

Above or Below: Modeling a Telicity Restriction on Karuk Directional Applicatives*

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1. Introduction

Karuk, a language isolate of northern California (ISO-693-3:kyh), distinctively includes a set of over 50 directional suffixes that express the Path and/or Ground of a motion event. In (1), for example, the bolded directional suffix *-furuk* in (1) indicates that the motion of the subject is INTO (the Path) an ENCLOSED SPACE (the Ground.) The suffix also allows the introduction of a new argument, *ahaváraak* ‘hollow tree,’ further specifying the Ground.

- (1) sú’ ahaváraak ú-kfuuk-**furuk**
down hollow.tree 3SG-crawl-**into.an.encoded.space**
‘He crawled into a hollow tree.’
(Bright n.d.), *ikfuk* entry)¹

Macaulay (2004) has previously analyzed a set of these suffixes as Pylkkänen (2002, 2008)-style high applicatives, but this analysis does not account for a heretofore undescribed generalization regarding the distribution of the suffixes; they cannot appear with telic roots. I present two analyses which do account for the generalization. First, a revision of Macaulay (2004)’s analysis that builds in a telicity restriction to the semantics of the directional applicatives, and second, an analysis couched in the framework of verbal syntax presented in Ramchand (2008), which builds in a syntactic complementarity between PathP (the po-

*I thank Karuk elders Sonny Davis, the late Charlie Thom, and especially the late Vina Smith for their generosity and patience in sharing their language with me. Thanks also to Amy Rose Deal, Andrew Garrett, Line Mikkelsen, and audiences at NELS 46, UC Berkeley, UC Santa Cruz, and Stanford for helpful discussion. Any errors are my own.

¹Glossing conventions: 3SG - 3rd Person Singular Subject Agreement (and so on for all person-number combinations); 3SG>3 - 3rd Person Singular Subject and 3rd Person Object Agreement; APPL - Applicative; ANT - Anterior Tense; AS.MOT - Associated Motion; DUR = Durative Aspect; PER - Perfect Aspect; PL.ACT - Plural Action; PROSP - Prospective Aspect. Semantic type conventions: s = type of eventualities, t = type of truth values, e = type of individuals. Source codes are in the format (Speaker, Title of Text, Text Identifier: Sentence Number, Year of Publication) for data drawn from the corpus, and in the format (Speaker, Date of Elicitation) for data from my fieldwork.

sition of directional suffixes) and ResP, the part of the verb that is responsible for (some aspects) of telicity. Though the Karuk data presented here will not be able to decide between the two analyses, in either case the Karuk data I present here offer strong support for the complementarity of what Ramchand (2008) calls Path and Result.

In the following section I provide background on the Karuk language and the system of directional suffixes. In section 3, I briefly introduce Pylkkänen (2008)’s high and low applicatives and Macaulay (2004)’s high applicative analysis of the suffixes, and in section 4 present data regarding the distribution of the suffixes and the telicity restriction, along with a novel test for diagnosing telicity. Section 5 presents a revision of the high applicative analysis to account for the telicity restriction and section 6 presents an alternative analysis in Ramchand (2008)’s framework. Section 7 concludes.

2. Karuk Background

Karuk is a highly endangered language isolate traditionally spoken along the middle course of the Klamath River in northern California, with less than six first language speakers remaining today².

Three general aspects of Karuk grammar will be relevant in the upcoming discussion and as such are introduced here. First, Karuk exhibits widespread pro-drop; sentences need not (and generally do not) explicitly express any of the verb’s arguments apart from verbal agreement.

Second, Karuk exhibits optional tense marking. Despite the existence of three past tense morphemes in the language (*-at*, ‘recent past’, *-aheen* ‘anterior past’, and *-anik* ‘ancient past’), verbs with past reference need not be explicitly marked as such (and indeed rarely are explicitly marked). Verb forms which are unmarked for tense can have either a present or past tense reading. I will refer to verbs which lack tense marking as ‘tenseless verbs’ throughout the paper.

Thus, despite (2a) having past time reference and (2b) having present, the two bolded verb forms are identical save for the difference in agreement.

- (2) a. pi’êep pa-nani-’ákah vaa kaan **u-sxáay-tih**.
 long.ago the-1SG.POSS-father thus there 3SG-fish-DUR
 Years ago my father was fishing there,
- b. payêem naa káru kaan **ni-shxáay-tih**.
 now 1SG.PRON also there 1SG-fish-DUR
 and now I’m also fishing there. (Vina Smith, 10/26/2014)

Lastly, Karuk is a heavily suffixing language; Bright (1957) describes the Karuk verbal template as having 8 derivational suffix positions.

²The data in this paper come from my fieldwork conducted with Karuk elders in Yreka, California, from 2012 to the present, as well as from *Ararahih’urípih*, the online Karuk dictionary and corpus, which combines an updated and expanded version of the Bright & Gehr (2004) dictionary, modern day fieldwork data, and earlier documentation ranging back to the early twentieth century.³ The majority of the historical corpus data come from Bright (1957), a comprehensive grammar, lexicon and text collection of the language.

2.1 Karuk Directional Suffixes

Karuk has around fifty directional suffixes (cf. Bright 1957, pp.94-111), that range from expressing only the Path of a motion event to expressing the Path and Ground (Macaulay 2004) (cf. Talmy 1985, for notions of Path and Ground). (3) shows a representative sample of these suffixes.

- (3) a. Path only: *-sipriv* ‘up’; *-iroopith* ‘around’
b. Path and Ground: *-taku* ‘onto a horizontal surface’; *-furuk* ‘into an enclosure’; *-vara* ‘in through a tubular space’; *-roovu* ‘upriverward from here’; *-Ovrath*⁴ ‘into a sweathouse’

These suffixes fall into Bright (1957)’s suffix positions 2, 3, and 4, and generally appear adjacent to the root.⁵

2.2 Directionals as Applicatives

Excepting a few of the Path-only type, directional suffixes introduce new arguments and are thus applicatives (cf. Macaulay 2004).⁶ (4a) shows an intransitive verb *ikvip* ‘run’ without a directional suffix, while (4b) shows the same verb with the directional *-ma* ‘to’ attached.

- (4) a. *kári xás ú-kvip*
and then 3SG-run
‘And he ran.’
(Mamie Offield, “Coyote’s Journey”, WB_KL-05:77, 1957)
- b. *xás xôoxhirak u-kvírip-ma*
then Martin’s.Ferry 3SG-run-to
‘And he ran to Martin’s Ferry.’
(Julia Starritt, “Coyote Goes to a War Dance”, WB_KL-06:58, 1957)

The addition of *-ma* to the verb in (4b) allows for the addition of a new object, *xôoxhirak* ‘Martin’s Ferry,’ as the goal of the motion. However, despite these cases clearly suggesting

⁴The *o* represents a copy vowel, that takes on the quality of the vowel in the immediately preceding syllable.

⁵The only suffix Bright (1957) places in position 1, *-va* ‘Plural Action,’ has variable order determined by scope. When *-va* appears in position 1, adjacent to the root, it generally has a conventionalized, non-compositional meaning (Garrett et al. 2015). When occurring with directionals, *-va* more commonly follows them.

⁶In his cross-linguistic survey of applicative constructions, Peterson (2007) describes no system as rich as Karuk in number of applicatives. The ‘multiple applicative’ languages he describes, such as Nez Perce or Yimas, generally have several applicatives of different types - they may have a beneficiary, instrumental, and directional applicative and so on, but do not seem to come close to having over 50 of a single type as Karuk has. However, systems nearly as rich as the Karuk system are described for many Californian and Pacific Northwest languages (Mithun 1999). Despite Macaulay (2004) recognizing these directionals as applicatives (at least in Karuk), they have not generally been discussed in the applicatives literature.

the suffixes are applicatives, there is a potential confound: applied objects need not be expressed.

- (5) xás ú-kfuuk-**furuk**.
and 3SG-crawl-**into.an.enclosed.space**
'So he crawled in.'
(Julia Starritt, WB_KL-04:126, 1957)

In (5), despite the presence of the directional suffix *-furuk* 'into an enclosed space' and the fact *-furuk* can introduce one as in (1), there is no expressed applied object. Given that the language exhibits pro-drop, there is no reason to expect that applied objects, as arguments of the verb, should not be able to be dropped as the subject and direct object can. Furthermore, the interpretation of locative expressions differs when the locative is introduced by a directional from when it is independent, further arguing for the locative being an argument introduced by the directional (cf. Garrett & Mikkelsen 2015).

- (6) a. xás kun-ihy-**ivraath**-va ikmaháchraam
and 3pl-shout-**into.sweathouse**-PL.ACT sweathouse
And they shouted into the sweathouse.
(Julia Starritt, "Coyote Goes to a War Dance", WB_KL-06:66, 1957)
- b. pa-mu-táat iinâak **ú-hyiv** ka'íruu!
the-his-mother inside 3sg-shout INTERJ
Inside his mother shouted, "Stop it!"
(Lottie Beck, "The Kidnapped Child," WB_KL-61:40, 1957)

In (6a), with the directional *-ivraath* 'into a sweathouse,' the interpretation is that the shouters are outside of the sweathouse, shouting into it. In (6b), with no directional, the shouting is interpreted as occurring inside (as known from the context - the mother is inside the house), as opposed to coming from outside. Because the directional suffixes express a Path, the applied objects they introduce which specify the ground will be somehow related to that Path (as the sweathouse is the goal of the metaphorical Path of the shouting), whereas independent locative expressions will not have such relationships.

Having established the directionals as applicatives, in the following section I briefly summarize Pylkkänen (2008)'s high and low applicative structures and Macaulay (2004)'s argument that the directional suffixes are high applicatives.

3. The High Applicative Analysis

Pylkkänen (2008) argues for a division between high applicatives, which are above VP, and low applicatives, which are within VP. Though in this discussion I will focus on high applicatives, a few features of low applicatives need to be described. Namely, Pylkkänen (2008) argues that low applicatives always denote a semantic transfer-of-possession relation between two individuals, the Theme and the Patient, and can only combine with verbs

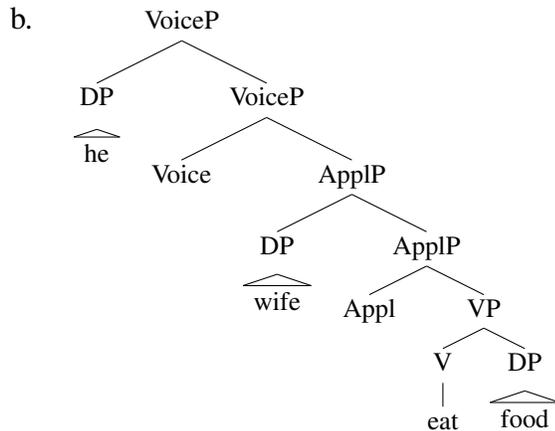
Above or Below: Karuk Directionals

that have internal arguments as they must denote a relationship between the internal argument and some other individual. Thus, they cannot combine with unergative verbs.

Her high applicative structure is shown in (7b) (for the Chaga sentence in (7a)) below.

(7) (Pylkkänen 2008, ch. 1, ex. 2a and 6a)

- a. N-ǎ-í-lyì-í-à m-kà k-élyá
 FOC-1SG-PRES-eat-APPL-FV 1-wife 7-food
 ‘He is eating food for his wife’ (Chaga)



Pylkkänen (2008) argues that high applicatives denote a semantic relation between events and individuals and have no restrictions on transitivity. Unlike low applicatives, high applicatives can combine with unergative verbs. Pylkkänen (2008)’s semantics for high applicatives is given in (8); the high applicatives combine with VPs by Event Identification (cf. Kratzer 1996), rather than Function Application.

(8) $\lambda x.\lambda e.\text{Appl}(e,x)$

Based on the above discussion, to diagnose whether a given applicative is high or low in this system, we can apply the following diagnostics.

- (9) a. Does it denote a transfer-of-possession relationship?
 b. Is it unable to combine with unergative verbs?

If the answer to the preceding questions is yes, then in Pylkkänen (2008)’s system the applicative would be considered a low applicative. If the answer is no, then the applicative would be considered a high applicative.

Based on the above diagnostics, Macaulay (2004) argues that the Karuk directional suffixes are high applicatives, for the reasons in (10).

- (10) a. The directionals do not denote a transfer-of-possession relationship. They denote a relationship between an individual (the Ground) and/or Path to a motion event.
b. They can combine with unergative verbs like *ikvip* ‘run,’ as shown in (4b).

If the Pylkkänen (2008) high and low applicative distinction was the only possibility for characterizing applicatives, then indeed, the Karuk directionals should be characterized as high applicatives. However, in the next section I describe facts about the distribution of the suffixes, most importantly their inability to combine with telic roots, that are not expected *a priori* under a Pylkkänen (2008)-style high applicative analysis.

4. Distribution of the Suffixes

Generally, the directionals only appear on motion or fictive motion verbs (cf. Talmy 1999, for fictive motion). Within that class of verb, however, there are three observable types, differentiated by their ability to combine with directional suffixes.

- (11) a. V- roots, which must occur with a directional suffix.
b. v roots, which optionally combine with a directional suffix.
c. V# roots, which cannot combine with a directional suffix.

v- roots were a class that the Karuk dictionaries of Bright (1957) and Bright & Gehr (2004) appear to recognize, in that many roots were described in those sources as bound stems, requiring either derivational or directional suffixes. Looking at a concrete example, *arih-* ‘go, jump,’ described as bound in Bright & Gehr (2004), never appears without a directional suffix in its 91 occurrences in the *Ararahih’urípih* online corpus.⁷

The v# roots, however, have up to now not been a recognized class.⁸ However, the difference between these and the V- roots is categorical, even when viewed only through the corpus.⁹ For example, the V# root *ipak* ‘return’ has 49 occurrences in the corpus, never with a directional suffix, and *mah* ‘to find, see’ (the third most common verb in the corpus) has 144 occurrences, never with a directional suffix.

⁷For scale, the most common verb in the corpus, *piip* ‘say,’ occurs 438 times. *arih-* (based on a count of the occurrences of its derivatives) is within the ten most common verbs.

⁸Bright & Gehr (2004) describes only one verb, *uufithva* ‘to swim,’ as being unable to combine with directionals (as opposed to *ikpuh*, ‘to swim,’ which does combine with directionals. Unfortunately, *uufithva* has only 1 occurrence in the corpus, making it impossible to judge the claim of it never combining with directionals.

⁹In the current Karuk fieldwork situation, it has proven impossible to get direct judgments on the grammaticality of verb forms with directionals. My experience has been that novel directional verb forms, even with verbs that are documented as having combined with other directionals, are not recognized. Verb forms produced by my consultants with directionals have also generally already been documented in earlier fieldwork, such that no (or very few) novel forms have been produced. From this I conclude that in the Karuk of modern day speakers, the directional suffixes are no longer productive. However, the pattern they show in the lexicon, insofar as it is regular, can still inform about what the structure of the verb roots and suffixes have been in earlier periods of documentation when the language was not (as) endangered.

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The table in (12) provides illustrative examples of each type. There are two trends that emerge from the table that are important to point out here. First, though intransitives dominate all types, all three types include both transitive and intransitive verbs. *iyur-* ‘to put or stick something’, for instance, is a transitive V- root, *thitiv* ‘to hear’ is a transitive V root, and *mah* ‘to find, see’ is a transitive V# root. The ability to combine with directionals thus cannot be due to some sort of transitivity restriction.

(12)

V-	V	V#
<i>arih-</i> ‘go, jump, move quickly’ <i>va-</i> ‘go’		<i>ipak</i> ‘come back, return’ <i>vâaram</i> ‘leave, go away, go’ <i>ipvâaram</i> ‘go back, go home’ <i>uum</i> ‘arrive’ <i>iipma</i> ‘return’ <i>ahoo</i> ‘arrive, walk, go, travel’
	<i>voor</i> ‘crawl’ <i>ikfuk</i> ‘climb, crawl’ <i>ikpuh</i> ‘swim’ <i>thivruh</i> ‘float’ <i>ikvip</i> ‘run’ <i>ikxip</i> ‘fly’ <i>ishkak</i> ‘jump’	
<i>vêeh-</i> ‘(object) to stick, project’ <i>iyur-</i> ‘to put, stick (long object)’ <i>it-</i> ‘look’	<i>iihya</i> ‘(long object) to stand, project’	<i>mah</i> ‘find, see’
	<i>thitiv</i> ‘hear’	

Second and more importantly for this discussion, V# roots are all translated (at least some of the time) with English telic verbs - in fact telicity of translation appears to be what unites them. Given that some of them, such as *ahoo* ‘arrive, walk, go, travel,’ are not always translated as telic verbs, and because translation into English as telic alone is a poor way to judge the Aktionsart of the verbs in Karuk, another test must be used to determine whether they are truly telic.

4.1 Testing for Telicity

Classic tests for determining aspects of telicity, including the *for/in* time adverbial tests and complement of *stop* and *finish* tests which can identify achievements (cf. Dowty 1979), have proven inconclusive for Karuk, at least in the current fieldwork situation, due generally to language attrition and the loss in modern Karuk of key lexical items needed for such tests (such as the verb *kooha* ‘stop’.)

All is not lost, however. As discussed above, Karuk verbs often lack tense marking. Smith et al. (2007) and Mucha (2013) argue that, for tenseless verbs in Navajo and Hausa

respectively, a number of pragmatic principles apply to produce the effect that bounded verbs (including telics) are interpreted by default as having past reference, and unbounded verbs are interpreted by default as having present reference.

Tenseless verbs in Karuk exhibit the same pattern of default temporal interpretation as described for Navajo and Hausa. Namely, as in (13a), clearly bounded verbs like the achievement *iv* ‘to die’ by default receive past interpretations, and, shown in (13b), clearly unbounded verbs like *ikvip* ‘to run’ receive default present interpretations, as indicated by the translations my consultant (VS) provided.¹⁰ Note that my consultant’s word choice is not important, only whether the verb was translated with past tense or present.

- | | | | | |
|------|----|--|----|--|
| (13) | a. | EM: u-’iv
3SG-die
VS: He died.
(Vina Smith, 11/29/2014) | b. | EM: u-kvip
3SG-run
VS: He’s running.
(Vina Smith, 11/29/2014) |
|------|----|--|----|--|

Thus, from whether a verb is translated as past or present, we can tell whether it is bounded or unbounded. V# roots when tested are given past translations as in (14), indicating they are bounded or, for our purposes, telic.

- | | | | | |
|------|----|---|----|--|
| (14) | a. | EM: u-’ípak
3SG-come.back
VS: He came back.
(Vina Smith, 11/29/2014) | c. | EM: u-pvâaram
3SG-go.back
VS: He left.
(Vina Smith, 11/29/2014) |
| | b. | EM: u-’áhoo
3SG-walk
VS: He came.
(Vina Smith, 11/29/2014) | d. | EM: u-mah
3SG>3-see
VS: He seen it.
(Vina Smith, 11/29/2014) |

As shown in (13b), with *ikvip* ‘run,’ V roots are given present interpretations, indicating they are unbounded or, for our purposes, atelic.

With the results of this test in hand, it is clearer that the roots which cannot combine with directionals are telic roots. In the next section I present an amendment to Macaulay (2004)’s high applicative analysis that attempts to account for this telicity restriction.

5. Revising the High Applicative Analysis

To account for the inability of the directionals to combine with telic verbs, we can posit a relatively simple amendment to Pylkkänen (2008)’s high applicative semantics, along

¹⁰The data in (13) were gathered through the following procedure. I spoke verb forms with only 3SG agreement, without aspect and tense marking, and asked my consultant to provide me with the first translation that came to mind. Between each such test, my colleague Line Mikkelsen would ask our consultant about how to say the plural of a noun, like ‘cats’ or ‘gods.’ The plural noun elicitation would often take several minutes and contain much metalinguistic discussion in English, while each verb trial took at most a minute or two with little to no discussion of the forms or translations. The reason for proceeding as such was to make sure that our consultant did not begin to interpret successive tenseless verbs as part of a narrative which could bias her interpretations away from the default.

the lines of the generalized semantics given for directionals in (15). The major differences between (15) and Pykkänen (2008)’s semantics are that (15) combines with the VP by Function Application¹¹ and includes a domain restriction on what VP properties it can combine with. Specifically, it can only combine with atelic properties.¹²

$$(15) \quad \lambda P \in D_{\langle s,t \rangle} : \text{ATL}(P). \lambda x. \lambda e. P(e) \ \& \ \text{path}(e,x)$$

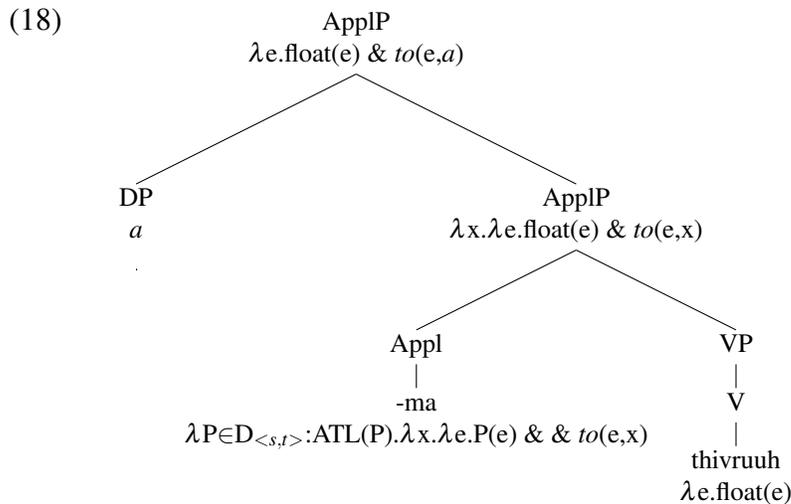
The atelic function $\text{ATL}(\dots)$ I use here is defined as in (16).

$$(16) \quad \neg \exists e. \text{Culm}(P,e)^{13}$$

In prose, (16) states that there does not exist an event such that said event culminates with respect to property P . As a domain requirement on which properties can combine with (15), only atelic verbs will be able to satisfy it, as no event will be able to culminate with respect to only the property of an atelic verb on its own.

In the denotation of any actual directional suffix, the *path* in (16) would be replaced with whatever the Path denoted by the directional was. To exemplify, the denotation for the directional *-ma*, ‘to,’ is given in (17). A tree showing a sample derivation for the verb *thivruuhma* ‘float to’ is given in (18).¹⁴

$$(17) \quad \llbracket -ma \rrbracket = \lambda P \in D_{\langle s,t \rangle} : \text{ATL}(P). \lambda x. \lambda e. P(e) \ \& \ \& \ \text{to}(e,x)$$



¹¹Function application can be just as easily used for Pykkänen (2008)’s non-directional high applicatives, as in the following generalized denotation (which should be compared to the denotation in (8)). $\lambda p \in D_{\langle s,t \rangle}. \lambda x. \lambda e. p(e)$ and $\text{Appl}(e,x)$.

¹²For simplicity I leave out any reference to time in the semantics.

¹³Thanks to Amy Rose Deal for suggesting this to me. I follow Zucchi (1999) in treating culmination as “a relation between events, times, and properties with respect to which events culminate” (p.185).

¹⁴Following Pykkänen (2008), I assume the external argument is introduced not by the verb but by a Voice head as in Kratzer (1996). As it is irrelevant for the present analysis, I leave out VoiceP in the following trees.

Any telic verb like *ipak* ‘to return’ or *uum* ‘arrive’ will fail to satisfy the domain restriction on the directionals, as events will be able to culminate with respect to the properties they denote given their telicity. As such they will cause a presupposition failure if attempting to combine with a directional, accounting for the impossibility of such combinations.

This analysis is not without its issues, however. Specifically, there is no direct, obligatory link between the domain restriction disallowing combination with telic verbs and the directional semantics of the applicatives. It is theoretically conceivable that a *-ma'* could exist that lacked the domain restriction, as in (19):

$$(19) \quad \llbracket -ma' \rrbracket = \lambda p \in D_{\langle s,t \rangle} . \lambda x . \lambda e . p(e) \ \& \ path(e,x)$$

With this in mind, the presence or lack of the relevant domain restriction should be lexically determined - one could expect that some directionals would have the restriction, and some would not. However, this is not what is observed in Karuk, where the *v#* verbs do not combine with any directionals. Given the large number of directionals in Karuk (over 50), it seems unlikely that the directional-atelic connection should be entirely a lexical accident. Research into the other languages with robust directional systems, if they revealed the same restriction as observed in Karuk, would militate further against this view.

In the next section I present an alternative analysis couched in the framework of Ramchand (2008) which predicts the incompatibility of directionals and telic verbs through the syntactic incompatibility of Path and Result.

6. A Ramchandian Analysis

Ramchand (2008) decomposes the VP into several distinct phrases, including INITP, roughly equivalent to *vP*; PROC, which all dynamic verbs contain; and RESP, which is responsible for (some cases) of telicity.¹⁵ Her structure for a telic verb phrase such as *break the stick* (excluding INITP, which is irrelevant for our purposes) is given in (20) below.¹⁶

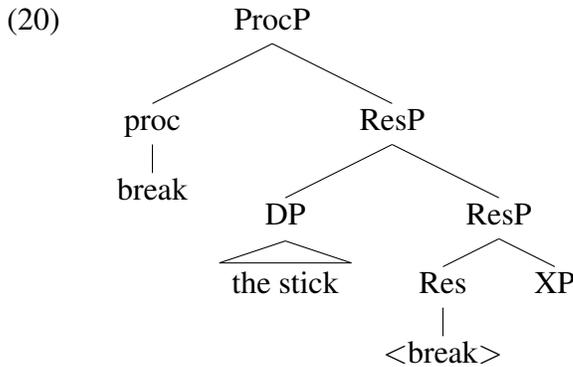
Ramchand (2008) also includes a PATHP in her system, where elements denoting Paths¹⁷ (such as some English prepositions) are located, as a complement to PROC. The structure for the verb phrase *walk into the house* is given in (21).

¹⁵Strictly speaking, Ramchand (2008) argues that only achievements include ResP, based on arguments she has that the tense head can only interpret and semantically compose with a verb with InitP, ProcP and ResP if all of the subevents those phrases predicate over are temporally overlapping, which, in her reasoning, requires ProcP to be instantaneous (so that InitP and ResP temporally overlap) and the verb to thus be punctual and an achievement. For purposes of simplicity, and because I lack tests to assess whether telic verbs in Karuk are achievements or accomplishments, I will treat all telic verbs as including ResP.

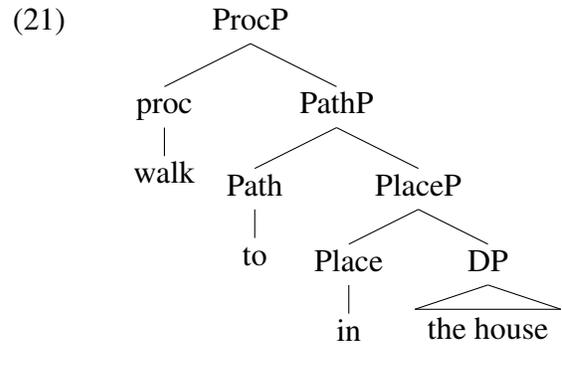
¹⁶For Ramchand (2008), verb roots can remerge into whatever positions they are featurally qualified for. Thus, if *break* has a PROC and RES feature, it will first project its ResP, and then remerge to project its ProcP.

¹⁷Ramchand (2008) defines Path as ‘the relation that holds between an entity and an event, if a monotonic property of that entity is monotonic with respect to the part-whole structure of the event as well’ (p. 50). In the case of the directionals, this monotonic property is spatial and directed - for example, the suffix *-roov*, ‘upriverward,’ includes a monotonic property of how far upriver an event is taking place, which increases monotonically as the event proceeds temporally.

Above or Below: Karuk Directionals

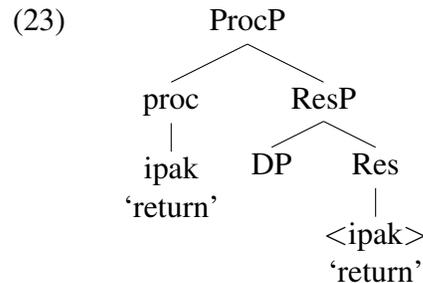
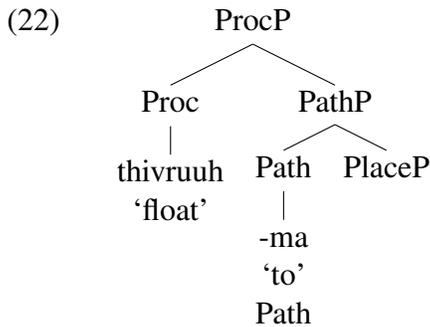


adapted from (Ramchand 2008, p. 114)



Ramchand (2008) argues that PATHP and RESP can never co-occur in one VP. PROC can only have one of them as its complement. Given that directional suffixes, with their Path semantics, should be PATHPs in Ramchand’s system, and given that RESP is the locus of (punctual) telicity, the inability of directional suffixes to combine with telic verb roots falls out from the syntactic complementarity between PathP and ResP in Ramchand (2008)’s system; if a verb includes a ResP, no directional suffix PathP can combine with it.

(22) showcases the proposed structure for V roots, using *thivruuhma* ‘float to,’ while (23) showcases the structure of a V# root, using *ipak* ‘return.’



Importantly, in (23), the telic root *ipak* includes a ResP, and as such a PathP cannot be a part of the structure, owing to their complementarity. This accounts for the inability of the PATHP directionals to combine with telic verbs which definitionally in this system contain RESP. Furthermore, this analysis builds in a more direct connection between the Path semantics of the directionals and the inability of them to combine with telic verbs, as having a Path feature, which necessitates having Path semantics, will cause the directionals to project a PathP and will make merging with ResP impossible.¹⁸

¹⁸However convenient this theory seems to be for Karuk in predicting the observed pattern, Ramchand (2008) provides only thin direct empirical support for the proposed Path-Result complementarity. Namely, she argues that the sentence, *John jumped towards the fence*, should only have a ‘multiple jump reading’ with *towards*, which she considers to be a pure Path preposition, because a single jump interpretation would indicate a punctual event that must be caused by the presence of a ResP in the structure.

My own judgments do not replicate hers: I can get either a multiple jump reading, where John jumps several times toward the fence, or a single jump reading, where he jumps only once. The supposed absence

That the complementarity is itself supported does not however mean that the syntactic means of deriving it argued for in Ramchand (2008) are the only possibility. We have already seen in the previous section that a revised high applicative analysis with a quite different syntax can account for the telicity restriction, though without making the restriction a necessary part of directional applicative semantics.

It is important to note that PATHP, the location of the directional suffixes in this proposal, is within VP. Thus, though having properties expected of high applicatives in Pylkkänen (2008)'s system (namely denoting a semantic relationship between an event and individual and combining licitly with unergative verbs), the directionals would be 'low' applicatives structurally.

The directionals then would be a new type of low applicative that falls outside of Pylkkänen (2008)'s model and the connection she makes between structural position and semantic relationship. This is not an untenable consequence, as definitionally Event Identification¹⁹ should be able to compose a verb, assumed to of the type $\langle e \langle s, t \rangle \rangle$, with directionals, which once saturated partially with their applied object have the type $\langle s, t \rangle$. Event Identification should not care about low versus high structural position as long as the types of its input functions match its requirements.²⁰

In essence, then, the two analyses differ not only in predictions regarding whether the telicity restriction is universal or merely a lexical possibility, but more pointedly in their syntactic structure and predictions. In the high applicative analysis, the applied object should c-command any internal arguments (as in both high and low applicatives in Pylkkänen (2008)), and in the Ramchandian analysis, the opposite should be true, the direct object should c-command the applied object (as direct objects will be introduced as the specifier of Proc.) In theory, then, we should see binding effects that allow us to distinguish these two structural possibilities.

Unfortunately, the Karuk language is not ideal for the study of binding. For one, there are no reflexive pronouns in the language, only a rarely used verbal reflexive suffix *-vaana* (with two attestations in the corpus) and a reciprocal particle *púraan* that modern day speakers do not control. Condition A effects are thus impossible to discover. As for Condition B and C effects, the corpus does not provide any answers. There are only a few transitive verbs which can combine with directionals, such as *iyur-* 'to put, place' and *thitiv* 'hear.' As applied objects introduced by directionals are almost always topological or natural features of the landscape, constructing a scenario where the direct object of a verb like *thitiima* 'to hear from a direction' is meant to be coreferential with the applied object

of a single jump reading for (23) is the only direct evidence that Ramchand (2008) gives for the complementarity; thus it can only be said to be weakly supported in English. The Karuk data are much clearer, however. Either a verb can combine with a directional suffix or it can't. Karuk, then, provides stronger support for the complementarity than English or Ramchand (2008) provides.

¹⁹Event Identification takes a function of type $\langle e \langle s, t \rangle \rangle$ and a function of type $\langle s, t \rangle$ and outputs a function of type $\langle e \langle s, t \rangle \rangle$.

²⁰ Casting more doubt on the difference between high and low applicative semantics in Pylkkänen (2008)'s system, Larson (2010) argues that Pylkkänen (2008)'s transfer-of-possession semantics for low applicatives makes the false prediction that a sentence such as *John wrote Mary a letter* should be entailed by *John wrote a letter and Bill gave that letter to Mary*, a prediction which he argues a semantic analysis of low applicatives which denotes a relationship between an event and individual does not make.

indicating the direction proves to be difficult. In any case, the evidence from these effects necessary to choose between a high applicative analysis and Ramchandian ‘low’ applicative analysis are currently not to be found in Karuk and I must remain agnostic as to which is ultimately the right analysis.

7. Conclusion

In this paper I have presented novel data regarding a restriction on the distribution of Karuk directional suffixes, in that they cannot combine with telic verbs, and based on this data have presented two structurally dissimilar analyses that could account for the restriction. One amends the high applicative analysis of Macaulay (2004) so as to include a domain restriction in the directional semantics that disallows combination with culminated events, and another situates the directionals as low PathP applicatives within the VP as afforded by Ramchand (2008)’s system. Though Ramchand’s system produces a favorable prediction which the revised high applicative analysis does not, namely that the directional semantics are necessarily incompatible with telicity, the syntactic means by which that complementarity is derived are as of now unsupported in Karuk, though there is also no direct syntactic evidence for the more standard high applicative view. In this case, the Karuk data do not allow for a confident choice between either of the analyses.

Regardless of which analysis one chooses, however, the typology of applicatives in Pylkkänen (2008) must be seen as incomplete and the possibility must be afforded for semantic restrictions like the telicity restriction on the semantics of applicatives beyond what Pylkkänen (2008) discusses or predicts.

The Karuk data do provide strong support for a complementarity between directional semantics, Path, and telicity, Result, likewise regardless of which analysis turns out correct. Why, however, should these be complementary? Ramchand (2008) offers no deep semantic explanation. Though I can provide no answer in this paper, given that directionals appear to encode scalar change (from less upriver to more upriver, for instance) and that telic predicates like *arrive* have been argued to encode changes on a two-point scale (from ‘not having arrived’ to ‘having arrived’) (cf. Rappaport Hovav & Levin 2010), perhaps an explanation can be sought in the processes by which scales can or cannot combine and in a more sophisticated, scalar semantics for the directionals.

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References

2016. Ararahih’urípih: A dictionary and text corpus of the Karuk language.
<http://linguistics.berkeley.edu/~karuk/>.
- Bright, William. 1957. *The Karok language*. University of California Press.
- Bright, William. n.d. Karuk verbs.
- Bright, William, & Susan Gehr. 2004. *Karuk dictionary*. Karuk Tribe of California.

- Dowty, David. 1979. *Word meaning and Montague grammar*. Dordrecht: Kluwer.
- Garrett, Andrew, Erik Maier, Line Mikkelsen, & Clare Sandy. 2015. Exploring Karuk morphology in a parsed text corpus. Talk presented at the Annual Meeting of the Society for the Study of the Indigenous Languages of the Americas, January 8th 2015 .
- Garrett, Andrew, & Line Mikkelsen. 2015. Documenting, analyzing, and teaching the grammar of direction in Karuk. In *4th International Conference on Language Documentation and Conservation (ICLDC)*. URL <http://hdl.handle.net/10125/25285>.
- Kratzer, Angelika. 1996. Severing the external argument from its verb. In *Phrase structure and the lexicon*, ed. Johan Rooryck & Laurie Zaring. Springer.
- Larson, Richard K. 2010. On Pylkkänen's semantics for low applicatives. *Linguistic Inquiry* 41:701–704.
- Macaulay, Monica. 2004. On the Karuk directional suffixes. In *BLS 30*, 81–101.
- Mithun, Marianne. 1999. *The languages of native north america*. Cambridge University Press.
- Mucha, Anne. 2013. Temporal semantics in Hausa. *Linguistics and Philosophy* 36:371–415.
- Peterson, David A. 2007. *Applicative constructions*. Oxford University Press.
- Pylkkänen, Liina. 2002. Introducing arguments. Doctoral dissertation, MIT.
- Pylkkänen, Liina. 2008. *Introducing arguments*. The MIT Press.
- Ramchand, Gillian Catriona. 2008. *Verb meaning and the lexicon: A first-phase syntax*. Cambridge University Press.
- Rappaport Hovav, Malka, & Beth Levin. 2010. Reflections on manner/result complementarity. In *Lexical semantics, syntax, and event structure*, ed. Malka Rappaport Hovav, Edit Doron, & Ivy Sichel. Oxford University Press.
- Smith, Carlota S., Ellavina T. Perkins, & Theodore B. Fernald. 2007. Time in Navajo: Direct and indirect interpretation. *International Journal of American Linguistics* 73:40–71.
- Talmy, Leonard. 1985. Lexicalization patterns: Semantic structure in lexical forms. In *Language typology and syntactic description volume III: Grammatical categories and the lexicon*, ed. T. Shopen. Cambridge University Press.
- Talmy, Leonard. 1999. Fictive motion in language and "ception". In *Language and space*, ed. Paul Bloom, chapter 6. MIT Press.
- Zucchi, Sandro. 1999. Incomplete events, intensionality, and imperfective aspect. *Natural Language Semantics* 7:179–215.