

Degree Achievements of Color

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Abstract Color adjectives have hardly been incorporated into treatments of deadjectival degree achievements (e.g., *whiten*). In this paper, we begin to bridge this gap by examining color expressions and the degree achievements they form in Malayalam. While English degree achievements allow both a comparative (*become whiter*) and a positive (*become white*) reading, Malayalam degree achievements only have the positive reading. We attribute this to the structure of the base form from which degree achievements are derived, suggesting it has norm-related positive meaning (*white to a degree that exceeds the standard*), and we discuss some of the consequences this analysis has for analyses of degree achievements in English.

Keywords: gradable adjectives, degree achievements, color expressions, degree semantics

1. Introduction

Degree achievement verbs (*increase, fall, grow, age*) present challenges for theories of argument structure based on aspectual characterizations (Dowty, 1979, 1991, Abusch, 1986 a.o). These verbs show variable behavior with respect to telicity, and furthermore, the (a)telic interpretation is not straightforwardly affected by properties of the verbs' arguments, unlike the case of, e.g., incremental theme verbs (*eat an apple* vs. *eat apples*) or directed motion verbs (*descend* vs. *descend the stairs*).

A subclass of degree achievement verbs is morphologically related to gradable adjectives (*widen, cool, dry, lengthen*) and they too exhibit the peculiar telicity properties of the wider class of degree achievements. It is now standardly believed that the aspectual properties of deadjectival degree achievements can be attributed to the scalar structure of the base adjective (Hay et al., 1999, Winter, 2006, Kennedy and Levin, 2008, Deo et al., 2013).¹ The relevant distinction is between three types of gradable adjectives: open adjectives with no maximal or minimal value in the scale associated with the adjective, closed adjectives with maximum standards, and closed adjectives

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¹ We will refer to such degree achievements as 'deadjectival', and to their related adjectives as 'base adjectives', as common in the literature, but we do not necessarily assume that the verbs are morphologically built from adjectives. Some adjective-verb pairs are likely just sharing a root that is categorized as an adjective or as a verb through non-overt morphology (e.g., *cool, dry*); in other cases, just the adjectival affix is non-overt (e.g., *wide-widen*); in yet other cases the verb seems to be derived on the basis of a nominal stem (*long-lengthen*).

that only have minimum standards (Kennedy and McNally, 2005, Kennedy, 2007).^{2,3} All gradable adjectives have positive forms that reference a standard – a degree on the relevant scale – that has been reached or exceeded. For instance, to be long is to have length that is at least as much as some generally agreed-on standard (e.g., 3 pages for a poem, 300 pages for a novel). The distinction among the different types of adjectives has to do with how the standard is determined. Open adjectives (*wide, long, expensive, pretty*) have standards that are set purely contextually, while closed adjectives (*wet, dry, full*) have default conventional standards that can be shifted contextually.⁴ The default standard can be the minimum degree on the scale (*wet*), or the maximum degree on the scale (*dry, full*), allowing for contextual modification (e.g., *full but not completely full*).

The scalar structure of the base adjective affects the aspectual properties of the deadjectival degree achievement verbs in the following way. Degree achievements derived from open adjectives, i.e., adjectives without a maximum or minimum standard like *wide* and *long* are atelic by default; they behave similarly to activity verbs such as *walk* on standard tests for telicity. On the other hand, degree achievements derived from gradable adjectives whose scalar structure has a maximum value, such as *dry* and *straight*, are telic by default and so behave similarly to accomplishments such as *run around the lake*. Finally, degree achievements derived from adjectives with just a minimum standard and no maximal standard, such as *moist* and *dirty*, behave like atelic verbs at least as far as some of the telicity tests are concerned, though with respect to other tests they pattern as telic verbs.

The source of the differential aspectual behavior of the three types of degree achievements can be characterized in terms of reference to the positive or the comparative form of the base adjective. Specifically, *lengthen* can be analyzed, descriptively, as *become longer*, and its default atelic behavior would then follow from the absence of an assertion that the standard has been reached during the run time of an event of lengthening: the measured argument achieves a greater degree on the scale of length, but that degree is not necessarily as high as the standard. The degree achievement verb *dry*, on the other hand, can be said to have the meaning of the telic *become dry*: the measured argument reaches the standard of dryness during a completed event of drying. Something more needs to be said about *moisten*, given that it functions as atelic on some tests but as telic on others, and that it licenses an inference to the positive form of the base adjective, i.e., *become moist*. Similarly, an elaboration concerning variation from the default readings is needed as well. We return to these issues in Section 2.

² Open scale adjectives are also known as *relative* adjectives, while adjectives with a minimum or maximum standard are known as *absolute*. Independently of the terminology, caution needs to be taken with classifications along scale structure, as a given adjectives can be interpreted with respect to more than one scale, as noted by Kennedy and McNally (2005).

³ In addition, certain color adjectives, on a color-extension reading, where the gradable property makes reference to the amount of the object in question that has the color property, can have a midpoint standard, as shown by McNally (2011). In these cases, the degree to which the color-extension holds should be more than minimal but less than maximal.

⁴ See Toledo and Sassoon (2011) and Sassoon and Toledo (2011) for a different view moving away from fixed scales.

Deadjectival degree achievements can have color adjectives as their core, e.g., *whiten*, *redde*. There seems to be no discussion of their properties in the literature on degree achievements, as far as we know. This is perhaps not entirely surprising, given that the semantics and the syntactic behavior of color adjectives themselves is not very well understood, and the few studies that have examined the question (Kennedy and McNally, 2010, McNally 2011, McNally and de Swart, 2011, Alexiadou, 2013, Moltmann, 2013, Menon and Pancheva, 2016) have concluded that color adjectives have properties that set them apart from other adjectives. Views on the scalar structure of color adjectives also differ: Hansen (2011) classifies them as relative, Clapp (2012) as minimum standard absolute, and McNally (2011) as absolute adjectives with mid-point standards. An experimental investigation of inference judgments reveals a great degree of variability among speakers (Hansen and Chemla, 2017). Based on these prior characterizations, since color adjectives do not have maximum standards, we would expect them not to form telic degree achievements by default.

In this paper, we take a closer look at degree achievements formed from color terms in a Dravidian language with no lexical category of adjectives, namely Malayalam. Color terms appear in two different forms, a simple color term and a complex color term. Some color roots can form both simple and complex color expressions, but the majority of color roots form only one type of expression. In addition, color roots that can appear as complex forms, can also form degree achievement verbs. We note that in Malayalam, degree achievement verbs based on color terms only have telic readings, contrary to expectations that are based on characterizations in the literature of their scale structure. A closer look at the morpho-semantics of such expressions in Malayalam will allow us to understand better the source of variable telicity of degree achievements of color and of deadjectival degree achievements more generally. We show that the adjectival core of degree achievements may vary in its semantics. In some languages, such as English, a weaker semantics is encoded grammatically, with pragmatic factors playing a role in further restricting the meaning, while in languages such as Malayalam, a stronger meaning is encoded by the grammar.

The rest of the paper is structured as follows: in Section 2, we discuss standard accounts of degree achievements. We then introduce novel data from color expressions in Malayalam and discuss how degree achievements of color are formed and how their meaning is derived, in Section 3. In Section 4, we look at telic/atelic distinctions of these degree achievements. Section 5 concludes the paper.

2. Telic/Atelic Distinctions in Degree Achievements

In this section, we outline the different aspectual behavior of degree achievements. We present the classic account of English degree achievements (Dowty, 1979, Abusch, 1986) as well as more recent formal accounts such as Hay et al. (1999), Winter (2006) and Kennedy and Levin (2008). We show that these accounts attribute a comparative semantics to the adjectival core of degree achievements and then derive the stronger, positive, interpretation through additional conditions.

2.1 The role of scale structure

Variable telicity effects in degree achievements can be shown by the presence of both ‘in X time’ and ‘for X time’ adverbials, a standard test for telicity (in combination with perfective viewpoint aspect). In the case of deadjectival degree achievements, the two interpretations can be said to correspond to a “positive” vs. a “comparative” interpretation of the base adjective. *Cool* allows both readings in (1) (Kennedy and Levin, 2008, (1)).

- (1) a. The soup cooled in an hour. ≈ The soup became cool after an hour. (Telic)
 b. The soup cooled for an hour. ≈ The soup became cooler for an hour. (Atelic)

The telic interpretation of deadjectival degree achievements entails that the telos – the point of transition into a result state – has been reached. The standard degree on the scale associated with the base adjective serves to demarcate the telos. As the event progresses, the measure function that is part of the meaning of the base adjective maps an event participant to increasingly greater degrees on the relevant scale. In (1), as the event of the soup cooling progresses in time, the temperature of the soup reaches higher and higher degrees of coolness. Once the (contextually determined) standard degree of coolness is reached, the result state of the soup being cool is reached as well. The telic interpretation can thus be said to make reference to the positive form of the base adjective, as in (1a). The atelic interpretation does not invoke the standard degree, instead it can be said to make reference to a comparative form of the base adjective, as in (1b).

Not all degree achievements show equal ease in appearing with both ‘in X time’ and ‘for X time’ adverbials. Dimensional adjectives like *long*, *wide*, *deep* form degree achievements that don’t combine well with *in*-adverbials (Kennedy and Levin, 2008), suggesting they are atelic (see (2a)). On the other hand, degree achievements like *dry* prefer modification by *in*-adverbials, but would also accept *for*-adverbials. In this respect, verbs like *dry* are similar to telic predicates like *run across the bridge/around the lake* (which admit *for*-adverbials) and not to telic predicates like *run to the store/into the lake* (which don’t) (Zwarts, 2005, Winter, 2006). Finally, degree achievements based on absolute adjectives without a maximum standard, like *moisten* and *dirty*, seem to accept both *in*- and *for*-adverbials.⁵

- (2) a. They lengthened the rope {for an hour / ?? in an hour}
 b. The clothes dried {for an hour / in an hour}
 c. The towel moistened {for 10 seconds / in 10 seconds}

Another test for telicity involves inferences from the progressive to the perfect, as illustrated in (3). The atelic nature of *lengthen* and other degree achievements formed from dimensional adjectives is confirmed by the entailment pattern in (3a). On this progressive-to-perfect inference test, *dry* patterns as telic predicates do, (3b). Finally, degree achievements derived from adjectives

⁵ The acceptability of *for*-adverbials in (2b, c) could be attributed to the claim in Dowty (1979) that *for*-adverbials can turn accomplishments into activities. Arguably, what is relevant is the impoverished viewpoint morphology of English. For the *in*-/*for*-adverbial test to go through, telic predicates need to combine with perfective viewpoint, and the non-progressive morphology on *dried* and *moistened* cannot reliably be taken to be perfective.

with just a minimum standard and no maximal standard, such as *moist* or *wet*, behave like atelic verbs at least as far as inferences from the progressive to the perfect are concerned, as in (3c).⁶

- (3) a. They are lengthening the rope. \Rightarrow They have lengthened the rope. (Hay et al., 1999, (27a))
 b. The clothes are drying. \nRightarrow The clothes have dried. (Hay et al., 1999, (26))
 c. The towel is moistening. \Rightarrow The towel has moistened. (based on Winter 2006: 336)

As we have seen above, the relative adjective *long* conditions a default atelic interpretation for the degree achievement *lengthen*. Seemingly in conjunction with this, we also have the inference involving the comparative form rather than the positive form of *long*, (4). The opposite pattern is found with the degree achievement *dry* which is based on an absolute adjective with a maximum standard, and which behaves like a telic predicate. Here the perfect entails the positive form of the adjective, (5). There is also an inference to the comparative form, but that follows from the incremental scalar change semantics of degree achievements. Of relevance is whether the stronger inference, to the positive form, is available, and in the case of (5) it is.

- (4) They have lengthened the rope. \Rightarrow The rope became longer.
 \nRightarrow The rope became long.

- (5) The clothes have dried. \Rightarrow The clothes became dry.

However, the correspondence breaks down with *moisten*, which is based on an absolute adjective without a maximum standard. This degree achievement verb patterns as atelic according to the progressive-to-perfect test, (3c)), yet the inference from the perfect is to the positive form, not just to the comparative form, (6). See Winter (2006) for discussion of these facts.

- (6) The towel has moistened. \Rightarrow The towel became moist.

This suggests that there is no strict correspondence between atelic readings and the comparative form of adjectives, which the facts of (1) suggested earlier. Apparently, degree achievements that license an inference to the positive form can also yield atelic readings, like *moisten* does. We can describe the facts as follows. The scale structure of the base adjective determines whether the degree achievement allows a comparative or a positive inference with respect to the result state of *become*. Relative adjectives yield degree achievements with a comparative result state (e.g., *become longer*). Such forms are atelic, as there is no assertion that the contextual standard has been reached. The presence of a maximum standard in the scales of absolute adjectives results in degree achievements with a positive result state (e.g., *become dry*). Such forms are clearly telic. Since the standard is at the end-point, a proper subpart of an event of an entity becoming dry is not itself an event of that entity becoming dry. Finally, adjectives with a minimum standard also yield degree achievements with a positive result state (e.g., *become moist*), but such forms, although also clearly telic, pattern with atelics on the progressive-to-perfect test, as their telos is not a final end-point.

⁶ Telicity patterns are not affected by the syntactic structure: inchoative and causative forms of individual degree achievement verbs pattern alike (Hay et al., 1999).

In another instance where the correspondence between (a)telicity and comparative vs. positive inferences breaks down, telic readings do not necessarily entail the positive form. The addition of to a measure phrase turns degree achievements that are otherwise atelic to telic, yet the inference is still to the comparative form, with the measure phrase interpreted as a differential (e.g. Kennedy and Levin, 2008).

- (7) a. The road widened 30 km in ten years. \Rightarrow The road became wider by 30 km.
- b. The river lengthened 5 km in hundred years. \Rightarrow The river became longer by 5km.

The last set of examples bring us to another point: telic interpretations can be derived from atelic degree achievements, with suitable modification of context alone. Contexts that specify a standard, even implicitly, can prevent progressive-to-perfect inferences with *lengthen* (e.g., Hay et al., 1999). In (8), context supplies an implicit desired length for the pants, turning atelic *lengthen* (*become longer*) to its telic counterpart *become longer by reaching the desired length*. Modification by *in*-adverbials becomes possible, and the failure of the progressive-to perfect inference follows.

- (8) a. The tailor lengthened my pants in 20 minutes.
- b. The tailor is lengthening my pants. \nRightarrow The tailor lengthened my pants.

Importantly, the comparative inference persists. To the extent that the result state in (9) can be described as *long to the desired length*, the contextually supplied measure is interpreted as saturating the degree argument of *long* without an inference that a broader standard of what counts as long for pants has been reached. We thus see that whereas (a)telicity effects are to some extent malleable, inferences to the positive or comparative form are fixed by the scalar structure of the adjective.

- (9) The tailor lengthened my pants. \Rightarrow The pants became long to the desired length.
- \nRightarrow The pants became long, after reaching the desired length.

2.2 Formal analyses of variable telicity effects

The behavior of degree achievements presents a challenge to formal analyses. We would like to have a uniform account involving a verbal component (*become*) and an adjectival core that describes the result state, which is blind to the semantics of individual adjectives, with the scale structure of the base adjective, once the adjective is lexicalized, determining the aspectual behavior of the degree achievement verb, making it of the *lengthen*, *dry*, or *moisten* types. But as we saw earlier, the adjectival core describing the result state of *become* appears to be comparative in one case (*lengthen*) and positive in others (*dry*, *moisten*), undermining uniformity. Furthermore, there are some deviations from a one-to-one correspondence between the inferred adjectival form (comparative or positive) and aspectual behavior.

An early influential account of English degree achievements is that of Dowty (1979) and Abusch (1986), who suggest that degree achievements have a BECOME component and an adjectival component. The account adopts a vague predicate analysis of gradable adjectives (Kamp, 1975, Klein, 1980). The representation of the account in (10) is from Kennedy and Levin (2008), who

recast the original time-based semantics in terms of events. A degree achievement like *lengthen* has the form of $\text{BECOME}(\text{long})$ and is true of an entity and an event, if at the initial part of the event the entity is not long and at the final part of the event the entity is long. Importantly, what counts as long varies from context to context. Adjectives like *long* are taken to be functions from contexts to properties of individuals, as in (11). On telic readings, the contextual argument is fixed to the context of utterance, resulting in a ‘positive’ reading: for an entity to count as long in the current context means that the entity exceeds the current contextually set standard. On atelic readings, the contextual argument is existentially bound, resulting in a ‘comparative’-like reading: the entity becomes long with respect to some context, not necessarily the current one, so there is no inference that the current contextual standard has been reached.

- (10) a. $\lambda x \lambda e \text{BECOME}(P)(x)(e)$
 b. $\text{BECOME}(P)(x)(e) = 1$ iff $P(x)(\text{init}(e)) = 0$ and $P(x)(\text{fin}(e)) = 1$
 where $\text{init}(e)$ and $\text{fin}(e)$ are the initial and final parts of an event e .

- (11) $\llbracket \text{long} \rrbracket = \lambda c \lambda x. x$ counts as long with respect to c

The Dowty/Abusch account is uniform in the desired way, and it links the aspectual behavior of degree achievements to variation in the semantics of their adjectival part. Yet the account has empirical limitations. First, it predicts that all degree achievements can have both telic and atelic interpretations, and this is not so, as we have seen. Second, it does not allow for the scale structure of the different types of adjectives to affect the aspectual behavior of their corresponding degree achievements. Finally, the account leaves no way in which a measure phrase can compose and be interpreted as a differential (as discussed in Kennedy and Levin, 2008). Nevertheless, the basic idea that degree achievements incorporate a change-of-state BECOME and a form related to an adjective, whose semantics determines the aspectual properties of the degree achievement verb, persists in subsequent analyses.

Hay et al. (1999) and Winter (2006) propose accounts that essentially treat the adjectival component of degree achievements as comparative (e.g., *become longer*), and derive the different aspectual behavior of the different types of degree achievements through further conditions. Hay et al. (1999) suggest a preference for stronger meanings, so in the case of verbs like *dry*, the value of the scalar change is maximized, in effect interpreting *become drier* as *become dry*. Similarly, Winter (2006) proposes that degree achievements have to satisfy the property of ‘culmination’, in addition to scalar ‘progress’ (the contribution of a comparative adjective). ‘Culmination’ ensures that absolute adjectives end up contributing the stronger, positive, inference, and not just the comparative inference that ‘progress’ ensures. By meeting the requirement of ‘culmination’ degree achievements based on adjectives with minimum or maximum standards, like *moisten* and *dry*, are interpreted as *become moist/dry*, with an inference that the standard has been reached as the result of the scalar change.

- (12) a. Progress – the degree of the verb’s argument on the scale of the corresponding adjective increases during the interval I.
 b. Culmination – at the end of the interval I, the degree attained is within the set of degrees associated with the adjective, if such a set is specified by a given standard value.

Some problematic aspects of Hay et al. (1999) and Winter (2006) are discussed in Kennedy and Levin (2008). Importantly for us, these accounts illustrate an attempt to encode the adjectival component of degree achievements as comparative, and then to strengthen the meaning in the case of degree achievements based on absolute adjectives, and on relative adjectives in suitable contexts as in (9).

Kennedy and Levin's (2008) proposal also builds degree achievements on the basis of a comparative adjectival core. Specifically, they suggest that while adjectives denote measure functions, i.e., functions from individuals (and times) to degrees on a relevant scale, the adjective-based core in degree achievements is a derived measure function – what they call a ‘measure of change’ function – that measures the difference in degree on the relevant scale that an individual has at the beginning and end of an event. The semantics Kennedy and Levin (2008) propose for the ‘measure of change’ function is informally given in (13). Like regular measure functions, measure of change functions need to combine with degree morphology (positive, comparative, etc.) and so Kennedy and Levin (2008) suggest that a verbal *pos* (for ‘positive’) morpheme as in (14a) completes the morphological structure of degree achievements, (14b).

(13) For any measure function m (e.g., *long*), a measure of change function m_{Δ} maps objects and events in its domain to the degree that represent the difference between the object's measure (e.g., *length*) at the beginning of the event and at the end of the event.

(14) a. $\text{pos}_v = \lambda g \in \text{Dm}_{\Delta} \lambda x \lambda e. g(x)(e) \geq \text{std}(g)$
 b. $\text{pos}_v(m_{\Delta}) = \lambda x \lambda e. m_{\Delta}(x)(e) \geq \text{std}(m_{\Delta})$

The default meaning of degree achievements according to (14b) is atelic, as measure of change functions use derived scales with minimum standards. For instance, the measure of change function long_{Δ} that is part of the degree achievement *lengthen*, is associated with that part of the scale of the adjective *long* whose minimum value is the degree to which the individual argument of *lengthen* is long at the beginning of the event. At the same time, the scale of the measure of change function includes the maximal element from the scale of the adjectival measure function. So, in the case of degree achievements like *dry*, the scale of the measure of change function dry_{Δ} will have as a minimal element the degree to which the individual argument is dry at the beginning of the event, and as a maximal element the degree of complete dryness. The preference for telic interpretation with degree achievements such as *dry* is attributed to a pragmatic principle. Because the telic interpretation of *dry* entails the atelic interpretation, it is preferred, unless there are further contextual factors at play.

We see from the discussion above that a fruitful approach to degree achievements in English is to give a comparative semantics to the adjectival core and then derive the stronger, positive, interpretation through additional conditions (pragmatic strengthening in Hay et al., 1999 and Kennedy and Levin, 2008, or ‘culmination’ in Winter, 2006). Our own account of Malayalam, motivated by the morphological structure of degree achievements considered in the wider context of the morpho-semantics of property-concept expressions in the language, gives the ‘adjectival’ component the stronger, positive meaning. Such an account obviously will not work for English, as it will give the wrong interpretation for degree achievements based on relative adjectives, such as *lengthen*. But neither will the weaker semantics based on a comparative ‘adjective’ work for

Malayalam. We develop the analysis in line with the more general grammar of ‘adjective’-like expressions in the language (as Malayalam has no lexical adjectives), but in Section 4 we also show that empirically, degree achievements in Malayalam only have positive interpretations. We can conclude that some cross-linguistic variation is allowed by the grammar of degree achievements. While the verbal component can be given largely the same meaning across languages, the adjectival component may vary in its semantics. In some languages, a weaker semantics is encoded grammatically, with pragmatic factors playing a role in further restricting the meaning, while in other languages a stronger meaning is encoded by the grammar.

2.3 Degree achievements based on color adjectives

As we noted in the introduction, there have been different opinions in the literature regarding the scale structure of color adjectives, considering them to be relative adjectives, minimum standard absolute adjectives, or absolute adjectives with mid-point standards. Hansen and Chemla (2017) report the results of an inference judgment experiment in which color adjectives pattern like minimum standard adjectives, and not like relative adjectives. Participants agreed that the inferences in (15) hold for *blue* and *green*, and for *dirty* and *wet*, but not for *tall* and *heavy*. The results thus would seem to support the position advanced by Clapp (2012) that the scale structure of color adjectives involves minimum standards.

- (15) a. X is more Adj than y \Rightarrow X is Adj
 b. X is not Adj \Rightarrow x has a zero degree of Adj-ness

An additional issue however, is that color adjectives exhibit an ambiguity between a qualitative and quantitative readings (Kennedy and McNally, 2010). The former measures how much an object’s color resembles that color’s prototype (e.g., typical green color); the latter measures how much of an object’s surface is of that color. In a second experiment, Hansen and Chemla (2017) asked participants to choose which of two pictures is “the Adj alien” (e.g., *the green alien*, *the tall alien*, *the spotted alien*), and qualitative and quantitative interpretations of color adjectives yielded different responses, from each other, and from both relative and absolute adjectives with minimum standards. The authors interpreted the results as indicating that participants treat color adjectives that are read quantitatively as having absolute scales, with either minimum, medium, or maximum standards, whereas responses to color adjectives read qualitatively are less clear, though most seem to support an analysis in terms of absolute scales with minimum standards.

What are the implications for degree achievements based on color adjectives? To the extent that there was systematicity in participants’ responses in Hansen and Chemla’s (2017) experiments, qualitative readings should yield aspectual inferences like that of minimum standard absolute adjectives (e.g., *moisten*), whereas quantitative readings should show greater inter-speaker variability, with aspectual inferences like that of *moisten* or of *dry*.

Degree achievements based on color terms allow modification by both *in*- and *for*-adverbials, like *dry* and *moisten* do, as in (2b-c), and unlike *lengthen*, as in (2a) (unless an end-point is contextually specified, as in (8a)). Both telic and atelic readings are available in (16), whether the color term is understood qualitatively (every part of the apple turning closer and closer to a proto-typical, for an

apple, red color) or quantitatively (first, parts of the apple turn red and then other parts do so as well).⁷

(16) The apple reddened {in a day/for a day}

For the progressive-to-perfect test, whether the color term is read qualitatively or quantitatively seems to matter: the former shows atelic behavior, as in (17a), whereas the latter doesn't, as in (17b), though, following Hansen and Chemla's (2017) claims, there may be speakers for whom this is not the case and the two readings pattern the same, as if based on minimum standard absolute adjectives.

- (17) a. The entire apple is reddening (evenly). \Rightarrow The entire apple has reddened (evenly).
b. The apple is reddening in parts. \nRightarrow The apple has reddened.

We also expect that degree achievements of color should lead to inferences involving the positive, rather than the comparative form, as we saw was the case for *moisten* and *dry* (in (5)-(6)). This seems to be the case, at least on the qualitative reading, though we find judgments here to be particularly subtle, and even more so, as far as the quantitative reading is concerned.

(18) The apple has reddened \Rightarrow The apple became red.

The strengths and weaknesses of the theories discussed in section 2.2 regarding degree achievements based on absolute adjectives can be naturally extended to degree achievements of color. Kennedy and Levin (2008) in particular can accommodate well the subtlety of judgments around (17)-(18), as this theory relies both on the standard associated with the scale of the color adjective, which the measure of change function inherits, and on the standard associated with the *pos_v* morpheme, as in (14), given that the latter standard can potentially be set differently even within sub-groups of speakers for whom the former standard is set the same.

In the next section, we present novel data from Malayalam that show that degree achievements in this language only have positive interpretations.

⁷ Similar variable telicity effects are found in other languages. A reviewer points out examples in Spanish where the degree achievement formed from the color term 'white' is infelicitous with *for*-adverbials, thereby behaving as a telic predicate, as in (i). Yet, Spanish *whiten* shows atelic behavior in other examples, (ii).

- (i) María se blanqueó los dientes en una hora / *durante una hora
'María whitened her teeth in an hour / *for an hour'.
(ii) Usando este producto cada día, irás blanqueando los azulejos amarillentos
'Using this product every day, you will whiten the yellowish tiles.'

3. The Structure and Meaning of Color Expressions in Malayalam

The issue of whether Malayalam (and Dravidian language family, in general) has an adjectival category is a controversial one. In previous work, we have shown that Malayalam does not have a lexical class of adjectives (Menon, 2013, Menon & Pancheva, 2014, Menon, 2016). There are two classes of expressions that behave syntactically and semantically like adjectives – Class 1 (relativized roots) and Class 2 (nominalized roots). The first class of expressions all end in *-a*, the Proto-Dravidian verbal relative clause marker. These forms can attributively modify a noun phrase and appear in the predicative position after being nominalized. The second class of expressions are nominalized roots ending in the *-am* marker. These roots are often borrowed from Sanskrit. These nominalized forms can appear in the predicative position and they can appear in the attributive position after being relativized with a non-finite verbal element and the *-a* relative marker. In our previous work, we analyzed both the Class 1 and Class 2 forms as involving roots that denote property-concepts, lexemes that are often lexicalized as adjectives in other languages. These roots then combine with verbal functional heads and subsequently other functional heads that allow them to participate in variety of grammatical structures. Our analysis showed that variation in property-concept predication and attributive modification is rooted in the morpho-syntax and semantics of the functional vocabulary that categorizes property-concept roots.

3.1 Simple and Complex Color Expressions

Color expressions in Malayalam are part of Class 1 expressions. However, unlike other Class 1 forms, they appear in two different morphological forms – simple and complex (Menon and Pancheva, 2016). These color expressions have different internal morpho-semantic composition, as we will show, although they are built on the basis of the same property-concept denoting root (19a).

- (19) a. \sqrt{we} l ‘whiteness’
b. *simple color*: we||a ‘white’
c. *complex color*: we|utta ‘whitened’

The simple color and complex color forms are built on the same root \sqrt{we} l, which we translate as ‘whiteness’. The forms can be morphologically decomposed further into the relative clause marker *-a*, found in both the simple and complex forms, and the morpheme *-utt-* found in the complex form only.

We assume, following the spirit of Francez and Koontz-Garboden, (2015), that roots which lexicalize property concepts denote abstract substances (which we notate with *IT*). Similar to our earlier analysis for Class 1 and Class 2 forms, we assume that when property-concept roots combine with an appropriate categorizing head, the resulting expression is a predicate of individuals that are instances of the abstract substance.⁸ The two color forms involve the

⁸ Francez and Koontz-Garboden’s (2015) attribute the meaning of abstract substances (or rather, functions from portions of substances to truth values) only to nominal ‘property concept lexemes’, not to roots. Our ‘instance of a substance’ is similar to their ‘portion of a substance’, and both are a subcase of the more general notion of a ‘token of a type’.

combination of the root with different verbalizing morphemes: a null v with possessive semantics and a degree argument, and a null v without possessive semantics or a degree argument (Menon and Pancheva, 2016). Consequently, the two forms of ‘white’ in (19) differ in meaning, and, as we will see, in whether they can serve as input to the formation of degree achievements.

Complex color terms are derived when the property-concept root, $\sqrt{\text{we}}$ ‘whiteness’ combines with a possessive v_{poss} head and the resulting expression is then relativized with the relative $-a$ marker. The relative $-a$ doesn’t change the semantic type of the expression, but makes it syntactically appropriate to be an attributive modifier, i.e., it changes the verbal predicate ‘be white’ to the participial form ‘being white’. The v_{poss} introduces the possessive relation between individuals and instances of Π , as well as a measure function μ relating instances of Π and degrees on a quantity scale. (20) shows the derivation, as it is found in Menon and Pancheva (2016). We will update this proposal later in the section.

- (20) a. $\llbracket \emptyset_{v_{\text{poss}}} \rrbracket = \lambda \Pi. \lambda d. \lambda x. \exists y [y \text{ is an instance of } \Pi \ \& \ x \text{ has } y \ \& \ \mu(y) \geq d]$
 b. $\llbracket \text{we}[\text{ut}ta] \rrbracket = \lambda x. \exists d \exists y [y \text{ is an instance of whiteness} \ \& \ x \text{ has } y \ \& \ \mu(y) \geq d \ \& \ d > d_s]$
 $\approx \lambda x. \exists d [x\text{'s whiteness} \geq d \ \& \ d > d_s]$
 Lit. ‘having an instance of whiteness measuring to a degree that exceeds the standard’

Alternatively, the property concept root can combine with a null v head, without possessive semantics, as in (21a). The relative marker $-a$ attaches next and turns the verb into a participle, syntactically suitable to be an attributive modifier. This is the morpho-semantic derivation of simple color forms.

- (21) a. $\llbracket \emptyset_v \rrbracket = \lambda \Pi. \lambda x. [\Pi(x)]$
 b. $\llbracket \text{we}[\text{a}] \rrbracket = \lambda x. [x \text{ is an instance of whiteness}]$
 Lit. ‘being an instance of the property of whiteness’

The resulting form is non-possessive, and possession can be encoded overtly by combining the form in (21b) with the possessive existential copula $un\text{t}\partial$.

Among the color roots in Malayalam, only the property concept denoting root for ‘whiteness’ exhibits both a simple and complex form. There are two other color roots which only appear in the complex form and the rest only have simple forms, as shown in the table below (a simplified version of Menon and Pancheva (2016), (22)). We will assume that these are accidental gaps without a special semantic significance.⁹ Some roots denoting color property concepts combine

⁹ Possibly, some of the roots that lack complex color forms do not denote inherent color terms but non-color substances, from which the color meaning is derived. We suspect this is the case for $\sqrt{\text{ča}}$ ‘ash’ at least. The restriction on complex color forms for such cases will be semantic then, but not of the kind that is particularly relevant here. Moreover, simple forms of the roots that otherwise appear as ‘black’ and ‘red’ do exist but they do not have the meaning of color associated with them. For instance,

- (i) kara ‘stain’
- (ii) čuva ‘taste’

with non-possessive *v* only, while others combine with possessive *v_poss* only, with the root for ‘whiteness’ being able to combine with both.

(22)	ROOT¹⁰	SIMPLE	COMPLEX	ADJ-LIKE MEANING
	√we	we a	we utta	‘white’
	√kar	--	karutta	‘black’
	√kem	--	čuvanna	‘red’
	√pačč	pačča	--	‘green’
	√niil	niila	--	‘blue’
	√maṇ	maṇṇa	--	‘yellow’
	√čaar	čaara	--	‘ash grey’
	√uut	uuta	--	‘violet’

Table 1: Color Expressions in Malayalam

Only the roots that have a complex color form, i.e., the roots forming ‘white’, ‘black’, and ‘red’, also appear as verbs: *we||ukk-uka* ‘to whiten’, *karukk-uka* ‘to blacken’, *čuvakk-uka* ‘to redden’. All the other color expressions have to combine with a separate verb meaning ‘become’ to express the meaning of a degree achievement. The restriction is not entirely surprising: in English too only certain color adjectives can combine with verbal *-en*: e.g., *to whiten*, *to blacken*, *to redden*, but **to greyen*, and not all color adjectives can form degree achievements: *to yellow*, but **to orange*. But in Malayalam this restriction appears to have a morpho-semantic source, rather than a morpho-phonological one. Degree achievement verbs rely on the presence of scalar structure, and only the complex color forms have the requisite scalarity. So, we do not need to make another stipulation: the only unexplained, accidental fact here is the absence of complex color forms for all color roots.

3.2 Analysis

In the previous section, we noted that some color expressions in Malayalam can appear in two different forms – simple and complex. The complex forms have an additional morphology, *-utt/-ann-*. With respect to this morphology, it is tempting to analyze *-utt/-ann* as the spell-out of *v_poss*, as in (20a). But this will introduce an asymmetry with other, non-color, expressions built on property concept roots in Malayalam, as in (24). These expressions incorporate in their meaning possession and scalarity (as illustrated in (25)) and they behave very similarly to complex color forms in terms of their distribution in attributive and predicative position (Menon and Pancheva, 2014, 2016). A uniform analysis will maintain that the *v_poss* head is null for color and non-color expressions alike. Below, we show a derivation of a color root, combining with a null *v_poss* head and the relative clause marker.

In these forms, the ‘a’ ending is not the relative clause marker and these forms are nominals as evidenced by their co-occurrence with determiners.

- (iii) oru kara ‘a stain’
- (iv) aa čuva ‘that taste’

¹⁰ These roots can be traced back to their Proto-Dravidian origin as shown in Krishnamurti (2003). The change from the Proto-Dravidian root for ‘red’ √*kem* to the Malayalam word for ‘red’ *čuv* is a historical phonological change.

(23) $[[\sqrt{\text{wel}} \ \emptyset_{v_poss}] -a] \rightarrow \text{wel-ukk-a}$

(24) valiya ‘big’, čerīya ‘small’, puthiya ‘new’, pazhaya ‘old’, nalla ‘good’

(25) a. $[[\sqrt{\text{nall}} \ \emptyset_{v_poss}] -a] \rightarrow \text{nall-a}$

b. $[[\text{nalla}]] = \lambda x. \exists d \exists y [y \text{ is an instance of goodness \& } x \text{ has } y \ \& \ \mu(y) \geq d \ \& \ d > d_s]$
 $\approx \lambda x. \exists d [x\text{'s goodness} \geq d \ \& \ d > d_s]$

Lit. ‘having an instance of goodness measuring to a degree that exceeds the standard’

What then is the role of the *-utt/-ann* morpheme in complex color forms, and how does it relate to the *ukk-akk* morpheme found in its place in the corresponding degree achievement verbs? In the table below, we show the three degree achievement verbs in the language and their corresponding complex form. Only the three color expressions that have a complex form also have degree achievements – *wel[-ukk-uka* ‘to become white’, *kar-ukk-uka* ‘to become black’, *čuv-akk-uka* ‘to become red’.

(26)	ROOT	COMPLEX	DEGREE ACHIEVEMENT	ADJ-LIKE MEANING
	$\sqrt{\text{wel}}$	<i>wel[utta</i>	<i>wel[ukk-uka</i>	‘white’
	$\sqrt{\text{kar}}$	<i>karutta</i>	<i>karukk-uka</i>	‘black’
	$\sqrt{\text{kem}}$	<i>čuvanna</i>	<i>čuvakk-uka</i>	‘red’

Table 2: Degree Achievement verbs in Malayalam

Note that complex color expressions and degree achievements do not have the same form. Complex color expressions have the *-utt/-ann-* morpheme and the relative clause marker *-a*. These degree achievement forms have the morpheme *-ukk/-akk* in place of *-utt/-ann-*, and the infinitival verbal ending ‘*-uka*’.

Our proposal is that the *-utt/-ann* morpheme in complex color forms indicates the presence of a change-of-state verbal head that is also present in degree achievements and surfaces there as *-ukk/-akk*. Both complex color expressions and degree achievements are built on the basis of a root combining with *v_poss*, with the resulting expression then combining with the change-of-state verbal head. This derives degree achievement verbs. Complex color forms are then built on the basis of the degree achievement, with a resultative meaning. The relation between the two forms is similar to that between the degree achievement ‘whiten’ and the participle ‘whitened’ (with the meaning of an unaccusative ‘that has whitened’ rather than a passive ‘that has been whitened’).

We illustrate the structures below. First, we need to update the morpho-semantics for complex color expressions suggested earlier in (20). We give the new morpho-semantic structure in (27). The update consists of the presence of a change-of-state head, BECOME, as in (27c), and of a new role for the *-utt/-ann* morpheme, which spells out the change-of-state BECOME rather than the *v_poss* head, as originally suggested in (20b). The meaning of BECOME is based on the analysis of degree achievements in Dowty (1979) and Abusch (1986), but we differ from their type of account in two ways: these authors do not adopt a degree-based semantics for the complement of BECOME and they allow for both comparative and positive inferences, *become whiter/white* (see discussion

in Kennedy and Levin, 2008 on both these points).¹¹ We, on the other hand, suggest that the complement of BECOME is a degree expression, and in particular, a positive, norm-related, one. We use POS-*white* in (20d) as a shorthand for ‘have an instance of whiteness measuring to a degree that exceeds the standard’. On this account, no ambiguity is expected to arise, only the meaning *become white* should be available. But before we discuss the interpretation, we note that the form in (27d) is not the final complex color expression. For one, it is still missing the relative marker -*a*, but more importantly, it also is missing a resultative component. We return to these later.

- (27) a. $\llbracket \emptyset_{v_poss} \rrbracket = \lambda II. \lambda d. \lambda x. \exists y [y \text{ is an instance of } II \ \& \ x \text{ has } y \ \& \ \mu(y) \geq d]$
 b. $\llbracket we[-\emptyset_{v_poss}] \rrbracket = \lambda x. \exists d \exists y [y \text{ is an instance of whiteness} \ \& \ x \text{ has } y \ \& \ \mu(y) \geq d \ \& \ d > d_s]$
 c. $\llbracket BECOME \rrbracket = \lambda P_{\langle e, t \rangle}. \lambda x. \lambda e. BECOME(P)(x)(e)$
 where $BECOME(P)(x)(e) = 1$ iff $P(x)(init(e)) = 0$ and $P(x)(fin(e)) = 1$,
 and $init(e)$ and $fin(e)$ are the initial and final parts of an event e .
 d. $\llbracket [we[-\emptyset_{v_poss}] BECOME] \rrbracket = \lambda x. \lambda e. BECOME(POS-white)(x)(e)$
 Lit. ‘to become having (i.e., to come to have) an instance of whiteness measuring to a degree that exceeds the standard’

Putting aside for the moment the full morpho-semantic structure of complex color expressions, we note that (27d) is the structure of degree achievements. Like other unaccusative verbs in the language degree achievements are relations between events and individuals. Existential closure of the event variable comes as part of the merge of aspectual heads.

We already discussed why there are no degree achievement verbs corresponding to the simple color forms. The outstanding question is why there aren’t more degree achievement verbs in the language. In principle, the change-of-state BECOME could combine with the [root *v_poss*] forms that are part of the non-color expressions in (24)/(25) (i.e., Class 1 forms in Menon and Pancheva, 2014, 2016), but such degree achievements do not exist.¹² Again, similar facts obtain in English as well. Not all gradable adjectives can serve as inputs to degree achievements. Forms like **biggen* / **to big*, **smallen* / **to small*, **olden* / **to old* are not acceptable, with the intended meanings instead expressed by degree achievements like *grow*, *increase*, *decrease*, *age*.¹³ So, we will conclude that the absence of such forms in Malayalam, as in English, is accidental.

¹¹ We adopt an event-based rather than time-based lexical meaning of BECOME, as in Kennedy and Levin’s (2008) re-formulation of the Dowty/Abusch account.

¹² While the forms in (24) do not have related degree achievements, there are other verb forms in Malayalam that arguably incorporate a change-of-state BECOME and a property concept expression.

(i) tur-akk-uka ‘to open’ ~ tur-aan-u ‘opened’
 (ii) tan-ukk-uka ‘to cool’ ~ tan-utt-u ‘cooled’

¹³ Possible candidates such as ‘widen’ and ‘lengthen’ involve the use of nominals and an “increase” or “decrease” predicate.

(i) wiiti ‘width’ ~ wiiti kooti ‘increased in width’
 (ii) neelam ‘length’ ~ neelam kurappu ‘decreased in length’

This strategy is also used by simple color terms, which do not have degree semantics, as noted earlier and illustrated in (21).

What about the overt realization of the BECOME head? In complex color forms, it surfaces as *-utt/-ann*, whereas in degree achievements, it surfaces as *-ukk/-akk*. We can see the relation between the two forms more clearly when we consider the role of tense/aspect. It turns out that *-ukk/-akk* is found in the infinitive, present and future forms of degree achievements, but not in the past perfective (28b)-(29b), where *-utt/-ann* surfaces instead.

- (28) a. *we[-ukk-uka]* ‘to become white’
 b. *we[-utt-u]* ‘became white’
 c. *we[-ukk-unnu]* ‘becomes white’
 d. *we[-ukk-um]* ‘will become white’

- (29) a. *čuv-akk-uka* ‘to become red’
 b. *čuv-ann-u* ‘became red’
 c. *čuv-akk-unnu* ‘becomes red’
 d. *čuv-akk-um* ‘will become red’

We can describe the overt realization of BECOME as in (30).

- (30) a. [BECOME perfective] → *-utt/-ann*
 b. [BECOME imperfective / infinitive] → *-ukk/-akk* (elsewhere case)

We suggest that the relevant head is aspectual rather than a tense, for two reasons. First, complex color forms behave like non-finite participles rather than finite relative clauses. The relative *-a* suffix doesn’t attach to *-um* ‘future’-marked forms, for instance. Second, the existence of tense in Malayalam has been questioned (Amritavalli and Jayaseelan, 2005). For instance, multiple ‘tense’ morphemes may appear in single words, with only the right-most such morpheme contributing finiteness and being interchangeable with other ‘tense’ morphemes (Mohan and Mohan, 2009). The affixes furthermore can appear inside nominalizations. Analyzing the affixes as aspectual straightforwardly addresses this issue. Moreover, aspectual information alone can derive temporal interpretation, in the absence of tense, as has been suggested for other languages (Lin, 2006, 2010, Tonhauser, 2011, a.o.). Therefore, we follow Amritavalli and Jayaseelan (2005) in analyzing the *-u* suffix as perfective rather than a past tense marker. (We continue to refer to it as ‘past’ in the following paragraph when we reference prior work, using this term purely descriptively.)

Turning to the question of morphological realization, degree achievement verbs are not special in having different forms for ‘past’ vs. e.g., ‘present’. The *-u*¹⁴ marking for ‘past’ is one of two suffixes (the other being *-i*¹⁵). The selection of the appropriate ‘past’ suffix depends on a combination of morphological and phonological factors (Asher and Kumari, 1997: 286). The *-u* suffixing verbs correspond to the verb classes 1-12 (Pillai, 1965), listed below. As can be seen from this table, there is great variation in the phonological correspondence between the ‘present’ and ‘past’ forms.

¹⁴ Mohan and Mohan (2009) suggest that the morpheme is *-tu*.

¹⁵ *-i* suffixing verbs do not induce stem allomorphy and can be thought of as more regular than *-u* suffixing verbs.

(31) <i>Classes 1-12 (-u suffixing)</i>		
	‘Present’ form	‘Past’ form
Class 1	čey-unnu ‘do, does’	čeyt-u ‘did’
Class 2	kaṇ-unnu ‘see’	kaṇt-u ‘saw’
Class 3	toḍ-unnu ‘touch’	toḍt-u ‘touched’
Class 4	paṛay-unnu ‘say’	paṛaṇṇ-u ‘said’
Class 5	koḷl-unnu ‘affect’	koḷt-u ‘affected’
Class 6	viṇ-unnu ‘fall’	viṇt-u ‘fell’
Class 7	tinn-unnu ‘eat’	tinn-u ‘ate’
Class 8	koṭukk-unnu ‘give’	koṭutt-u ‘gave’
Class 9	kakk-unnu ‘steal’	kaṭt-u ‘stole’
Class 10	kaṭikk-unnu ‘bite’	kaṭičč-u ‘bit’
Class 11	paṭikk-unnu ‘study’	paṭičč-u ‘studied’
Class 12	turakk-unnu ‘open’	turann-u ‘opened’

The relevant verb classes are Class 8 and Class 12. The phonological changes between *-ukk* and *-utt* that we observe with complex color ‘white’ and ‘black’ are also found with verbs in Class 8, while the changes between *-akk* and *-ann* seen with complex color ‘red’ is found with verbs in Class 12. This lends additional support to our proposal that *-ukk/-utt* and *akk/-ann* spell out BECOME in different morphological environments (see also Zubizarreta and Oh, 2007, and Kang and Zubizarreta, 2017 for an account of the Korean *-eci* which corresponds to a resultative degree achievement).

Importantly, the realization of BECOME in past perfective degree achievements and in complex color forms is the same. We don’t think this is a coincidence. We attribute the identity of overt realization to the presence of a perfective aspectual head in complex color expressions, as in (32a). This head is responsible for the resultative meaning we noted earlier. We can now complete the update of the morpho-semantics of the complex color expressions. The structure is as in (32c). The participial has the same interpretation as the form in (32b) prior to the addition of *-a*.

- (32) a. $[[\text{perfective}]] = \lambda V_{\langle e, vt \rangle}. \lambda x. \exists s. \exists e [V(x)(e) \ \& \ \text{result}(s, e) \ \& \ \text{holds}(s, x)]$
b. $[[[[we\ell - \emptyset_{v_poss}] \text{ BECOME}] \text{ perfective}]] =$
 $\lambda x. \exists s. \exists e. \text{BECOME}(\text{POS-}white)(x)(e) \ \& \ \text{result}(s, e) \ \& \ \text{holds}(s, x)$
Lit. ‘to have come to have an instance of whiteness measuring to a degree that exceeds the standard’
c. $[[[[[we\ell - \emptyset_{v_poss}] \text{ BECOME}] \text{ perfective}] -a] \rightarrow we\ell[ut\text{ta}]$

In this section, we have seen that color roots can form simple color expressions, complex color expressions, or degree achievements. Only complex color expressions have corresponding degree achievements. We suggested that a common morpho-semantic structure underlies both of these forms.

We now turn to the aspectual behavior of degree achievements of color in Malayalam in the next section.

4. Telic/Atelic Distinctions in Malayalam Degree Achievements of Color

While degree achievements in English show variable behavior with respect to telicity, Malayalam color expressions behave like telic predicates. In a counterpart of the progressive-to-perfect test, the imperfective form does not entail the past.

- (33) kuppayam wel[lukk-unnu \nRightarrow kuppayam wel[lutt-u
 dress white-PRES dress white-PAST
 ‘The dress is becoming white.’ ‘The dress became white.’

Unlike the English examples in (18), *for*-adverbials are infelicitous in Malayalam degree achievements.

- (34) a. kuppayam oru manikuur-il wel[lutt-u
 dress an hour-LOC white-PAST
 ‘The dress whitened in an hour.’
 b. # kuppayam oru manikuur neram wel[lutt-u
 dress an hour for white-PAST
 ‘The dress whitened for an hour.’

Similar judgments hold for Complex color expressions with an overt verb *become*, expressed by the equative copula in the past tense form.¹⁶

- (35) a. kuppayam oru manikuur-il wel[lutta niram aayi
 dress an hour-LOC white-REL color became
 ‘The dress became whitened in an hour.’
 b. # kuppayam oru manikuur neram wel[lutta niram aayi
 dress an hour for white-REL COLOR became
 ‘The dress became whitened for an hour.’

Both these tests establish that degree achievements formed on the basis of complex color expressions are telic predicates.¹⁷ Given that complex color expressions are norm-related, a positive interpretation results.

A further prediction of the analysis is regarding the entailment of prior change of state. Complex color terms should entail prior change of state, whereas simple color terms should not, as seen in (36) (examples adapted from Koontz-Garboden and Beavers, 2017).

¹⁶ The same overt change-of-state copula ‘aayi’ can be used with simple color expressions.

¹⁷ There is another test noted in Hay et al. (1999) and Winter (2006), using *almost* where predicates with an endpoint telos, like *dry* and *run to the lake* (as opposed to atelic and other telic predicates, like *moisten* and *run around the lake*) allow scalar readings (i.e., the telos is almost reached). This test cannot be used in Malayalam since there is no lexical word meaning ‘almost’.

- (36) a. we[[a kuppayam orikkalum we[[utt-illa
 white_simple dress never whiten-NEG
 ‘The white dress has never been whitened.’
- b. #we[[utta kuppayam orikkalum we[[utt-illa
 white_complex dress never whiten-NEG
 ‘The whitened dress has never been whitened.’

However problematic it is for English, an account based on a positive rather than a comparative core is suitable for Malayalam. We arrived at the account based on the morpho-semantic structure of complex color terms and degree achievements of color, in light of the general grammar of property-concept expressions in the language, and in this section, we saw that the predictions of the account with respect to telicity are met. Thus, we can conclude that there is cross-linguistic variation in the grammar of degree achievements, with languages like Malayalam being more restrictive than languages like English.

5. Conclusion

The goal of this paper has been to illustrate that degree achievements derived from property concept expressions of color in Malayalam behave distinctly from degree achievements of color in other languages, such as English. The degree achievements of color in Malayalam differ in two respects: they only have telic interpretations, and they have a verbal core, not being based on adjectives. We analyzed these degree achievement forms as morphologically quite complex. They contain a change-of-state head, BECOME, spelled out as *-utt/-ann*, as well as a possessive verbal form, itself based on a property-concept denoting root, and contributing a norm-related (positive) interpretation.

Our analysis identifies the complex interactions between the internal structure of color expressions in Malayalam and the degree achievements formed on the basis of such expressions. It further clarifies the relation between aspectual behavior and comparative vs. positive inferences of different types of degree achievements based on adjectives with different scale structure. More generally, the account provides insights into universality and variation in the cross-linguistic grammar of degree achievements.

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