

WAYS OF TALKING ABOUT THE PAST: THE SEMANTICS OF *-in-* AND *=in* IN BUNUN¹

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Abstract

This paper assesses the semantics of two homophonous markers, *-in-* and *=in* in Isbukun Bunun (Formosan, Austronesian). While both markers are used to express some kind of anteriority reading, there is no consensus about their semantic category. By presenting new empirical evidence, we offer an alternative analysis for both markers. We argue in detail that *-in-* is an existential past tense marker, which is in line with Jeng (1999) and De Busser (2009) but differs in many important details. We also suggest that *=in* is a discourse-level change-of-state marker, in contrast to the dominant view. This study not only suggests that temporal components can be associated with different categories cross-linguistically, but also has implications for analyzing similar markers in other Formosan languages.

Keywords: past tense, perfect aspect, inchoativity, Isbukun Bunun, existential past
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1 Introduction

This paper assesses the semantics of two homophonous markers, *-in-* and *=in* in Isbukun Bunun (Formosan, Austronesian). The former is an infix and has an allomorphic variant *-i-*,² while the latter is an invariant enclitic attachable to various lexical words. We choose to look at the two markers for a number of reasons. First, their phonological identity raises the question of how their use differs. Second, while both markers are used to express some kind of anteriority reading, there is no consensus about their semantic category. The infix *-in-* has been analyzed or described differently as marking past tense (Zeng 1986; Huang 1997; Jeng 1999; De Busser 2009), experiential (perfect) aspect (Lin 1997; Huang & Shi 2016), perfective aspect (Zeitoun et al. 1996), or telicity (Lin 2010). On the other hand, the enclitic *=in* is predominately described as a perfect aspect marker (Zeitoun et al. 1996; Huang 1997; Lin 1997; Jeng 1999; Lin 2010), but yet it has also been considered to be a perfective (De Busser 2009). Finally, investigating the semantics of *-in-* and *=in* in Bunun has implications for studying similar phenomena in other Formosan languages, including widespread cognates of *-in-* and diverse forms of enclitics loaded with a function comparable to that of *=in*.

By presenting new empirical evidence, we offer an alternative analysis for both markers. We argue that *-in-* is an existential past tense marker, which is in line with Jeng (1999) and De Busser (2009) but differs in many important details, and *=in* is a discourse-level change-of-state (COS) marker, in contrast to the dominant view. The two markers differ in how they express anteriority: while the past tense *-in-* lexically specifies that there is a past time at which the described event holds, the anteriority effect with *=in* arises due to a pragmatically conditioned change of state. Our findings also show that *-in-* and *=in* possess decomposable semantic features common to temporal operators in other languages, thus bearing implications for cross-linguistic studies on the semantics of tense/aspect.

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² When the first syllable of the verb root contains a consonant and the vowel /a/, *-i-* instead of *-in-* is inserted after the vowel /a/ (Zeng 1986). For example, after undergoing *in*-infixation, *ma-sabah* ‘AF-sleep’ becomes *ma-*<i>*sabah* ‘AF-*<E.PST>*sleep’.

The organization of this paper is as follows. In the rest of this section, we introduce the Bunun language and the dialect which our data is based on (Section 1.1), review previous descriptions of these two markers in the literature (Section 1.2), and elucidate our methodology of elicitation (Section 1.3). Next, Sections 2 and 3 respectively discuss the empirical evidence for our analysis of the infix *-in-* and of the enclitic *=in*. Section 4 summarizes this paper and explores the implications of our findings.

1.1 Language background

Five dialects and three branches of Bunun are generally recognized (Li 1988): Northern (Takituduh & Takibakha), Central (Takbanuaz & Takivatan), and Southern (Isbukun), which historically correspond to five family clans. The heartland of the Bunun language is believed to be central Taiwan, specifically mountainous regions in Nantou County, from which clan members migrate to other parts of Taiwan, mostly Hualien and Taitung County in the east and Kaohsiung City in the south. The Southern dialect is the most widely distributed one, followed by Central and then Northern dialects. Possibly due to this geographical distribution, the Southern dialect is also the most researched one, again followed by Central and then Northern dialects. Based on speakers' self-report, Southern speakers are better understood by Northern and Central speakers than the other way around. In this study, we specifically deal with Isbukun Bunun spoken in Namasia District of Kaohsiung City. Hence, all the Bunun data presented in this paper comes from Isbukun unless otherwise indicated. All cited data are modified for the sake of orthographic and glossing consistency.

1.2 Previous descriptions of *-in-* and *=in*

Different terms have been proposed for the infix *-in-* and enclitic *=in* based on different Bunun dialects. In Zeitoun et al.'s (1996) typological investigation of Formosan temporal/aspectual systems, reflexes of the Proto-Austronesian infix **-in-* in several Formosan languages, including Isbukun Bunun, are claimed to be perfective aspect markers.³ Their main reason is that sentences with *-in-* “must be interpreted as referring to a past and completed situation” (p.29), and the event is “viewed in disconnection with S[peech] T[ime]” (p.45). The same view is adopted by many subsequent studies (e.g. Su 2008; Li 2010; Hsieh 2011; Jiang 2012). However, the perfective proposal is probably not on the right track, since, as pointed out by De Busser (2009:234), sentences marked with *-in-* need not be interpreted as completed (see (3) below). Moreover, the disconnection with speech time is what is commonly found with a past tense rather than with a perfective aspect, as in English and many other languages (e.g. Musan 1997; Lin 2007; Altshuler & Schwarzschild 2013; Thomas 2014; Bochnak 2016; Cable 2017). In Section 2.1.1 we shall present evidence against a perfective analysis of *-in-*.

As for the enclitic *=in* in Bunun, Zeitoun et al. treat it as a perfect aspect marker, on the grounds that “with *-in-*, the event is on-going and has a certain relevance (resultant state/perfect) at speech time” (p.45). This claim is illustrated by (1), the free translation of which suggests that the drinking event continues from a past time up to the utterance time.

- (1) *Hud=in saikin danum.*⁴
 drink=IN 1SG.NOM water
 ‘I have been drinking water.’ (Zeitoun et al. 1996:45)

However, as we will show in Sections 3.2 and 3.3, *=in* always induces a change of state unless it is used to convey a contrary-to-expectation reading. In other words, in contexts without such a reading, sentences with *=in* cannot express a continuous/universal-perfect reading (compare (1) to (41) below).⁵ Based on their

³ Zeitoun et al. (1996) also claim that perfectivity in other Formosan languages is denoted by various enclitics rather than *-in-* (e.g. *=lra* [la] in Nanwang Puyuma, *=to* [tu] in Amis, and *=nga* [ŋa] in Budai Rukai). However, our study of the Bunun *=in* suggests a re-examination of the perfective account in these languages (see Sections 3.2 & 4.2).

⁴ We adopt the conventional orthography and follow the Leipzig Glossing rules. Additional gloss abbreviations are as follows: AF ‘Actor Focus’; CONJ ‘conjunction’; COS ‘change of state’; E.PST ‘existential past’; EPIS ‘epistemic’; HUM ‘human’; INTJ ‘interjection’; LF ‘Locative Focus’; LNK ‘linker’; NEUT ‘neutral case’; NPST ‘non-past’; PF ‘Patient Focus’; PRT ‘partitive’; RF ‘Referential Focus’.

⁵ We do not discuss “resultant state/perfect” mentioned by Zeitoun et al. since it is unclear what it refers to and no illustrative examples are provided.

is intended to show that the washing event terminates (as suggested by the translation—part of my body was washed).

- (4) *Laupang='ak taldanav=in.*
 now=1SG.NOM AF.wash=IN
 'I just finished washing (part of my body).' (Takivatan Bunun, De Busser 2009:225)

Moreover, De Busser claims that =*in* “certainly never indicates continuation” (p.229). These generalizations are mostly based on translation, and because there are no clear entailment tests, it is unclear how one can be sure whether culmination or termination is involved, or whether events continue or not. As we shall see in Section 3.2, once all predicate types are taken into consideration, a clear picture emerges: =*in* is used for not only culminated events, but also inceptive ones, depending on the type of event; we will also demonstrate that event inception can be associated with ongoing or forthcoming events.⁸

Lin (2010) adopts a perfect analysis of the enclitic =*in*, but argues that the infix *-in-* is a telicity marker, turning atelic events into telic ones. According to Lin, types of object that verbs take determine the telicity of the predicates in Bunun: they are telic with a numeral modifier, and atelic otherwise. Lin shows that when marked by *-in-*, an atelic predicate cannot be continued with a sentence which states that the event continues up to the utterance time, as shown in (5).

- (5) *Ma-<i>kulut is lukic ca banaz takna', # untu ma-kulut=ang cia ca*
 AF-<IN>cut OBL tree NOM man yesterday then AF-cut=still 3SG.OBL NOM
bananaz laupaku.
 man now
 Intended for 'The man chopped a tree yesterday, and the man is still cutting it now.'
 (Takituduh Bunun, Lin 2010:77)

However, this example only shows that the chopping event has terminated. Given that termination is typologically possible for both perfective telic and atelic events (see e.g., Singh 1998; Altshuler 2014), this test cannot be taken as an entailment test for telicity/culmination of telic events. What typically diagnoses whether telic events reach their endpoints (or that atelic events are shifted into telic ones) is the possibility of coordinating with a statement that the event is not completed; this is nevertheless not shown in Lin's discussion. We leave a detailed investigation of lexical aspect in Bunun to another occasion, and simply note that a telicity analysis does not straightforwardly capture the properties of *-in-* to be discussed in this paper.

Finally, in their recent reference grammar of Isbukun Bunun, Huang and Shi (2016:117-119) consider the infix *-in-* to be a subset of perfect exclusively used for experiential readings, and equate it with the Mandarin *-guo*, a marker similarly used for experiential readings (see e.g., Lin 2007; Wu 2008). Nevertheless, not all of their examples can be interpreted as experiential or translated with *-guo*. For example, the sentence in (6), in which *-in-* modifies a stative verb, can only be translated with a past tense reading, and the original Mandarin translation is incompatible with *-guo*. We will argue below that the experiential reading is simply an instantiation of existential past tense without domain restriction (Sections 2.1.2.2 and 2.4).

- (6) '*<in>i-lumah sangan a tama=a.*
 <IN>AF.be.at-home a.while.ago NOM father=DIST.NOM
 'Father was home a while ago.' (Original translation in Mandarin, Huang and Shi 2016:138)

⁸ In addition to completion, De Busser (2009) identifies three other functions of *-in-*: resultative meaning, change of state, and anteriority. Without offering much evidence, he assumes that completion and resultative meaning are “instantiations” of perfective and change of state and anteriority are only its “functional extensions” (p.230). Note that in De Busser's discussion the resultative meaning does not mean the result state of a telic event but “an event as being the result of some other event” (p.225), and the anteriority of =*in* means that the event of a temporal clause is anterior to that of the main clause.

As for the enclitic =*in*, Huang and Shi term it perfect but analogize it to the Mandarin sentence-final particle *le*, which has been given analyses beyond a temporal category (e.g., Soh 2009).⁹ They explicitly state that the reading that =*in* yields is determined by the predicate it modifies: inceptive readings with activity predicates, completive readings with achievements, and change-of-state readings with statives. Our data not only support this more fine-grained characterization but also complement it with accomplishment predicates; these will be discussed in Section 3.2.

This section has summarized the major proposals for the two Bunun markers over the past two decades. The infix *-in-* shares features with past tense—its use is restricted to the past and reveals disconnection effects from the present time. It has been considered to be a perfective or an experiential perfect aspect, but the decision is often exclusively based on translation without independent semantic tests.¹⁰ By contrast, the enclitic =*in* has a rather different property: it refers to an anterior event, and relates it to the current situation; it also shows interactions with different types of predicate. Against the backdrop of these studies, we will argue in this paper that neither of these markers denotes the semantics of perfective or perfect.

A final remark is on the interaction of *-in-* and the four ways of marking focus (AF *m-/ma-*; PF *-un*; LF *-an*; RF *is-/s-*). Blust (1998:347) notes that “while PAn **-in-* and its reflex in many daughter languages may co-occur with the IF [RF in this study], AF, or LF affixes, it has a zero allomorph with the PF suffix.” In other words, reflexes of PAn **-in-* in many languages have a portmanteau function for both tense/aspect and PF marking. Interestingly, we have identified in Jeng and Ispalidav’s (2016) Isbukun Bunun Dictionary word forms and/or example sentences of *-in-* co-occurring with all four focus affixes, including the PF. We illustrate this distribution with unmarked word forms followed by their *in*-marked counterparts: AF *manah* vs. *m<in>anah* ‘to shoot, hunt’; PF *ludah-un* vs. *l<in>udah-un* ‘to hit, strike’; LF *pa’anak-an* vs. *pa<i>’anak-an* ‘to beat up’; RF *is-pinang* vs. *s<in>-pinang* ‘to sow (seeds)’.¹¹ At this point, it is unclear whether the PF form *<in>V-un* in Bunun is sporadic or entrenched.¹²

1.3 Methodology

Unlike previous studies, most of our data are embedded under a specific context and accompanied with grammaticality and felicity judgments as well as the consultant’s comments (see Matthewson 2004 for the procedures for contextual elicitation). Moreover, these data are augmented by a storyboard based on ‘Miss Smith’s Bad Day’ (Matthewson 2014).¹³ The procedure of eliciting the storyboard is as follows: we first illustrated the story frame by frame to the speaker in Mandarin, and then we recorded the speaker’s retelling of the story. In subsequent sessions, we then went through the recorded story with the speaker to transcribe the story and to conduct follow-up elicitation. For the details and benefits of utilizing storyboard in elicitation, the reader is referred to Burton and Matthewson (2015).

2 The semantics of *-in-*

We argue that the infix *-in-* is not any kind of aspect but a past tense marker. The examination of *-in-* against the properties of several aspectual categories shows that an aspectual analysis is unattainable (Section 2.1 and 2.2). Instead, the properties of *-in-* are all explainable if *-in-* is analyzed as a past tense and, more precisely, as an existential past tense, following the diagnostics proposed in Chen et al. (2017) for Javanese and Atayal (Section 2.3). Section 2.4 provides a formal analysis.

⁹ Huang and Shi (2016) also consider that the suffix *-nahtung* marks perfect just like the enclitic =*in*, but they do not show what types of perfect semantics the two markers each encode.

¹⁰ While translation can be useful at different stages of elicitation, it is not a sufficient method of exploring meaning (cf. Matthewson 2004).

¹¹ The Isbukun Bunun Dictionary is accessible online at <https://e-dictionary.apc.gov.tw/bnn/Intro.htm>.

¹² Blust (1998) points out that Thao is unique among Formosan languages since it allows the combination of *-in-* and PF. We are not sure how robust the same combination is in Bunun, but for our purpose the crucial point here is that Bunun *-in-* is compatible with various focus markers.

¹³ The original storyboard can be found at http://totemfieldstoryboards.org/stories/miss_smith/.

2.1 Not an aspect marker

In this section, we present evidence that the infix *-in-* cannot be analyzed as a perfective aspect or a(n) experiential (perfect) aspect.

2.1.1 Not a perfective aspect marker

Jeng (1999) argues that *-in-* is not a perfective aspect but a past tense based on the past temporal restriction of *-in-* and the compatibility of *-in-* with viewpoint aspects including an imperfective one. Our data confirm these claims. In what follows, we first illustrate these two pieces of evidence with our own data and then provide further support for a past tense analysis.

First, the occurrence of *-in-* is restricted to a past reference time. As shown in (7), the presence of *-in-* in the sentence (realized as *-i-* here, see fn. 2) is inconsistent with the presence of a present-time adverb (see also (2) above).

- (7) *Ma<i>sabah saia {takna / *laupakadau} sia sapalan=cia.*
 <E.PST>AF.sleep 3SG.NOM yesterday / now LOC bed=DIST.OBL
 ‘He slept on that bed yesterday.’ / ≠ ‘He is sleeping on that bed now.’

Future-time reference in Bunun requires the proclitic *na=*, as in (8)a,¹⁴ and the presence of *-in-* in such sentences is infelicitous, as in (8)b (see also Huang 1997:380).¹⁵

- (8) Context: “Can I come over at 3 pm. tomorrow?” “No, 3pm. is not good because ...”
 a. **(Na)=ma-pa-tal’isuh saikin Aping=cia.*
 FUT=AF-CAUS-bathe 1SG.NOM Aping=DIST.OBL
 ‘I will be giving Aping a bath.’
 b. *Na=ma-(*<i>)pa-tal’isuh saikin Aping=cia.*
 FUT=AF-<E.PST>CAUS-bathe 1SG.NOM Aping=DIST.OBL
 ‘I will be giving Aping a bath.’

Data such as these clearly show that *-in-* is temporally restricted and cannot be an aspect marker in the theory of Reichenbach (1947) and Klein (1994): such aspectual markers should be able to combine with a past, present, or future tense to yield a different reference time. The observed restriction to the past thus favors the proposal that *-in-* is a past tense rather than an aspect such as perfective. Nevertheless, perfectives in many languages (including the English simple past) can be pragmatically restricted to the past (Bennett and Partee 1978; Dahl 1985; Kamp and Reyle 1993; Giorgi and Pianesi 1997; Smith 1997). There is also a possibility that *-in-* is a past perfective marker. These possibilities, however, are ruled out by the fact that *-in-* can co-occur with *Ca*-reduplication (which has been considered to be an imperfective aspect, cf. Jeng 1999; Huang and Shi 2016), yielding a past habitual or past progressive reading:¹⁶

¹⁴ In our data, *na=* is obligatory for the future. This fact, however, is inconsistent with the note made by De Busser (2009:212) based on Takivatan Bunun spoken in Hualien; that is, “[i]t is perfectly possible to have a future event without explicit irrealis marking [i.e., *na=*]”.

¹⁵ The only case where *-in-* and *na=* can co-occur is when *na=* is interpreted as epistemic. For example, *-in-* in (i) marks a past scolding event that the speaker conjectures (see also Huang and Shi 2016:128) (but see Lin 2010:109; De Busser 2009:241).

(i) *Na=h<in>aungun-an saia takna mas isaicia tu cina, aupa mahansu dahis=a.*
 EPIS=<E.PST>scold-LF 3SG.NOM yesterday OBL 3SG.POSS LNK mother because AF.stink face=DIST.NOM
 ‘He might have been scolded by his mother because he looks upset.’

¹⁶ Example (10) falsifies Huang and Shi’s (2016:125) claim that the combination of *-in-* and *Ca*-reduplication cannot be interpreted as progressive. We leave the difference between progressive readings with *Ca*-reduplication and those without for another occasion; this hinges on a detailed investigation of *Ca*-reduplication, which is beyond the scope of this paper.

- (9) Context: Describing my grandma's life before.
Saia masa makuang=ang lutbu hai, kaa ma<i>l<sa~>sabah.
 3SG.NOM when.PST AF.bad=still body TOP just <E.PST><IPFV~>AF.lie.down
 'When she was still ill, she often just lay (on something).'
- (10) Context: Describing what I was doing yesterday.
Ma-<i>da~damu saikin haludun.
 AF-<E.PST>IPFV~catch 1SG.NOM cricket
 'I was catching crickets.'

These data would not be possible if *-in-* were analyzed as a perfective aspect or as encoding a perfective component.¹⁷

Another property which *-in-* shares with past tense rather than with perfective aspect is that when marking stative predicates, it induces an inference that the described state ceases to hold in the present.¹⁸ This is illustrated by (11).

- (11) *M<in>asmuh a saia habas.*
 <E.PST>AF.fat NOM 3SG.NOM before
 '(S)he was fat before (and is not fat now).'
- (Huang & Shi 2016:120)

This property is similarly found with the past tense in English (e.g., Musan 1997; Altshuler and Schwarzschild 2013) and in other languages (e.g., Thomas 2014; Bochnak 2016; Cable 2017). By contrast, perfective statives are not typically interpreted in the past; instead, they often induce coerced readings with states, e.g., inchoative readings, at the present time (Bybee et al. 1994; Tonhauser 2006). If *-in-* were a perfective marker, stative predicates marked by *-in-* would be either impossible or result in a present inchoative reading.

Overall, the properties discussed above are all expected if *-in-* is analyzed as a past tense: Firstly, as a past tense, *-in-* exhibits a temporal restriction to the past. Secondly, *-in-* can co-occur with *Ca*-reduplication to yield past habitual or progressive readings. Lastly, stative predicates marked by *-in-* are interpreted in the past and share the cessation effect with past tenses in other languages.

2.1.2 Not an experiential (perfect) aspect

The infix *-in-* has a dominant experiential reading, as exemplified in (12), and for this reason it has been considered to be an experiential (perfect) aspect (e.g., Lin 1997, Huang and Shi 2016).

- (12) *M<in>uhalhal saikin sia lukis.*
 <E.PST>AF.fall 1SG.NOM LOC tree
 'I have once fallen from a tree.' (Original translation in Mandarin, Huang and Shi 2016:57)

In this section, we first show that an analysis that equates *-in-* with the English perfect aspect will not capture the fact that *-in-* does not have any other uses of the perfect. Furthermore, *-in-* does not always give rise to an experiential reading, which calls into question the analysis of *-in-* as an aspect that exclusively marks experiential readings.¹⁹

¹⁷ Another type of evidence would be like the Takivatan Bunun example in (3) above, where sentences with *-in-* can express an ongoing reading typical of imperfective/progressive aspect. Data in Isbukun Bunun requires further work.

¹⁸ The cessation effect is described as a "past/present contrast" in De Busser (2009), according to which, sentences with *-in-* "express the idea that some past event is meaningfully different from the present situation" (p.235).

¹⁹ The infix *-in-* is sometimes described as an "experiential marker", and a reviewer asks why we only examine a perfect analysis. However, the term "experiential marker" is usually given without an explanation or analysis, and it is not our purpose to speculate what analysis it refers to. What we argue here is that the experiential reading of *-in-* is only one of its many readings, all of which can be unified by existential quantification.

2.1.2.1 Nothing resembles the English perfect except for experiential readings

The infix *-in-* shares nothing in common with the English present perfect aspect except for an experiential reading. Table 1 lists eight properties of the English present perfect, each of which is to be examined against the Bunun *-in-*.

Table 1: *Bunun -in- vs. English perfect*

Properties	<i>-in-</i>	<i>have + p.p.</i>
Experiential perfect	y	y
Adverbial restrictions	n	y
Current relevance	n	y
Lifetime effects	n	y
Recent past/hot news	n	y
Result state	n	y
Universal perfect	n	y
Anteriority (ET < RT)	n	y

A brief note about this comparison is in order. We do not presuppose that the English present perfect is prototypical or standard; rather, the well-studied properties of the English perfect serve to discover the behaviors of the Bunun *-in-*. A similar method has been applied to many other languages (e.g., Mathewson et al. 2015; Bowler and Ozkan 2017; Chen 2017; Bertrand et al. 2017; a.o.), the result of which does not lead to an English-type perfect but reveals interesting cross-linguistic variation.

First, the experiential perfect reading of the English present perfect is similarly attested with the Bunun *-in-* but this is the only similarity between the two markers; they share none of the remaining properties in Table 1. In addition to (12) above, (13) is another example that illustrates the experiential reading.²⁰ It is taken from our storyboard, where both Miss Savi's question and Biung's reply concern an event that happens at some point in one's life.

- (13) a. Miss Savi: *Sima kamu sai-sian ludun mu-da~daan?*
 Who 2PL.NOM <E.PST>go-DEM mountain AF.move-IPFV~road
 'Who has climbed (lit. gone and walked on) a mountain?'
 b. Biung: *Zaku! Zaku! Haiap saikin. Sai-sian saikin ludun.*
 1SG.NEUT 1SG.NEUT AF.know 1SG.NOM go<E.PST>-DEM 1SG.NOM mountain
 'Me! Me! I know. I have climbed (lit. gone to) a mountain.'

In English, the present perfect cannot co-occur with adverbs that express a definite past time, as in (14)a, and this contrasts with the past perfect or a tenseless perfect in (14)b-c. However, in Bunun, the marker *-in-* is compatible with different types of past-time adverbial, for example, *takna* 'yesterday' in (15), *tangusan tu buan* 'last month' in (16), *sangan* 'a while ago' in (2) and (6) above, and *habas* 'in the past' in (2) above.²¹

- (14) a. **Chris has left York yesterday.* (Klein 1992:525)
 b. *Uli had left on Tuesday.* (Katz 2003:147)
 c. *Peter believes Steven to have gone to Boston last summer.* (Katz 2003:147)

²⁰ The motion verb *sai-sian* is a suppletive form of *ku-sian* 'go-DEM' marked with *-in-*.

²¹ This adverbial restriction is absent with perfects in many other languages, even those closely related to English (Giorgi and Pianesi 1997). While we cannot conclude from this diagnostic, the full comparison does not point to a perfect analysis.

- (15) M<*in*>uhalhal saikin takna sia lukis.
 <E.PST>AF.fall 1SG.NOM yesterday LOC tree
 ‘I fell from a tree yesterday.’
- (16) A<*i*>taz-an saia tangusan tu buan mas maluspingaz.
 <E.PST>die-LF 3SG.NOM last month LNK month OBL wife
 ‘His wife died (on him) last month.’ (Original translation in Mandarin, Jeng and Ispalidav 2016)

Events expressed by the English present perfect are known to bear certain relevance to the current context. This can be illustrated by one of Portner’s (2003) examples: the second perfect sentence in (17) is odd in the context where the illness of Mary has no significant result, but is acceptable when some relevance is plausible in the context (i.e., Mary’s need to see a doctor).

- (17) *Mary has lived in London for five years. She has become ill.*
 × Context A: Mary moved to London five years ago, and hasn’t left. During this time, she became ill only once, three years ago.
 √ Context B: Londoners who have developed illnesses during the last five years are advised to go see their doctors, as their illnesses are likely due to some dangerous pollutants which were inadvertently released into the air.
 (Portner 2003:463)

Current relevance is, however, not a component of the Bunun *-in-*. Example (18) shows that a sentence marked with *-in-* is not a felicitous response to a question regarding someone’s current state of recollection; this contrasts minimally with a felicitous sentence marked by the enclitic =*in* (to be discussed in Section 3). In other words, the infix *-in-* does not bear current relevance.

- (18) Context: Do you remember that we studied Bunun together?
 a. # *Wa, s<in>ipungul saikin.*
 INTJ <E.PST>AF.forget 1SG.NOM
 Intended for ‘I’ve forgotten.’
 b. *Wa, sipungul=in saikin.*
 INTJ AF.forget=COS 1SG.NOM
 ‘I’ve forgotten.’

Another pragmatic effect that the English present perfect incurs is lifetime effects. Lifetime effects describe that the grammatical subject of a present perfect sentence must be alive at the utterance time for the present perfect sentence to be felicitous (see related properties such as repeatability or future possibility, whereby recurrence of the event in question need to be possible at the utterance time; e.g., McCawley 1971; Inoue 1979; Katz 2003; Portner 2003). An example is given in (19).

- (19) # *My late grandma has given birth to three children.*

However, (20) clearly illustrates that no such pragmatic effect is observed with the Bunun *-in-*.

- (20) Context: Talking about our late grandma.
Ta<in>us-’uvaaz inaak nas-cinahudas tu ta~tau mas ’uvaaz.
 AF.bear<E.PST>-child 1SG.POSS late-grandmother PRT HUM~three OBL child
 ‘My late grandma gave birth to three children.’

The English present perfect is also known to be associated with a recent past reading, but the Bunun *-in-* does not allow it. For instance, as shown by the contrast in (21), the discovery of the recent death of a pet cannot be expressed by the verb of dying *mataz* infixed by *-in-*; rather this is rendered by the same verb encliticized by =*in*.

- (21) Context: A kid interrupts: “Miss Savi, our pet rat has just died!” (Elicited based on ‘Miss Smith’s Bad Day’)
- a. # *Imita s-<in>aipuk tu aluaz=a m<in>ataz.*
 1INCL.POSS RF-<E.PST>raise LNK rat=DIST.NOM <E.PST>AF.die
 Intended for ‘The rat we keep has died.’
 Consultant’s comment: “It’s not possible that it revives. People die once, except for Jesus.”
- b. *Imita s<in>aipuk tu aluaz=a mataz=in.*
 1INCL.POSS RF<E.PST>-raise LNK rat=DIST.NOM AF.die=COS
 ‘The rat we keep has died.’

When marked by the present perfect, telic predicates allow for a result state reading, as exemplified in (22) (with the inferred result state in brackets). By contrast, the Bunun *-in-* is not felicitous for a result state reading; this is exemplified in (23), where the intended result state of the speaker’s wallet being at home is only expressible by *=in*.

- (22) a. *I have opened the door.* [The door is open.]
 b. *I have arrived in Paris.* [I am in Paris.]

- (23) Context: On your way to a store, you realized that you didn’t bring your wallet.
- a. # *Ma-<i>kaunga saikin madas inaak tu patsuian.*
 AF-<E.PST>leave.behind 1SG.NOM AF.carry 1SG.POSS LNK wallet
 Intended for ‘I’ve left my wallet at home.’
 Consultant’s comment: “You are talking about your experience: for example, there was a time you left your wallet at home after you left the house”.
- b. *Kaunga-an=in=ku inaak patsuian sia lumah.*
 leave.behind-LF=COS=1SG.OBL 1SG.POSS wallet LOC house
 ‘I’ve left my wallet at home.’

Universal perfect readings obtain in situations where an event has been going on since a past time and persists up to the utterance time. In English, universal perfect readings are only possible with stative predicates or predicates marked with the progressive, as illustrated by (24).

- (24) a. *Mary has been angry since yesterday.*
 b. *John has been watching TV since 6 o’clock this morning.*

In Bunun, however, the infix *-in-* does not allow these readings, with or without *Ca*-reduplication, as shown in (25)a-b; rather, the intended universal perfect reading uses *Ca*-reduplication without *-in-*.

- (25) Context: Another kid complains, “Miss Savi, he has been pulling my hair!” (Elicited based on ‘Miss Smith’s Bad Day’)
- a. # *Maisi-kitngaab hai, ma-<i>damu inaak tu hulbu.*
 AF.be.from-begin TOP, AF-<E.PST>pull 1SG.POSS LNK hair
 ‘Since the beginning of class, he has been pulling my hair.’
- b. # *Maisi-kitngaab hai, ma-<i>da~damu inaak tu hulbu.*
 AF.be.from-begin TOP, AF-<E.PST>IPFV~pull 1SG.POSS LNK hair
 ‘Since the beginning of class, he has been pulling my hair.’

- c. *Maisi-kitngaab hai, ma-da~damu inaak tu hulbu.*
 AF.be.from-begin TOP, AF-IPFV~pull 1SG.POSS LNK hair
 ‘Since the beginning of class, he has been pulling my hair.’

Lastly, the fact that the infix *-in-* does not allow free reference times not only suggests that it is unlike an aspect (see also Section 2.1.1) but also that it is interpreted as relating reference time to utterance time. We expect that *-in-* does not behave as a past perfect in expressing an event anterior to a past reference time. This is borne out: the response to the question in (26) is intended to convey that the light-switching event occurs earlier than the time when the speaker reached home; in this case, *=in* rather than *-in-* is the correct rendition.

- (26) Q: *Masa ku-lumah kasu hai, maza sadu-an=su?*
 when.PST go-house 2SG.NOM TOP what see-LF=2SG.OBL
 ‘When you reached home, what did you see?’

A1: # *Ma<i>l<si~>Singhal a dingki.*
 <E.PST><IPFV~>AF.be.luminous NOM light
 Intended for ‘The light had been switched on.’

A2: *Mal<si~>singhal=in a dingki.*
 <IPFV~>AF.be.luminous=COS NOM light
 ‘The light had been switched on.’

2.1.2.2 Experiential readings are existential

A remaining possibility is that *-in-* is a perfect aspect used exclusively for experiential readings. However, *-in-* in (7), (9)-(10), and (15)-(16) above does not have an experiential reading but a past tense reading instead. Specifically, experiential readings do not arise with a past-time adverb or in a past context. We argue that the reading of *-in-* is only existential; further evidence for the existential quantification of *-in-* is given in Section 2.3.

2.2 Interim summary

We have shown that the infix *-in-* exhibits properties that do not support a perfective analysis; especially, *-in-* co-occurs with *Ca*-reduplication (which only produces imperfective-like readings), yielding a past progressive or habitual reading. Also, the use of *-in-* is restricted to the past, and with stative predicates it gives a cessation inference. The simple past readings and cessation effects are unexpected for a pure perfective aspect but follow naturally from a past tense analysis. A rejection for *-in-* being a past tense marker is that *-in-* has salient experiential readings as found with the English perfect. However, a thorough examination of possible perfect properties shows that the infix *-in-* has nothing else in common with the English present perfect, and importantly, the experiential readings do not necessarily arise.

2.3 Evidence that *-in-* is an existential past tense

In this section, we aim to unify the experiential and simple past readings of the infix *-in-*. We argue that it is a past tense marker that encodes existential quantification over past times, following recent proposals in Chen et al. (2017) for Javanese and Atayal (see also Sharvit 2014; Thomas 2014; Mucha 2017). We offer two pieces of evidence. For one thing, *-in-* is infelicitous in deictic and anaphoric contexts, and for the other it shows scopal interactions with negation. These two properties are unexpected for a pronominal tense but fully compatible with an existential quantifier analysis; they, together with the experiential reading, strongly support that the infix *-in-* is an existential past tense marker.

2.3.1 Existential past vs. pronominal past

The existential past and pronominal past analysis are two competing approaches to the semantics of tense, mostly based on English data. An existential past tense is an operator encoding an existential quantifier over past times, often attributed to Prior (1967) (see Ogihara 1996; Kusumoto 2005; von Stechow 2009; a.o.). A

pronominal past tense is paralleled to a pronoun, which refers to a contextually salient past time (i.e., deictic uses) or a past time that has been established in the context or a narrative (i.e., anaphoric uses) (Partee 1973, 1984; Heim 1994; von Stechow 1995; Kratzer 1998; a.o.). While it has been debated whether the English past tense is existential or pronominal, past tenses in some languages have been argued to be unambiguously existential; for example, in Japanese (Sharvit 2014), Medumba (Bantu; Mucha 2017), Mbyá (Guaraní; Thomas 2014), Javanese and Atayal (Austronesian; Chen et al. 2017). We argue that the Bunun *-in-* closely resembles its cognate *-in-* in Atayal in exhibiting properties that are only explainable under an existential analysis.

2.3.2 Infelicity of *-in-* in deictic and anaphoric contexts

Unlike a pronominal past tense, an existential past tense is infelicitous in deictic or anaphoric contexts. The Bunun *-in-* behaves as predicted by an existential past. This is illustrated by (27), where the infix *-in-* is banned in reference to a salient contextual past time, namely the time before the speaker left the house.

- (27) Context: Driving on the highway after leaving the house, you realize (adapted from Partee 1973):
- a. I didn't turn off the stove! (Partee 1973:602)
- b. *Aa! Nii tu {#s<in>ukud-an / sukud-an}=ku gasu.*
 INTJ NEG LNK <E.PST>turn.off-LF / turn.off-LF=1SG.OBL gas
 'Oh! I didn't turn off the gas.'

Likewise, the Bunun *-in-* does not move the reference time forward in narratives; this is illustrated by (28), where a sequence of the watering event following the weeding event must be expressed by an unmarked verb. Using the same verb marked by *-in-* instead is infelicitous in this context and yields a back-shifting reading (i.e., the watering event occurs before the weeding event).²² Note that in contrast to the Bunun *-in-*, the English past tense is felicitously used in both deictic and anaphoric contexts.

- (28) Context: Describe what you saw Abus do this morning.
- a. #*Malabut saia ismuut at ma<i>suul saia hana.*
 AF.remove 3SG.NOM grass CONJ <E.PST>AF.water 3SG.NOM flower
 Intended for 'She weeded, and watered flowers.'
 (OK: 'Having watered flowers, she weeded.')
- b. *Malabut saia ismuut at masuul saia hana.*
 AF.remove 3SG.NOM grass CONJ AF.water 3SG.NOM flower
 'She weeded, and watered flowers.'

2.3.3 Interpretation of *-in-* under negation

Due to existential quantification, an existential past tense is expected to exhibit scopal interactions with operators like negation, whereas a pronominal past would not be able to do so. It turns out that the infix *-in-* shows scopal properties. Scoping *-in-* under negation yields a negative experiential reading (i.e. narrow-scope existential). For example, the negation *nii* preceding *-in-* in (29) gives rise to non-existence of the event in question ('never');²³ a pronominal past tense would not yield such a reading (but one such that 'I didn't have breakfast at a contextually salient time'). It is unclear to us at this stage whether *-in-* can scope over the negation *nii* to yield an inverse scope reading.

²² Example (28) clearly shows that at least in narrative contexts, an *-in-* sentence does not freely alternate with a bare sentence. This thus falsifies Jeng's (1999:462) claim that *-in-* sentences form a free variant with bare sentences.

²³ A verbal predicate is negated by either the negator *nii* alone (as in (30) and (31)) or the negator plus the linker *tu* (as in (29)). The two patterns are conditioned by whether the negator is adjacent to the verb without intervening constituents like pronominal clitics or free forms (Huang and Shi 2016:159; Li 2018:471) and is irrelevant to the availability of the 'never' reading.

- (29) Context: Describing your life experience.
Nii tu m<in>aun mas pinit'um'um.
 NEG LNK <E.PST>AF.eat OBL breakfast
 'I have never had breakfast.'

Notice that the co-occurrence of *-in-* and negation is not restricted to negative experiential readings. The temporal domain of existential quantification that *-in-* encodes does not have to encompass one's entire lifetime: it can be restricted to a specific time span, as indicated by a temporal adverbial in (30) or contextually implied in the question and answer of (31). Both examples show the past time that *-in-* quantifies over is domain-restricted.

- (30) Context: He is very sleepy now because...
Nii sanglabian ma<i>sabah.
 NEG last.night <E.PST>AF.sleep
 'He didn't sleep last night.'

- (31) Context: Your friend is looking for his wallet.
 Q: *Adu s<in>adu kasu inaak tu patsuian?*
 Q <E.PST>AF.see 2SG.NOM 1SG.POSS LNK wallet
 'Did you see my wallet?'
 A: *Nii saikin s<in>adu isuu tu patsuian.*
 NEG 1SG.NOM <E.PST>AF.see 2SG.POSS LNK wallet
 'I didn't see your wallet.'

2.4 Analysis of *-in-*

We assign a domain-restricted quantificational semantics to *-in-*, following the precedents (Ogihara 1996; von Stechow 2009; Mucha 2017; Chen et al. 2017; a.o.). Essentially, *-in-* as a tense first adjoins to a domain restriction variable *C*, the result of which denotes a function that takes a predicate of times *P* and an evaluation time *t*, and asserts that a time *t'* precedes *t*, at which *P* holds. The *t* argument will be saturated by the utterance time, *t_c*.

- (32) $\llbracket -in- \rrbracket^{g.c} = \lambda C_{\langle i,t \rangle}. \lambda P_{\langle i,t \rangle}. \lambda t. \exists t' [t' < t_c \ \& \ C(t') \ \& \ P(t')]$ (modified from von Stechow 2009:150)

The domain restriction variable ensures that the past times quantified over by *-in-* are restricted to a salient contextual time. This captures apparently varied readings of *-in-*: when there is an (implicitly or explicitly) established past reference time, *-in-* quantifies over the past time, and gives a past-tense reading; in the absence of a salient past reference time, the domain of the existential quantifier is naturally the span of one's life, hence an experiential (perfect) reading.

What should be emphasized is that while the domain restriction of *-in-* resembles a pronoun referring to the reference time, *-in-* still encodes a quantifier, and as such it is not equivalent to a temporal anaphor. The function of *-in-* is not to directly pick up that interval but to quantify over a(n) (referred) interval; the difference is much like the one between a definite NP or pronoun and an indefinite member of a definite set in the nominal domain. This explains the unacceptability of *-in-* in the Partee's stove context (see (27) above): although the context does provide a salient interval for the domain variable of *-in-*, what it calls for is a definite past tense rather than an indefinite one. By contrast, *-in-* is felicitous in the question of (31), which is similarly uttered with a contextually established salient time (i.e., a while before your friend's search), because it concerns about the existence of the seeing event within that time.

Our analysis also reveals that *-in-* differs from morphologically tenseless sentences that are interpreted in the past (e.g., (28b) above) (cf. fn. 22). In other words, *-in-* is not a past tense optionally used to restrict the temporal interpretation of morphologically tenseless sentences, unlike what is claimed for in other languages (e.g., Bochnak 2016). Looking into the semantics of past tense markers hence provides an alternative to the seeming optionality in the overall tense system in Bunun. For future research, it is worth exploring tense of

morphologically tenseless sentences and how it differs from *-in-* in other contexts, especially in complement clauses.

3 The semantics of *=in*

This section turns to the enclitic *=in*. Departing from most of the previous literature, we argue that *=in* is not an aspectual marker but a discourse marker that induces a certain change of state. While the change of state of *=in* does not go unnoticed (e.g., Huang 1997:383; Su 2008:23; Chen 2009:20; Huang and Shi 2016:117), we show that it is pragmatically conditioned; for this reason, we argue that any aspectual analysis of *=in* is inadequate.

3.1 Evidence that *=in* is not a perfect aspect

As reviewed in Section 1.2, the enclitic *=in* has been treated as a perfect aspect based on either a universal perfect or anteriority reading. However, these claims are mostly based on data without any contexts. Sections 3.2 and 3.3 will show that *=in* always gives rise to a change of state, at a propositional or discourse level, and as a result, universal perfect readings (which involve a homogeneous property rather than a change of state) are only attested when the change of state is interpreted at a discourse level. In this subsection, we focus on evidence against an anteriority-based perfect analysis of *=in* as in Jeng (1999).

Sentences with *=in* have been argued to express perfect meanings based on out-of-the-blue contexts, where the reference time is the utterance time. Our examination of cases where *=in* occurs in a past or future reference time shows that the anteriority reading does not necessarily hold. With a past reference time introduced by a *masa*-clause, the matrix going event may precede or occur at same time with (but not follow) the reference time, as in (33). With a future reference time introduced by a *mais*-clause and marked by *na=* in the matrix clause, the marker *=in* commonly receives an imminent future reading, as in (34) (see also Huang 1997:383; Jeng 1999:476).

- (33) *Masa tauna-lumah saikin hai, mu-daan=in saia.*
 When.PST AF.reach-house 1SG.NOM TOP AF.go-road=COS 3SG.NOM
 ‘When I reached home, (s)he was leaving.’ / ‘When I reached home, (s)he had left.’
- (34) *Mais tauna-lumah saikin hai, na=mu-daan=in saia.*
 when.NPST AF.reach-house 1SG.NOM TOP FUT=AF.go-road=COS 3SG.NOM
 ‘When I reach home, (s)he will be leaving.’ / ≠ ‘When I reach home, (s)he will have left.’

The progressive reading in (33) and the imminent future reading in (34) clearly deviate a perfect aspect, which would give a past perfect reading with a past reference time or a future perfect reading with a future reference time. It is noteworthy that the imminent future reading is similarly attested with other types of predicate marked with *=in*, for example, an activity predicate in (35):

- (35) Context: You come to your friend’s home when she’s busy. She says, “Please have a seat and wait...”
Na=ma-pa-tal’isuh=in saikin Aping=cia.
 FUT=AF-CAUS-shower=COS SG.NOM Aping=DIST.OBL
 ‘I am about to give Aping a bath.’ / ≠ ‘I will have {started/been in the process of} giving Aping a bath.’

3.2 Evidence that *=in* is not a perfective aspect

It has been debated whether *=in* yields a completive or continuous reading (Zeitoun et al. 1996; Jeng 1999; De Busser 2009), and the completive reading has led to a perfective analysis (De Busser 2009). However, Huang (1997) and Huang and Shi (2016) correctly point out that in Isbukun, the reading of *=in* (in out-of-the-blue context) varies with the type of predicate: completion readings with achievements, inceptive readings with activities, and inchoative readings with statives; some of their examples (translated from Mandarin) are given here.

- (36) *Mataz=in a k<in>alat mas Subali=cia a 'asu=a.* [Achievement]
 AF.die=COS NOM <E.PST>AF.bite OBL Subali=DIST.OBL NOM dog=DIST.NOM
 ‘That dog that bit Subali died.’ (Huang and Shi 2016:223)
- (37) *Tangis=in a 'isaicia a 'uvaaz.* [Activity]
 AF.cry=COS NOM 3SG.POSS LNK child
 ‘His child cried (and is still crying).’ (Huang and Shi 2016:118)
- (38) *Ma-diav=in a bunbun=a.* [State]
 AF-yellow=COS NOM banana=DIST.NOM
 ‘Those bananas became yellow.’ (Huang and Shi 2016:118)

It should be noted that statives marked with *=in* are only interpreted as inchoative; for instance, placing (39) in a context that targets a homogeneous state is rejected:

- (39) Context: You are teaching kids the color. You say, “Look. Those bananas are yellow.”
 #*Ma-diav=in a bunbun=a.* [State]
 AF-yellow=COS NOM banana=DIST.NOM
 Intended for ‘Those bananas are yellow.’

To complete the picture, we include accomplishment predicates, which are not covered in the literature. Much like activities, accomplishments marked with *=in* have inceptive readings; (40) shows that it is felicitous to continue the *=in* sentence with the statement that the accomplishment event has not culminated.

- (40) *Ka-lumah=in saikin tu dusa, ka-nii=ang ka-nahtung-an.*
 AF.build-house=COS 1SG.NOM PRT two build-NEG=still build-finish-LF
 ‘I built two houses, but I haven’t finished (them) yet.’

It is clear from these above readings that *=in* does not always induce a completive reading with telic events (i.e., accomplishments and achievements) as a perfective aspect analysis would predict; notice that we adopt a notion of completion which refers to the final points/culmination of telic events (cf. Smith 1997). Instead, the resulting reading varies depending on the durativity of events: completion for achievements and non-completion/continuation for activities and accomplishments.²⁴ Importantly, what is shared by all the readings is an initial change of state. The change-of-state semantics must be lexicalized in the semantics of *=in*. Recall that a homogeneous stative reading with *=in* is impossible (see (39) above); likewise, a universal perfect reading, in which an event begins in the past and continues up to the utterance time, cannot be expressed with *=in*, as in (41) and (42).

- (41) Context: He used to be fat, and he is still fat now.
Maisi-kauma'ikit saia masmuh(=in).*
 AF.be.from-little 3SG.NOM AF.fat=COS
 ‘He has been fat since he was young.’
- (42) Context: Another kid complains, “Miss Savi, he has been pulling my hair!” (Elicited based on ‘Miss Smith’s Bad Day’)
*Maisi-kitngaab hai, {ma-da~damu / *ma-da~damu=in} inaak tu hulbu.*
 AF.be.from-begin TOP, AF-IPFV~pull / AF-IPFV~pull=COS 1SG.POSS LNK hair
 ‘Since the beginning of class, he has been pulling my hair.’

²⁴ While the fact that accomplishment predicates marked with *=in* are not culminated may be paralleled with non-culminating perfectives in other languages (see e.g., Singh 1998; Koenig and Muansuwan 2000; Soh and Kuo 2005; Bar-el 2005; Koenig and Chief 2008; a.o.), a change-of-state proposal better captures all the readings of *=in*.

In the next subsection, we present a failed attempt at analyzing *=in* as change-of-state/inchoative aspect; we discuss the reason why such an aspectual analysis is unattainable.

3.3 Evidence that *=in* is not an inchoative aspect

A remaining possible analysis of Bunun *=in* is that it is an aspect marking inchoativity/inception. Such an analysis has been proposed for the Samoan *'uo* (Hohaus 2016).²⁵ According to Hohaus (2016:101), *'ua* is used with stative predicates to convey that “a change of state has taken place and that the respective state did not hold before the evaluation time”. As a result, it cannot co-occur with an individual-level state, as in (43), and is unacceptable in contexts where the described event has begun before the evaluation time, as in (44).

(43) Context: Providing a character description of your friend John:

'O Ioane 'ua sau mai Egelagi.
 FOC John INCH come from England
 Intended for ‘John, he is from England.’ (Hohaus 2016:101)

(44) Context: Your grandmother broke her arm three weeks ago and has been in a lot of pain ever since. Today, her doctor called her to ask: “How are you feeling today?” She replied:

'Ua tīgā lo'u lima.
 INCH painful my arm
 ‘My arm is (now) painful.’ (Hohaus 2016:102)

Hohaus argues that *'ua* requires the evaluation time (similar to the reference time, whose value is given by tense) be the initial sub-interval of the running time of the eventuality. In other words, *'ua* specifies that an initial sub-interval of the event coincides with the reference time. In what follows, we discuss advantages and disadvantages of applying this analysis to *=in* and eventually conclude that it is undesirable.

Firstly, the Bunun *=in* exhibits the initiality requirement observed for the Samoan *'uo*. In cases where the reference time refers to the utterance time, *=in* requires that the beginning runtime of the event be very adjacent to the utterance time. This is evidenced by its incompatibility with past-time adverbials: as shown in (45), while *=in* is compatible with *laupakadau* ‘now’, it cannot co-occur with *laupang* ‘just, very recently’ or any past-time adverbs in out-of-the-blue contexts.²⁶

- (45) a. *Masabah=in saia laupakadau.*
 AF.sleep=COS 3SG.NOM now
 ‘(S)he is falling asleep now.’
- b. * *Laupang saia masabah=in.*²⁷
 just 3SG.NOM AF.sleep=COS
 Intended for ‘(S)he has just fallen asleep.’
- c. * *Masabah=in saia {takna / sangan}.*
 AF.sleep=COS 3SG.NOM yesterday / a.while.ago
 Intended for ‘(S)he {slept/was sleeping} {yesterday/just now}.’

An inchoative aspect proposal could explain why the reading of *=in* varies with a different reference time (Section 3.1). When the reference time denotes an instantaneous time interval—for example the utterance time or a punctual reference time—an initial sub-interval of an event, despite spanning a short time, inevitably

²⁵ It is also comparable to the Niuean *kua* (Matthewson et al. 2015) without utilizing perfect semantics.

²⁶ Jeng (1999:477) notes that “the Bunun perfect can co-occur with the present, past, and future tenses”; however, all his examples where *=in* and past-time adverbs co-occur also involve the use of *-in-*. As we show in (45)b-c, *=in* alone is not compatible with past-time adverbs.

²⁷ Unlike other temporal expressions, *laupang* behaves more like a verb than an adverbial because it can host nominative person clitics (Li 2018:225) or immediately precede nominative NPs.

includes the reference time, hence an anterior reading. That is, an anterior reading parallel to a past tense or a past perfect is simply a pragmatic effect of matching the beginning of an event and the utterance time. With the adjacency requirement, we also expect a simultaneous/on-going reading. Similarly, when the reference time is in the future, the described event must begin at the future time, hence an imminent future reading. Moreover, the aspectual analysis also captures the different interpretive effects varying with the durativity of events (Section 3.2). Since *=in* only concerns the initial status of events, process events (activities and accomplishments) naturally continue at the reference time whereas achievements are themselves instantaneous so that the entire event must be no later than the instantaneous reference time, thus yielding a completion reading (i.e., they begin and complete at the same time at the reference time).

However, the inchoative aspect analysis does not correctly account for the following fact: *=in* can induce a separate non-inchoative reading given an appropriate context. Recall that, as shown in (41)-(42) above, the inchoative reading of *=in* is incompatible with a time interval stretched from the past up to the utterance time. However, the sentence with *=in* in (46), which forms a near-minimal pair with (41), has an unambiguous universal perfect reading. What it differs from (41) is that *=in* in (46) indicates that the proposition—a third person referred to has been fat—is counter to the interlocutors’ expectation, specifically that of the addressee/listener.

- (46) Context: You doubt he was not fat when he was little, but I think:
Maisi-kauma'ikit saia hai, nau tu masmuh=in.
 AF.be.from-little 3SG.NOM TOP should LNK AF.fat=COS
 ‘Since he was little, he has been already fat for sure.’

The fact that the “change-of-state” and the “contrary-to-expectation” interpretations are expressed by the same form is reminiscent of the Mandarin sentence-final particle *le*, which has been analyzed as a marker that induces a change within or across propositions assumed by interlocutors (Soh 2009). The similarity suggests that *=in* is more of a discourse-level change-of-state marker, which explains why it does not consistently contribute an inchoative reading as an aspectual marker would do. Future investigations will be benefited from comparing *=in* and “change”-inducing elements cross-linguistically, such as English *already* (Löbner 1989; Mittwoch 1993; Vander Klok and Matthewson 2015; a.o.) and so-called iamitive markers in many Southeast Asian languages (Olsson 2013; Dahl and Wälchli 2016), and from situating *=in* in the studies of Common Ground (Stalnaker 1999, 2002).

Building the precise semantics of *=in* will also require a clear understanding of how *=in* is used in combination with other aspectual/temporal markers, including the existential past tense *-in-*, and of whether a contrary-to-expectation reading is equally available in the combinations. We leave a formal analysis of *=in* and establishing the overall architecture of tense and aspect in Bunun for another occasion.

4 Concluding remarks

In this last section, we summarize our main findings and discuss theoretical and typological implications of our proposal for studying similar phenomena in other languages, especially other Formosan languages.

4.1 Summary of the findings

By presenting new data, we have provided an alternative account for the semantics of *-in-* and *=in* in Bunun. We argue that the two markers differ in how they express anteriority. The infix *-in-* is a past tense, and lexically denotes existence of events in the past. The domain-restricted existential quantification of *-in-* explains why its reading is sometimes comparable to an experiential-perfect reading and sometimes a past-tense reading. By contrast, the enclitic *=in* induces a change of state, either at the level of propositional meaning or discourse. At the propositional level, the anteriority effect of *=in* arises possibly due to coincidence of the inception of events and the reference time. We also suggest the direction of future work on the non-inchoative reading of *=in*. The consequence of our findings for the two homophonous markers refutes the claim that Bunun has both perfect and perfective category (pace Zeitoun et al. 1996).

4.2 Theoretical and typological implications

The proposed semantics for the two anteriority morphemes in Bunun contributes to the theory of temporal semantics and the idea of decomposing temporal categories. The infix *-in-* supports the existence of existential past tense (Sharvit 2014; Thomas 2014; Mucha 2017; Chen et al. 2017) and clearly shows that the semantics of tense can be empirically distinguished but not merely reflects notational variants. Even within languages that are argued to have existential past tenses, the existential past tenses may not behave exactly the same; for example, the Bunun *=in* differs from the existential past markers in Medumba, whose quantificational domain is lexically restricted (Mucha 2017). The enclitic *=in* shows not only that properties partly similar to perfective or perfect can be unified by change of state but also that the change of state need not be encoded in an aspect.

Typologically, our finding suggests the need for a re-assessment of temporal/aspectual markers that bear similarities to these two markers in other Austronesian languages, especially other Formosan languages. First, our analysis of the Bunun infix *-in-* has implications for widespread reflexes of PAN **-in-* in Western Austronesian. These reflexes are generally described as marking “past tense or completive aspect” (Blust 1998:347) or “perfective aspect” (Blust 2013:385). However, a perfective analysis for *-in-*, at least in Bunun (this work) and Atayal (Chen et al. 2017), is unattainable. Consequently, it is questionable whether a perfective analysis equally applies to other reflexes.

Second, a perfect or perfective analysis for *=in* in Bunun has difficulty in unifying all of its possible readings. Our proposal that *=in* is a dedicated change-of-state marker could be possibly extended to similar markers in other Formosan languages, many of which have also been described as perfective markers. Among Formosan languages, change of state is expressed either by sentence-final particles, as in Atayal (Rau 1992:158), Seediq (Sung 2016:89), and Saisiyat (Huang 2003:98) or by head-adjacent clitics, as in Bunun, and all the other Formosan languages, including Amis (Wu 2006:123), Kavalan (Hsieh 2016:79), Thao (Wang 2004:216), Puyuma (Teng 2008:32), Paiwan (Li 2010:37), Rukai (Chen 2008:179), and Tsou (Pan 2007:42). Given the fact that they are similarly reported to describe the beginning of an eventuality, it is expected that they share more functional affinities with the Bunun *=in* than perfective/perfect aspect markers.²⁸

Our study also bears a methodological point. The semantics of *-in-* and *=in* is uncovered through examination against the properties of temporal categories. This shows that in order to approach semantic nuances of temporal/aspectual markers in languages, a targeted and hypothesis-driven study is desired.

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²⁸ For instance, a change-of-state analysis may be applied to account for why Kavalan *=ti* incurs two different readings on the same motion verb: an anterior reading on the bare form, e.g. *maseq=ti* (AF.arrive=COS) ‘to have arrived’, but an inchoative reading on the future form, e.g. *qaseq=pa=ti* (arrive=FUT=COS) ‘be about to arrive’ (Hsieh 2016:80).

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