that this alternation is in fact akin to the causative verb alternation, which in English occurs without the addition of any overt morphology.<sup>11</sup> If this is true then it tells us something about the nature of causation, namely that it is linguistically relevant to both dynamic and stative eventualities.

Specifically, I have ended up arguing in this paper that there is a stative version of causation that has implications for stative predication as well (in agreement essentially with Arad 1999). While Arad (1999) is an investigation of psychological predicates, my own focus was on simple adjectival meanings where I argued the effects of stative causativisation could also be seen.

Why is that these adjectives in particular and not all property denoting adjectives in English undergo a labile ‘causative’ alternation? In other words, why can’t an adjective like *rusty* apply both to my pipes, and the condensation that made them so? (45).

(45) a. My pipes are rusty.  
 b. \*Condensation is very rusty. You must make sure your home is free from moisture.

In fact, causation is not enough, since as we have seen, all of the adjectives that participate in this alternation that I have found seem to belong to the domain of psych adjectives, those that describe a psychological effect in an experiencer. Two deep properties of adjectives underly this restriction. The first is that adjectives cannot express more than one argument. This means that if you ‘causativized’ a normal property predication, the notional holder of that property would not get expressed.

However, we also know from the literature on adjectives that the notion of ‘judge’ or ‘evaluator’ of a property predication is crucial to the semantics of many (possibly) all such property ascriptions. This has implications because of the fact that the evaluative judgement of an animate entity is also a kind of psychological state. This paves the way for slippage between psych-state-causing predication (‘The movie is sad’) and simple basic predication with an implicit evaluator (‘The meatballs are tasty.’). I would argue that it is precisely this slippage that allows the experiencer to remain absent in psych adjectives like ‘sad’ and ‘curious’.

With respect to the argument roles offered in the literature for adjectives, I suspect that the notion of evaluation is a crucial implicit component of all adjectival predication.

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<sup>11</sup>In German, recent work by Temme (2014) shows that there are two different types of adjective in German that behave differently from a syntactic point of view, and which are classified exactly along the same kind of dimension as *frightened* vs. *frightening* in English. In the German case, the adjectives are sometimes underived, or derived using semi-productive morphology. Temme calls the two types of adjective the (Object Experiencer) OE adjectives and (Subject Experiencer) SE adjectives. The SE adjectives are the ‘frightened’ type of adjective with EXPERIENCER external arguments, while the OE adjectives are the ‘frightening’ type of adjective with STIMULUS external arguments. Two two types of adjectives have different syntactic behaviour, even when not derived from a verb. The difference between German and English here is that the German adjectives do not alternate but are rigidly fixed in one or the other category. If I am right that causation is what is at stake here, the existence of productive labile causativization for verbs in English but not German is suggestive here, and supports an analysis of the alternation in terms of derived causation.

I also suspect that the difference between psych-states and concrete states may not itself be important except for the fact that animate entities are the only ones that can hold the former. With respect to the adjectival alternation described here, it could be the result of some kind of predictable semantic drift, or it might be productive within strict semantic constraints, I am not in a position to decide. The important thing is that the representations seem to involve causational superstructure in the ‘derived’ form, and this is interesting.

In the literature, it has already been claimed that as a semantic notions, scalar structure is relevant to both A and V (Hay et al. 1999, Kennedy and McNally 2005). If this analysis is right then causation too is a semantic notion that has cross categorial relevance in this sense. As with scalar structure, causation in the adjectival domain is never mapped dynamically to a temporal scale (gradable adjectives and causing properties are still both stative). The relevance of both causation and scalar structure in the adjectival domain allows us to see that these notions are in principle separable from temporal structure. This small idiosyncratic puzzle from English thus shows us something potentially interesting about the categories of A and V and of the syntax-semantics interface more generally.

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