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

Joel Dunham
University of British Columbia
jrwdunham@gmail.com

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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

*Many thanks to Beatrice Bullshields without whose knowledge of Blackfoot and patience with my mangling of it this paper would never be. I would like to thank Hotze Rullmann, Rose-Marie Déchaine, Martina Wiltschko, Lisa Mathewson, Solveiga Arnoskaite, Amelia Reis Silva and Shujun Chin (among others) for taking the time to think about this paper and offer thoughtful feedback. Finally, I acknowledge the funding that made this research and its presentation possible: SSHRC Standard Research Grant 410-2006-2166 (awarded to Martina Wiltschko) as well as SSHRC Fellowship 767-07-1968.
• 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 tense

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

• UT is instantaneous

<table>
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<tr>
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• 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 …’

nitsiksttsso’kini
nit-ø-ø-ik-isttsi-mo’kín-yi
1-PRES-PERF-INT-pain-torso-be
‘I am really hungry’ (Matthewson and Silva 2007)

• 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 …’

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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=nonparticulat; 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.
#nitsskiita
nit-∅-∅-ihkiita
1-PRES-PERF-bake
Target: ‘I am cooking.’ (Matthewson and Silva 2007)

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

- future: ´aak- ‘will’
- imminent future: dyaak- ‘going to’

Tenses Assumed Here:

- present: 0- RT≤ UT
- past: 0- RT< UT
- future: ´aak- 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) nitáihpiyi
nit-∅-á-ihiyi
1-PRES-IMPF-dance
‘I am dancing’

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

2.2.2 Past in-progress

(5) otao’toohsi
ot-∅-∅-o’too-hsi
3-PAST-PERF-when-arrive-CONJ
matónni anná John anná
DEM-PROX John DEM-PROX
Mary áihpiyi
Mary 0-á-ihiyi
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).
2.2.3 Future in-progress

(7) daksikakawaasainiwa
áak-ikak-á-waasał’ni-wa
FUT-just-IMPF-cry-3SG
‘he will just be crying’ (Frantz and Russell (1995))

2.3 Á- is used to express habitual meaning

Habitual meaning: the event in question is viewed as characteristic of a given interval t.

2.3.1 Present habitual

(8) áa nitáó’tsis
áa nit-ó-á-o’tsisii
yes 1-PRES-IMPF-smoke
‘Yes, I smoke’

(9) áa nitóó’tsis
áa nit-ó-ó-o’tsisii
yes 1-PRES-PERF-smoke
*‘Yes, I smoked’^5

2.3.2 Past habitual

(10) ámo kiisskoohtsik ... ma aakii mi
ámo kiisskoohtsik ... m-wa aakíí m-yi
DEM long.time.ago ... DEM-PROX woman DEM-OBV
áísikapistotsim
∅-á-ksikk-apistotsim
PAST-IMPF-white-make
‘A long time ago ... the woman would clean up’

^5Note: a form homophonous to this one but (by assumption) containing null past instead of null present is glossed by my consultant as ‘yes, I smoked’. Such an English gloss is compatible with a past habitual interpretation. It is not clear whether the Blackfoot form to which it is attributed is also compatible with the same interpretation. Further elicitation is required.
• past habitual meaning is more commonly expressed in the elicitation context with the prefix aisooka- ‘used to’

(11) nitáísookaisimi
    nit-∅-aisooka-simi
1-PAST-PAST.HAB-drink
‘I used to get drunk’

2.3.3 Future habitual

(12) kitaakaikakaohki
    kit-áak-ikak-á-ohki
2-FUT-just-IMPF-bark
‘You will only bark’ (a curse on all dog-kind)

2.4 Á- has a modal component (Imperfective Paradox)

Imperfective Paradox: the event denoted by a telic predicate (i.e., one with a lexically-specified endpoint or telos) must be interpreted as having culminated when perfective but not when imperfective

Modal component: the Imperfective Paradox has been argued, in English, to be the result of a modal component in the meaning of the progressive (cf. Dowty (1979); Parsons (1989); Landman (1992))

(13) ayákokii matónni ki annohk
    ∅-á-yákokiyyi matónni ki annohk
PAST-IMPF-erect.tipi(vai) yesterday and now
sáakyáyákokii
∅-saaki-á-yákokiyyi
PRES-still-IMPF-erect.tipi(vai)
‘he was putting up his tipi yesterday and right now he’s still putting it up’

(14) *iyákokii matónni ki annohk
    ∅-∅-yákokiyyi matónni ki annohk
PAST-PERF-erect.tipi(vai) yesterday and now
sáakyáyákokii
∅-saaki-á-yákokiyyi
PRES-still-IMPF-erect.tipi(vai)
Target: ‘he was putting up his tipi yesterday and right now he’s still putting it up’

2.5 Á- is sometimes compatible with stative predicates

• some á-prefix ed stative predicates generate only the reading where the state is viewed as repeatedly holding or coming to hold
(15) anna  Joel  iksspita  
an-wa  Joel  ∅-∅-iik-sspita
 DEM-AN.SG  Joel  PRES-PERF-INT-tall
 ‘Joel is tall’

(16) anna  Joel  áísspita  
an-wa  Joel  ∅-á-sspita
 DEM-AN.SG  Joel  PRES-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-∅-∅-ssksino-aa-wa
 1PRES-PERF-know-DIR-3SG
 ‘I know him.’ (Frantz and Russell (1995))

(18) kitáísk sino  
kit-∅-∅-á-ssksino-o
 2-PRES-IMPF-know-DIR
 ‘I know you.’ (Uhlenbeck (1911, p. 19))

• some á-prefix stative predicates are altogether ungrammatical

(19) *kitáísiksikai’koowan  
kit-∅-á-sik-ika-ikoan
 2-PRES-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.IMPF  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) nitáístisitso’atsimasii annahk Martina
nit-∅-∅-ististsitsa-o-táatsim-aa-hsi ann-wa-hka Martina
1-PAST-PERF-when-at.first-meet-DIR-CONJ DEM-PROX.SG-INVS martina
áotsisi
∅-∅-o’tsisi
PRES-IMPF-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) \[
\begin{align*}
\text{[(21)]} &= \exists t[< (t, t_u) \land \exists e[\subseteq (e, t) \land I.\text{meet.M(e)}] \land \\
& \quad \forall t' [\subseteq (t', t) \land \text{Cont}(t') \to \exists e'[\text{M.smoke(e')} \land ><(t', e')]]] \\
\text{where ‘} >< \text{’ is a coincidence function purposefully left vague}
\end{align*}
\]

• 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 $t$

$$t \approx 5 \text{ min}$$

(24)

\[
\begin{tikzpicture}
  \node (t) at (0,0) {$t$};
  \node (tu) at (3.5,0) {$t_u = UT$};
  \node (t') at (2.5,-1) {$t'$};
  \node (M) at (0,-1) {I.meet. M(e)}; \node (Smk) at (0,-1.5) {M.smk(e)}; \node (E) at (0,-2) {I.smoke(e)};
  \draw[-stealth] (t') -- (Smk) node[above, midway] {M.smk(e)};
  \draw[-stealth] (M) -- (Smk) node[above, midway] {I.meet. M(e)};
  \draw[-stealth] (Smk) -- (E) node[above, midway] {I.smoke(e)};
\end{tikzpicture}
\]

Monoclausal constructions

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

(25) $nítā’'tís$ 
\begin{align*}
& \text{nīt-∅-ā-o’tsisii} \\
& 1-\text{PRES-IMPF-smoke} \\
& \text{‘I smoke’} \\
& \text{‘I am smoking’}
\end{align*}

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

- 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)
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 . . .

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):

\[
(29) \quad \text{A} \quad \text{PAST} \quad \text{B} \\
\quad \quad \text{C} \quad \text{WHEN} \quad \text{E} \quad \text{PERF} \quad \text{I MEET M.} \\
\quad \quad \text{D} \quad \text{IMPF} \quad \text{M. SMOKE}
\]

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)

\(^{6}\)Note: 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., \[ \text{[Martina SMOKE]} = \lambda e [\text{smoking}(e) \land \text{Agent}(e)(\text{Martina})] \]

(30) \[ \text{[WHEN]} = \lambda X \lambda Y \lambda e \lambda C [X(e) \land \forall e' [C(e') \leftrightarrow Y(e') \land \triangleright \langle e, e' \rangle]] \]

\[ \text{type: } <\langle e, t \rangle, \langle e, t \rangle, <\langle e, t \rangle, <\langle e, t \rangle, \rangle \rangle \]

- Conceptual core: take two *e-abstracts* and make them coincide (\( \triangleright \))

(31) \[ \text{[IMPF]} = \lambda \psi \exists t [\subseteq (e, t) \land \text{Cont}(e) \land \exists C[\psi(e)(C) \land \exists C[\psi(e)(C) \land C \neq \emptyset]] \]

\[ \text{type: } <\langle e, e, t \rangle, >, <\langle e, t \rangle \rangle \]

- Conceptual core: introduce universal quantification (\( \forall \))

(32) \[ \text{[PERF]} = \lambda \psi \exists t [\subseteq (e, t) \land \exists C[\psi(e)(C) \land C \neq \emptyset]] \]

\[ \text{type: } <\langle e, e, t \rangle, >, <\langle e, t \rangle >, >, <\langle e, t \rangle \rangle \]

- Conceptual core: introduce existential quantification (\( \exists \))

(33) \[ \text{[PAST]} = \lambda \psi \exists t [\subseteq (t_u, t) \land \exists C[\psi(t)(C) \land C \neq \emptyset]] \]

\[ \text{type: } <\langle e, e, t \rangle, >, <\langle e, t \rangle >, >, <\langle e, t \rangle \rangle \]

- Conceptual core: place frame interval before UT (\( (t_u, t) \))

(34) \[ \text{[PRES]} = \lambda \psi \exists t [\subseteq (t_u, t) \land \exists C[\psi(t)(C) \land C \neq \emptyset]] \]

\[ \text{type: } <\langle e, e, t \rangle, >, <\langle e, t \rangle >, >, <\langle e, t \rangle \rangle \]

- Conceptual core: UT is subinterval of frame interval (\( \subseteq (t_u, t) \))

4 Necessary modifications of Bonomi’s proposal

- coincidence (\( \triangleright \)) 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: \( \triangleright \)

- the coincidence relation between events \( \triangleright \langle e, e' \rangle \) 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 *nitástsitsi tatsimasii annahk Martina áôtsisi* can mean ‘Right after I met her, Martina lit up a smoke’

(36) \[ \triangleright \langle \alpha, \beta \rangle = 1 \text{ iff } \]

1. \( \alpha \) and \( \beta \) have some temporal overlap

   ELSE IF (1) IS NOT POSSIBLE:

2. \( \alpha \) and \( \beta \) are temporally contiguous
4.2 Against vacuous quantification?

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

\[(37) \quad [t(21)] = \exists t(<(t, t_u) \land \exists e[\subseteq (e, t) \land \text{I.meet}(e)] \land \\
\quad \forall t'[\subseteq (t', t) \land \text{Cont}(t') \rightarrow \exists e'[\text{M.smoke}(e') \land ><(t', e')]]]\]

- 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 *nitástsito’tatsimasii annahk Martina’ótsisi* 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

\[(38) \quad \text{Mary handled the mail from Antarctica}\]

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

\[(39) \quad \text{ayákokii matónni ki annahk sákyayákokii}
\quad \text{‘he was putting up his tipi yesterday and right now he’s still putting it up’}\]

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

\[(40) \quad \text{CONSTRAINT AGAINST VACUOUS QUANTIFICATION}\]

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:
   $\forall x[P(x) \rightarrow Q(x)] \Rightarrow \forall x[P(x) \rightarrow Q(x)(w)]$
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. \( \therefore \) 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 tipi-erecting event
2. the tipi is still not complete
3. \( \therefore \) there were no such relevant intervals between noon yesterday and now
4. \( \therefore \) in all inertia worlds there is an interval between noon yesterday and sometime 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 \( \dot{a} \)-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:

- \( \text{nítástisits’atsimasii annahk Martina áótsísi} \) 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 \( \text{nítsskiitaa} \) ‘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) \[\mathcal{L}(2) = \exists \mathcal{C}(t_u, t) \land \exists \mathcal{C}(e, t) \land \exists \mathcal{C}(I.cook(e') \land >e(e', e'))]\]

- 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 ...

References


