Two types of habituals: Kiowa ingredients of a modular imperfective[1]

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Abstract. This paper argues that the Kiowa language (kio) employs two distinct methods of building habituals, each with its own morphological representation. The free adverbial *àn* is a 'distributive' over events which gives a sense of plurality 'strewn' across the topic time, while the bound adverbial *bôː+* is a durative expressing an event that lasts the entire topic time. These methods of imperfectivity are proposed as complementary in the literature, but the Kiowa facts show that the components of the imperfective are modular.

Keywords: imperfective, aspect, habitual, Kiowa, event plurality

1. Introduction

The imperfective has a wide variety of uses, which different approaches derive in distinct components of a broad abstract imperfective morpheme. The habitual use in particular has recently been derived with success by one of two methods. Ferreira (2016) derives habituals from plurals— many events taking place build a habit. Deo (2009, 2015) argues instead that a regular partition of the relevant time derives the habit.

In Kiowa (kio), however, we find both kinds of imperfective working together to build habituals, which suggests that they are not necessarily complementary, but instead contribute modularly towards the imperfective. In this paper we demonstrate two habitual morphemes that provide distinct routes to habitual readings. One employs a distributed plurality of events, while the other employs a durative meaning. Instead of partitioning the relevant time, the event is asserted over the entire time, and habituality is one possible interpretation.

This paper relies on examples gathered from texts and elicited through fieldwork with speakers of the Kiowa language, a moribund member of the Kiowa-Tanoan family. It is the heritage language of the Kiowa Tribe of Oklahoma, now centered in SW Oklahoma in the U.S. A brief grammatical note to help readers is that it is 'non-configurational', roughly SOV but only V is required. Verbs are polysynthetic, with a structure as follows: [AGT>DAT>OBJ agreement=incorporated stem+main stem-NEG/ASP/MOOD/EVID] (Watkins, 1984). Its number system is well-known for its mixture of morphological simplicity and semantic complexity (Harbour, 2008). Kiowa is a tone language, but many morphemes neutralize tones for the rest of the prosodic word they are in, to low tones (Sivertsen, 1956). This 'lowering' is indicated with $_*$.

2. The Kiowa imperfective

Kiowa imperfective marking (IPFV) is used for ongoing (1), imminent (2), and habitual readings (3). Kiowa lacks tense marking, so any of these imperfective sentences could also be uttered about past times if adverbials allow, even as the translations in this paper focus on present 'tense' readings.[2]

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[2]Abbreviations: AGT>DAT>OBJ: (agent) (> dative >) object/theme, A: agent, AGT: agent, ANAPH: anaphor, ASP: aspect marking, D: dual, DAT: dative/oblique, DIST: spatiotemporal distributive, DUR: durative EVID: indirect

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(1) èm= gún**mɔ̀**
3S>REFL=dance.**IPFV**
'She is dancing.'

(2) k^{hj}ą́hį́ːgɔ́ː èn= ɔ̀ːzôn**mɔ̀**
tomorrow 3D>REFL=start out.**IPFV**
'They (two) are setting out tomorrow.'

(3) Context: Talking about children's roles in preparing dance grounds
ę́ːhɔ̀ːdè$_*$+ pàj+ kùn– ę̀ː ét$_*$= t^{h}ą̀ː+ **ɔ̀ːmɔ̀.** mɔ̀p'âl **àn** ét$_*$= tɔ̀ːtɔ̀p
present day+summer+dance–at 3I>3P=help+ **do.IPFV** trash **HAB** 3I>3P=gather up.IPFV
'At the Gourd Dances these days, they help out. They pick up the trash.' (Neely, 2012)

3. Two means of providing habitual readings

Habitual readings usually involve the adverbial *àn*. This form is syntactically fixed in AspP (Adger et al., 2009) below negation. It triggers IPFV in all cases (4a), unless some other morphology blocks it. The blockers are negation, which neutralizes aspect marking (5), and stative verbs, which do not bear aspect marking (6).

(4) a. **àn** èm= gún**mɔ̀**
HAB 3S>REFL=dance.**IPFV**
'She dances.'
b. ***àn** èm= gún
HAB 3S>REFL=dance.**PFV**

(5) a. hɔ́n **àn** èm= gą́ːn**ɔ̂ː**
not **HAB** 3S>REFL=dance.**NEG**
'She does not dance / she never dances.'
b. *hɔ́n **àn** èm= gún**mɔ̀**
not **HAB** 3S>REFL=dance.**IPFV**

(6) jɔ́kɔ́j k^{h}ɔ́ː$_*$+ t^{h}àj **àn** ∅= ą́ːg^{j}à
young woman blanket+on top **HAB** 3S=be sitting.SG/DU
'The young woman usually sits on a blanket.

A second way to build habituals is the stem *bôː+*, which is incorporated into the verb (7). This form always triggers IPFV as well, unless it is blocked by the same blockers that block it with *àn*: Negation (8) and statives (9).

(7) a. èm= **bôː$_*$**+gùn**mɔ̀** b. *èm= **bôː$_*$**+gùn
3S>REFL=DUR+dance.**IPFV** 3S>REFL=DUR+dance.**PFV**
'She often/usually/always dances'

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evidentiality, HAB: habitual I: inverse number (agreement), INV: inverse number (nouns), IPFV: imperfective aspect, NEG: negative, NOM: clause nominalizer, NS: non-singular internal argument, OBJ: object/theme, P: plural (3+) agreement, PL: plural (3+) internal argument, PFV: perfective aspect, PRS: presentative deixis, REFL: reflexive, S: singular agreement, SG: singular internal argument, SG/DU: singular/dual internal argument, SS: same-subject switch-reference,

(8) a. hɔ́n **bôː$_*$+**gʉ̀ːnɔ̀ː
not DUR+dance.**NEG**
'She does not often/usually/always dance'.

b. *hɔ́n èm= **bôː$_*$+**gùn**mɔ̀**
not 3S>REFL=DUR+dance.**IPFV**

(9) jɔ́kɔ́j tʰáj ∅= **bôː$_*$+**ɑ̀ːgʲà
young woman on top 3S=DUR+be sitting.NS
'She is often/usually/always on horseback'

We must point out that *bôː+* is often translated as 'always' or 'all the time', at least since Harrington (1928). However, elicitation shows that the predicate need not hold of every relevant time. For instance, in (10), a follow-up clause (in brackets) contradicts a universal reading, and speakers accept this.

(10) tɑ́jpè$_*$+ kùn– gʲà ∅= tsán= tsɛ̀ː èm= **bôː$_*$+**gùnmɔ̀,
Gourd Clan+dance–at 3S=arrive:PFV=when.SS 3S>REFL=**DUR+**dance.IPFV
[né páː hɔ́n èm= gʉ́ːnɔ̂ː]
but some(times) not 3S>REFL=dance.NEG
'When she comes to Gourd Clan, she usually dances **but sometimes she doesn't**.'

4. Distinguishing àn from bôː+

These two forms of the habitual are semantically similar but distinct morphemes. Both have similar translations, and examples like (11) show how neither *àn* nor *bôː+* can be used with single or occasional occurrences.

(11) kʰíːdêl *Tom* **(*àn)** kɔ́ːtɔ̀$_*$+ tòː– kù ∅= **(*bôː)**+báː
yesterday Engl. **(HAB)** commerce+house–to 3S=**(DUR)**+go.PFV
'Tom went to the store yesterday.'

We might at first hypothesize that the two forms express the same meaning from distinct categories, one free and one incorporated, especially since they routinely co-occur.

(12) ɔ̂ngɔ̀ **àn** án= **bôː$_*$+**ɔ̀m+dɔ̀ː dé– tsò, pʼíːdé án= ɔ́m+dɔ́ːmêː, kʰɔ̀ːsètón
instead **HAB** >3S>3P=**DUR+**do+ be NOM–as down.below >3S>3P=do+ be.EVID leggings
∅= sɔ́ːdèː
>3S>3S=be set.PL:EVID
'However, as he generally did with his lower body, he had put on leggings.' (New Clothes for Church)[3]

However, three factors where they differ lead us to distinguish the two forms: With negation, episodic durations, and untested characterists.

4.1. Negation

The two morphemes trigger different interpretations under negation. With negation, *àn* is generally translated as 'habitually doesn't' or 'never'. Given *àn*'s fixed position under negation, we expect it to have low scope (*not > habitual*). From this we predict that it allows readings where

[3] >X>Y means 'Y internal argument, X dative'. In (12), these verbs are result passives with a semantic agent expressed as the dative argument.

the described event never occurs or rarely occurs (it habitually does not occur), and also where it occasionally occurs (it does not habituallly happen). It should be unavailable with 'almost always' readings (not always), and it is.

(13) hón **àn** ∅= t'ɔ̀m+tsą́ːnɔ̂ː
not **HAB** 3S=first+ arrive.**NEG**
'She doesn't usually get there first./She never gets there first'

1. If she almost always does: Rejected
2. If she occasionally does: Accepted
3. If she rarely does: **Accepted**
4. If she never does: **Accepted**

Meanwhile *bôː+* also takes scope below negation (not > habitual), but the 'rarely' and 'never' readings are not accepted.

(14) hón ∅= **bôː+** t'ɔ̀m+tsą̀ːnɔ̂ː
not 3S=DUR+first+ arrive.**NEG**
'She doesn't usually/always get there first.'

1. If she almost always does: Rejected
2. If she occasionally does: Accepted
3. If she rarely does: **Dispreferred**
4. If she never does: **Rejected**

4.2. Episodic durations

Bôː+ can be used in non-habitual contexts to mean 'the entire time' (15). In these instances, IPFV marking is still required unless blocked by negation or statives.

(15) pá:gɔ̀ː kún$_*$– kù ∅= tsán gɔ̀ èm= **bôː$_*$+** gùn**mɔ̀**
one dance–to 3S=arrive.PFV and.SS 3S>REFL=**DUR+** dance.**IPFV**
'She came to only one dance, and she danced/was dancing the whole time.'

These contexts bar *àn.*

(16) *pá:gɔ̀ː kún$_*$– kù ∅= tsán gɔ̀ **àn** èm= gún**mɔ̀**
one dance–to 3S=arrive.PFV and.SS **HAB** 3S>REFL=dance.**IPFV**
'She came to only one dance, and she danced/was dancing the whole time.'

4.3. Untested characteristics

Habituals are well-known for their ability to be true even if the described action has yet to happen. Testing shows that *àn* can be used for such untested characteristics, while *bôː+* cannot be.

(17) Context: Bill is starting a new job tomorrow, and you're telling your son about it.
a. gį́ː– gʲà **àn** gʲà= sɔ́ːté$_*$+tɔ̀ː b. *gį́ː– gʲà gʲà= **bôː$_*$+** sɔ̀ːtè+ tɔ̀ː
night–at **HAB** 3S>3P=work+ act.IPFV night–at 3S>3P=**DUR+** work+act.IPFV

'He works at night.'

With these diagnostics, we determine that *àn* and *bôː+* are semantically distinct morphemes. They both indicate habitual meaning, so we conclude that Kiowa takes two paths to habitual meanings. In the rest of this paper we pursue the ensuing question: How do we follow these paths to habituality and maintain these other distinctions?

5. Incorporating plurality and regularity

In order to clarify the meanings of these morphemes, to account for their differences, we can first try to apply a notion of habituality already proposed. Ferreira (2016) derives habitual readings from progressives via plurality. An operator *pl* selects homogeneous sums from the event property's extension *P*, which can be partitioned into non-overlapping proper parts that are also in *P* (18). Assuming that verbs are lexically cumulative (Kratzer, 2007), the habitual is just the application of this plural to the imperfective.

(18) $\text{pl} = \lambda P \lambda e.\ P(e)\ \&\ \exists e_1, e_2, \ldots, e_n < e : P(e_1)\ \&\ P(e_2)\ \&\ \ldots\ \&\ P(e_n)\ \&\ \otimes(e_1, e_2, \ldots, e_n\ \&\ e = e_1 \oplus e_2 \oplus \ldots \oplus e_n$

However, Deo (2009, 2015) finds that mere plurality fails to capture any temporal quality of habituals. Habits last a while, and are often regular. Mere repetition does not suffice. Kiowa facts reinforce Deo's point. The sentence in ((17)) 'Bill works at night' is not made true simply if Bill works for a few nights. We have to be describing his job, or at least a routine, which lasts throughout the time in question.

5.1. Regular partitions

Deo's approach (Deo 2015: 488) is an attempt to salvage a universally-quantified imperfective with a proper restrictor: The imperfective introduces a relevant time interval, divides it contextually into regular partitions. Each partition has an event instantiating the predicate.

(19) $[\![\text{IPFV}(P)(i)]\!] = 1$ iff every (suitably restricted) history *h* continuing *i* contains a *j* where $i \subset_{nf} j$ and every subinterval *k* of *j* that is also a cell of a contextually provided regular partition of *j* overlaps with a *P* interval.

The different readings of the imperfective arise from adjusting the interval. The habitual is one that lasts across the topic (or reference) time. As it is partitioned 1, the partition leads to a habitual reading.

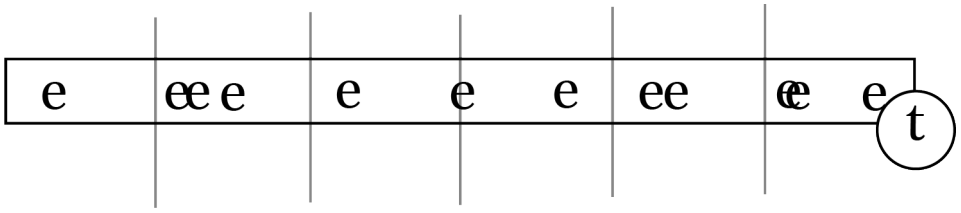

Figure 1: Partition across the relevant time interval

However, this approach has flaws when applied to habitual meanings of the imperfective, which we will focus on here. First, there is no guarantee that there is a plurality of partitioned subin-

tervals. We must stipulate more than two subintervals (i.e. more than one partition). Worse is an empirical problem: Habitual events are not often that regular.

Deo's approach does not require the events to be regular, only that the *partitions* are regularly divided– a partition can have multiple events in it. However, this leads to a Texas Sharpshooter problem. We can divide the interval any way we like to ensure that each partition has one event in it — into two, three, four, however many (Figure 2). There is no obvious link between the regularity of the intervals and the frequency of events. Even if the events are regular, there is no reason why the intervals must match them.

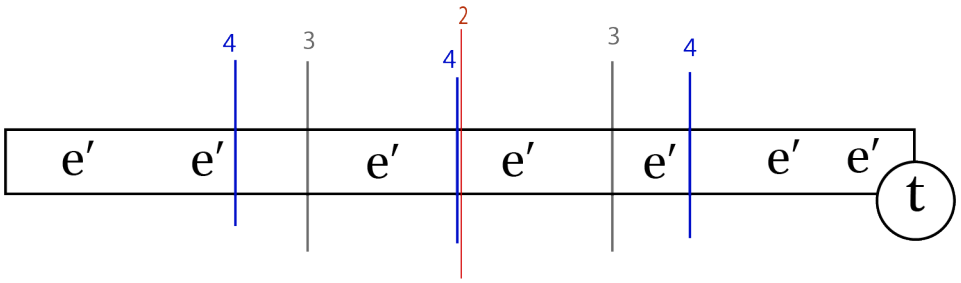

Figure 2: Dividing intervals into any number of partitions

The ability to craft the partitions to ensure a true result weakens Deo's approach but does not quite falsify it. What does falsify it is the existence of contexts in which *àn* is felicitous but any non-trivial *regular* partition has empty pieces. On Deo's account such contexts are predicted to block habituals, but they occur in Kiowa. In fact, they are easy to elicit. In (20), any partition with more than two intervals will contain an interval where no event occurs (Figure 3). A partition with two intervals hardly qualifies as a habit. This leaves no possible partition where a habitual reading can arise from the proposed denotation.

(20) Context: You call your sister about once a day, but sometimes you go a few days without calling; other days you call several times.
nóː+pʼíː **àn** gʲà= kʰɂːmɔ̀
me+sister **HAB** 1S>3S=call.IPFV
'I call my sister' (judged true)

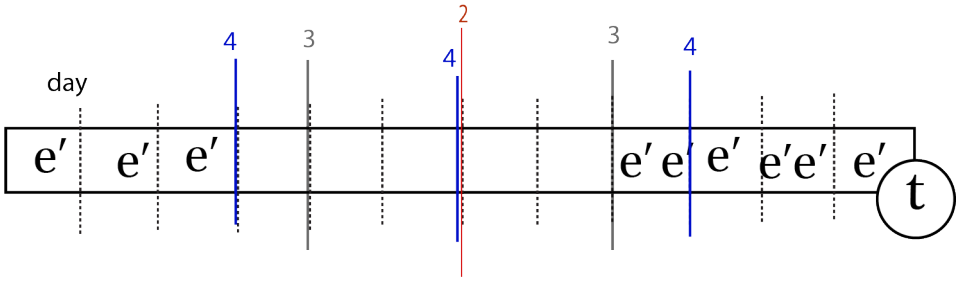

Figure 3: No suitable partition contains an event

Neither Ferreira's significant plurality nor Deo's regular intervals suffice to account for the habituals of Kiowa, so we need a different approach.

6. Analyzing two types of habituals

This section lays out the meanings of both habituals, with *àn* being a 'distributive' that requires plurality and leads to habitual readings, and with *bôː+* as a 'durative' that stretches long enough to allow habitual readings, but also permits 'whole time' readings.

6.1. Distributive habituals

To capture the meaning of *àn*, we propose applying the concept of verbal distributives. The term *distributive* here is not the one that semanticists typically use for quantification. I will use DIST to distinguish the present use from that use. DIST is an affix common in North American languages, which indicates that the described action takes place multiple times spread out across different places (Mithun 1997: 88).

With nouns and statives, a 'spread around' reading obtains.

(21) *tukô:yo'* 'snow'
*tu-**t**-kô:yo* 'snow here and there' (Quileute, from Mithun 1997: 88)

With eventives, a 'going around' reading obtains, even if it does not always wind up in the translation.

(22) wa'– k– nata–hr– **nion'**
FACTUAL–1SA–visit–ANDATIVE–**DIST.PFV**
'I went visiting here and there' (Mohawk, Mithun 1997: 88)

(23) wa'– k– hninon–**nion'**
FACTUAL–1SA–buy– **DIST.PFV**
'I bought some things' (Mohawk, Mithun 1997: 88)

Importantly, a plural object does not trigger DIST by itself; the event has to be spread out. Mithun points out that in (23), "The buying was distributed over an assortment of groceries in a shopping cart. This verb would not be used for the purchase of a single carton of eggs."

Kiowa has a similar construction, with the bound auxiliaries *–gôm/gų́ː* occurring with eventives and *–yɔ́ː* with statives (Watkins, 1984).

(24) ɔ́ːkɔ́ ∅= t^{h}ón+dɔ́ː=dé– èm à= tsán– **gòm**
well 3S=dig+ be= NOM–to 1S=arrive–**DIST.PFV**
'I got around to places where wells had been dug.' (Watkins 1984: 180)

(25) kɔ́j– gú á= kúː– **yɔ́**
Kiowa–INV 3P=be lying:PL–**DIST**
'Kiowas are camped about.' (Watkins 1984: 84)

Likewise, a plural event does not suffice to trigger DIST. As the contexts in (26) show, the plural events have to be spread out across a significant area. The main verb was chosen to reflect a plural object, but their spacing matters.

(26) bímk^{h}ɔ́j–g^{j}à hę́ːg^{j}à g^{j}àt= sɔ́ː– **gôm**
bag– at toy 3S>3P=put in:PL–**DIST.PFV**

'She went around putting toys in the bags.'
a. **Yes:** Bags set apart in a circle on a blanket, and she put a toy in each bag
b. **No:** Bags next to each other in the center of a blanket, and she put a toy in each bag

We can formalize DIST as indicating that the event is plural; that is, a sum of atomic subevents of the same predicate, and also that these subevents are *strewn about* the location of the event. The denotation of DIST is given in (27), and is illustrated in Figure 4.

(27) $[\![\text{DIST}]\!]([\![\text{P}]\!]) = \lambda e' \lambda w.$ e′ is a sum of atomic/minimal sub-eventualities e strewn about the location of e in w, and $\forall e[\ e \leq e' \rightarrow P(e)(w) = 1\ ]$

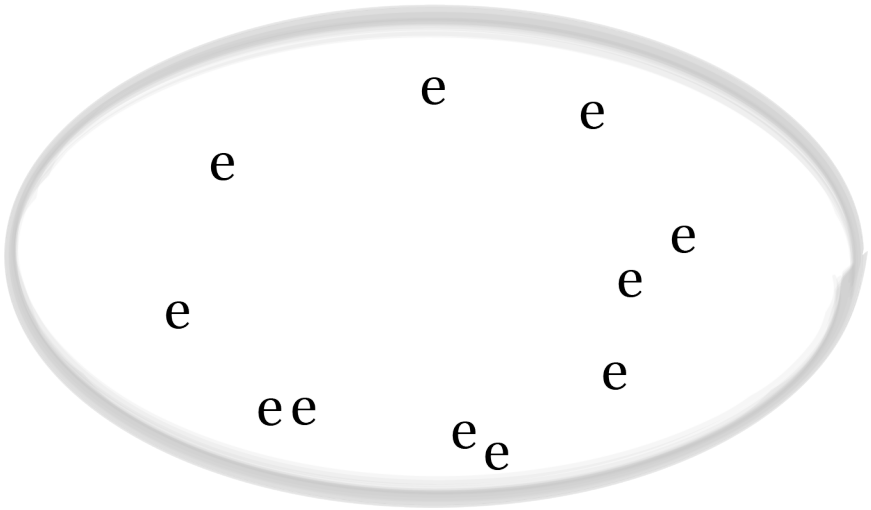

Figure 4: Subevents strewn about the event location

The choice of *strewn* to describe this distribution is deliberate. It is the participle of the archaic verb *strew* 'scatter across a surface, spread widely', so it conjures an image of pieces sprinkled all over the place. *Strew* requires a substantial plural (or mass) theme, whose atomic (or minimal) components are distributed across the area in question (28).[4] Regularity of spacing is possible, but not required.

(28) a. Basketballs are strewn about the court.
b. #Two basketballs are strewn about the court.

These are exactly the concepts we see with the habitual, so we can formalize the proposal. $[\![\grave{a}n]\!]$ expresses a similar meaning to $[\![\text{DIST}]\!]$, but instead of spreading subevents around the location of e, it strews them around the relevant time interval introduced by the imperfective ((29), exemplified in Figure 5).

(29) $[\![\grave{a}n]\!]([\![\text{P}]\!]) = \lambda t \lambda e \lambda w.$ e is a sum of atomic/minimal subevents e′ that are strewn about t in w, and $\forall e'[\ e' \leq e \rightarrow P(e')(w) = 1\ ]$

This denotation can be incorporated into the imperfective simply. It still requires an interval argument, so we assume that $[\![\grave{a}n]\!]$ can modify a stripped-down imperfective. Strewing derives

[4]It might not be a coincidence that PLURAL in Kiowa means 3 or more.

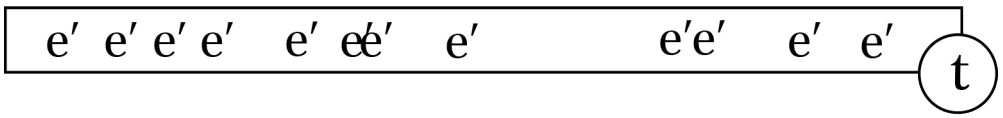

Figure 5: Strewing around the relative time

the significant plurality of sub-events in the relevant world. If the habit is modal, the plurality is as well. Since temporal intervals are linear, any sense of 'strewn around' is linear as well.

As with ⟦ DIST ⟧, the strewing of events in ⟦ *àn* ⟧ can be regular, but need not be. Figure 6 exemplifies this regularity. Thus, the particle is compatible with regular or irregular habits.

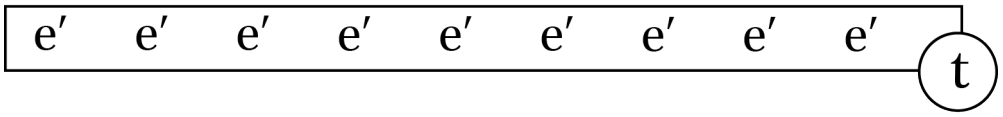

Figure 6: Regular strewing

Strewing is compatible with spreading events out, because it requires breadth. The pieces cannot all be in the same place.

The described habit need not stretch throughout the relevant time interval. In (30), the relevant interval is 2016, as modified by the temporal adverbial. However, there were no events in the second half of the year.

(30) Context: You sang at some pow-wows in the spring and summer of 2016, but sat out the fall and winter ones.

2016–jɔ̂ː kún$_*$– gʲà **àn** gʲàt= dɔ́ː+ tɔ́ː
2016–in dance–at **HAB** 1S>3P=sing+act.IPFV
'<u>In 2016</u>, I sang at pow-wows.'

6.2. Durative habituals

We propose that the second habitual, *bôː+*, denotes a durative (DUR), asserting that P holds of event e at every subinterval of the relevant time t.

(31) ⟦ *bôː+* ⟧(⟦ P ⟧) = λtλeλw. P(e)(w) = 1 & ∀t′[t′ ≤ t → ∃e′[e′ ≤ e & P(e′)(w) = 1]]

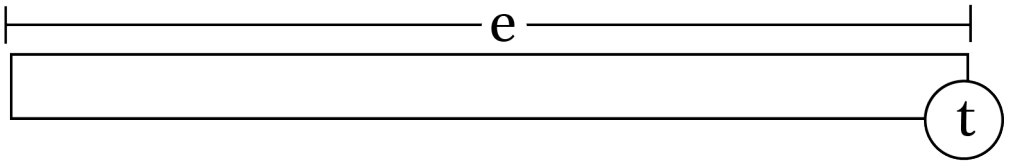

Figure 7: Durative habitual

If the predicate P has the subinterval property, the 'whole time' reading comes naturally.

(32) ∅= **bôː$_{*}$+**dę̀ː+ tsòː– dèː
3S=**DUR+**sleep+be lying:SG–EVID
'He slept the whole time.'

(33) hón ∅= **bôː$_{*}$+**dę̀ː+ tsòː– gɔ̂ː– hèl
not 3S=**DUR+**sleep+be lying:SG–NEG–EVID
'He didn't sleep the whole time.' (comment: He did sleep some of the time.)

If P does not have this property, ⟦ bôː+ ⟧⟦ P ⟧)(t) cannot straightforwardlys hold of its events e.

(34) gi̇à= **bôː$_{*}$+** gòːbòp
1S>3S=**DUR+** miss.IPFV
'I am missing it (the target) all the time.' (Harrington 1928: 64)

Instead, P is coerced into a state of affairs P_s with the subinterval property, akin to what happens with the universal perfect (cf. *He has built houses for 25 years*).

The habitual reading emerges if the speech act participants infer associated subevents where P holds (but not P_s), and if the relevant time is long enough for a habit to form (7).

6.3. Both habituals together

Essentially, Kiowa speakers can build habitual readings with two distinct mechanisms. The 'true' habitual *àn* conditions the event's subevents as strewn about the relevant time, and a sense of duration is derived from the time it takes for those subevents to take place. Alternately, the durative *bôː+* conditions the event itself as lasting the entire relevant time, and a sense of habit is derived from coercing events that cannot reasonably last that long.

This distinction allows the two forms to co-occur (12), to assert that the event lasts the entire relevant time and its subevents are strewn about the relevant time. Each asserts the other's implicature, as Figure 8 demonstrates for (35).

(35) gò ám **àn** ɛ́ːgòː sɔ́ttè$_{*}$+kûypàːgòː– dè= àl ɔ́= **bôː$_{*}$+** tsél
and.SS ANAPH **HAB** now.PRS new+ Lone Wolf–NAME=also >3S>3I= **DUR+** be set.SG
kʼɔ̀nbǫ́hǫ̀ːdò
hat.INV
'And you know how Lone Wolf the Younger always has a hat on.' (New Clothes for Church 2:27)

7. Deriving distinctions between habituals

Now that we have established two distinct habituals in Kiowa, we can explore how this distinction explains their distinguishing characteristics. In section 4 we demonstrated how the two forms behaved differently under negation, with episodic duration, and with characteristic readings.

For episodic duration, we see that *bôː+* involves a subinterval property, which lends itself naturally to a 'whole time' reading. Meanwhile, *àn* requires multiple events dispersed but not necessarily taking place over the entire time period.

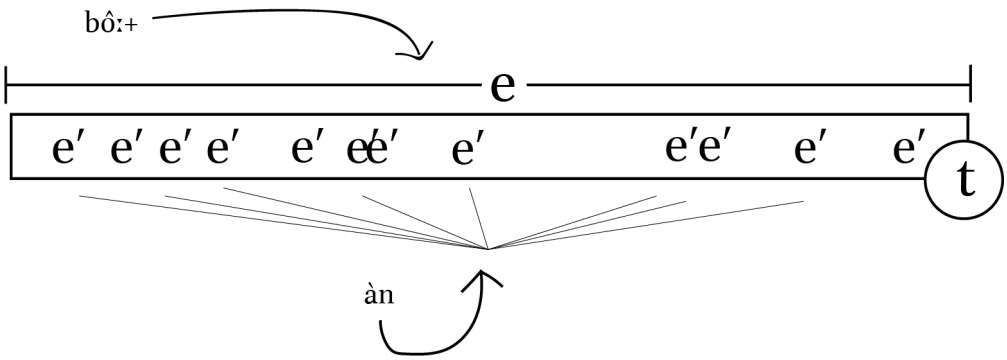

Figure 8: Both habituals working together

Behavior under negation proves trickier to resolve. Negation *àn* leads to a straightforward result: the predicate is not strewn about the relevant time interval. It can occur sometimes, rarely, or not at all. Negating *bôː+* with a durative reading should allow any reading weaker than 'always'. However, only the occasional reading is accepted readily. More elicitation is required, but as a hypothesis, it appears that there is a lower limit to *bôː+*, which requires it to be true in at least some cases, and this limit is not subject to negation. Perhaps it is a presupposition. Also, if *bôː+* expresses that P holds over 'most' rather than 'all' subintervals, it fits better. It would still allow the 'all' reading, and its negation would rule out the 'almost always' reading.

To prevent characteristic readings in *bôː+*, we hypothesize that a limit on coercion in these cases only licenses it when the speaker's coercive choice depends on actual events. This may involve another presupposition on *bôː+*.

8. Conclusion

Whatever the exact denotations may turn to be, we have distinguished two ways of achieving habitual readings in Kiowa, reflected in distinct morphemes. One resembles the plural but has a condition spreading the events out. The other is durative in nature, and leads to habituality by coercion. Since they both can occur together, their meanings reinforcing each other, we may think of the ingredients of the imperfective as modular rather than complementary. That in turn may lead to better explanations for habitual progressives like *I can't talk with him; he's **always reading** his phone.*

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