

Unifying habituality and progressivity in the imperfective: a Blackfoot case study*

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1 Road Map

1. á- marks imperfective aspect: it expresses habitual and in-progress interpretations, it has a modal component and it is compatible with statives
2. following Bonomi (1997), the habitual and in-progress readings are given a unified formal semantic analysis
3. the Bonomi-an analysis requires and is here given further specification—e.g., defining ‘coincidence’—in order to account for the above facts
4. predictions of and problems with Bonomi’s insight are explored

1.1 What is Blackfoot?

- Plains Algonquian language spoken in Alberta and Montana
- ca. 5000 speakers (4 dialects, 4 reserves)
- polysynthetic: almost everything (tense, aspect, modals) is a verbal affix

2 Á- is Imperfective-like

Criteria

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- used to express in-progress meaning (cf. Comrie (1976))
- used to express habitual meaning (cf. Comrie (1976))
- has a modal component (*imperfective paradox*) (cf. Dunham (2007); Hedin (2000))
- is compatible with statives (cf. Comrie (1976))

2.1 Tense in Blackfoot

Matthewson and Silva (2007): Blackfoot has past and present tense¹

- neo-Reichenbach-ian system: UT, RT & ET (Reichenbach 1947)

- UT is instantaneous

TENSE/ ASPECT	SOUND	MEANING
present	∅-	RT=UT
• past	∅-	RT<UT
imperfective	á-	RT⊆ET (cf. Kratzer (1998))
perfective	∅-	RT⊇ET

- True Prediction I: stative predicate in present perfective is grammatical since states can hold at instants (cf. ‘sub-interval property’ of Dowty (1979))

(1) Context: *You tell your friend ‘I can’t come see you now because ...’*

nitsiksttso’kini

nit-∅-∅-iik-isttsi-mo’kín-yi

1-PRES-PERF-INT-pain-torso-be

‘I am really hungry’ (Matthewson and Silva 2007)^{2,3}

- True Prediction II: eventive predicate in present perfect is ungrammatical since events cannot occur at instants

(2) Context: *You tell your friend ‘I can’t come see you now because ...’*

¹This is not an uncontroversial claim. Ritter and Wiltschko (2005) argue that Blackfoot lacks tense in that Infl relates participants and not temporal intervals. However, Matthewson and Silva (2007) show that Ritter and Wiltschko’s primary semantic argument for this claim is based on data that has not been judged false by our consultant.

²Explanation of example data: first line is a broad phonemic transcription based on the orthography of Frantz and Russell (1995); second line is a morphemic transcription; third line contains the glosses for each morpheme in the first second line. The following abbreviations are used in the morpheme gloss line: 1=first-person; 2=second-person; 3=third-person; 4=obviative third-person; 21=first-person plural inclusive; SG=singular; PL=plural; AN=animate; IN=inanimate; IMPF=imperfective aspect; PERF=perfective aspect; PAST=past tense; PRES=present tense; FUT=future tense; DEM=demonstrative; CONJ=conjunctive; NEG=negation; PRO=‘attached pronoun’; NONAFF=nonaffirmative suffix; NON-PAR=nonparticular; INT=intensifier; PAST.HAB=past habitual; SUBJ=subjunctive; INCH=inchoative; INV=inverse suffix; DIR=direct suffix.

³Unless otherwise attributed, all examples come from the author’s own fieldwork.

#nítsskiitaa

nit-∅-∅-ihkiitaa

1-PRES-PERF-bake

Target: ‘I am cooking.’ (Matthewson and Silva 2007)

Silva (2007); Frantz (1991): Blackfoot has two futurate tenses⁴

	TENSE/ MODAL	SOUND	GLOSS
•	future	áak-	‘will’
	imminent future	áyaak-	‘going to’

Tenses Assumed Here:

	TENSE	SOUND	MEANING
•	present	∅-	RT _⊆ UT
	past	∅-	RT<UT
	future	áak-	RT>UT

2.2 *Á-* is required to express in-progress meaning

In-progress meaning: the event in question is viewed as in the process of unfolding or, in other words, *in progress* at a given temporal interval *t*.

2.2.1 Present in-progress

- (3) *nítáihpiyi* *annohk*
 nit-∅-á-ihpiyi annohk
 1-PRES-IMPF-dance now
 ‘I am dancing’

- (4) **nítsspiyi* *annohk*
 nit-∅-∅-ihpiyi annohk
 1-PRES-PERF-dance now
 Speaker’s comment: “that would mean ‘I danced now’ ”

2.2.2 Past in-progress

- (5) *otao’toohsi* *matónni* *anná* *John* *anná*
 ot-∅-∅-a’-o’too-hsi matónni ann-wa John ann-wa
 3-PAST-PERF-when-arrive-CONJ yesterday DEM-PROX John DEM-PROX
Mary *áihpiyi*
 Mary ∅-á-ihpiyi
 Mary PAST-IMPF-dance
 ‘Yesterday Mary was dancing when John came’

⁴See Silva (2007) for an analysis of these two ‘futures’ based on Copley et al. (2004).

- (15) *anna Joel iksspita*
 ann-wa Joel \emptyset - \emptyset -iik-sspitaa
 DEM-AN.SG Joel PRES-PERF-INT-tall
 ‘Joel is tall’
- (16) *anna Joel ásspita*
 ann-wa Joel \emptyset -á-sspita
 DEM-AN.SG Joel PRES-IMP-IMPF-tall
 ‘Joel gets tall’ [i.e., whenever he takes a magical pill]
 *‘Joel is tall’
- some *á*-prefixed stative predicates appear with no appreciable difference in meaning from their *á*-less counterparts
- (17) *nítssksinoawa*
 nit- \emptyset - \emptyset -ssksino-aa-wa
 1PRES-PERF-know-DIR-3SG
 ‘I know him.’ (Frantz and Russell (1995))
- (18) *kitáisksino*
 kit- \emptyset - \emptyset -á-ssksino-o
 2-PRES-IMP-IMPF-know-DIR
 ‘I know you.’ (Uhlenbeck (1911, p. 19))
- some *á*-prefixed stative predicates are altogether ungrammatical
- (19) **kitáísiksikai’koowan*
 kit- \emptyset -á-sik-ika-ikoan
 2-PRES-IMP-IMPF-black-foot-being
 Target: ‘you are Blackfoot’
 Target: ‘you become a Blackfoot.’
- The behaviour of *á*- with the clearly heterogeneous class of stative predicates are left unexplained . . .

3 Bonomi’s unification of progressivity and habituality

3.1 The to-be-accounted-for data

- Bonomi (1997) shows that in Italian a past imperfective main clause of a when-construction can have both past in-progress and past habitual meaning
- (20) *Quando fu notato da Miles Davis, Ahmad*
 quando **fu** **nota-to** da Miles Davis, Ahmad
 when **be.PAST.PERF** **notice-PAST.PART** by Miles Davis, Ahmad
Jamal suonava in un trio
 Jamal **suona-va** in un trio
 Jamal **play-PAST.IMP-IMP** in a trio

‘When Ahmad Jamal was noticed by Miles Davis, he was playing in a trio’
 ‘When Ahmad Jamal was noticed by Miles Davis, he was a member of a trio’
 (Bonomi 1997, p. 491)

- The following Blackfoot example parallels the Italian one above: past in-progress and past habitual meaning

- (21) *nítáístsitso'tatsimasii* *annahk* *Martina*
 nit- \emptyset - \emptyset -a'-isttsitsa-o'táaatsiim-aa-hsi ann-wa-hka Martina
 1-PAST-PERF-when-at.first-meet-DIR-CONJ DEM-PROX.SG-INV martina
áótsisi
 \emptyset -á-o'tsisii
 PRES-IMPFF-smoke
 ‘When I first met Martina, she was smoking’
 ‘When I first met Martina, she was a smoker’

3.2 Bonomi’s analysis

3.2.1 Bonomi’s insight

A SINGLE DENOTATION CAN ACCOMMODATE BOTH INTERPRETATIONS OF (21):

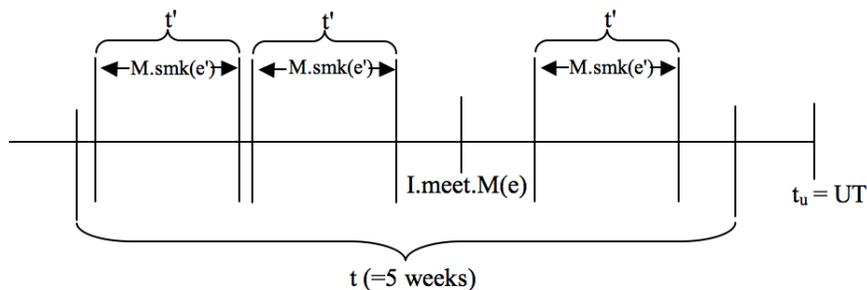
- (22) $\llbracket (21) \rrbracket = \exists t[\langle t, t_u \rangle \wedge \exists e[\subseteq(e, t) \wedge I.\text{meet.M}(e)] \wedge$
 $\forall t'[\subseteq(t', t) \wedge \text{Cont}(t') \rightarrow \exists e'[\text{M.smoke}(e') \wedge \rangle \langle (t', e')]]]$
 where ‘ $\rangle \langle$ ’ is a coincidence function purposefully left vague

- PARAPHRASE: *There is a past interval t during which there occurs an event e of the speaker meeting Martina and all contextually relevant subintervals t' of t coincide with an event e' of Martina smoking*
- Note: the interval (our t) that tense relates to the UT is what Bonomi (1997) calls the *frame interval*

The longer the frame interval, the more likely is habitual meaning

- In a five-week frame interval t it is relatively unlikely that a near-instantaneous meeting event will overlap temporally with any of the (let’s assume) five-minute smoking events occurring within t

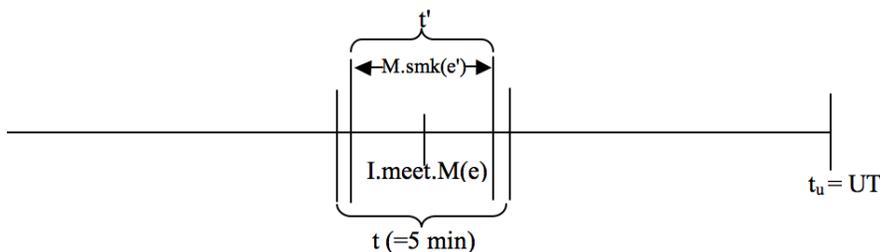
(23)



The shorter the frame interval, the more likely is in-progress meaning

- In a five-minute frame interval it is almost certain that a near-instantaneous meeting event will overlap temporally with any of the (five-minute) smoking events occurring within t

(24)



Monoclausal constructions

- sentences containing a single imperfective clause are assumed to have an implicit when-clause

(25) *nitáó'tsis*
 nit-~~Ø~~-á-o'tsisii
 1-PRES-IMPF-smoke
 'I smoke'
 'I am smoking'

(26) $[[(25)] = \exists t[\subseteq(t_u, t) \wedge \exists e[\subseteq(e, t) \wedge \text{Cont}(e)] \wedge \forall t'[\subseteq(t', t) \wedge \text{Cont}(t') \rightarrow \exists e'[\text{I.smoke}(e') \wedge ><(t', e')]]]]$

- PARAPHRASE: *There is a present interval t within which there is a contextually salient event e and all contextually relevant subintervals t' of t coincide with an event e' of the speaker smoking*
- effectively, an implicit when-clause (here event e) is assumed

Explicit frame interval

- Bonomi (1997) claims that the frame interval can be made explicit, but no examples are given
- PREDICTION: an explicit long frame interval should more readily lead to a habitual interpretation and a shorter interval to an in-progress one
- while the English progressive must be coerced into a habitual interpretation, the coercion is (in my judgment) easier with the longer frame interval of (27)

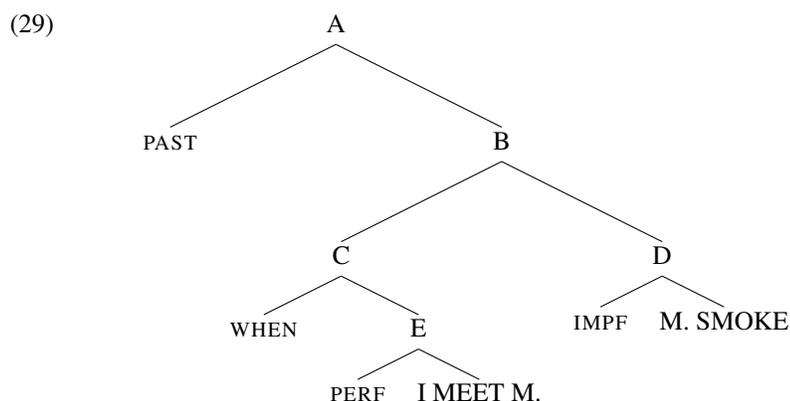
- (27) *Let me tell you about this past year in Vancouver. I'll start with my syntax teacher. When I first met Martina, she was smoking. And I thought this quite strange given my stereotype of Vancouverites ...*
- (28) Detective: *Mr Dunham, can you account for your whereabouts last evening between 5 and 6 p.m.?*
 Dunham: *Well, yes. I was at a cafe on campus and I had a chance encounter with a syntax professor named Martina. When I met her, she was smoking. And I thought this quite strange given my stereotype of Vancouverites ...*

Summary:

- Sentences whose matrix verb is imperfective are not ambiguous but semantically vague
- Contextual (or explicit) 'sizing' of the frame interval reduces the vagueness: leading to a favouring of either in-progress or habitual meaning

3.2.2 A smattering of Bonomi's formalism

Structure assumed for (21)⁶:



Denotations

- Bonomi (1997) clearly worked backwards from the insight of (22) in order to postulate denotations for WHEN, PERF and IMPF
- as a result these denotations are not easily parsed into an English paraphrase and the derivations are complex (see Dunham (2007) for in-depth discussion)

⁶Note: Bonomi (1997) argues that when-constructions with an imperfective matrix clause and a perfective (possibly implicit) 'when' clause have the structure shown in (29), where WHEN takes wide scope. However, when-constructions where *both* clauses have imperfective aspect are structurally ambiguous: WHEN taking wide scope in one configuration and IMPF taking wide scope in another. This structural ambiguity results in two types of habitual interpretation and although interesting in itself, it is beyond the scope of the present talk.

- tense-less, aspect-less sentences are *e*-abstracts, i.e., lambda extractions on events.
E.g., $\llbracket \text{Martina SMOKE} \rrbracket = \lambda e[\text{smoking}(e) \wedge \text{Agent}(e)(\text{Martina})]$
- (30) $\llbracket \text{WHEN} \rrbracket = \lambda X \lambda Y \lambda e \lambda C [X(e) \wedge \forall e' [C(e') \leftrightarrow Y(e') \wedge \langle \langle e, e' \rangle \rangle]]$
type: $\langle \langle e, t \rangle, \langle \langle e, t \rangle, \langle e, \langle e, t \rangle \rangle \rangle \rangle$
 - Conceptual core: take two e-abstracts and make them coincide ($\langle \langle \rangle$)
- (31) $\llbracket \text{IMPF} \rrbracket = \lambda \psi \lambda t \forall e [\subseteq(e, t) \wedge \text{Cont}(e) \wedge \exists C [\psi(e)(C)] \rightarrow \exists C [\psi(e)(C) \wedge C \neq \emptyset]]$
type: $\langle \langle e, \langle e, t \rangle \rangle, \langle i, t \rangle \rangle$
 - Conceptual core: introduce universal quantification (\forall)
- (32) $\llbracket \text{PERF} \rrbracket = \lambda \psi \lambda t \exists e [\subseteq(e, t) \wedge \exists C [\psi(e)(C) \wedge C \neq \emptyset]]$
type: $\langle \langle e, \langle e, t \rangle \rangle, \langle i, t \rangle \rangle$
 - Conceptual core: introduce existential quantification (\exists)
- (33) $\llbracket \text{PAST} \rrbracket = \lambda \psi \exists t [\langle (t, t_u) \wedge \exists C [\psi(t)(C) \wedge C \neq \emptyset]]$
type: $\langle \langle e, \langle e, t \rangle \rangle, t \rangle$
 - Conceptual core: place frame interval before UT ($\langle (t, t_u) \rangle$)
- (34) $\llbracket \text{PRES} \rrbracket = \lambda \psi \exists t [\subseteq(t_u, t) \wedge \exists C [\psi(t)(C) \wedge C \neq \emptyset]]$
type: $\langle \langle e, \langle e, t \rangle \rangle, t \rangle$
 - Conceptual core: UT is subinterval of frame interval ($\subseteq(t_u, t)$)

4 Necessary modifications of Bonomi's proposal

- coincidence ($\langle \rangle$) cannot be left vague
- in order to derive correct interpretations from (22) we must say something about vacuous quantification

4.1 The problem of vague coincidence: $\langle \rangle$

- the coincidence relation between events $\langle \langle e, e' \rangle \rangle$ that is essential to WHEN should be vague enough to allow sometimes exact overlap (examples seen so far) and sometimes temporal contiguity (35)
- (35) *When Bill turned on the light, the roaches scurried under the fridge.*

Problem:

- this falsely predicts that *nitáístsitso'tatsimasii annahk Martina áótsisi* can mean 'Right after I met her, Martina lit up a smoke'
- (36) $\llbracket \langle \langle \alpha, \beta \rangle \rangle \rrbracket = 1$ iff
 1. α and β have some temporal overlap
ELSE IF (1) IS NOT POSSIBLE:
 2. α and β are temporally contiguous

4.2 Against vacuous quantification?

Potential problem: reconsider denotation (22), repeated here as (37), specifically the second line:

$$(37) \quad \begin{aligned} \llbracket (21) \rrbracket &= \exists t[\langle t, t_u \rangle \wedge \exists e[\subseteq(e, t) \wedge \text{I.meet.M}(e)] \wedge \\ &\quad \forall t'[\subseteq(t', t) \wedge \text{Cont}(t') \rightarrow \exists e'[\text{M.smoke}(e') \wedge \rangle \langle t', e' \rangle]]] \end{aligned}$$

- strictly, $\forall x[P(x) \rightarrow Q(x)]$ is true in whenever $\neg \exists x[P(x)]$
- but such vacuous quantification would to make the seemingly false prediction that *nitáistsitso'tatsimasii annahk Martina áótsisi* would be evaluated as true in a model where there is a past meeting event but no past smoking events
- to avoid this seemingly undesirably effect, we could appeal to a general prohibition against vacuous quantification in natural language (cf. Kratzer (1995) and Chomsky (1982))

Unrealized habituals and the imperfective paradox revisited:

- Krifka et al. (1995) point out that a habitual ('characterizing') sentence like (38) can be true even if no mail has ever arrived from Antarctica

(38) *Mary handled the mail from Antarctica*

- Recall also that telic predicates with imperfective aspect can fail to entail the occurrence of their type of event

(39) *ayákokii matónni ki annohk sáákyayákokii*

'he was putting up his tipi yesterday and right now he's still putting it up'

- just as (38) can be true with no mail-handling events, so too can (39) be true with no tipi-putting-up events

(40) CONSTRAINT AGAINST VACUOUS QUANTIFICATION

1. wherever possible, assume from $\forall x[P(x) \rightarrow Q(x)]$ that $\exists x[P(x)]$
2. if $\neg \exists x[P(x)]$ is forced, intentionalize:
 $\forall x[P(x) \rightarrow Q(x)] \quad \Rightarrow \quad \forall w' \in W_{inert}[\forall x[P(x)(w') \rightarrow Q(x)(w')]]$
3. if $\neg \exists x[P(x)]$ is still forced, push righthand bound of frame interval until $\exists x[P(x)]$

Unrealized habituals

1. *within some past interval t, at all relevant intervals when Antarctic mail came, Mary handled it*
2. *there were no such relevant intervals*

3. ∴ *in all inertia worlds*, within t , at all relevant intervals when Antarctic mail came, Mary handled it. I.e., Mary was disposed to handle such mail; she would have handled it (40.2)

Non-culminated accomplishments

1. between noon yesterday and now, all relevant *tipi-erecting* intervals coincide with a *tip-erecting* event
2. the *tipi* is still not complete
3. ∴ there were no such relevant intervals between noon yesterday and now
4. ∴ *in all inertia worlds* there is an interval between noon yesterday and some time later than now in which a relevant *tipi-erecting* interval coincides with a *tipi-erecting* event (40.2, 40.3)

5 Summary & Challenges

- Blackfoot, a language perhaps as far-removed from Indo-European as is possible, arguably has imperfective aspect
- The Bonomian analysis of the semantics of the Italian *imperfetto* can straightforwardly be applied to Blackfoot *á*-IMPF
- It was found that Bonomi's vague coincidence function overgenerated and a system of ranked violable coincidence constraints was proposed (36)
- It was suggested that unrealized habitual events and non-culminated telic events could both be treated within Bonomi's system as violations of a lowly ranked constraint prohibiting vacuous quantification (40) and subsequent (assumedly general) 'repair mechanisms'

5.1 In-progress reading is always already habitual

Potential problem:

- *nítátsitso'tatsimasii annahk Martina áótsisi* said with a five-minute frame interval engenders an in-progress interpretation but also entails, by our definition of habituality, that Martina was a habitual smoker for those five minutes
- is this a true problem? ...

5.2 Present perfective revisited:

Potential problem:

- present perfective *nítsskiitaa* 'I cooked; *I am cooking' (2) no longer can be argued to force an inherently durational event into an instantaneous interval (cf. the denotation in (41))

(41) $\llbracket(2)\rrbracket = \exists t[\subseteq(t_u, t) \wedge \exists e[\subseteq(e, t) \wedge \text{Cont}(e) \wedge \exists e'[\text{I.cook}(e') \wedge \succ\langle(e, e')\rangle]]]$

- we lose the contrast between eventives and statives in the present perfective originally used by Matthewson and Silva (2007) to argue for null present and past tense ...

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