The temporal interpretation of clause chaining in Northern Paiute*

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Abstract

Northern Paiute uses clause chaining to express temporal relations between clauses conveyed by temporal subordinators, such as *after* and *while* in English. Rather than a subordination structure, however, I show that clause chaining in the language has an underlying coordination structure. I propose that the temporal relations between clauses in a chain arise, in part, from verbal morphology conveying relative tense. In Northern Paiute, these relative tenses can be bound in a coordination structure, just as in an embedded clause in other languages (Ogihara 1994, 1995, 1996, Abusch 1997). This semantics is enriched pragmatically, I argue, to produce a 'forward moving' temporal interpretation that is characteristic of narrative discourse (Kamp and Rohrer 1983, among others). This in-depth investigation of one language raises questions about the syntax and semantics of clause chaining in other languages.

Languages have a variety of grammatical resources for conveying information about time, including tense, temporal adverbials, and temporal adjunct clauses. Northern Paiute — a Uto-Aztecan language of the Numic branch spoken in the western United States — frequently uses a different device. In CLAUSE CHAINING, two or more clauses convey that some events take place, roughly

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speaking, at the same time or in a temporal sequence, depending on whether the suffix *-na* (1a) or the suffix *-si* (1b) is present.[1]

(1) a. Yaisi o=woetsimmi**-na**, yaisi o=ggwɨdzɨ**-na**,
PTC 3SG.ACC=watch**-SIM** PTC 3SG.ACC=stir**-SIM**
o=ddza-puni-hu-dzaga-ti.
3SG.ACC=IP.fingers-see-PFV-MOT-TI
'While you are watching it, while you are stirring it, you look at it every once and a while.' (dialogue, MS, BP09-1-t4, 7)

b. Yaisi mɨ=toogɨ=tɨwau nobiya-u**-si**, mɨ=toogɨ=tɨwau
PTC PL=dog=also pack-PFV**-SEQ** PL=dog=also
tsa-hibi-kɨ-u-ga**-si**, tammi mia-ga-kwɨ mii.
IP.fingers-drink-APPL-PFV-MOT**-SEQ** 1PL.INCL.NOM go-MOT-IRR QUOT
'So then, having packed up the dogs, and having made sure those dogs get a drink, so we'd take off.' (narrative, Nepa Kennedy, 'Root-Digging Time', Thornes, p.c.)

The clauses that contain one of these suffixes, which I will call MARKED CLAUSES, cannot stand on their own. In contrast, the final clause in each example above, which I will call the UNMARKED

[1]The data in this paper comes primarily from my own fieldwork on the variety of Northern Paiute spoken at Mono Lake in eastern California (Lee Vining, California) and immediately to the north in Bridgeport and Coleville, California and Sweetwater, Nevada. In addition to the Mono Lake dialect, there are several other closely related dialects spoken across, and immediately adjacent to, the Great Basin. These dialects are all mutually intelligible; the variation amongst them is primarily phonological and lexical (see Babel, Houser, and Toosarvandani 2012 and Babel, Garrett, Houser, and Toosarvandani 2013 for details). To a lesser extent, I have also drawn on data from the Burns, Oregon variety (Thornes 2003).

Northern Paiute is severely endangered. For all dialects, there are probably no more than 300 fluent speakers today (Golla 2011:174). For the Mono Lake dialect specifically, there are around five speakers, with varying levels of proficiency. The fieldwork data I present here comes entirely from the two oldest, most fluent speakers of the Mono Lake variety. At the time of writing, Edith McCann was 90 years old and Madeline Stevens was 93 years old. They learned Northern Paiute as their first language and were introduced to English when they started school. Both trace their ancestry to Bridgeport, though they also have family from Mono Lake (Lee Vining) and Sweetwater. There are only a few differences in their speech; these consist entirely of very small lexical differences that reflect minor historical variation amongst the communities in the Mono Lake dialect area (e.g. *tɨba'a* 'pinenut' in Lee Vining, but *tɨba* elsewhere).

Examples from other sources receive the usual parenthetical citation. Examples from my own fieldwork are annotated with relevant metadata: (i) how the data was collected: in a dialogue, through elicitation, in a narrative, or in a prompted narrative, (ii) the initials of the speaker who uttered the example or provided a judgement for the example (EM or MS), (iii) a number (starting with BP) identifying the source recording for the example, and (iii) the example's location in the source recording (either a line number in the corresponding transcription of the recording or a timestamp). The source recordings and transcriptions are not available to the public, at the request of the speakers, because they contain culturally sensitive and personal content.

I use the following abbreviations in this paper: ACC = accusative, APPL = applicative, DAT = dative, DEM = demonstrative, DIM = diminutive, DL = dual, DS = different subject, EMPH = emphatic particle, EXCL = exclusive, GEN = genitive, IMPF = imperfective, ERG = ergative, FOC = focus, INCEP = inceptive, INCL = inclusive, IND = indicative mood, INT = intensive, IP = instrumental prefix, IRR = irrealis, L = l-grade in Choctaw (Broadwell 1997:32), LOC = locatival postposition, MOD = modal particle, MOT = motion suffix, NEG = negation, NOM = nominative, NSP = nonspecific patient, PASS = passive, PFV = perfective, PL = plural, PRF = perfect, PROG = progressive, PRS = present tense, PST = past tense, PTC = discourse particle, Q = question particle, QUOT = quotative, REFL = possessive anaphor, SEQ = sequential suffix, SG = singular, SIM = simultaneous suffix, SS = same subject, STAT = stative, TI = 'general tense' (see Section 2), TOP = topic, TPAST = today's past tense in Amele (Roberts 1988:45).

CLAUSE, is inflected like an independent sentence.[2]

In many languages, these relations between clauses — temporal simultaneity and sequence — are conveyed by temporal subordinators, such as *while* and *after* in English. They create subordination structures that, at least on the surface, look strikingly similar to clause chaining in Northern Paiute.

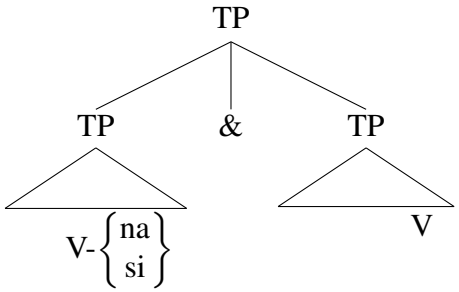
(2) a. **While** the senators were debating the motion, they drank tea.

b. **After** Ben won the race, he collapsed with exhaustion.

The temporal adjunct clauses either temporally include (2a) or precede (2b) the main clause. In addition, the main clause in each example can stand on its own as an independent sentence, while the clause introduced by the temporal subordinator can only be adjoined.

Despite this surface resemblance, there is a persistent intuition in the literature that the clauses in a chain stand in a looser relation to each another — "like beads on a string," in Foley's (2010:27) words — one that is more characteristic of coordination. Indeed, as I will show later in Section 1, clause chaining in Northern Paiute has a coordination structure, as in some other languages (see Roberts 1988 on Amele, Foley 2010 on various Papuan languages, and Nonato 2014 on Kisêdjê).

(3) *The syntax of clause chaining in Northern Paiute (preliminary version)*



If clause chaining in Northern Paiute has this coordination structure, how does it convey temporal relations between clauses, as temporal subordinators do?

I argue in Section 2 that the SIMULTANEOUS SUFFIX *-na* and the SEQUENTIAL SUFFIX *-si* realize the T(ense) head inside the marked clause. In terms of their semantics, I propose that they are dedicated markers of RELATIVE TENSE — specifically, what von Stechow (1995:372) calls a 'bound relative tense.' They can only relate the time at which the marked clause is interpreted to a time whose value is provided by linguistic material elsewhere in the sentence. An analysis generally along these lines is suggested by Foley (2010:44f.) for several Papuan languages, though he does not show how the semantics of relative tense gives rise to the temporal interpretation of clause chaining.

In Section 3, I propose that the simultaneous and sequential suffixes combine with coordination compositionally to produce part of the temporal interpretation of a clause chain. In Northern Paiute, the relative tense conveyed by one of the suffixes in a marked clause can be abstracted over in a coordination structure, just as relative tenses are in embedded clauses in other languages (Ogihara 1994, 1995, 1996, Abusch 1997). For each marked clause in a chain, this establishes a relation

[2]These are sometimes called 'medial' and 'final' clauses, respectively (Longacre 2007:399). While this might seem an accurate characterization of the clause chains in 1a–b, the terms adopted in the text are more appropriate for Northern Paiute. The linear order of the marked and unmarked clauses is variable — see Section 3.2.

of temporal inclusion or temporal precedence between it and the unmarked clause. This account, which relies on semantic binding, derives the insensitivity of these temporal relations to the linear order of the marked and unmarked clauses.

In Northern Paiute, the marked clauses in a chain are also related temporally to one another, though this is not part of their semantic content. I argue in Section 4 that these temporal relations arises through pragmatic enrichment. In narratives, the clauses in a chain receive the same 'forward moving' interpretation that a sequence of independent sentences does (Kamp and Rohrer 1983, among others). This additional meaning component is sensitive to the linear order of clauses in a chain, capturing Foley's intuition that they resemble "beads on a string."

The existing literature on clause chaining primarily consists of typological surveys (e.g. Longacre 2007) and comparative work on geographically or genetically related languages (e.g. Foley 2010), or it deals with clause chaining only in connection with another topic (e.g. Finer 1985, Roberts 1988, Broadwell 1997). It is thus difficult right now to determine whether the syntax and semantics that I propose for clause chaining in Northern Paiute can be extended to other languages, since they cannot be compared in any really substantive way. But I hope that this in-depth investigation of one language will raise questions about others, leading in the end to a richer theory of clause chaining.

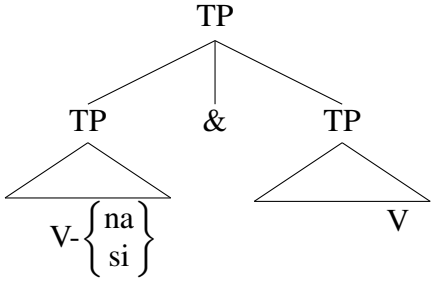
1 The syntax of clause chaining in Northern Paiute

Clause chaining has a remarkably uniform surface profile across languages. In his typological survey, Longacre (2007:398–417) identifies a number of core properties. First, as he puts it (p. 399), one clause "has a verb of distinctive structure that occurs but once in the entire chain, while the other clauses have verbs of different and more restricted structures." In Northern Paiute, as we have already seen, there is one unmarked clause, which is accompanied by one or more marked clauses. Second, the temporal relations between clauses are marked by morphology signaling a distinction between either (i) temporal simultaneity or (ii) temporal sequence (p. 400). In Northern Paiute, these relations are conveyed by verbal morphology: the simultaneous suffix *-na* and the sequential suffix *-si*.

In addition, Longacre observes (p. 399) that clause chaining frequently marks switch reference — that is, whether the subject of one clause is the same as or different from the subject of the following clause. As far as I know, Northern Paiute never realizes switch reference formally (see also Thornes 2003:277f.). But there is no reason to think that this is a necessary property of clause chaining. Switch reference marking can, but need not, appear at a variety of clause junctures, including both unequivocal coordination structures and a variety of subordination structures (see the discussion in McKenzie 2012:79–91).

Going beyond this surface description, I propose that clause chaining has a coordination structure in Northern Paiute. Two or more full clauses, which I assume are TPs, are combined by an asyndetic, or phonologically null, coordinator. (These clauses are headed by T(ense), a label that does not necessarily have any semantic import.)

(4) *The syntax of clause chaining in Northern Paiute (preliminary version)*



I will argue for this structure by setting aside three alternative structures. While each of these alternatives may be able to account for some of the properties of clause chaining in Northern Paiute, only the clausal asyndetic coordination structure in 4 can account for all of them.

In some languages, clause chaining is analyzed as subordination (Finer 1985, Broadwell 1997, 2006). But as I show in Section 1.1, questions and left-peripheral operators, such as modal clitics and negation, do not treat the marked clause as contained within the unmarked clause in Northern Paiute. In other languages, clause chaining is analyzed as coordination, but at the level of the verb phrase (Foley 2010, Nonato 2014:45–63). I argue in Section 1.2 that clause chaining in Northern Paiute must coordinate full clauses. Each member of a chain can contain the same left-peripheral elements. Finally, in Section 1.3, I consider the possibility that the simultaneous and sequential suffixes are themselves coordinators. I conclude, however, that they must be contained within the marked clause, since they select for its contents.

1.1 Clause chains are not subordinated

The primary subordination strategy in Northern Paiute is nominalization (see also Thornes 2003:427–447). One nominalizer, the suffix *-na*, derives patient nominalizations (5a), object relative clauses (5b), and the complements of perception verbs (5c) (Toosarvandani 2011, 2014b).

(5) a. **I=saa-na** ne-hu.
1SG.GEN=cook-NMLZ burn-PFV
'**What I was cooking** burned.' (elicitation, EM, BP32-9-s, 15)

b. **Isu tsiadamɨ i=bisabi-na** wadzi-mia-hu.
DEM.NOM girl 1SG.GEN=like-NMLZ hide-go-PFV
'**The girl that I like** ran away.' (elicitation, MS, BP32-4-s, 40)

c. Nɨɨ **a=bbauma-wɨnnɨ-na** naka.
1SG.NOM **4.GEN=rain-PROG-NMLZ** hear.IMPF
'I hear **it raining**.' (elicitation, MS, BP37-1-s, 6)

The simultaneous suffix is a distinct lexical item, even though it has the same form as the nominalizer in 5a–c. To start, it is in complementary distribution with the sequential suffix, which cannot plausibly be analyzed as a nominalizer. The sequential suffix cannot occur on a verb in argument position (6a), in a relative clause (6b), or on the complement of a perception verb (6c).

(6) a. * **I=saa-si** ne-hu.
1SG.GEN=cook-SEQ burn-PFV
(elicitation, EM, BP47-10, 46:49)

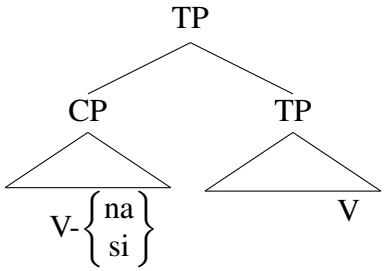
b. * **Isu** **tsiadamɨ i=bisabi-si** wadzi-mia-hu.
DEM.NOM girl **1SG.GEN=like-SEQ** hide-go-PFV
(elicitation, EM, BP50-2, 1:10:00)

c. * N~~ɨɨ~~ **a=bbauma-wɨnnɨ-si** naka.
1SG.NOM **4.GEN=rain-PROG-SEQ** hear.IMPF
(elicitation, EM, BP47-10, 46:13)

In the Appendix, I provide three additional arguments that the simultaneous suffix is distinct from the homophonous nominalizer suffix.

Even if the marked clause is not a nominalization, it could be subordinated to the unmarked clause, much like a temporal adjunct clause in English.

(7) *The syntax of clause chaining in Northern Paiute (first alternative)*



The marked clause would have to be adjoined quite high — to the entire unmarked clause — since it precedes everything in the unmarked clause. As a consequence, this alternative subordination structure ends up being quite difficult to distinguish syntactically from the coordination structure in 4. In neither does an expression in the marked clause c-command into the unmarked clause, or vice versa.

For several North American languages, Finer (1985) assumes a subordination structure like 7 for clause chaining to accommodate his theory of switch reference marking. Broadwell (1997, 2006) adopts this subordination structure for clause chaining in Choctaw (Muskogean: Southeastern United States), in part because the marked clause cannot contain tense (8a), unlike a true coordination structure (8b).

(8) *Choctaw*

a. * John-at hiilha**-tok**-nah Bill-at taloow-aachi̲h.
John-NOM dance**-PST**-DS Bill-NOM sing-IRR

b. John-at hilha**-tok** ano̲ti Bill-at taloow-aachi̲h.
John-NOM dance**-PST** and Bill-NOM sing-IRR
'John danced, and Bill will sing.' (Broadwell 1997:39)

Regardless of its merit, this argument is not relevant for Northern Paiute, since the language lacks ABSOLUTE TENSE (Comrie 1985:36): it does not mark the relation between the time at which a clause is interpreted and the utterance time (see also Thornes 2003:396). Below, I offer three other arguments that clause chaining in Northern Paiute does not have the subordination structure in 7.

Asymmetrical wh-movement

While extraction is not possible from an adjoined clause, it is possible from the main clause. A wh-phrase, for instance, can raise to precede a temporal adjunct clause.[3]

(9) **What**$_1$, when he was studying for his exam, did John drink **t**$_1$?

In Choctaw, Broadwell (1997:39) argues that clause chaining has such a subordination structure, because it is possible to extract from the unmarked clause (10a). This contrasts with unambiguous coordination structures, which do not permit such asymmetrical wh-movement (10b).

(10) *Choctaw*

a. **Katah-oosh**$_1$ John-at taloowa-nah **t**$_1$ hilhah?
who-FOC.NOM John-NOM sing.L-DS dance
'Who$_1$ did John sing and t$_1$ dance?'

b. * **Katah-oosh**$_1$ John-at taloowa-tok anoti **t**$_1$ hilha-tok?
who-FOC.NOM John-NOM sing-PST and dance-PST

(Broadwell 1997:39)

Turning now to Northern Paiute, if the marked clause were adjoined to the unmarked clause, as in the alternative subordination structure in 7, it should exhibit the same extraction pattern. But it is not possible for a wh-phrase to move across the marked clause.

(11) a. * **Haga**$_1$ su=miitsi-'yu nana tɨba tɨka-na, su=tɨɨtsi-'yu naatsi'i=bɨno'o
who NOM=short-NOM man pinenut eat-SIM NOM=little-NOM boy=PTC
t$_1$ mutuhe'e?
kiss.IMPF
Intended: 'Who, while the short man was eating pinenuts, did the little boy kiss?' (cf. **Who$_1$ was the short man eating pinenuts, and the little boy kissed t$_1$?*) (elicitation, EM, BP48-3, 52:50)

b. * **Haga**$_1$ su=miitsi-'yu nana tɨ=nodɨggwa puni-si, yaisi su=naatsi'i **t**$_1$ punni?
who NOM=short-NOM man REFL=wife see-SEQ PTC NOM=boy see.IMPF
Intended: 'Who, after the short man saw his wife, did the boy see?' (cf. **Who did the short man see his wife, and the boy saw t$_1$?*) (elicitation, EM, BP48-10, 16:08)

This pattern of extraction does follow from the coordination structure for clause chaining in 4 that I am proposing. In 11a–b, the wh-phrase has been extracted asymmetrically from the second coordinate, violating the Coordinate Structure Constraint (Ross 1967:161).

Interestingly, it is possible to question a constituent inside the marked clause. (This is completely ruled out in a temporal adjunct clause: i.e. **What$_1$ when he was studying for t$_1$, did John drink?*)

[3]The orthographic commas in 9 belie that the temporal adjunct clause is fully integrated into the sentence. The characteristic intonation of a parenthetical is missing.

(12) a. **Haga**$_1$ su=tɨɨtsi-'yu nana **t**$_1$ mutuhe-na, yaisi su=naatsi'i=bɨno'o tɨba
who NOM=little-NOM man kiss-SIM PTC NOM=boy=PTC pinenut
tɨka?
eat.IMPF
'Who is the little man kissing while the boy is eating pinenuts?' (cf. **Who*$_1$ *is the little man kissing* t_1*, and the boy is eating pinenuts?*) (elicitation, MS, BP48-3-s, 13)

b. **Haga**$_1$ su=miitsi-'yu nana **t**$_1$ puni-si, yaisi su=naatsi'i tɨ=bbia
who NOM=short-NOM man see-SEQ PTC NOM=boy REFL=mother
punni?
see.IMPF
'Who did the short man see, before the boy saw his mother?' (cf. **Who*$_1$ *did the short man see* t_1*, and the boy saw his mother?*) (elicitation, EM, BP48-10, 17:13)

How is this possible if clause chaining in Northern Paiute has a coordination structure? The wh-phrase in 12a–b appears to raise out of just the first coordinate in violation of the Coordinate Structure Constraint.

There is good reason to think that the wh-phrase does not actually leave the first coordinate. While Northern Paiute has wh-movement to a clause-initial position (13a), it is not obligatory (13b).

(13) a. **Haga**$_1$ su=mogo'ni t_1 pisapi?
who NOM=woman like.IMPF
'Who does the woman like?' (elicitation, EM, BP44-7, 7:25)

b. Su=mogo'ni **haga** pisapi?
NOM=woman **who** like.IMPF
'Who does the woman like?' (elicitation, EM, BP44-7-s, 5)

This suggests that the wh-phrase in 12a–b might just raise into the left periphery of the first coordinate. Question semantics would be contributed by an operator taking scope over both clauses in the chain (perhaps along the lines suggested by Cable 2010).[4]

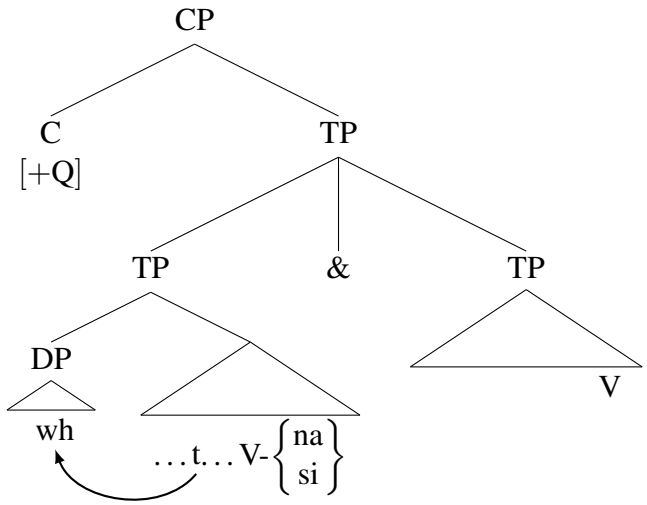
[4]While this operator is phonologically null in wh-question, there is an overt question particle in polar questions. It can take scope over an entire clause chain.

(i) Context: I come into the house. I hear stomping and singing coming from another room.
Hau su=tɨɨtsi-'yu naatsi'i hubiadu-na, yaisi u=bbɨɨa=bɨno'o nɨka?
Q NOM=little-NOM boy sing-SIM PTC 3SG.GEN=friend=PTC dance.IMPF
'Was the little boy's friend dancing while he was singing?' (elicitation, EM, BP50-1, s, 2)

(ii) Context: I come into the barn, and I don't see the cow.
Hau su=paba-'yu kutsu wadzi-mia-hu-si, su=naatsi'i u=ggwati-hu?
Q NOM=big-NOM cow hide-go-PFV-SEQ NOM=boy 3SG.ACC=shoot-PFV
'Did the boy shoot the cow after it escaped?' (elicitation, EM, BP49-3-s, 1)

The contexts in i–ii make it felicitous for the question particle to take wide scope. They establish that the speaker does not know whether both clauses in the chain are true.

(14)



It should be possible, then, also to question a constituent inside the unmarked clause, as long as it does not leave that clause. Indeed, this is the case.[5]

(15) a. Su=nana ɨwi-na, yaisi **himma**$_1$ su=naatsi'i **t**$_1$ tɨka?
NOM=man sleep-SIM PTC **what** NOM=boy eat.IMPF
'While the man is sleeping, what is the boy eating?' (elicitation, MS, BP58-4, 21:05)

b. Su=toogga ya'e-hu-si, yaisi **himma**$_1$ su=naatsi'i **t**$_1$ tɨmɨ-hu?
NOM=dog die-PFV-SEQ PTC **what** NOM=boy buy-PFV
'After the dog died, what did the boy buy?' (elicitation, MS, BP58-4-s, 3)

I conclude, then, that clause chaining in Northern Paiute does not have a subordination structure, because it does not permit asymmetrical wh-movement from just one clause. This is compatible, however, with it having a coordination structure.

Across-the-board wh-movement

While across-the-board extraction is permitted in coordination structures (16a), it is ungrammatical in subordination structures, because the moved element crosses an adjunct island boundary (16b).

(16) a. **What**$_1$ did the nurse polish **t**$_1$, and the plumber play **t**$_1$?

b. * **Who**$_1$ did Max tell **t**$_1$ after he saw **t**$_1$?

In Northern Paiute, wh-movement can take place in an across-the-board fashion from each clause in a chain.

(17) a. **Himma**$_1$ nɨɨ **t**$_1$ tɨka-na, yaisi su=naatsi'i=bɨno'o **t**$_1$ tɨka?
what 1SG.NOM eat-SIM PTC NOM=boy=PTC eat.IMPF
'What, while I eat it, does the boy eat, too?' (cf. *What*$_1$ *do I eat* t_1*, and the boy eats* t_1*, too?*) (elicitation, EM, BP39-2-s, 24)

[5]In a three-clause chain, it should be grammatical for the medial marked clause to contain a wh-phrase at its left edge. And, it should be ungrammatical for a wh-phrase in sentence-initial position to be extracted from the medial marked clause. Unfortunately, the relevant sentences are quite challenging for speakers to judge because of their length.

b. **Haga**$_1$ su=tɨɨtsi-'yu naatsi'i **t**$_1$ mutuhe-hu-si, su=nana=bɨno'o **t**$_1$ mutuhe-hu?
who NOM=little-NOM boy kiss-PFV-SEQ NOM=man=PTC kiss-PFV
'Who, after the little boy kissed them, did the man kiss, too?' (cf. *Who*$_1$ *did the little boy kiss* t_1*, and the man kissed* t_1*?*) (elicitation, EM, BP43-4-s, 4)

If clause chaining had the alternative subordination structure, 17a–b should both be ungrammatical. But this across-the-board wh-movement is completely expected if clause chaining in Northern Paiute instead has a coordination structure.

Second-position clitics

Another argument that clause chaining in Northern Paiute does not have the alternative subordination structure comes from second position clitics. The language has several clitics that express modality and occur after the first major sentence constituent (Thornes 2003:336–341).

(18) a. **Ɨɨ=sakwa** pida.
2SG.NOM**=MOD** start.fire
'You should start the fire.' (elicitation, EM, BP33-5-s, 47)

b. Himma**=sakwa** tammi madabbui.
thing**=MOD** 1PL.INCL make
'We might make something.' (elicitation, EM, BP34-2-s, 17)

c. Mu'a**=sakwa** tammi tɨba'a hani-gaa-kwɨ.
tomorrow**=MOD** 1PL.INCL pinenut do-MOT-IRR
'Tomorrow, we are going to go get pinenuts.' (elicitation, EM, BP33-5-s, 51)

The modal clitic *=sakwa*, for instance, can occur after the subject (18a), a fronted direct object (18b), or a sentence initial adverb (18c).

If the marked clause were adjoined in clause-initial position, then a modal clitic should immediately follow the marked clause in second position. Instead, it shows up after the first constituent inside the unmarked clause, taking scope just within that clause. (The sentences in 19a–b were judged relative to contexts in which the marked clause describes an actual situation.)

(19) a. Context: The woman is making a fire, but the boy is sitting around doing nothing.
Su=miitsi-'yu mogo'ni pida-na, su=naatsi'i**=sakwa** kutsu patsa.
NOM=short-NOM woman make.fire-SIM NOM=boy**=MOD** cow kill
'While the short woman is starting a fire, the boy should kill a cow.' (elicitation, EM, BP50-4, 16:25)

b. Context: The cow is already loose and running around.
Su=paba-'yu kutsu na-dza'maggwɨ-hu-si, su=naatsi'i**=sakwa** u=ggwati.
NOM=big-NOM cow PASS-let.go-PFV-SEQ NOM=boy**=MOD** 3SG.ACC=shoot
'After the big cow is let go, the boy should shoot it.' (elicitation, EM, BP50-4, 12:05)

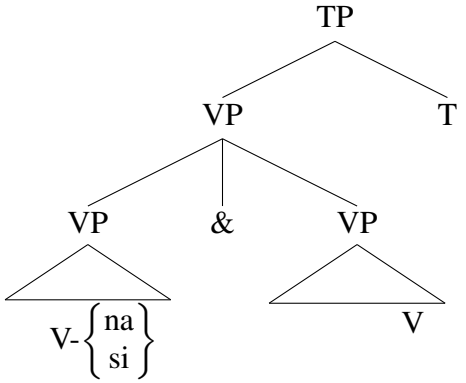
Since the marked clause does not count as the first element in a sentence for modal clitics, clause chaining in Northern Paiute cannot have a subordination structure. This distribution is, in contrast,

compatible with a coordination structure. In 19a–b, the modal clitic simply appears after the first element inside a coordinate, the unmarked clause. (As I will show below, modal clitics can also occur inside the marked clause.)

1.2 Clause chaining coordinates full clauses

Based on the three arguments above, I conclude that clause chaining in Northern Paiute does not have a subordination structure, though this may be appropriate for Choctaw and other languages. This leaves us with a coordination structure, which is the same conclusion that others have come to for various Papuan languages. But in these languages, Foley (2010) proposes that clause chaining coordinates subclausal constituents under a single T head (see also Nonato 2014).

(20) *The syntax of clause chaining in Northern Paiute (second alternative)*



Foley's main argument for this low-coordination structure comes from the absence of functional categories in the marked clause that are found in independent sentences, such as absolute tense, negation, and illocutionary force (Foley and Van Valin 1984:256–263). Since Northern Paiute does not overtly mark absolute tense, I use negation and modal particles to show that the alternative low-coordination structure in 20 is not appropriate for its clause chaining construction.

Negation

In Northern Paiute, negation appears either in sentence-initial position (21a) or following the subject at the left edge of the verb phrase (21b) (Thornes 2003:328).

(21) a. **Kai** nɨmmi wiupui-gga yaa.
NEG 1PL.EXCL.NOM buckberry-have there
'We have no buckberries this time.' (dialogue, MS, BP23-1-t1, 3)

b. Su=natɨzuabi **kai** togi i=ma-nɨmma.
NOM=medicine **NEG** correct 1SG.ACC=IP.hand-feel
'The medicine doesn't make me feel quite right.' (elicitation, Thornes 2003:328)

Assuming that negation adjoins either to TP or to VP — the two positions where it is attested cross-linguistically (Laka 1990:9–85) — it can be used to probe the structure of clause chaining.

Under the alternative low-coordination structure, high negation should be impossible inside the unmarked clause because it would be just a VP. But this is, in fact, possible.

(22) a. Su=tɨɨtsi-'yu naatsi'i ɨwi-na, **kai** su=mogo'ni mia-hu.
NOM=little-NOM boy sleep-SIM **NEG** NOM=woman go-PFV
'While the little boy was sleeping, the woman didn't leave.' (elicitation, EM, BP50-4, 17:46)

b. Su=paba-'yu kutsu wadzi-mia-hu-si, yaisi **kai** su=naatsi'i
NOM=big-NOM cow hide-go-PFV-SEQ PTC **NEG** NOM=boy
u=ggwati-hu.
3SG.ACC=shoot-PFV
'After the cow escaped, the boy didn't shoot it.' (elicitation, EM, BP50-4, 26:18)

High negation should not be possible inside the marked clause either, though showing this is a bit more involved. It is clear that the negative particle *kai* can occur in sentence initial position.

(23) a. **Kai** su=tɨɨtsi-'yu naatsi'i hubiadu-na, su=mogo'ni mia-hu.
NEG NOM=little-NOM boy sing-SIM NOM=woman go-PFV
'While the little boy wasn't singing, the woman left.' (elicitation, EM, BP50-7, 31:42)

b. **Kai** su=kutsu wadzi-mia-hu-si, su=naatsi'i u=ggwati-hu.
NEG NOM=cow hide-go-PFV-SEQ NOM=boy 3SG.ACC=shoot-PFV
'After the cow didn't escape, the boy shot it.' (elicitation, EM, BP50-7, 26:57)

If these clause chains had the alternative low-coordination structure, high negation should only be able to take scope over the entire coordination. But as the translations in 23a–b indicate, it can take scope just inside the marked clause. This is exactly what we would expect if clause chaining in Northern Paiute coordinates full clauses.

Second-position clitics

Recall from Section 1.1 that modal clitics occur in second position in Northern Paiute. I assume this means they occupy C, like the highest auxiliary or main verb in a verb-second Germanic language (Koster 1975, among others). If clause chaining had the alternative low-coordination structure, a modal clitic, such as *=sakwa*, should not be possible inside the unmarked clause. But as we saw in 19a–b above, this is indeed possible.

It is unclear whether the alternative low-coordination structure should also permit a modal clitic inside the marked clause. It depends on whether a modal clitic can be interpreted inside the first VP coordinate, and yet surface in C of the matrix clause. At any rate, it is possible for a modal clitic to appear after the first element of the marked clause.

(24) a. Su=miitsi-'yu mogo'ni**=sakwa** pida-na, su=naatsi'i yaisi kutsu patsa.
NOM=short-NOM woman**=MOD** make.fire-SIM NOM=boy PTC cow kill
'The short woman should start a fire, so the boy will kill a cow.' (elicitation, EM, BP48-6, 17:45)

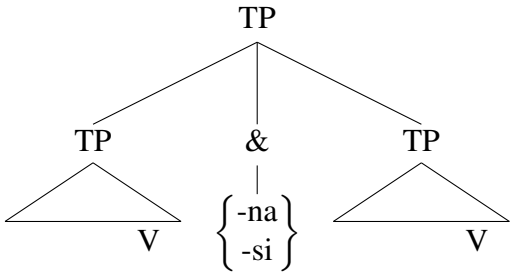
b. Su=paba-'yu kutsu**=sakwa** na-dza'ma'wɨ-hu-si, yaisi su=tɨɨtsi-'yu
NOM=big-NOM cow**=MOD** PASS-let.go-PFV-SEQ PTC NOM=little-NOM
naatsi'i u=ggwati-hu.
boy 3SG.ACC=shoot-PFV
'The cow should be let go, so that the boy can shoot him.' (elicitation, EM, BP48-3-s, 16)

The distribution of modal clitics in 19 and 24 is exactly what we expect if clause chaining in Northern Paiute coordinates full clauses. While I have been assuming for simplicity that these are TPs, there is no reason they could not also be CPs. Then, there would be a position for modal clitics inside both the marked and unmarked clause.

1.3 Clause chaining is asyndetically coordinated

Northern Paiute does not have overt coordinators, so clause chaining would have to employ asyndetic coordination. Unless, that is, the simultaneous and sequential suffixes were themselves coordinators. They would be terminal nodes in the syntax, but they would attach phonologically to the element on their left.

(25) *The syntax of clause chaining in Northern Paiute (third alternative)*



With this alternative structure, the marked clause would have no special status: it would be whatever clause happens to occur first. But there is good reason to think that clause chaining in Northern Paiute does, in fact, have an asyndetic coordination structure.

The simultaneous and sequential suffixes interact with aspectual morphology inside the marked clause. In Northern Paiute, verbs cannot appear in a bare form in nonmodal contexts (26a). They must minimally bear morphology expressing either imperfective aspect, such as the progressive suffix (26b), or perfective aspect (26c).

(26) a. * Su=nana tɨ=kaadzi **madabbui**.
NOM=man REFL=car **fix**
Intended: 'The man is fixing his car.' (elicitation, EM, BP44-4, 3:27)

b. Su=naatsi'i tɨ=kaadzi **madabbui-wɨnnɨ**.
NOM=boy REFL=car **fix-PROG**
'The boy is fixing his car.' (elicitation, EM, BP50-1-s, 4)

c. Su=nana tɨ=kaadzi **madabbui-hu**.
NOM=man REFL=car **fix-PFV**
'The man just fixed his car.' (elicitation, EM and MS, BP44-4, 4:05)

In the marked clause of a chain, however, the verb can appear without any aspectual morphology.

(27) a. Su=nana t**ɨ**=kaadzi **madabbui**-na, hubiatu.
NOM=man REFL=car **fix**-SIM sing.IMPF
'While the man is fixing his car, he is singing. (elicitation, EM, BP48-5, 38:03)

b. Su=nana t**ɨ**=kaadzi **madabbui**-si, yaisi u=ddza-kana-gg**ɨ**-hu.
NOM=man REFL=car **fix**-SEQ PTC 3SG.ACC=IP.fingers-grab-APPL-PFV
'After the man fixed his car, he started it.' (elicitation, EM and MS, BP50-1, 5:50)

If clause chaining had the alternative structure in 25, where the simultaneous and sequential suffixes were themselves coordinators, then 27a–b should be ungrammatical. The verb in the first coordinate would be in its bare form. While the suffixes' interaction with aspect remains to be explained, I conclude that they are contained inside the marked clause. Consequently, clause chaining in Northern Paiute must have an asyndetic coordination structure.

1.4 One last alternative

I have argued that clause chaining in Northern Paiute has a clausal asyndetic coordination structure, because only this accounts for all of its properties. Like other coordination structures, clause chaining in Northern Paiute does not permit asymmetrical extraction, a violation of the Coordinate Structure Constraint, though it does allow for across-the-board movement; second-position clitics also do not treat the marked clause like a (subordinated) first element. Moreover, clause chaining in Northern Paiute must coordinate *full* clauses, as negation and second-position clitics can be found in both the marked and unmarked clauses. Finally, the simultaneous and sequential cannot themselves be coordinators, since they are able to select for the contents of the marked clause.

Throughout this discussion, I have assumed a binary distinction between coordination and subordination, into which I have fit clause chaining in Northern Paiute. There is, however, a substantial line of inquiry that allows for clause chaining to instantiate a third, intermediate category between coordination and subordination (Olson 1981, Foley and Van Valin 1984:256–263, Van Valin and La Polla 1997:448–454, Van Valin 2005:183f.). In a COSUBORDINATION relation, neither clause is embedded inside the other, as in coordination. But "[t]he crucial property distinguishing cosubordination from coordination is operator dependence" (Van Valin 2005:187). As in subordination, one of the clauses is semantically dependent on the other: in particular, the cosubordinated clauses share a single operator, such as tense, mood, or illocutionary force, taking scope under it together.

Within Role and Reference Grammar (RRG), the category of cosubordination is often assumed as a theoretical primitive. Foley (2010) argues that this is dangerous, however, since the relevant notion of semantic dependence "remain[s] undertheorized" (p. 40). While a putative cosubordinated clause may be semantically dependent with respect to one operator, it may not be semantically dependent with respect to another operator. In Tauya (Trans-New Guinea: New Guinea), for instance, the clauses in a chain can — though they do not have to — take scope together in a polar question (28a). This is not the case with other operators: in 28b, only the second clause takes scope under negation.

(28) *Tauya*

a. Tepau-fe-pa yate fitau-e-nae?
break-PRF-SS go throw-1/2-Q
'Did you break it and go away?'
'You broke it, and did you go away?'
'Did you break it? And you went away.' (MacDonald 1990:226)

b. Ne fofe-a-te ya-ni wate ∅-tu-e-ʔa.
3SG come-3SG-DS 1SG-ERG NEG 3SG-give-1/2-IND
'He came, and I didn't give it to him.' (MacDonald 1990:233)

There is thus no unified notion of semantic dependence within even one construction in one language, much less across constructions and across languages.

For this reason, I do not take clause chaining in Northern Paiute to instantiate a category of cosubordination. Nonetheless, it is clear that, while the clauses in a chain are not embedded inside one another, as in a typical coordination structure, the marked clause is semantically dependent on the unmarked clause in some intuitive sense. This underlaid the original observation that the marked clause in a chain superficially resembles a temporal adjunct clause introduced by a subordinator like *when* or *after*. My proposal in the ensuing sections for the temporal interpretation of clause chaining in Northern Paiute can be seen as an attempt to theorize the relevant notion of semantic dependence for this construction in this language without appealing to a primitive category of cosubordination.

2 The temporal contribution of the suffixes

The clausal asyndetic coordination structure for clause chaining in Northern Paiute leaves us with something of a mystery. In general, coordinates must be alike in some sense (see, for instance, Huddleston and Pullum 2002:1323). But the marked clause contains the simultaneous or the sequential suffix, while the unmarked clause does not. I will argue that this asymmetry reflects only a superficial difference between the marked and unmarked clauses. The suffixes are members of a syntactic category that is not phonologically overt in the unmarked clause.

What is this category? At first, it is tempting to analyze the simultaneous and sequential suffixes as aspect, since as we saw in Section 1.3, they can appear on a bare verb in place of aspectual morphology. But they are not in complementary distribution with imperfective and perfective aspect morphemes (29a–b). By comparison, the progressive and perfective suffixes cannot cooccur (30a–b).

(29) a. Su=naatsi'i tɨ=kaadzi madabbui-**wɨnnɨ-na**, yaisi hubiadu-wɨnnɨ.
NOM=boy REFL=car make-**PROG-SIM** PTC sing-PROG
'While the boy is fixing his car, he is singing.' (elicitation, EM, BP50-1, 9:19)

b. Su=nana tɨ=kaadzi madabbui-**hu-si**, yaisi u=ddza-kana-ggɨ-hu.
NOM=man REFL=car fix-**PFV-SEQ** PTC 3SG.ACC=IP.fingers-grab-APPL-PFV
'After the man fixed his car, he started it.' (elicitation, EM, BP50-1-s, 1)

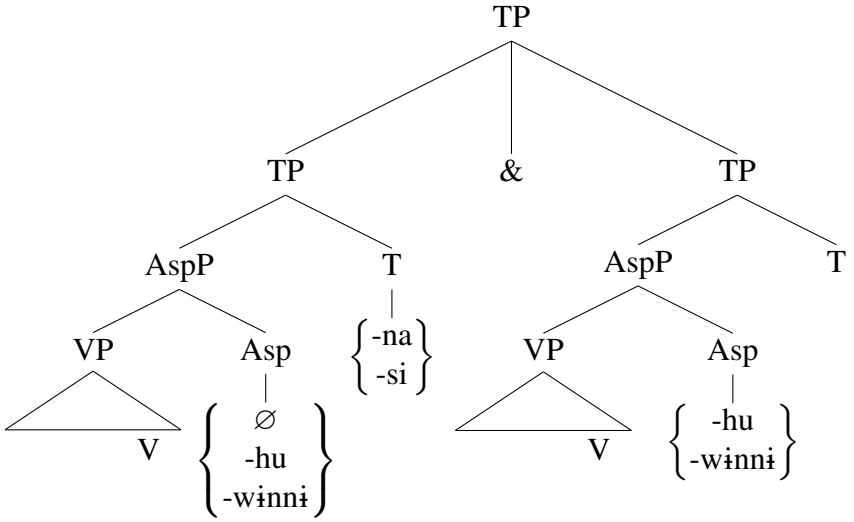
(30) a. * Su=naatsi'i tɨ=kaadzi madabbui**-wɨnnɨ-hu**.
NOM=boy REFL=car make**-PROG-PFV** (elicitation, EM, BP50-1, 34:39)

b. * Su=naatsi'i tɨ=kaadzi madabbui**-hu-wɨnnɨ**.
NOM=boy REFL=car make**-PFV-PROG** (elicitation, EM, BP50-1, 34:46)

I instead take the simultaneous and sequential suffixes to be members of a syntactic category that *selects* for aspect. Specifically, I propose that they are members of T.

Among other things, this means that the simultaneous and sequential suffixes can select for overt aspectual morphology like the progressive and perfective suffixes, or they can select for a phonological null member of Asp(ect) that is in complementary distribution with them.

(31) *The syntax of clause chaining in Northern Paiute (intermediate version)*



In the unmarked clause or in an independent sentence, T is not pronounced, and it must select for an overt member of Asp (perhaps for that reason). Thus, only in the marked clause of a chain can a verb appear without overt aspectual morphology.

Northern Paiute does not have absolute tense — the time at which a clause is interpreted is not related to the utterance time — so it is not surprising that T is phonologically null in the unmarked clause. But why is the T head in marked clauses realized as the simultaneous or sequential suffix? Elaborating on a suggestion by Foley (2010:44f.), I propose that they are dedicated markers of RELATIVE TENSE — specifically, what von Stechow (1995:372) calls 'bound relative tense.' They can only relate the time of the marked clause to a time whose value is provided by linguistic material elsewhere in the sentence. In other languages, relative tenses appear in embedded clauses, where they relate the time of the embedded clause to the time of the main clause (Ogihara 1994, 1995, 1996, Abusch 1997, and many others). In Northern Paiute, as I will discuss later, the simultaneous and sequential suffixes relate the time of the marked clause to the time of the unmarked clause.

If a language does not have absolute tense, we might think that it should also lack relative tense. But historically, it is not implausible that a language could have had distinct morphemes dedicated to absolute and relative tense and then lost just the set conveying absolute tense. Something like this probably happened in Northern Paiute. In Mono, its most closely related sister language, Lamb (1957:282) identifies an absolute tense marker *-ti* that "[i]ndicates present or near past time," or in

other words, nonfuture tense. In Mono, we can see directly that the simultaneous and sequential suffixes are members of T, since Lamb observes (p. 281) that they are in complementary distribution with this nonfuture tense suffix.

Northern Paiute preserves the fossilized remnants of the nonfuture tense suffix. The so-called 'general tense' suffix *-ti* optionally shows up in two morphological environments: (i) after the applicative suffix *-ggɨ* (Thornes 2003:398) and (ii) after certain motion suffixes, including *-dzaga*, which indicates random motion, e.g. 1a. While the general tense suffix is neither productive nor semantically contentful, it cannot cooccur with the simultaneous (32a) and sequential (32b) suffixes.

(32) a. Su=naatsi'i **na-dɨka-ggɨ(*-ti)-na**, yaka.
NOM=boy **PASS-eat-APPL-TI-SIM** cry.IMPF
'While the boy is being fed, he cries.' (elicitation, EM, BP40-5, 27:37)

b. Su=naatsi'i **na-dɨka-ggɨ(*-ti)-si**, yaisi ɨwi-huka.
NOM=boy **PASS-eat-APPL-TI-SEQ** PTC sleep-INCEP
'After the boy was fed, he fell asleep.' (elicitation, EM, BP40-5, 29:47)

The distribution of these remnants of absolute tense in Northern Paiute confirms that the simultaneous and sequential suffixes realize the T head in the marked clause.

For now, I focus on the semantics of the simultaneous and sequential suffixes, leaving for later how they combine compositionally with surrounding material to produce the temporal interpretation of a clause chain. To start, in Section 2.1, I provide some general background on tense and aspect in Northern Paiute. In particular, I demonstrate that the language lacks absolute tense, in addition to sketching the semantics of the progressive and perfective suffixes. Then, in Section 2.2, I turn to the simultaneous suffix, which I argue conveys relative present tense. In contrast, the sequential suffix conveys relative past tense, as I argue in Section 2.3. Both suffixes can select either for an overt aspectual morpheme or for a null Asp head conveying (im)perfective aspect.

2.1 Background on tense and aspect in Northern Paiute

In one common framework for tense and aspect, a sentence is interpreted with respect to three times (Reichenbach 1947, among many others). The EVENT TIME is the run time of the event described by the sentence. The REFERENCE TIME is the time which the sentence can broadly be said to be 'about,' relative to which the event time is positioned. The EVALUATION TIME is a time that restricts the location of the reference time.

Within this framework, it is possible to treat tense as establishing a relation between the reference time and the evaluation time, while aspect establishes a relation between the reference time and the event time (Klein 1994). For absolute tenses, such as the present or past tense in main clauses in English, the evaluation time is the time of utterance. The absolute present tense establishes a relation of overlap between the reference time and utterance time, while the absolute past tense locates the reference time before the utterance time. An absolute future tense would locate the reference time after the utterance time.

Northern Paiute lacks absolute tense altogether, cf. Yukatec Maya (Bohnemeyer 2002), Kalaallisut (West Greenlandic; Shaer 2003, Bittner 2005), and Paraguayan Guaraní (Tonhauser 2011).

While the sentence in (33a) receives a default present interpretation, adding a temporal adverb results in a past (33b) or future (33c) interpretation.

(33) a. Su=nana tɨ=kaadzi madabbui-wɨnnɨ.
NOM=man REFL=car fix-PROG
'The man is fixing his car.' (elicitation, EM, BP46-3, 33:44)

b. **Idzi'i** tɨ=kaadzi madabbui-wɨnnɨ.
yesterday REFL=car fix-PROG
'He was fixing his car yesterday.' (elicitation, EM, BP44-4, 8:00)

c. **Mu'a** tɨ=kaadzi madabbui-wɨnnɨ.
tomorrow REFL=car fix-PROG
'He will be fixing his car tomorrow.' (elicitation, EM, BP44-4-s, 8)

Crucially, in 33a–c, the form of the verb does not change; the reference time is constrained entirely by the temporal adverb. Northern Paiute does not even seem to have a covert absolute tense that would restrict temporal interpretation to the nonfuture, as in St'áat'imcets (Matthewson 2006).

In many languages without absolute tense, aspect determines a default temporal interpretation. Imperfective aspects, such as the progressive, give rise to a default present interpretation (33a). In contrast, perfective aspect gives rise to a default past interpretation (34a).

(34) a. Su=nana tɨ=kaadzi madabbui-hu.
NOM=man REFL=car fix-PFV
'The man fixed his car.' (elicitation, EM and MS, BP44-4, 4:05)

b. **Mino'o** tɨ=kaadzi madabbui-hu.
now REFL=car fix-PFV
'He just fixed his car now.' (elicitation, EM, BP50-1-s, 10)

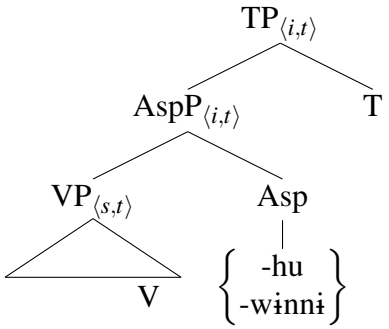
c. **Mu'a** tɨ=kaadzi madabbui-hu.
tomorrow REFL=car fix-PFV
'He will fix his car tomorrow.' (elicitation, EM, BP44-4-s, 6)

Again, this default past interpretation can be overridden by a temporal adverb, such as *mino'o* 'now' (34b) or *mu'a* 'tomorrow' (34c).

Compositionally, the Asp head establishes a relation between the event time and the reference time by taking the VP, which denotes a property of events (type $\langle s,t\rangle$), as its argument and returning a property of times (type $\langle i,t\rangle$) (Kratzer 1998).[6]

[6]I assume a type-theoretic, compositional semantics that has a rule of Function Application for interpreting complex constituents (cf. Heim and Kratzer 1998:49). The truth conditions of a sentence, and the contribution that subparts of a sentence make to them, are represented by a predicate logic metalanguage with the lambda calculus. Constants are bolded. I use x, y, and z as variables over individuals (type e); e, e', e'', etc. as variables over events (type s); t, t', t'', etc. as variables over time intervals (type i); and, p, q, and r as variables over truth values (type t). The only higher-order variables are f, g, and h, which range over functions from either individuals, events, or time intervals to truth values.

(35)



I assume that every clause in Northern Paiute is headed by T for syntactic reasons: it assigns case to, and agrees with, the subject in its specifier. But since there is no absolute tense, in independent sentences and in the unmarked clause of a chain, the T head does not establish a relation between the reference time and the utterance time. It thus can denote the identify function, which returns the property of times expressed by AspP.

The final semantic value for a sentence should not be a property of times, but rather a truth value. Sentences in Northern Paiute are interpreted relative to a time in the context, just as in English (Partee 1973, 1984). This definite time interval is often taken to be introduced by absolute tense (Kratzer 1998). In Northern Paiute, it can instead be introduced by an interpretive rule (cf. Tonhauser 2011:288).

(36) *Root Clause Rule*
The final translation of a root clause translated as ϕ of type $\langle i,t\rangle$ is $\phi(t_n)$.

If a TP denotes a property of times, the Root Clause Rule predicates this property of a time interval whose referent comes from the context (t_n, where n is a numerical index).[7] In Northern Paiute, this temporal reference is not, of course, constrained by absolute tense, though it can be restricted by other expressions, such as temporal adverbials.

The progressive suffix

Northern Paiute has a suffix, traditionally called the continuous suffix (Thornes 2003:406), which conveys progressive aspect: it depicts an event as ongoing.

(37) a. Amamu'a su=naatsi'i **tɨ=kaadzi madabbui-wɨnnɨ**. Yaisi mino'o tɨggwisu
morning NOM=boy **REFL=car make-PROG** PTC now still
madabbui-wɨnnɨ.
make-PROG
'This morning, the boy was fixing his car. He is still fixing it now.' (elicitation, MS, BP46-7, 3:10)

b. Idzi'i su=naatsi'i **hubiadu-wɨnnɨ**. Yaisi tɨggwisu hubiadu-wɨnnɨ.
yesterday NOM=boy **sing-PROG** PTC still sing-PROG
'Yesterday, the boy was singing. He is still singing.' (elicitation, EM, BP47-9, 33:00)
[EM: "He sang all night long."]

[7] As an alternative, this definite time interval could be introduced by a time-referring pronoun that adjoins to root clauses, cf. topic situations (Kratzer 2014). The property of times expressed by the TP would be predicated of this pronoun to yield a truth value. As far as I can see, this does all the same work the Root Clause Rule does.

As a type of imperfective aspect, the progressive suffix requires the event to have not yet terminated (at the reference time). It is thus compatible with an assertion of continuation for both accomplishment predicates (37a) and activity predicates (37b) (Smith 1997:63f.). For the latter, the speaker's comments make clear that there is a single singing event that does not terminate.

For simplicity, I assume an extensional meaning for the progressive suffix in Northern Paiute. In the lexical entry in 38, it takes the VP, which expresses a property of events, as its argument and returns a property of times. This property of times holds of any reference time that is located within a non-final subpart of the event time. Thus, with the progressive suffix, a sentence describes an event that is ongoing during the reference time.

(38) *The semantics of the progressive suffix*
$[\![\text{-wɨnnɨ}]\!] = \lambda f \lambda t \exists e(f(e) \wedge t \subset_{nf} \tau(e)) : \langle \langle s,t \rangle, \langle i,t \rangle \rangle$

More formally, the progressive suffix existentially quantifies over the VP's event argument. The run time of this event is given by the temporal trace function τ (Link 1987:250). The progressive suffix requires the reference time to be properly contained in a non-final subpart ($\subset_{nf}$) of this time interval.

This semantics for the progressive suffix can be tested using temporal adverbials, which constrain the reference time — see Cover and Tonhauser 2015 for discussion.

(39) a. Context: The boy started fixing his car at 1 o'clock; he finished fixing it at 3 o'clock.
Waha-ggwe su=naatsi'i tɨ=kaadzi madabbui-wɨnnɨ.
two-LOC NOM=boy REFL=car fix-PROG
'At two o'clock, the boy was fixing his car.' (elicitation, EM, BP50-2, 45:33)

b. Context: The boy started singing at 1 o'clock; he continued until 3 o'clock.
Waha-ggwe su=naatsi'i hubiadu-wɨnnɨ.
two-LOC NOM=boy sing-PROG
'At two o'clock, the boy was singing.' (elicitation, EM, BP50-2, 45:09)

In 39a–b, the reference time is restricted by the temporal adverbial *wahaggwe* 'at two o'clock' to the time interval at two o'clock. Both sentences are judged true in the contexts provided because they satisfy the lexical entry in 38. The two o'clock time interval is included within a nonfinal segment of the fixing and singing events.

The progressive suffix also interacts in nontrivial ways with aktionsart. Since the reference time is *properly included* within the event time, the predicate must be durative, e.g. an activity (37a) or an accomplishment (37b). The progressive suffix is not automatically compatible with other types of predicates.

(40) a. # Su=nana **mia-wɨnnɨ**.
NOM=man **go-PROG**
Intended: 'The man is leaving.' (elicitation, EM, BP44-7, 1:24:13)

b. Nɨɨ **akwisiye-wɨnnɨ**.
1SG.NOM **sneeze-PROG**
'I am sneezing (over and over again).' (elicitation, EM, BP45-5, 1:45:04)
[EM: "[...]means you sneeze a lot of times."]

It is simply infelicitous with an achievement predicate like *mia* 'go' (40a). With semelfactive predicates, such as *akisiye* 'sneeze', it coerces an iterative interpretation (40b). (See Toosarvandani 2014a for a discussion of aktionsart in Northern Paiute.)

It will ultimately probably be necessary to provide a modal semantics for the progressive suffix (Dowty 1977, 1979:133–192, Landman 1992, Portner 1998). Like the progressive in English, it exhibits the imperfective paradox (Dowty 1979:133).

(41) a. Su=mogo'ni ka=poo wokwopa-wɨnnɨ. Su=kaadzi
NOM=woman ACC=road cross-PROG NOM=car
u=wɨ-dzaga-hu-kaa.
3SG.ACC=IP.long.thing-strike-PFV-MOT
'The woman was crossing the road. The car hit her and ran.' (elicitation, EM, BP50-1, 1:17:26)
[MT: "Does she make it all the way to the other side of the street, or no?" EM: "Probably not, if they hit her in the road."]

With the progressive suffix, the accomplishment predicate *ka=poo wokwopa* 'cross the street' describes an event that does not have to culminate in the actual world. For present purposes, though, the lexical entry for the progressive suffix in 38 is sufficient.

The perfective suffix

In Northern Paiute, perfective aspect is conveyed by what is traditionally called the punctual suffix (Thornes 2003:406ff.). It portrays an event in its totality; for accomplishment predicates, which are inherently telic, it requires their culmination (42a).

(42) a. # Amamu'a su=naatsi'i **tɨ=kaadzi madabbui-hu**. Yaisi mino'o tɨggwisu
morning NOM=boy **REFL=car make-PFV** PTC now still
madabbui-wɨnnɨ.
make-PROG
Intended: 'This morning, the boy fixed his car. He is still fixing it now.' (elicitation, MS, BP46-7, 2:09)
[MS: "No, he don't cuz he's already finished it, and then. . . " EM: "Yeah, he already done it in the morning, so. . . he finished it in the morning."]

b. # Idzi'i su=naatsi'i **hubiadu-hu**. Yaisi tɨggwisu hubiadu-wɨnnɨ.
yesterday NOM=boy **sing-PFV** PTC still sing-PROG
Intended: 'Yesterday, the boy sang. He is still singing.' (elicitation, EM, BP47-6, 4:06)
[EM: "He sang yesterday, then he started to sing again, today."]

I assume a standard semantics for the perfective aspect (Kratzer 1998:107), as shown in the lexical entry in 43. It takes the VP, which expresses a property of events, as its argument and returns a property of times. This property of times is true of any reference time that contains the event time. Thus, for accomplishment predicates, a sentence with the perfective suffix describes an event that culminates within the reference time.

(43) *The semantics of the perfective suffix*
$[\![\text{-hu}]\!] = \lambda f \lambda t \exists e(f(e) \wedge \tau(e) \subseteq t) : \langle \langle s,t \rangle, \langle i,t \rangle \rangle$

Somewhat surprisingly, with activity predicates, the perfective suffix is also incompatible with an assertion of continuation, even though they are not telic. Speakers observe that 42b is true only if there is more than one discontinuous singing event.[8] For this reason, this semantics for the perfective suffix in Northern Paiute will need to be enriched, so that even atelic predicates terminate within the reference time. This can be achieved by requiring the reference time to contain the *largest* event described by the VP, cf. perfective aspect in Dëne Sųłiné (Wilhelm 2007:47–53). For simplicity's sake, though, I stick with the simpler lexical entry above.

This semantics can also be tested using temporal adverbials. A sentence containing the perfective suffix is true in a context where the event time is located within the reference time, which is restricted by *idzi'i* 'yesterday'.

(44) a. Context: The boy fixed his car yesterday from 9 o'clock until 12 o'clock.
Idzi'i su=naatsi'i tɨ=kaadzi madabbui-**hu**.
yesterday NOM=boy REFL=car fix-**PFV**
'Yesterday, the boy fixed his car.' (elicitation, EM, BP50-4, 1:04:45)

b. Context: The boy sang yesterday from 9 o'clock until 12 o'clock.
Idzi'i su=naatsi'i hubiadu-**hu**.
yesterday NOM=boy sing-**PFV**
'Yesterday, the boy sang.' (elicitation, EM, BP50-4, 1:00:59)

Crucially, the perfective suffix must also be *incompatible* with an imperfective viewpoint (Cover and Tonhauser 2015). This is indeed the case.

[8] It can be shown independently that there is a distinction between activity and accomplishment predicates in Northern Paiute (Toosarvandani 2014a). As in English (Dowty 1979:58), the adverb *tu'i* 'almost' conveys that the event has not begun when it modifies an activity predicate. But with accomplishments, it can express that the event began but did not culminate.

(i) Context: The boy is singing now.
# Su=naatsi'i tu'i hubiadu-hu.
NOM=boy almost sing-PFV
'The boy almost sang.' (elicitation, EM, BP51-6, 13:00)
[EM: "*Isaya'e* ['Lying'], I guess."]

(ii) Context: The man is fixing his car now.
Su=nana tɨ=kaadzi'i tu'i madabbui-hu.
NOM=man REFL=car almost make-PFV
'The man almost fixed his car.' (elicitation, EM, BP51-6, 14:25)
[EM: "It's probably true, init? Cuz he's still working on it, he's not through. Yeah, that would be true."]

The sentence in i is judged false in a context where the boy has started singing. In contrast, the sentence in ii is judged as true in the parallel context where the man has started fixing his car but has not finished it yet.

(45) a. Context: The boy started fixing his car at 1 o'clock; he finished fixing it at 3 o'clock.

Waha-ggwe su=nana ti=kaadzi madabbui-hu.
two-LOC NOM=man REFL=car fix-PFV
Intended: 'At two o'clock, the man was fixing his car.' (elicitation, EM, BP51-6, 38:00)
[EM: "*Isaya'e* ['Lie']."]

b. Context: The boy started singing at 1 o'clock; he continued until 3 o'clock.

Waha-ggwe su=naatsi'i hubiadu-hu.
two-LOC NOM=boy sing-PFV
Intended: 'At two o'clock, the boy was singing.' (elicitation, EM, BP51-6, 37:10)
[EM: "Probably *isaya'e* ['lie']."]

The sentences in 45a–b are judged false because the reference time is restricted by the punctual time adverbial *wahaggwe* 'at two o'clock' to such a small time interval that it cannot include the event time.

2.2 The simultaneous suffix

Moving on now to the simultaneous suffix, I propose that it is a relative present tense. As shown in the lexical entry in 46, it takes a property of times, expressed by AspP, as its argument. The simultaneous suffix requires that this property hold of the reference time (t_1), and it relates the reference time to the evaluation time (t_0). Specifically, as a present tense, the evaluation time must be contained in the reference time.

(46) *The semantics of the simultaneous suffix*
$[\![\text{-na}]\!] = \lambda f(f(t_1) \wedge t_0 \subseteq t_1) : \langle\langle i,t\rangle,t\rangle$

In an absolute tense, the evaluation time would invariably refer to the time of utterance. But the simultaneous suffix is, by hypothesis, a dedicated marker of *relative* tense. As such, the evaluation time, which is designated as t_0, cannot receive an interpretation from the context. Instead, as I will discuss further in the next section, it must be semantically bound to receive a value. It will ultimately be identified with the reference time of the unmarked clause, establishing a relation of temporal overlap between the marked and unmarked clauses.

In other languages, the reference time introduced by relative tense has been argued to be existentially quantified (see, for example, Ogihara 1995). But in Northern Paiute, there is reason to think that the reference time introduced by the simultaneous suffix is referential, as Partee (1973) argues for absolute tense. In 23a, for instance, the marked clause, which contains negation, presumably makes an informative contribution. But if the reference time were existentially quantified, it would be trivially true: there is always some time interval at which the little boy is not sleeping. So, the reference time must be a definite time interval during which the boy is not sleeping. For this reason, in the lexical entry above, the reference time is a free variable (t_1) that finds a referent in the context.

This semantics correctly accounts for the meaning of the clause chain in 47a. It is judged true in the context in Figure 1, where the bathing and looking events occur at the same time.

Figure 1: The boy is bathing. The dog is sitting and looking at him in the bathtub. (Mercer Mayer. 1969. *Frog, where are you?* New York: Dial Books.)

(47) a. Su=t̶i̶i̶tsi-'yu naatsi'i nabagia-wi̶nni̶**-na**, su=ddoogga nabagia-na-ggwe
NOM=little-NOM boy bathe-PROG**-SIM** NOM=dog bathe-NMLZ-LOC
u=bbuni-kati̶.
3SG.ACC=see-sit.IMPF
'While the little boy is bathing, the dog is sitting and looking at him in the bathtub.'
(elicitation, EM, BP53-3, 57:25)

b. # Su=t̶i̶i̶tsi-'yu naatsi'i nabagia-hu**-si**, su=ddoogga nabagia-na-ggwe
NOM=little-NOM boy bathe-PFV**-SEQ** NOM=dog bathe-NMLZ-LOC
u=bbuni-kati̶.
3SG.ACC=see-sit.IMPF
'After the little boy bathed, the dog is sitting and looking at him in the bathtub.'
(elicitation, EM and MS, BP53-3, 1:00:15)
[MS: "*Nabagiahusi* means he's through bathing." EM: "Probably *isaya'e* init?"]

In contrast, when the marked clause contains the sequential suffix, the clause chain is judged as false in the same context (47b).

As we have already seen, the simultaneous suffix can appear without any overt aspectual marking (48a) or with the progressive suffix *-wi̶nni̶* (48b). It is not compatible with the perfective suffix (48c).

(48) a. Su=nana t**ɨ**=kaadzi **madabbui-na**, yaisi hubiadu-w**ɨ**nn**ɨ**.
NOM=man REFL=car **fix-SIM** PTC sing-PROG
'While the man is fixing his car, he is singing.' (elicitation, EM, BP52-2, 12:31)

b. Su=naatsi'i t**ɨ**=kaadzi **madabbui-w~~ɨ~~nn~~ɨ~~-na**, yaisi hubiadu-w**ɨ**nn**ɨ**.
NOM=boy REFL=car **make-PROG-SIM** PTC sing-PROG
'While the boy is fixing his car, he is singing.' (elicitation, EM, BP50-1, 9:19)

c. * Su=nana t**ɨ**=kaadzi **madabbui-hu-na**, yaisi hubiadu-w**ɨ**nn**ɨ**.
NOM=man REFL=car **make-PFV-SIM** PTC sing-PROG
Intended: 'After the man finished fixing his car, he is singing.' (elicitation, EM, BP50-1, 10:15)

I take this to mean that the simultaneous suffix selects for imperfective aspect. Crosslinguistically, it is common for present tense to be incompatible with an event described from a perfective viewpoint. This restriction is sometimes said to arise because an event that overlaps with the time of utterance "by definition [...]could not be viewed as bounded" (Bybee et al. 1994:83). If this explanation is correct, then it needs to be generalized to account for the simultaneous suffix, which is a *relative* present tense.

What is the aspect of the marked clause when there is no overt aspectual morpheme? Since the simultaneous suffix takes a property of times as its argument, it must coerce some relation between the event time and the reference time. This relation is characteristic of an imperfective aspect, such as the progressive.

(49) Context: The man started fixing his car and singing at 1 o'clock; he finished at 3 o'clock.
Waha-ggwe su=nana t**ɨ**=kaadzi **madabbui-na**, hubiadu-w**ɨ**nn**ɨ**.
two-LOC NOM=man REFL=car **fix-SIM** sing-PROG
'At two o'clock, while the man was fixing his car, he was singing.' (elicitation, EM, BP52-2, 15:40)

Even without the progressive suffix in 49, the reference time of the marked clause can be restricted by *wahaggwe* 'at two o'clock', so that it is included within a nonfinal segment of the event time.

For concreteness, I assume that when there is no overt aspectual morpheme, the simultaneous suffix selects for an Asp head that is phonologically null. It has the same semantics as the progressive suffix, locating the reference time within a non-final subpart of the event time.

(50) $[\![\varnothing_{\text{PROG}}]\!] = \lambda f \lambda t \exists e(f(e) \wedge t \subset_{nf} \tau(e)) : \langle \langle s,t \rangle, \langle i,t \rangle \rangle$

This lexical entry correctly predicts that the marked clause is compatible with an assertion of continuation for both accomplishment (51a) and activity (51b) predicates, even when it does not contain overt morphology expressing imperfective aspect.

(51) a. Su=nana t**ɨ**=kaadzi **madabbui-na**, yaisi t**ɨ**ggwisu u=madabbui-w**ɨ**nn**ɨ**.
NOM=man REFL=car **fix-SIM** PTC still 3SG.ACC=fix-PROG
'The man was fixing his car, and he is still fixing it.' (elicitation, EM, BP51-7, 42:10)

b. Su=nana **hubiadu-na**, yaisi tɨggwisu hubiadu-wɨnnɨ.
NOM=man **sing-SIM** PTC still sing-PROG
'The man was singing, and he is still singing.' (elicitation, EM, BP51-7, 41:23)

Similarly, the simultaneous suffix should interact in nontrivial ways with aktionsart. Just as with the progressive aspect, the simultaneous suffix all by itself is incompatible with achievements (52a) and induces an iterative interpretation with semelfactives (52b).

(52) a. # Su=nana **mia-na**, hubiatu.
NOM=man **go-SIM** sing.IMPF
Intended: 'While the man is leaving, he is singing.' (elicitation, EM, BP48-5, 21:08)

b. Nɨɨ **akwisiye-na**, su=naatsi'i=duadzu akwisiye-wɨnnɨ.
1SG.NOM **sneeze-SIM** NOM=boy=PTC sneeze-PROG
'While I am sneezing, the boy is sneezing, too.' (elicitation, EM, BP56-1, 41:03)
[EM: "More than once."]

There are contexts in other languages where aspect is not overtly marked. The future tense in French, for instance, is ambiguous between imperfective and perfective viewpoints. Because it can have either of these aspectual interpretations, Smith (1997:77–81) proposes that the future tense in French expresses a default aspect — the so-called neutral aspect — that has a relatively underspecified meaning. The neutral aspect requires the reference time to include only the initiation of an event, though it can optionally also include its termination (see also Pancheva 2003:282). In Northern Paiute, however, when there is no overt aspectual morphology, the simultaneous suffix is not interpreted with the neutral aspect that Smith proposes. In 49a–b, the reference time is included entirely in the process component of an accomplishment or activity, where it does not include the initiation of the event.[9]

2.3 The sequential suffix

I propose that the sequential suffix conveys a relative past tense. Like the simultaneous suffix, it takes the property of times expressed by AspP as its argument, requiring this property to hold of the reference time. But as shown in the lexical entry in 53, the sequential suffix requires the reference time of the marked clause (t_1) to *temporally precede* the evaluation time (t_0).

(53) *The semantics of the sequential suffix*
$[\![\text{-si}]\!] = \lambda f(f(t_1) \wedge t_1 < t_0) : \langle \langle i,t \rangle ,t \rangle$

Again, the evaluation time is a variable (t_0) that cannot receive an interpretation from the context. It will receive its value through semantic binding from the reference time of the unmarked clause, as I will discuss in further detail in the next section. This establishes the relation of temporal sequence between the marked clause and unmarked clause.

Just as expected, the clause chain in 54a is judged true in the context depicted in Figure 2, where the event of the boy waking up precedes the event of him discovering that the frog is missing.

[9] Schaden (2011:108–110) makes a similar argument even for the future tense in French.

Figure 2: While the boy is asleep, the frog escapes. After the boy wakes up, he notices the frog is gone. (Mercer Mayer. 1969. *Frog, where are you?* New York: Dial Books.)

(54) a. Su=naatsi'i tɨbuni-hu**-si**, tɨ=pa'mogo yaa-hu.
NOM=boy wake.up-PFV**-SEQ** REFL=frog miss-PFV
'After the boy woke up, he missed his frog.' (elicitation, EM, BP53-3, 1:06:05)

b. # Su=naatsi'i tɨbuni-wɨnnɨ**-na**, tɨ=pa'mogo yaa-hu.
NOM=boy wake.up-PROG**-SIM** REFL=frog miss-PFV
Intended: 'While the boy was waking up, he missed his frog.' (elicitation, EM and MS, BP53-3, 1:07:08)
[EM: "Probably would be lying, init?[. . .]" MS: "He not quite awake." EM: "He's not real awake."]

The parallel clause chain with the simultaneous suffix in 54b is judged false in the same context, by contrast, since it requires the marked clause to temporally include the unmarked clause.

Unlike the present tense, the past tense is, in general, compatible with perfective aspect. The sequential suffix cooccurs with both the progressive suffix *-wɨnnɨ* (55b) and with the perfective suffix (55c).

(55) a. Su=nana tɨ=kaadzi **madabbui-si**, yaisi u=ddza-kana-ggɨ-hu.
NOM=man REFL=car **fix-SEQ** PTC 3SG.ACC=IP.fingers-grab-APPL-PFV
'The man fixed his car, and then he started it.' (elicitation, EM and MS, BP50-1, 5:50)

b. T**ɨ**=kaadzi **madabbui-w**ɨ**nn**ɨ**-si**, yaisi sonap**ɨ**na-p**ɨ**nni.
REFL=car **fix-PROG-SEQ** PTC take.break-STAT
'He was fixing his car, and then he took a rest.' (elicitation, EM, BP50-1-s, 6)

c. Su=nana t**ɨ**=kaadzi **madabbui-hu-si**, yaisi u=ddza-kana-gg**ɨ**-hu.
NOM=man REFL=car **fix-PFV-SEQ** PTC 3SG.ACC=IP.fingers-grab-APPL-PFV
'The man fixed his car, and then he started it.' (elicitation, EM, BP50-1-s, 1)

When the sequential suffix appears without overt aspectual morphology, e.g. 55a, I propose that it, too, must select for a phonologically null Asp head.

As a default, this has the same semantics as the perfective suffix: the reference time must contain the event time.

(56) $[\![\varnothing_{\text{PFV}}]\!] = \lambda f \lambda t \exists e(f(e) \wedge \tau(e) \subseteq t) : \langle \langle s,t \rangle, \langle i,t \rangle \rangle$

Accordingly, it should be possible for the reference time of the marked clause to include the event time, even if the sequential suffix does not select for the perfective suffix. This is indeed the case.

(57) Context: The boy started and finished singing yesterday. Now, he's dancing.

a. **Idzi'i** su=naatsi'i **hubiadu-si**, mino'o n**ɨ**ga-w**ɨ**nn**ɨ**.
yesterday NOM=boy **sing-SEQ** now dance-PROG
'Yesterday, the boy sang, and now he is dancing.' (elicitation, EM, BP52-2, 28:20)

b. **Idzi'i** su=naatsi'i **hubiadu-hu-si**, mino'o n**ɨ**ga-w**ɨ**nn**ɨ**.
yesterday NOM=boy **sing-PFV-SEQ** now dance-PROG
'Yesterday, the boy sang, and now he is dancing.' (elicitation, EM, BP52-2, 29:20)

The singing event described by the marked clause in 57a is included within the reference time delimited by *idzi'i* 'yesterday'. The control sentence with the perfective suffix in 57b is judged true in the same context.

If the sequential suffix can only select for the phonologically null Asp head in 56, then it should always require event termination. Somewhat surprisingly, however, even when there is no overt marker of imperfective aspect, the sequential suffix is compatible with an assertion of continuation.

(58) a. Su=naatsi'i t**ɨ**=kaadzi **madabbui-si**, yaisi t**ɨ**ggwisu u=madabbu'i.
NOM=boy REFL=car **make-SEQ** PTC still 3SG.ACC=make.IMPF
'After the boy was fixing his car, he was still fixing it.' (elicitation, EM and MS, BP49-3, 1:19:55)

b. Su=naatsi'i t**ɨ**=kaadzi **madabbui-w**ɨ**nn**ɨ**-si**, yaisi t**ɨ**ggwisu u=madabbu'i.
NOM=boy REFL=car **make-PROG-SEQ** PTC still 3SG.ACC=make.IMPF
'After the boy was fixing his car, he was still fixing it.' (elicitation, EM, BP52-2, 39:15)

c. # Su=naatsi'i t**ɨ**=kaadzi **madabbui-hu-si**, yaisi t**ɨ**ggwisu u=madabbu'i.
NOM=boy REFL=car **make-PFV-SEQ** PTC still 3SG.ACC=make.IMPF
Intended: 'After the boy was fixing his car, he was still fixing it.' (elicitation, EM and MS, BP49-3, 1:16:19)
[EM: "No, you can't say that." MS: "No, *madabbuihusi* means he's done, he's gone."]

It is not contradictory to follow up the marked clause in 58a with an assertion that the event is still ongoing. Such an assertion of continuation is possible when the marked clause contains the progressive suffix (58b), but not the perfective suffix (58c).

To account for this fact, I propose that the sequential suffix can select for a phonologically null Asp head that conveys either perfective aspect (56) or imperfective aspect (50). It selects for the latter in 58a, so that no contradiction arises. Accordingly, if the sequential suffix can select for imperfective aspect, the reference time of the marked clause should be able to be included within the event time.

(59) Context: The man started fixing his car at 1 o'clock; he finished fixing it at 3 o'clock. At 2 o'clock, while he was fixing his car, the woman came into the house.

a. **Waha-ggwe** su=nana ti=kaadzi **madabbui-si**, su=mogo'ni nobi-ggwe
two-LOC NOM=man REFL=car **fix-SEQ** NOM=woman house-LOC
iga-hu.
enter-PFV
'At two o'clock, the man was fixing his car, and then the woman came into the house.' (elicitation, EM, BP52-2, 45:47)

b. **Waha-ggwe** su=nana ti=kaadzi **madabbui-winni-si**, su=mogo'ni
two-LOC NOM=man REFL=car **fix-PROG-SEQ** NOM=woman
nobi-ggwe iga-hu.
house-LOC enter-PFV
'At two o'clock, the man was fixing his car, and then the woman came into the house.' (elicitation, EM, BP52-2, 46:45)

c. # **Waha-ggwe** su=nana ti=kaadzi **madabbui-hu-si**, su=mogo'ni nobi-ggwe
two-LOC NOM=man REFL=car **fix-PFV-SEQ** NOM=woman house-LOC
iga-hu.
enter-PFV
Intended: 'At two o'clock, the man was fixing his car, and then the woman came into the house.' (elicitation, EM and MS, BP52-3, 35:00)
[EM: "Probably *isaya'e* ['lie'], init?[...]Then he worked till three."]

Indeed, when the sequential suffix does not select for overt aspectual morphology, the reference time can be included within the process component of an event (59a). Crucially, this is also the case when it selects for the progressive suffix (59b), but not the perfective suffix (59c).

I have been treating the sequential suffix as a type of tense — rather than aspect — because the marked clause can have both imperfective and perfective interpretations. The combination of past tense and perfective aspect is not, however, that different from perfect aspect, which locates the reference time after the event time, at least under one analysis (Klein 1994:109). It is possible, Bohnemeyer (2014) observes, to distinguish these alternatives using temporal adverbials.

(60) Context: The man started fixing his car at 9 o'clock; he finished fixing it at 12 o'clock. He drove off at 2 o'clock.

a. # **Waha-ggwe** su=nana ti̵=kaadzi **madabbui-si**,
two-LOC NOM=man REFL=car **fix-SEQ**
u=ddza-mia-ggi̵-huka.
3SG.ACC=IP.fingers-go-APPL-INCEP
Intended: 'At two o'clock, the man finished fixing his car, and then he drove it off.'
(elicitation, EM, BP50-7, 15:40)
[EM: "Well, you're lying[...]because you finished it at twelve o'clock."]

b. # **Waha-ggwe** su=nana ti̵=kaadzi **madabbui-hu-si**,
two-LOC NOM=man REFL=car **fix-PFV-SEQ**
u=ddza-mia-ggi̵-huka.
3SG.ACC=IP.fingers-go-APPL-INCEP
Intended: 'At two o'clock, the man finished fixing his car, and then he drove it off.'
(elicitation, EM, BP50-7, 14:42)
[EM: "*Isaya'e*['Lie'...]because he finished his car at twelve o'clock."]

When the marked clause contains no overt aspectual morphology, the reference time cannot follow the event time (60a). This is also true when it selects for the perfective suffix (60b). In neither example does the marked clause receive a perfect interpretation. Consequently, the sequential suffix itself must convey relative past tense.

3 The temporal semantics of clause chaining

How does this semantics for the simultaneous and sequential suffixes give rise to the temporal interpretation of clause chaining? As dedicated markers of relative tense, they introduce a variable for the evaluation time (t_0) that is not able to get its value from the context. It can neither refer to the utterance time nor to any other salient time interval.[10] Thus, the simultaneous and sequential suffixes can never occur in an independent sentence: the evaluation time would not have a value.[11] Instead, it must get its value from surrounding linguistic material. This can only happen when the evaluation time of the marked clause is bound by an appropriate operator in certain syntactic configurations.

In many languages, relative tenses only occur in embedded clauses, where the evaluation time can gets its value from the main clause. In English, for instance, relative tense shows up in the complement clause of propositional attitude verbs, such as *think*.

(61) He thought [that a burglar attacked him]. (Abusch 1997:4)

The past tense in English is ambiguous between an absolute tense, which locates the reference time before the utterance time, and a relative tense. There is an interpretation for the sentence in 61 in

[10] More formally, we might say that, for any model and any assignment, the denotation of the atomic expression containing just the variable t_0 is undefined.

[11] This is also why the evaluation time cannot be bound by a λ-operator in the lexical entry for the simultaneous and sequential suffixes. Then, the marked clause would express a property of times all by itself, and there is no reason the Root Clause Rule would not be able to apply to it.

which the evaluation time of the embedded clause is not the utterance time, but rather the reference time of the main clause. The time at which the burglar attacked him precedes *the time at which he was thinking*.

There is crosslinguistic variation in the environments where relative tense occurs. In some languages, it is restricted to the complements of propositional attitude verbs, e.g. English (Abusch 1997), Hebrew (Hatav 2010), and Russian (Barentsen 1996, Schlenker 2003:70f.). But in some languages, other embedded contexts can allow for relative tense. In relative clauses and temporal adjunct clauses in Japanese, the evaluation time of the embedded present or past tense can be identified with the reference time of the main clause (Ogihara 1994, 1995, 1996).

(62) *Japanese*

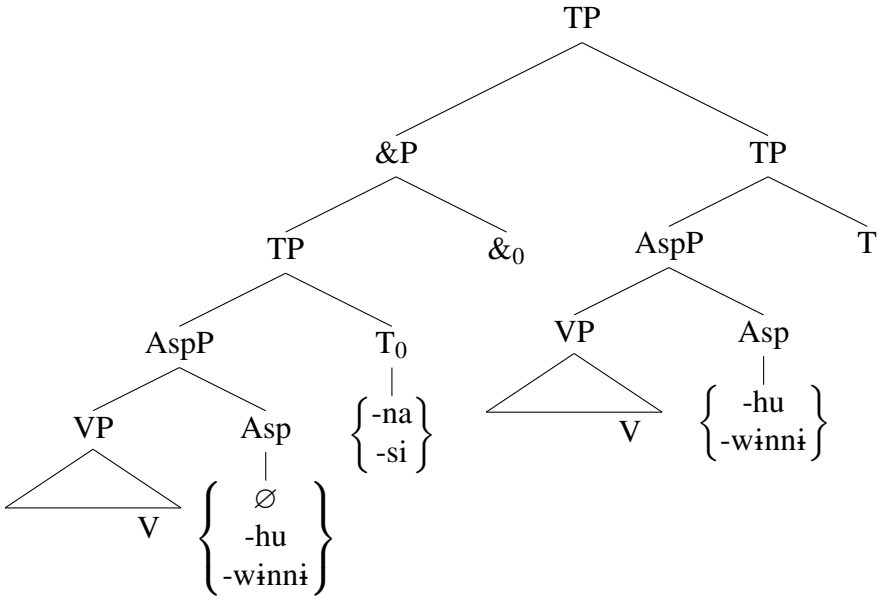
a. Taroo-wa [nai-te i-ru otok]-o mi-ta.
Taro-TOP cry-PROG-PRS man-ACC see-PST
'Taro saw a man who was crying (at the time of the meeting).' (Ogihara 1996:153)

b. Taroo-wa [nooberu-syoo-o tot-ta otoko]-o sagasi-ta.
Taro-TOP Nobel-prize-ACC win-PST man-ACC seek-PST
'Taro looked for a/the man who won a Nobel prize.' (Ogihara 1996:159)

In 62a, for example, the reference time of the relative clause is not related to the utterance time, but rather to the reference time of the main clause. The time at which the man was crying overlaps with the time at which Taro saw him. (See Ogihara and Sharvit 2012 for a recent survey of this crosslinguistic variation.)

I propose that coordination is another syntactic environment where relative tenses can occur. There is evidence from many languages that coordination structures are not symmetrical, but that the coordinator forms a constituent with one of the coordinates (see Ross 1967:162–165 and much subsequent work). Under this view, clause chaining in Northern Paiute could have an asymmetrical structure.

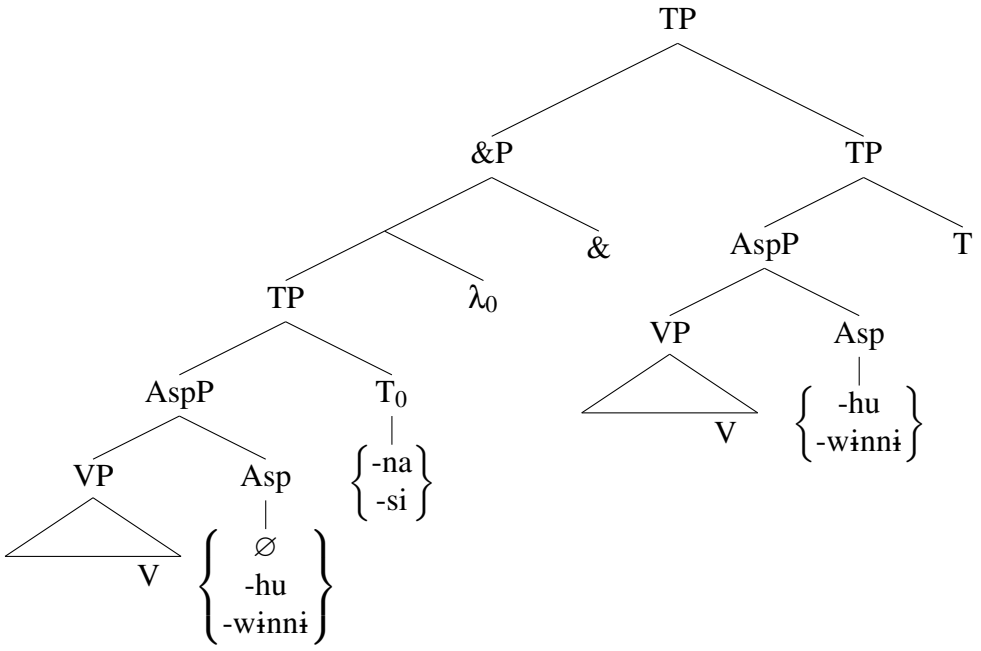
(63) *The syntax of clause chaining in Northern Paiute (final version)*



I treat the asyndetic coordinator as a head that takes one coordinate as its complement (Munn 1993). The resulting phrase then adjoins to the other coordinate, creating a coordinate structure whose category is identical to that of both coordinates.

The simultaneous and sequential suffixes can occur in the first coordinate of 63 because the coordinator introduces an operator that can bind the evaluation time of the marked clause. This language-specific property of Northern Paiute can be represented as an index on the asyndetic coordinator, following Kratzer (2009:194). For the purposes of the semantics, this index is parsed as a λ-operator that takes scope over the asyndetic coordinator's complement, abstracting over any variable whose index matches its own.

(64)



In this way, the λ-operator binds the evaluation time of the marked clause, creating a property of (evaluation) times.[12] The asyndetic coordinator can then combine the marked clause with the unmarked clause, which already expresses a property of (reference) times (as discussed in Section 2.1). As a result, the evaluation time of the marked clause is identified with the reference time of the unmarked clause, and the simultaneous and sequential suffixes end up expressing a temporal relation between the reference times of the marked and unmarked clauses.

More generally, this analysis of clause chaining in Northern Paiute supports a broader typology of lexical items that can introduce a λ-operator. From the distribution of relative tense, we know that certain content morphemes must be able to come with a binder, e.g. propositional attitude verbs (von Stechow 1995). In addition, DPs that have undergone movement (Heim and Kratzer 1998:186) and some functional morphemes (Adger and Ramchand 2005, Kratzer 2009) have been argued to introduce a λ-operator. To this list, coordinators can be added, perhaps not even just for

[12]What ensures that the index on the asyndetic coordinator matches only that of the evaluation time? McKenzie (2012:191f.) proposes that the lexical item introducing a binder can agree with the variable-denoting expression, obtaining the correct index in that way. For clause chaining in Northern Paiute, this feature transmission mechanism may not be needed. If the asyndetic coordinator bore an index other than that of the evaluation time in the marked clause, the sentence would be ungrammatical. By hypothesis, it cannot receive a value from the context, and so must eventually be bound.

clause chaining in Northern Paiute. To account for the properties of switch reference in Kiowa, McKenzie (2012:218–228) argues that coordinators, as well as certain subordinators, come with a λ-operator that binds a variable introduced by switch reference markers.

In Section 3.1, I go through a detailed derivation for a basic case of clause chaining in Northern Paiute, showing that the correct truth conditions arise compositionally. This semantics makes a couple predictions, which I show are borne out. First, it predicts that the meaning of a clause chain should not be affected by the linear order of the clauses, because they are related by semantic binding. Indeed, in Section 3.2, I show that a marked clause containing the sequential suffix always temporally precedes the unmarked clause, regardless of whether it precedes or follows it linearly. Second, this semantics provides relatively weak truth conditions for clause chains that contain multiple marked clauses. This is necessary, I argue in Section 3.3, for when the marked clauses are not themselves temporally related to one another.

3.1 Deriving temporal simultaneity and sequence

I proposed above that the λ-operator introduced by the asyndetic coordinator binds the evaluation time in the marked clause, abstracting over it to create a property of times. The unmarked clause already expresses a property of times, which in an independent sentence would be directly predicated of a time interval from the context by the Root Clause Rule. But in a clause chain, the property of times expressed by the unmarked clause is first combined by the asyndetic coordinator with the property of times expressed by the marked clause.

As shown in the lexical entry in 65, I take the asyndetic coordinator to express a generalized version of logical conjunction (Rooth and Partee 1982). When it combines two properties of times, their conjunction is true of a time interval just in case each property is individually true of that time interval.

(65) *The semantics of asyndetic coordination*
$[\![\&]\!] = \lambda f \lambda g \lambda t (f(t) \wedge g(t)) : \langle \langle i,t \rangle, \langle \langle i,t \rangle, \langle i,t \rangle \rangle \rangle$

Since the marked clause expresses a property of (evaluation) times and the unmarked clause expresses a property of (reference) times, the resulting conjoined property will be true of a time in the context just in case the property expressed by each clause holds of it individually. The evaluation time of the marked clause is as a result identified with the reference time of the unmarked clause. The simultaneous and sequential suffixes end up establishing a relation of either temporal simultaneity or sequence between the reference times of the marked and unmarked clauses.

To see this more formally, consider the following clause chain containing the simultaneous suffix, repeated from 48b above.

(66) Su=naatsi'i tɨ=kaadzi madabbui-wɨnnɨ-na, yaisi hubiadu-wɨnnɨ.
NOM=boy REFL=car make-PROG-SIM PTC sing-PROG
'While the boy is fixing his car, he is singing.' (elicitation, EM, BP50-1, 9:19)

The semantic derivation of 66 is given in Figure 3. In words, the unmarked clause expresses a property of time intervals (①). Before λ-abstraction, the marked clause denotes a truth value (②). Once the evaluation time introduced by the simultaneous suffix is abstracted over, the marked clause also expresses a property of time intervals (③). The asyndetic coordinator combines the

marked and unmarked clauses to yield a conjoined property of time intervals (④). Consequently, once the Root Clause Rule has applied, the whole clause chain is true at a time t_2 in the context just in case: (i) t_2 is contained in another time t_1 in the context that is itself contained in a nonfinal segment of the event of the boy fixing his car, and (ii) t_2 is contained in a nonfinal segment of the event of the boy singing (⑤). In other words, the sentence in 66 is true just in case the two events overlap in time.

The semantic derivation for the following clause chain containing the sequential suffix, repeated from 54a, proceeds in the same way.

(67) Su=nana tɨ=kaadzi madabbui-hu-si, yaisi u=ddza-kana-ggɨ-hu.
NOM=man REFL=car fix-PFV-SEQ PTC 3SG.ACC=IP.fingers-grab-APPL-PFV
'The man fixed his car, and then he started it.' (elicitation, EM, BP50-1-s, 1)

I do not provide a complete semantic derivation for this sentence, but its final translation, after the Root Clause Rule applies, is given below.

(68) $(\exists e(\textbf{fix}(\textbf{his-car})(\textbf{the-man})(e) \wedge \tau(e) \subseteq t_1) \wedge t_1 < t_2) \wedge$
$\exists e'(\textbf{start}(\textbf{his-car})(\textbf{the-man})(e') \wedge \tau(e') \subseteq t_2)$ $= 67$

In prose, the entire clause chain is true at a time t_2 in the context just in case: (i) t_2 is located after a time t_1 in the context that contains the event of the man fixing his car, and (ii) t_2 itself contains the event of the man starting his car. Consequently, the sentence in 67 is true just in case the event described by the marked clause temporally precedes the event described by the unmarked clause.

I have used semantic binding — specifically, abstraction over a variable introduced by the simultaneous or sequential suffix — to identify the evaluation time of the marked clause with the reference time of the unmarked clause. This mechanism is parallel to the one that McKenzie (2012:218–228) uses to account for switch reference in Kiowa.

(69) *Kiowa*
John hɛ́bà nàu Sam èm kɪ̄fàu.
John 3SG.enter.PFV and.DS Sam 3SG.REFL leave.PFV
'John entered, and Sam left.' (McKenzie 2012:219)

McKenzie proposes that the coordinator in 69 introduces a λ-operator that binds a variable contributed by the switch reference marker inside one coordinate. This creates a property that is combined with the property conveyed by the other coordinate. Finally, this conjoined property is predicated of an element in the context. This parallelism is striking, suggesting that the same mechanism may be responsible for establishing the temporal relations in clause chaining and switch reference marking. While Northern Paiute does not have switch reference marking in clause chaining, many other languages do (Longacre 2007:399).

3.2 When the marked clause follows the unmarked clause

This semantics makes an interesting prediction about chains in which the marked clause *linearly follows* the unmarked clause. In Northern Paiute, this happens not infrequently with both the simultaneous (70a–b) and sequential (71a–b) suffixes.

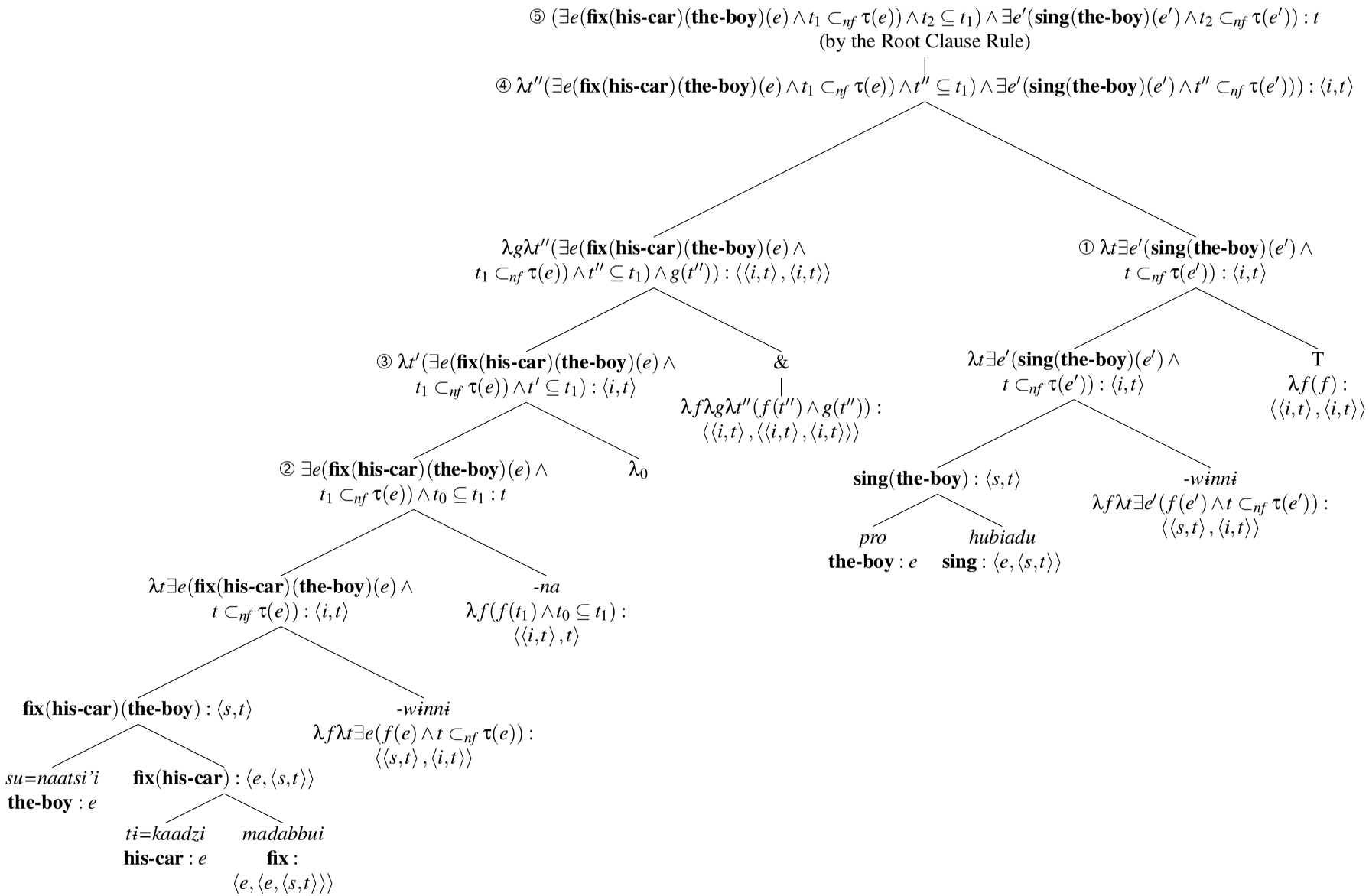


Figure 3: The semantic derivation for the clause chain in 66.

(70) a. Yaisi ka=ggwitua tɨggwisu tɨ=ddzotɨ'a ddɨggwa'ni mani-katɨ, **yaa paa'a-we**
PTC ACC=pail still REFL=hat look.like do-sit.IMPF **there water-LOC**
katɨ-na.
sit-SIM
'He still has the pail on his head that looks like a hat, while sitting in the water.' (prompted narrative, MS, BP24-1-t3, 42)

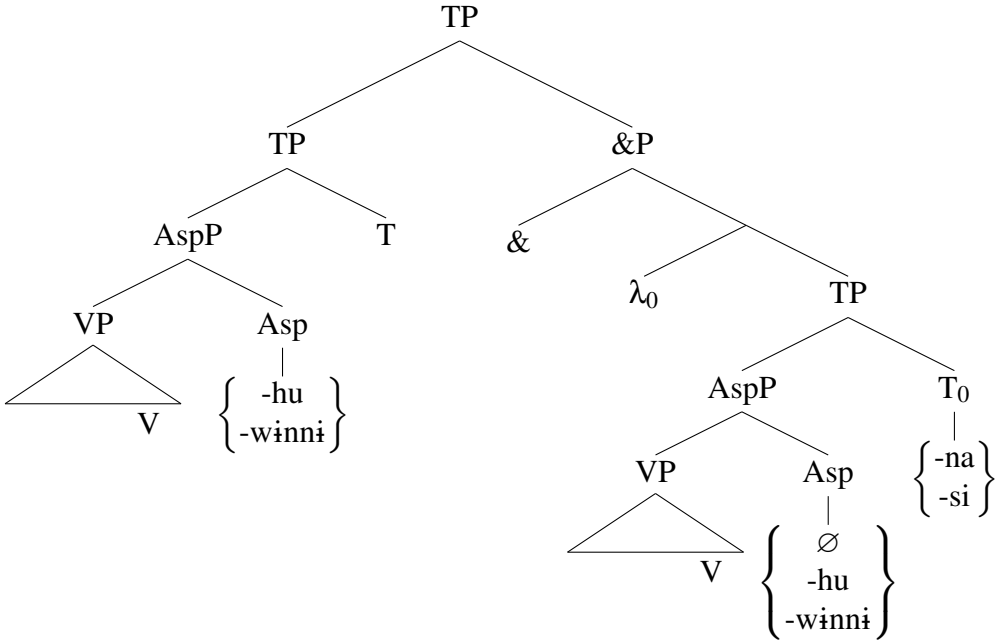
b. Yaa=bɨno'o moko ddakwi-ggwaddi, **mɨ=naatsi'i wotui-na**.
there=PTC shoe sit.DL.IMPF-DL **PL=boy wait-SIM**
'The shoes are sitting there, waiting for the boys.' (prompted narrative, MS, BP24-1-t3, 98)

(71) a. Yaisi yaa su=hɨbbɨ tɨhɨdda mia-hu, **umɨ-ma sɨe-hu-si**.
PTC there NOM=thing deer go-PFV **2/3PL.ACC-LOC get.scared-PFV-SEQ**
'The deer left because it got scared of them.' (prompted narrative, EM, BP25-2-t1, 93–95)

b. Yaisi pisa=ga ha'o mɨ=igwi načodau umɨ **tɨ=tua-mɨ**
PTC good=MOD how 2/3PL.ACC=smell tracks 2/3PL.ACC **REFL=child-PL**
na-koi-si[...]
PASS-kill.PL-SEQ
'Then she could really smell them, that her children were killed[...]' (narrative, Thornes 2003:496)

To account for this variation in the linear position of the marked clause, I propose that asyndetic coordination is structurally ambiguous in Northern Paiute. While the coordinator can form a constituent with the first coordinate, it forms a constituent with the *second* coordinate in 70–71. This way, the simultaneous or sequential suffix can be bound in the second coordinate by a λ-operator.

(72)



While this kind of structural ambiguity does not seem common, Northern Paiute may not be alone. In Lavukaleve (Central Solomons: Russell Islands), "pauses before coordinators are roughly equal

in frequency to pauses after the coordinator" (Terrill 2004:430). If these pauses correspond to constituency boundaries, then in this language, too, the coordinator can be parsed with either the first or the second coordinate.

Let me briefly consider an alternative. In many languages, a coordinate can be extraposed to the end of the sentence, along with the coordinator (Haspelmath 2004:7f.). But if the marked clause in 70–71 had been extraposed, it should be an island for extraction. In fact, wh-movement in an across-the-board fashion is possible even when the marked clause follows the unmarked clause.

(73) a. **Himma**$_1$ su=naatsi'i **t**$_1$ tɨka, yaisi su=mogo'ni=bɨno'o **t**$_1$ tɨka-na?
what NOM=boy eat.IMPF PTC NOM=woman=PTC eat-SIM
'What, while the woman eats it, does the boy eat, too?' (cf. *What*$_1$ *does the boy eat* t_1*, and the woman eat* t_1*, too?*) (elicitation, EM, BP50-4, 29:14)

b. **Haga**$_1$ su=nana **t**$_1$ mutuhe-hu, su=naatsi'i=bɨno'o **t**$_1$ mutuhe-hu-si?
who NOM=man kiss-PFV NOM=boy=PTC kiss-PFV-SEQ
'Who, after the boy kissed them, did the man kiss, too?' (cf. *Who*$_1$ *did the man kiss* t_1*, and the boy kissed* t_1*, too?*) (elicitation, EM, BP50-4, 31:34)

Under the structure in 72, this extraction from both clauses is expected, since no coordinate has been extraposed.

If asyndetic coordination in Northern Paiute is structurally ambiguous, we can neatly capture the fact that not all languages allow the marked clause to follow the unmarked clause. In Amele (Trans-New Guinea: New Guinea), the marked clause invariably precedes the unmarked clause.

(74) *Amele*

a. **Ho busale-ce-b** dana age qo-ig-a.
pig run.out-SEQ.DS-3SG man 3PL hit-3PL-TPAST
'The pig ran out, and the men killed it.' (Roberts 1988:53)

b. * Dana age qo-ig-a **ho busale-ce-b**.
man 3PL hit-3PL-TPAST **pig run.out-SEQ.DS-3SG**
(Roberts 1988:56)

According to Roberts (1988:53–58), clause chaining in Amele has a coordination structure. If the language only allows the coordinator to form a constituent with the first coordinate, then the marked clause should only be able to linearly precede the unmarked clause. Besides Northern Paiute, I know of only one other language that allows for the same variable order for the marked clause: Mbyá Guaraní (Tupí: Brazil; Dooley 2010:93f.). The relative rarity of clause chaining with this property could be derived from the relative rarity of coordination structures that are structurally ambiguous.

When the marked clause follows the unmarked clause, the semantics that I have proposed predicts that it should have the same temporal interpretation it does when it precedes the unmarked clause. This is because the temporal relation between the evaluation time of the marked clause and the reference time of the unmarked clause does not depend in any way on linear order. Indeed, in (70a–b), the marked clauses containing the simultaneous suffix are interpreted as temporally overlapping the unmarked clause. More strikingly, when the marked clause contains the sequential suffix, it still *temporally precedes* the unmarked clause. In 71a, the event of the deer getting scared

(by the boy and dog) precedes the event of it leaving. Similarly, in 71b, the event of the mother bear's children getting killed precedes the event of her smelling them and their tracks.

Without going through a complete semantic derivation, the clause chain in 71a has the following final translation, after the Root Clause Rule applies.

(75) $\exists e(\textbf{go}(\textbf{the-deer})(e) \wedge \tau(e) \subseteq t_1) \wedge (\exists e'(\textbf{get-scared}(\textbf{the-deer})(e') \wedge \tau(e') \subseteq t_2) \wedge t_2 < t_1)$
$= 71a$

In words, even though the marked clause follows the unmarked clause in linear order, the entire sentence is true at a time t_1 provided by the context just in case: (i) t_1 includes the event of the deer leaving, and (ii) t_1 follows a time t_2 in the context that includes the event of the deer getting scared. That is, it is true just in case the event of the deer getting scared *precedes* the event of the deer leaving.

This temporal relation between the marked and unmarked clauses is entailed. Clause chains are judged as true only when the event described by a marked clause bearing the sequential suffix precedes the event described by the unmarked clause in time, regardless of whether it precedes (76a) or follows (76b) in linear order. (Speakers were asked to provide truth value judgments for the sentences below with respect to the state of affairs depicted in Figure 2.)

(76) a. **Su=pa'mogo wadzi-mia-hu-si**, su=naatsi'i tɨbuni-hu.
NOM=frog hide-go-PFV-SEQ NOM=boy wake.up-PFV
'After the frog escaped, the boy woke up.' (elicitation, EM, BP38-2, 18:16)

b. Su=naatsi'i tɨbuni-hu, **su=tɨɨtsi-'yu pa'mogo wadzi-mia-hu-si**.
NOM=boy wake.up-PFV **NOM=little-NOM frog hide-go-PFV-SEQ**
'After the little frog escaped, the boy woke up.' (elicitation, EM, BP42-7-s, 8)

c. # **Su=naatsi'i tɨbuni-hu-si**, su=pa'mogo wadzi-mia-hu.
NOM=boy wake.up-PFV-SEQ NOM=frog hide-go-PFV
Intended: 'After the frog escaped, the boy woke up.' (elicitation, MS, BP38-2, 19:16)
[MS: "No, that would be after he woke up, but this is when he went to sleep."]

d. # Su=pa'mogo wadzi-mia-hu, **su=tɨɨtsi-'yu naatsi'i tɨbuni-hu-si**.
NOM=frog hide-go-PFV **NOM=little-NOM boy wake.up-PFV-SEQ**
Intended: 'After the frog escaped, the little boy woke up.' (elicitation, EM, BP43-4, 22:39)
[EM: "If he was awake and the frog left, then you could say that."]

When the marked clause instead describes the event of the boy waking up — which in the context provided temporally follows the event of the frog escaping — speakers correspondingly judge the clause chain as false (76c–d).

This is perhaps somewhat surprising given the general preference in language for iconicity. In particular, as I will discuss in the next section, sentences in narrative discourse get a 'forward moving' temporal interpretation that mirrors their linear order (Kamp and Rohrer 1983, among others). But, as the semantics I have proposed for clause chaining in Northern Paiute correctly predicts, the position of the marked clause does not matter for its temporal interpretation with respect to the unmarked clause. If it contains the sequential suffix, it is interpreted as temporally preceding the unmarked clause, even when it follows it in linear oder.

3.3 When there are multiple marked clauses

When there is more than one marked clause with the sequential suffix, speakers often report that they are temporally related, not just to the unmarked clause, but also to one another.

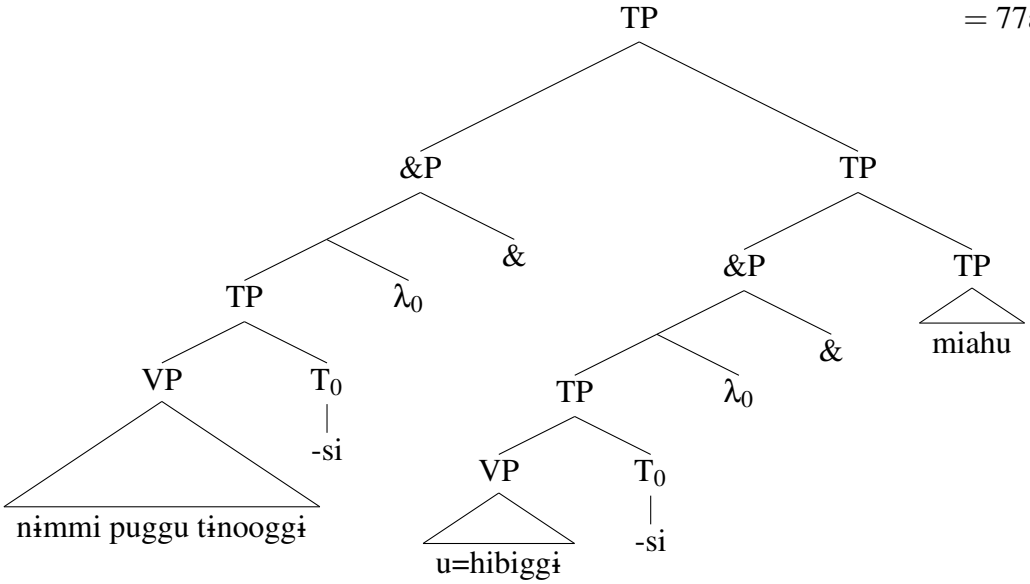
(77) a. **Nɨmmi puggu tɨnoo-ggɨ-si, u=hibi-ggɨ-si,** mia-hu.
1PL.EXCL.NOM horse pack-APPL-SEQ 3SG.ACC=drink-APPL-SEQ go-PFV
'**We packed up the horses, and then we watered them**, and then we left.' (elicitation, EM, BP44-2, 14:20)
[MT: "What happened first?[. . .]" EM: "Pack the horses. Then you gave them water, and then you left."]

b. **Nɨmmi puggu hibi-ggɨ-si, u=ddɨnoo-ggɨ-si,** mia-hu.
1PL.EXCL.NOM horse drink-APPL-SEQ 3SG.ACC=pack-APPL-SEQ go-PFV
'**We watered the horses, and then we packed them up**, and then we left.' (elicitation, EM, BP44-2, 16:12)
[EM: "You fed'em first, and then you pack it, and then you. . . "]

In 77a, the event of packing the horses described by the first marked clause is interpreted as temporally preceding the event of watering them described by the second marked clause. When the linear order of the two marked clauses is reversed, as in 77b, the temporal relation between them is also reversed.

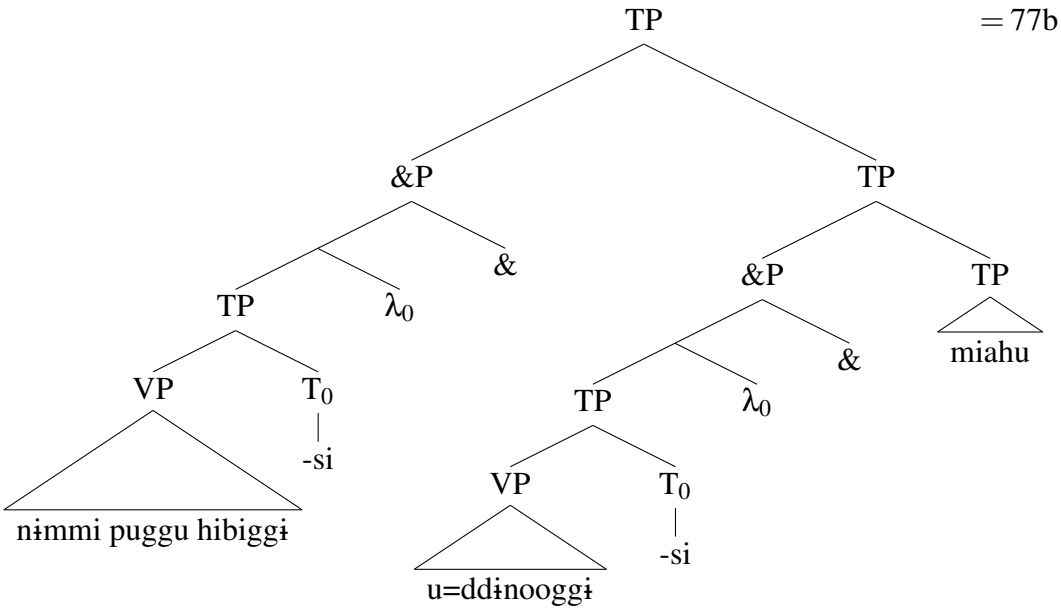
With the semantics for clause chaining in Northern Paiute I have proposed, however, the sentences in 77a and 78b have the same semantic content. To see this, consider their structures in 78a and 78b, respectively.[13] These are the identical except for the order of the two marked clauses.

(78) a. = 77a



[13]There is no other structure for these sentences that allows for the evaluation time of both marked clauses to be bound and for all three clauses to be combined by asyndetic coordination. Consider, for instance, an alternative structure in which the two marked clauses are first coordinated, and then this coordination structure combines with the unmarked clause: [TP [&P [TP [&P [TP VP-si] &] [TP VP-si]] &] [TP VP]]. While the evaluation time in both marked clauses is bound, they will not be able to compose semantically because of a type mismatch. The &P containing the first marked clause expresses a property of times, while the TP containing the second marked clause denotes a truth value.

b. = 77b



In both structures, each marked clause is located temporally before the unmarked clause. But the marked clauses are not related temporally to one another in any way.

More formally, the sentences in 77a and 77b have the final translations in 79a and 79b, respectively. Despite their different forms, they are logically equivalent.

(79) a. $(\exists e(\textbf{pack}(\textbf{the-horses})(\textbf{we})(e) \wedge \tau(e) \subseteq t_1) \wedge t_1 < t_3) \wedge$
$(\exists e'(\textbf{water}(\textbf{the-horses})(\textbf{we})(e') \wedge \tau(e') \subseteq t_2) \wedge t_2 < t_3) \wedge$
$\exists e''(\textbf{take-off}(\textbf{we})(e'') \wedge \tau(e'') \subseteq t_3)$ = 77a

b. $(\exists e(\textbf{water}(\textbf{the-horses})(\textbf{we})(e) \wedge \tau(e) \subseteq t_1) \wedge t_1 < t_3) \wedge$
$(\exists e'(\textbf{pack}(\textbf{the-horses})(\textbf{we})(e') \wedge \tau(e') \subseteq t_2) \wedge t_2 < t_3) \wedge$
$\exists e''(\textbf{take-off}(\textbf{we})(e'') \wedge \tau(e'') \subseteq t_3)$ = 77b

In both sentences, the evaluation time of each marked clause is identified with the reference time of the unmarked clause. Thus, in the final translations of both sentences, the entire clause chain is true at a time in the context just in case: (i) that time includes the event described by the unmarked clause, and (ii) for each marked clause, that time follows a time that includes the event described by the marked clause. As a consequence, the linear order of the marked clauses does not matter, since they are not temporally related to each other.

Setting aside for the moment the speakers' reports about the sentences in 77a–b, this relatively weak semantics is necessary to account for clause chains in which two marked clauses with the sequential suffix overlap in their temporal interpretation.

(80) a. **O'o-no yaisi una-tu kwaya mia-si**, **sogo-mia-si**, una-u
DEM-with PTC DEM-LOC far go-SEQ on.foot-go-SEQ DEM.ACC-EMPH
yaisi uuni-kwai pitɨ-ga na-tɨhona-dɨ-kwai.
PTC that.kind-LOC arrive-MOT PASS-dig.roots-NMLZ-LOC
'**So then it was that they went far off, going on foot**, and arrived there at the root digging place.' (narrative, Thornes 2003:486)

b. **Yaa hɨbbɨ-ggwe-tu paba tiipɨ hani-si**, **o=wɨ-taggi-si**,
there place-LOC-LOC big earth do-SEQ 3SG.ACC=IP.long-make.hole-SEQ
yaisi oi-tu painɨtsi oi-tu wokwati-kwɨ.
PTC there-LOC pinenuts there-LOC dump-IRR
'**At that place, after we dig a lot of dirt and we make a big hole in the ground**, then we will dump the pinenuts in there.' (elicitation, EM, BP13-4-t9, 5)

In 80a, the first marked clause describes an event of leaving, which overlaps with the second marked clause, which describes an event of leaving on foot. Rather than occurring in a temporal sequence, the second marked clause elaborates on the first marked clause by adding more detail. Similarly, in 80b, the second marked clause does not describe an event that temporally follows the event described by the first marked clause; it simply contributes additional information about how the hole digging happened.

The same fact can also be shown more directly. Speakers judge clause chains like the one in 81a true, even when the events described by two marked clauses overlap temporally.

(81) Context: The boy and girl are at home. Instead of studying, he is playing and she is dancing at the same time. They both stop before their mother comes home.

a. **Su=naatsi'i ti'tia-hu-si**, **su=tsɨa'a nɨga-hu-si**, su=mogo'ni
NOM=boy play-PFV-SEQ NOM=girl dance-PFV-SEQ NOM=woman
nobi-ggwe iga-hu.
house-LOC enter-PFV
'**After the boy played and the girl danced**, the woman came home.' (elicitation, EM, BP53-3, 51:12)
[EM: "They probably doing that when the lady was not there[. . .]at the same time. Then she came in after they were through."]

b. **Su=tsɨa'a nɨga-hu-si**, **su=naatsi'i ti'tia-hu-si**, su=mogo'ni nobi-ggwe
NOM=girl dance-PFV-SEQ NOM=boy play-PFV-SEQ NOM=woman house-LOC
iga-hu.
enter-PFV
'**After the girl danced and the boy played**, the woman came home.' (elicitation, EM, BP53-3, 54:00)
[EM: "They mean the same thing."]

Importantly, the liner order of the marked clauses does not matter. Speakers judged the clause chain in 81b as true in the same context, since it has the same semantic content as 81a.

As we have seen, the semantics that I have proposed for clause chaining in Northern Paiute only establishes a temporal relation between each marked clause and the unmarked clause. This correctly predicts that, when there is more than one marked clause containing the sequential suffix, they can overlap temporally, though they must both temporally precede the unmarked clause. There must be more to the meaning of clause chaining in Northern Paiute, however, since speakers report temporal relations between the marked clauses. In the next section, I argue that these do not arise from the semantics of clause chaining, but from the way that it is interpreted in discourse.

Before moving on, though, I would like to mention another prediction this account makes. In Northern Paiute, a clause chain can contain any number of marked clauses, with the simultaneous

and sequential suffixes occurring in any order. It should be possible for two marked clauses with the sequential suffix to have a third marked clause with the simultaneous suffix interleaved between them: e.g. [...V-*si*] [...V-*na*] [...V-*si*] [...V]. Under the semantics that I have proposed, this clause chain should only convey that the first and third marked clauses temporally precede the unmarked clause and that the second marked clause temporally overlaps the unmarked clause. The marked clause with the simultaneous suffix should not have to temporally overlap either of the other marked clauses. Unfortunately, it is extremely difficult to test this prediction. The simultaneous clause is necessarily in the progressive aspect, which like other statives is usually assumed by conversational participants to begin and end well before and after the time it is asserted of (Dowty 1986:48–52). Thus, even if the semantics of clause chaining do not require it, the simultaneous clause will likely be interpreted as temporally overlapping the surrounding sequential clauses.

4 Interpreting clause chains in discourse

When a sequence of sentences in discourse is understood as a narrative, it is often interpreted as 'forward moving' (Kamp and Rohrer 1983, among others). The sentences in 82, which contain telic predicates (achievements or accomplishments) in the perfective aspect, are interpreted as taking place in close temporal succession.

(82) Jameson entered the room. He shut the door. He switched off the light.
(after Hinrichs 1986:68)

The event of Jameson switching off the light is interpreted as taking place immediately after the event of him shutting the door, which is itself interpreted as taking place immediately after the event of him entering the room. In Northern Paiute, a sequence of sentences can receive the same forward moving interpretation.

(83) N̨immi ka=puggu t̨inoo-gg̨i-hu. U=hibi-gg̨i-hu. Mia-hu.
1PL.EXCL ACC=horse pack-APPL-PFV 3SG.ACC=drink-APPL-PFV go-PFV
'We packed the horse. We watered it. We left.' (elicitation, MS, BP53-3, 1:35)
[MS: 'You loaded the horses, and then you gave it drink. Then you went."]

In 83, the event of leaving is interpreted as taking place immediately after the event of watering the horse, which is itself interpreted as taking place immediately after the event of loading the horse.

I propose that this narrative progression gives rise to the enriched meaning that some clause chains have. In 84a–b, repeated from above, the speaker reports that the marked clauses are related temporally to one another, not just to the unmarked clause. In each sentence, the event described by the second marked clause is interpreted as taking place *immediately after* the event described by the first marked clause.

(84) a. **N̨immi puggu t̨inoo-gg̨i-si, u=hibi-gg̨i-si,** mia-hu.
1PL.EXCL.NOM horse pack-APPL-SEQ 3SG.ACC=drink-APPL-SEQ go-PFV
'**We packed up the horses, and then we watered them**, and then we left.' (elicitation, EM, BP44-2, 14:20)
[MT: "What happened first?[...]" EM: "Pack the horses. Then you gave them water, and then you left."]

b. **Nɨmmi puggu hibi-ggɨ-si**, **u=ddɨnoo-ggɨ-si**, mia-hu.
1PL.EXCL.NOM horse drink-APPL-SEQ 3SG.ACC=pack-APPL-SEQ go-PFV
'**We watered the horses, and then we packed them up**, and then we left.' (elicitation, EM, BP44-2, 16:12)
[EM: "You fed'em first, and then you pack it, and then you. . . "]

Moreover, the unmarked clause is related temporally to the preceding clause in a way that goes beyond its semantics. The event described by the unmarked clause does not just follow the event described by the second marked clause — it takes place *immediately after* it. Thus, the clause chain in 84a has the same forward moving interpretation as the parallel sequence of independent sentences in 83.

Importantly, this narrative progression is sensitive to linear order. For the clause chain in 84b, the speaker reports that the first marked clause temporally precedes the second marked clause. This means that narrative progression cannot all by itself be responsible for the temporal interpretation of clause chaining. The temporal relation between a marked clause and the unmarked clause must still be derived compositionally. As I argued in Section 3.2, the sequential suffix requires that the event described by the marked clause temporally precede the event described by the unmarked clause, regardless of their linear order. Without this semantic contribution, the clauses in a chain would always receive a temporal interpretation that was iconic. That is, when a marked clause containing the sequential suffix followed the unmarked clause in linear order, it would be interpreted — incorrectly — as following it in time as well.

The question of why some discourses are interpreted as forward moving narratives — and why some are not — is an extremely complicated one. So, in Section 4.1, I simply state some generalizations for narrative progression in Northern Paiute about how it relates sentences to the preceding discourse. For it to contribute to the temporal interpretation of clause chaining, each clause in a chain must be able to participate in narrative progression. In Section 4.2, I show that marked clauses are indeed temporally related to the preceding discourse in accordance with the generalizations for narrative progression. Finally, in Section 4.3, I show that the unmarked clause also obeys these generalizations, even when it occurs first in a chain.

4.1 The role of aspect in narrative progression

Aspect plays a crucial role in narrative progression (Kamp and Rohrer 1983, Partee 1984, Hinrichs 1986). The forward moving sequence of sentences in 83 is entirely in the perfective aspect. The imperfective aspect does not advance the narrative in the same way. For instance, the second sentence in 85, which is in the progressive aspect, describes the event of Josef firing his weapon and is interpreted as temporally overlapping the event of him turning around, described by the first sentence. Consequently, the third sentence, which describes the event of Josef firing his weapon, is interpreted as taking place immediately after the first sentence.

(85) Josephine turned around. The thief was fumbling in his bag. She fired her gun.

(86) His boss tried to turn the doorknob. The door was locked. She opened it with her key.

In English, atelic predicates in the perfective aspect exhibit the same behavior. In 86, the second sentence, which contains a stative predicate, does not advance the narrative, so that the third sentence is interpreted as taking place immediately after the first sentence.

In Northern Paiute, the imperfective aspect similarly does not advance the narrative. In 87, the second sentence containing the progressive suffix describes an event of playing that overlaps with the event described by the first sentence. Importantly, as the speaker's comments indicate, the third sentence is interpreted as taking place immediately after the *first* sentence.

(87) Su=mogo'ni nobi-ggwe iga-hu. Su=naatsi'i ti'atia-wɨnnɨ. Su=mogo'ni
NOM=woman house-LOC enter-PFV NOM=boy play-PROG NOM=woman
u=haa-hu.
3SG.ACC=scold-PFV
'The woman came into the house. The boy was playing. The woman scolded him.' (elicitation, EM, BP53-3, 20:45)
[EM: "He probably was playing in the house. Then the woman come in and then she bawl him out."]

(88) Su=mogo'ni nobi-ggwe iga-hu. Su=naatsi'i ti'atia-hu. Su=mogo'ni
NOM=woman house-LOC enter-PFV NOM=boy play-PFV NOM=woman
u=haa-hu.
3SG.ACC=scold-PFV
'The woman came into the house. The boy finished playing. The woman scolded him.' (elicitation, EM, BP53-3, 25:35)
[EM: "She bawled him out when he quit playing, I guess."]

In Northern Paiute, however, atelic predicates in the perfective pattern just like telic predicates. In 88, the event of the woman scolding the boy described by the third sentence takes place immediately after the event of the boy playing described by the second sentence. This is perhaps not surprising given the semantics of the perfective suffix in Northern Paiute, which requires event termination (see Section 2.1).

These empirical generalizations about narrative progression in Northern Paiute can be stated precisely in terms of how a sentence is temporally related to the preceding discourse.

(89) *Narrative progression in Northern Paiute*
For a clause S and for the closest linearly preceding clause in the perfective aspect S':
(i) if S is in the perfective aspect, S is interpreted as temporally immediately following S';
(ii) if S is in the imperfective aspect, S is interpreted as temporally overlapping S'.

Since only perfective sentences advance the narrative, each sentence is interpreted relative to the closest linearly preceding perfective sentence. Thus, when a sentence is in the perfective aspect, it is interpreted as taking place immediately after the closest preceding perfective sentence, e.g. (83) and (88). When a sentence is in the imperfective aspect, it is interpreted as temporally overlapping the closest preceding perfective sentence, e.g. the second sentence in (87).

I will not attempt here to provide a theory of narrative progression. At first glance, it might plausibly arise as a conversational implicature from Grice's (1975:46) fourth maxim of manner ("Be orderly.") The hearer infers a forward moving interpretation for narrative discourse because she assumes that the speaker is obeying the maxim and describing a sequence of events iconically.

While seemingly reasonable, there have been no attempts, to my knowledge, to develop a comprehensive theory of narrative progression within a Gricean framework. To be successful, it would have to address how the maxim of manner makes reference to the relevant aspectual distinctions.

There is, however, a substantial line of inquiry on narrative progression within Discourse Representation Theory (DRT; Partee 1984, Kamp and Reyle 1993:521–555, Muskens 1995, Kamp et al. 2011:196–249, Altshuler 2012). Every sentence is interpreted relative to a dynamically updated time interval, with the specific temporal relation between depending on aspect. While this relatively simple algorithm can account for narrative progression, there are many non-narrative discourses that are *not* interpreted as forward moving. One way of dealing with this challenge might be to incorporate information about world knowledge and/or rhetorical relations (Moens and Steedman 1988, Hobbs 1979, Hobbs et al. 1993, Kehler 2002, Asher and Lascarides 2003). For our purposes, the empirical generalizations about narrative progression in 89 are good enough.

4.2 The marked clause's relation to the preceding discourse

For narrative progression to be responsible for the enriched temporal interpretation of clause chaining, we still need to show independently that marked clauses are related to the preceding discourse in the way described by the generalizations in 89. While independent sentences participate in narrative progression, not all clauses do. In English, for instance, temporal adjunct clauses are never interpreted as temporally related to the closest preceding clause in the perfective aspect (Partee 1984:257–265, Hinrichs 1986:73–77).

(90) a. Mary turned the corner. While the cars were stopped, she crossed the street.
b. Mary turned the corner. After John saw her, she crossed the street.

The state of the cars being stopped described by the temporal adjunct clause in 90a does not overlap with, or even immediately follow, the event of Mary turning the corner. Similarly, the event of John seeing Mary described by the temporal adjunct clause in 90b does not have to immediately follow her turning the corner. Rather, in both cases, the temporal adjunct clause is interpreted at some unspecified subsequent time.

In clause chaining in Northern Paiute, however, the marked clause is temporally related to the preceding discourse in narratives. According to the generalizations in 89, a marked clause containing the simultaneous suffix should temporally overlap the closest preceding perfective clause, since it is always in the imperfective aspect.

(91) a. Ya'a yaisi su=ddoogga ka=sɨnabi-ma-ddɨ ka=nodda nobi tɨggwi-ggɨ-hu-si,
DEM PTC NOM=dog ACC=tree-LOC-LOC ACC=bee house fall-APPL-PFV-SEQ
mɨ=nodda=bɨno'o ina-hu-dui, mani-wɨnnɨ-na.
PL=bee=PTC go.everywhere-PFV-INT do-PROG-SIM
Su=naatsi'i=bɨno'o tu'i ggwati-na, tɨggwisu tu'i ggwati, tɨ=pa'mogo.
NOM=boy=PTC almost look.for-SIM still try look.for REFL=frog
Su=kɨɨbbɨ=bɨno'o ma-ma mɨ=muima-ggwɨnnɨ-na,
NOM=prairie.dog=PTC DEM-LOC 2/3PL.ACC=peek.out-PROG-SIM
sua'i.
laugh.IMPF

'The dog next to the tree made the beehive fall, and **the bees went everywhere**. The boy is still looking all over, looking all over for his frog. **The prairie dog is peeking out at them**, laughing.' (prompted narrative, MS, BP25-2-t2, 43–44)

b. [. . .]**yaisi su=naatsi'i tɨ=ddogga-tsi-no ka=pa'mogo yaa-hu**. Yaa
PTC NOM=boy REFL=dog-DIM-with ACC=frog miss-PFV DEM
na-ggwatɨma-ggwe-tu kado'o. Moko=sabbɨ yaa yakwi-gwaddi. Yaisi kado'o.
PASS-lock-LOC-LOC nothing shoe=PTC DEM sit.DL.IMPF-DL PTC nothing
Mia-pɨ amamu'a. **Yaisi sɨda nɨɨmma-gwaddi-na,** yaa tɨ=habinnu-ggwe
go-PRF morning **PTC bad feel-DL-SIM** DEM REFL=bed-LOC
o=bbuni-ddakwi-gwaddi.
3SG.ACC=see-sit.DL-DL
'[. . .]**the little boy and his dog realized the frog was missing**. The place where he was locked up was empty. Only the shoes were sitting there. There was nothing. It had left in the morning. **They were feeling bad**, sitting there in their bed looking at it.' (prompted narrative, MS, BP25-2-t2, 10–13)

The narrative in 91a was prompted using a picture book in which a boy and his dog are looking for a frog.[14] In the scene described by the speaker, a prairie dog is watching them, while the dog is barking at a beehive. The marked clause describes the event of the prairie dog peeking out of its hole, which overlaps with the event of the bees going all over the place described by the closest preceding perfective clause. Similarly, in 91b, an excerpt from earlier in the same story, the marked clause describes the state of the boy and his dog feeling bad, which overlaps with the event of their realizing that the frog is missing.

In addition, Partee (1984:262) provides an easy way to test whether or not a sentence is temporally related to the preceding discourse. She observes that the discourse in 92a is ill formed because the second sentence is interpreted as temporally overlapping the first sentence, even though the state of the room being empty cannot hold at the same time that people begin to leave.

(92) a. # People began to leave. The room was empty. The janitors came in.
(Partee 1984:262)

b. People began to leave. When the room was empty, the janitors came in.
(Partee 1984:262)

By contrast, Partee points out that the parallel discourse in 92c is felicitous. The state of the room being empty is described by a temporal adjunct clause, which is not subject to narrative progression. Since the state of the room being empty does not have to temporally overlap the preceding sentence, it can be interpreted at some later time, after all the people have left.

We can use this test to confirm that marked clauses are temporally related to the preceding discourse in narratives. The sequence of independent sentences in 93a is infelicitous because the state of the wood being gone cannot hold at the same time that the fire is being made — only at a later time when the fire has burned down and just embers are left.

[14] Mercer Mayer. 1969. *Frog, where are you?* New York: Dial Books.

(93) a. # N**i̵i̵** pida-hu. **Su=kuna kado'o**.
1SG.NOM make.fire-PFV **NOM=wood nothing**
Intended: 'I made a fire. **There was no wood.**' (elicitation, EM, BP44-2, 1:27:50)
[EM: "Yeah, but how are you going to be making fire when you got no wood?"]

b. # **N̵i̵i̵ pida-hu**. **Su=kuna kado'o-na**, n̵i̵i̵ ka=kutsu
1SG.NOM make.fire-PFV NOM=wood nothing-SIM 1SG.NOM ACC=meat
t̵i̵noho.
roast.IMPF
Intended: '**I made a fire. When there was no wood,** I was roasting the meat.' (elicitation, MS, BP44-5, 5:50)
[MS: "How did you start the fire if you didn't have no wood?"]

The parallel clause chain in 93b is also ill formed. By the generalizations in 89, the marked clause here is interpreted as temporally overlapping the preceding sentence. But the wood cannot be gone at the same time that the fire is made.

When a marked clause contains the sequential suffix, it can be interpreted as immediately temporally following the closest preceding perfective clause in narratives. This happens, in accordance with the generalizations in 89, when the marked clause is in the perfective aspect.

(94) a. **Su=naatsi'i oona ma-hu puni-kat̵i̵-hu. Isu naatsi'i yaisi yaa**
NOM=boy DEM DEM-EMPH see-sit-PFV DEM.NOM boy PTC DEM
huna-ggwa-tu kimma-hu-si=ggaisu ka=t̵i̵=ddoogga hidda-p̵i̵ni-hu.
outside-LOC-LOC come-PFV-SEQ=PTC ACC=REFL=dog hug-STAT-PFV
'**The boy saw him over there, sitting. The boy came outside** and hugged his dog.' (prompted narrative, EM, BP25-2-t1, 39–40)

b. [. . .]**yaisi t̵i̵wao ka=t̵i̵=p̵i̵a t̵i̵-patsa-kwai-tu mimia-u, ka=kutsu**.
PTC also ACC=REFL=friend NSP-kill-LOC-LOC go.DL-PFV ACC=cow
U-ba yaisi pipit̵i̵-u-gaa-si, yaisi usu t̵i̵wao idza p̵i̵i̵ owi
3SG-LOC PTC arrive.PL-PFV-MOT-SEQ PTC DEM.NOM also coyote self DEM
manai-čaa.
do-MOT
'[. . .]**and also went to where their friend was killed, the cow. Having arrived beside it,** that Coyote, *he* went and took over.' (narrative, Thornes 2003:481)

The discourse in 94a was prompted using the same picture book as before. It depicts a boy who sees his dog from the window of his room and then goes out to pick him up. The marked clause of the clause chain describes the event of the boy coming outside, which immediately follows the event of him seeing his dog described by the preceding sentence. Similarly, in 94b, the marked clause described the event of Coyote and the Porcupine arriving at where the Cow was killed, which takes place immediately after the event of their leaving.

We can again use Partee's test to confirm this. The sequence of independent sentences in 95a was judged infelicitous relative to the situation depicted in Figure 2, where the boy does not miss the frog when it escapes, only later after he wakes up.

(95) a. # Su=pa'mogo wadzi-mia-huka. **Su=naatsi'i o=yaa-hu.**
NOM=frog hide-go-INCEP **NOM=boy 3SG.ACC=miss-PFV**
Intended: 'The frog started to escape. **The boy missed his frog.**' (elicitation, EM, BP43-6, 4:00)
[EM: "*Tɨbunihusi, yaisi o=yaahu.* ['He wakes up and then he misses him']."]

b. # **Su=pa'mogo wadzi-mia-huka**. **Su=tɨɨtsi-'yu naatsi'i**
NOM=frog hide-go-INCEP NOM=little-NOM boy
o=yaa-hu-si, sɨta-hu.
3SG.ACC=miss-PFV-SEQ get.angry-PFV
Intended: '**The frog started to escape. The little boy missed his frog,** and then he got angry.' (elicitation, EM, BP43-6, 6:45)
[EM: "Well I think he was sleep, you know, when the frog left, yeah. Then, when he woke up, then he missed him and he got mad."]

The parallel clause chain in 95b is also bad. The marked clause with the sequential suffix must be interpreted as taking place immediately after the preceding sentence.

The marked clauses in a chain, then, are temporally related to the preceding discourse in narratives according to the generalizations in 89. A marked clause containing the simultaneous clause is interpreted as temporally overlapping the closest preceding perfective clause because it always selects for imperfective aspect. A marked clause containing the sequential suffix can be interpreted as taking place immediately after the closest preceding perfective clause when it is in the perfective aspect. When a clause chain contains more than one marked clause — as in the pair of sentences in 84a–b — they will each be temporally related to the preceding discourse. Since the closest preceding perfective clause can itself be another marked clause, the marked clauses in a chain have the forward moving interpretation that is characteristic of narrative discourse.

4.3 The unmarked clause's relation to the preceding discourse

The unmarked clause in a chain is also temporally related to the preceding discourse in narratives. This is particularly evident when the marked clause contains the sequential suffix. In the pair of sentences in 84a–b, for instance, the unmarked clause is located temporally *immediately after* the marked clause, which is the closest preceding perfective clause. This is a stronger meaning than what is provided by the semantics of the sequential suffix alone, which only conveys that the unmarked clause is temporally located *somewhere* after the marked clause. This is confirmed by Partee's test. Speakers judge 96 as infelicitous in the state of affairs depicted by Figure 2.

(96) # Su=tɨɨtsi-'yu pa'mogo wadzi-mia-huka-si, su=naatsi'i o=yaa-hu.
NOM=little-NOM frog hide-go-INCEP-SEQ NOM=boy 3SG.ACC=miss-PFV
'The little frog started to escape, and then the boy missed him.' (elicitation, MS, BP53-3, 31:45)
[MS: "*Isaya'e*['Lie'. . .]he missed him when he woke up."]

This clause chain is infelicitous because the event described by the unmarked clause does not occur immediately after the event described by the marked clause, just like an independent sentence (95a) or marked clause (95b).

If the unmarked clause participates in narrative progression when it occurs last in a clause chain, it should also do so when it *precedes* the marked clause. This is indeed the case.

(97) Su=naatsi'i=bɨno'o ka=tɨ=ddoogga haa-na, **kuyaa o=ddaya-ggwɨne-hu**
NOM=boy=PTC ACC=REFL=dog scold-SIM **far 3SG.ACC=send-MOT-PFV**
tabbu'a. **Yaisi ka=ggwitu'a tɨggwisu tɨ=tsotɨ'a ddɨggwa'ni mani-katɨ**, yaa
appear PTC ACC=pail still REFL=hat look.like do-sit.IMPF there
paa'a-we katɨ-na.
water-LOC sit-SIM
'The boy is scolding his dog, **and it looks like he sends him away. He still has the pail on his head that looks like a hat**, while sitting in the water.' (prompted narrative, MS, BP24-1-t3, 41–42)

(98) **Su=ddoogga=bɨno'o yaa ika tɨbbi-ma yaa-na'ona-ba-tɨ mia-hu**. **Yaisi**
NOM=dog=PTC there DEM.ACC rock-LOC there-LOC-LOC-LOC go-PFV PTC
yaa su=hɨbbɨ tɨhɨdda mia-hu, umɨ-ma sɨe-hu-si.
there NOM=thing deer go-PFV 2/3PL.ACC-LOC get.scared-PFV-SEQ
'**The dog went around the rock. The deer left** because it got scared of them.' (prompted narrative, EM, BP25-2-t1, 93–95)

In 97, repeated from 70a above, the unmarked clause describes the state of the boy continuing to have a bucket on his head. This overlaps the event described by the closest preceding perfective clause, in which the boy sends the dog away. Similarly, in 98, repeated from 71a above, the unmarked clause describes the event of the deer leaving. This is interpreted as taking place immediately after the event of the dog going around the rock described by the closest preceding clause in the perfective aspect.[15]

Just like a marked clause, then, the unmarked clause in a chain is temporally related to the preceding discourse in narratives. When the marked clause contains the sequential suffix, the un-

[15]What kind of temporal relation does the marked clause in 98 stand in to the preceding discourse? Since the sequential suffix conveys that the marked clause temporally precedes the unmarked clause, this overrides the pragmatic generalizations in 89. In fact, not every sequence of sentences comprises a narrative that is forward moving: they can stand in various rhetorical relations to one another (Moens and Steedman 1988, Hobbs 1979, Hobbs et al. 1993, Kehler 2002, Asher and Lascarides 2003). When one sentence serves as the explanation for another sentence, it is interpreted as temporally preceding it, even if it follows in linear order.

(i) Max fell. John pushed him. (Lascarides and Asher 1993:437)

(ii) Su=naatsi'i habi-hu. Su=tsɨa'a u=dda-tsa-kwiba-ggɨ-hu.
NOM=boy fall-PFV NOM=girl 3SG.ACC=IP.foot-IP.fingers-hit-APPL-PFV
'The boy fell. The girl tripped him.' (elicitation, EM, BP53-3, 11:15)
[EM: "She tripped him first, and then he fell down."]

In i, the second sentence is the explanation for the first sentence, and consequently the pushing event is interpreted as *preceding* the falling event. This is true in Northern Paiute as well. In ii, because the second sentence is the explanation for the first sentence, the tripping event is interpreted as preceding the falling event. This is, I propose, how the marked clause in 98 is understood. The generalizations in 89 are not relevant for relating it to the preceding discourse. As reflected in the translation, the deer's getting scared is interpreted as the *reason* that it leaves. I suspect that speakers might choose to order the marked clause after the unmarked clause for precisely this reason. If it contains the sequential suffix, the clause chain is not compatible with narrative progression. It can thus be used to invite the interlocutor to infer a different rhetorical relation, such as an explanation relation, between the clauses.

marked clause can be interpreted as taking place immediately after it, an interpretation that is stronger than what is provided by the semantics of the suffix alone. In addition, when the unmarked clause occurs first in a chain, it is interpreted as either temporally overlapping or immediately following the closest preceding perfective clause. This gives rise to a forward moving interpretation in narratives across all of the clauses in a chain.

5 Conclusion and future prospects

The temporal interpretation of clause chaining in Northern Paiute has, I have proposed, two meaning components. First, there is verbal morphology dedicated to conveying relative tense — the simultaneous and sequential suffixes — which establishes a temporal relation between each marked clause in a chain and the unmarked clause. This semantics is enriched pragmatically to give rise to the forward moving temporal interpretation that is characteristic of narrative discourse.

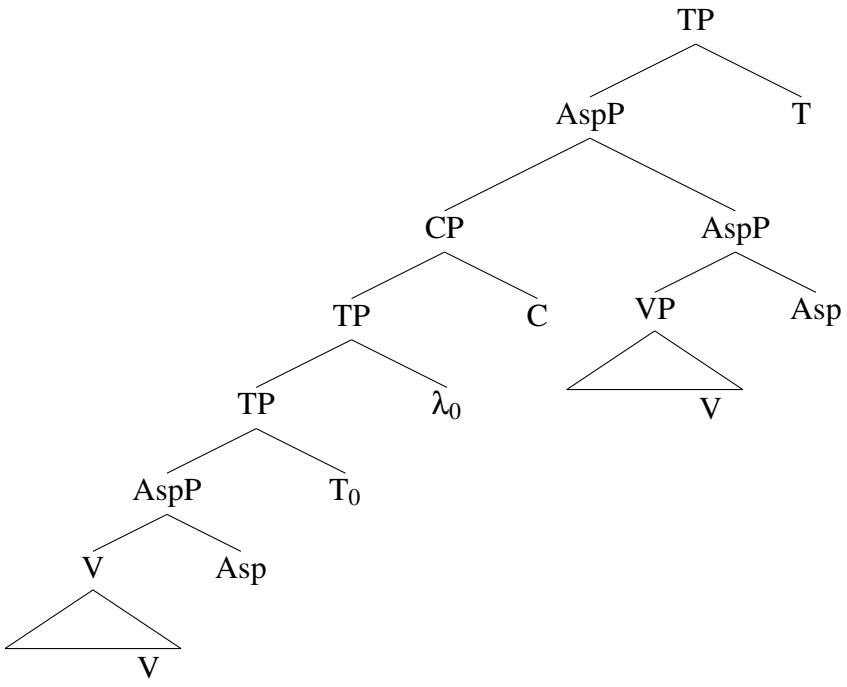
This is perhaps an unpleasing division of labor. Any sequence of clauses in discourse can exhibit narrative progression, so only the semantic component of clause chaining could in principle be eliminated. But it is necessary, because a marked clause always bears the same temporal relation to the unmarked clause whether it precedes or follows it. This linear-order-insensitive component of meaning, I have argued, is derived through semantic binding inside the marked clause. By contrast, the temporal relations between marked clauses are sensitive to linear order.

We probably cannot, as Foley (2010:48) points out, "[. . .]assume that clause chaining always corresponds to the same types of structures across languages." I have argued that clause chaining in Northern Paiute has a coordination structure. But in Choctaw and several other North American languages, it is likely that clause chaining has a subordination structure in which the marked clause is adjoined to the unmarked clause (Finer 1985, Broadwell 1997, 2006). Nonetheless, there are striking resemblances in the superficial form of clause chaining across a number of genetically unrelated and geographically isolated languages.

Notably, Longacre (2007:398–417) observes that many languages indicate formally on the marked clause whether it temporally overlaps or precedes the unmarked clause. In Northern Paiute, the simultaneous and sequential suffixes do this, I have proposed, because they convey relative present and past tense, respectively. Extending this analysis to comparable morphemes in other languages may allow us to account for this crosslinguistically uniform property of clause chaining, while still leaving room for variation in its syntax.

In Northern Paiute, the simultaneous and sequential suffixes can be abstracted over in a coordination structure because the coordinator is able to introduce an operator that semantically binds them. If a subordinator had the same property, clause chaining could instead have a subordination structure.

(99)



The relative tense inside the (subordinate) marked clause is abstracted over. The resulting property of times can combine with the (main) unmarked clause through set intersection (or Predicate Modification; Heim and Kratzer 1998:65), as long as it is adjoined low enough to combine with another property of times. This is in some ways like the semantic composition of a temporal adjunct clause (see, for instance, von Stechow and Grønn 2013:314).

There is a final property of clause chaining that I have ignored here for the most part. In many languages, though not in Northern Paiute, clause chains mark switch reference (Longacre 2007:399), just as coordination and subordination structures do in general. To account for switch reference marking in coordination structures, McKenzie (2012) proposes a compositional semantics that parallels the one that I have proposed for relative tense in clause chaining. This suggests that there may in fact be a more general compositional mechanism operating at clause junctures, which lies behind both the binding of relative tenses and switch reference markers. With further investigation, I hope that a more comprehensive theory of clause chaining will emerge, embedded within a better understanding of clause combination more generally.

Appendix: On deverbal nominalization

There are three arguments that the simultaneous suffix is distinct from a homophonous deverbal nominalizer, whose syntax and semantics I have discussed elsewhere (Toosarvandani 2011, 2014b).

First, the subject of a nominalization created by *-na* must be realized overtly. A weather verb, such as *tɨɨggwa* 'snow', normally takes no subject at all (100). But in the corresponding nominalization, an expletive—the fourth person clitic—is obligatory (101a).

(100) Tɨɨggwa-wɨnnɨ.
snow-PROG
'It's snowing.' (elicitation, MS, BP32-4-s, 13)

(101) a. N**ɨɨ** ***(a=)ddɨɨggwa-wɨnnɨ-na** punni.
1SG.NOM **4.GEN=snow-PROG-NMLZ** see.IMPF
'I see it snowing.' (elicitation, EM, BP37-3, 1:14:26)

b. **Tɨɨggwa-na**, n**ɨɨ** kai pisa ka=poo punni.
snow-SIM 1SG.NOM NEG good ACC=road see.IMPF
'When it is snowing, I don't see the road well.' (elicitation, MS, BP32-4-s, 1)

In contrast, the subject of the marked clause in a clause chain need not be overt (101b).

Second, the subject of the nominalization bears the genitive case (101b), never the nominative case (102a).

(102) a. * **Nɨɨ** saa-na ne-hu.
1SG.NOM cook-NMLZ burn-PFV
Intended: 'What I was cooking burned.' (elicitation, EM, BP43-2, 11:14)

b. **Nɨɨ** **hakɨ'i-na**, nabagi'a.
1SG.NOM **hiccough-SIM** bathe.IMPF
'While I was hiccoughing, I swam.' (elicitation, MS, BP31-5-s, 5)

In contrast, the subject of the marked clause can bear nominative case (102b).

Third, as I discuss in Section 2.2, the simultaneous suffix imposes a number of restrictions on the aktionsart of the verb. For instance, it is completely impossible with achievements (103a), and it forces an iterative interpretation with semelfactives (103b).

(103) a. * **Su=nana** **mia-na**, hubiatu.
NOM=man **go-SIM** sing.IMPF
Intended: 'When the man was leaving, he was singing.' (elicitation, EM, BP48-5, 21:08)

b. Su=naatsi'i **hunɨ-na**, nabagi'a.
NOM=boy **fart-SIM** bathe.IMPF
'While the boy is farting, he is taking a bath.' (elicitation, EM and MS, BP49-5, 1:36:37)
[MS: "Probably make couple bubbles." MT: "Could it have been more than once?" MS: "Yeah, it can be more than one." EM: "Yeah."]

(104) a. Su=mogo'ni **i=mia-na** punni-'yu.
NOM=woman **1SG.GEN=go-SIM** see.IMPF-IMPF
'The woman sees me leaving.' (elicitation, EM, BP49-3-s, 4)

b. Su=mogo'ni **i=hunɨ-na** naka.
NOM=woman **1SG.GEN=fart-NMLZ** hear
'The woman heard me fart.' (elicitation, EM, BP48-6, 42:33)
[EM: "That's just once."]

In contrast, the homophonous nominalizer is compatible with achievements (104a) and does not coerce an iterative interpretation with semelfactives (104b).

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