The semantics of Blackfoot arguments

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INTRODUCTION

This paper argues that Blackfoot transitive verb stem morphology reflects the semantic type of the complement.[1] Semantically bivalent verbs surface with three different stem types: 'transitive animate' (TA), 'transitive inanimate' (TI) and 'animate intransitive plus object' (AI+O) (Bloomfield 1946; Frantz 2009). Our evidence that stem type encodes the semantic type of the complement includes the (in)ability of complements to 'escape' a clause, and scope with respect to clause-mate quantifiers. Formally transitive (TA/TI) stems combine with choice functions of type *e*. Complements to formally intransitive (AI+O) stems are either predicates of type <*e*,*t*> or existential quantifiers of type <<*e*,*t*>,*t*>. While predicates of type <*e*,*t*> are pseudo-incorporated (Bliss 2013) and must scope under operators, existential quantifiers can have either wide or narrow scope. Blackfoot therefore encodes a distinction between saturated and unsaturated semantic complement types.

Unless otherwise noted, all data in this paper come from original fieldwork with one female speaker of the Káínaa dialect in her late 60s. Our methodology involves the standard techniques of translation tasks (in either direction), elicited production tasks based on explicitly described discourse contexts, and acceptability judgment tasks in which the speaker judges the felicity of Blackfoot sentences in particular discourse contexts. See Matthewson (2004) for further details of methodology.

TRANSITIVE VERB STEMS IN BLACKFOOT

The three types of stem for semantically transitive verbs are shown in (1) –(3): transitive animate (TA), transitive inanimate (TI), and animate intransitive plus object (AI+O), respectively (Bloomfield 1946; Frantz 2009).[2]

(1) naowatsiw [amo mamii/*akoopis]
na-**oowat**-yii-wa [amo-yi mamii-yi/*akoopis-yi]
PST-**eat.TA**-DIR-PRX DEM-OBV fish.AN-OBV/*soup.IN-OBV
'S/he ate this fish.' (Ritter and Rosen 2010:134)

(2) naowatoom [ani akoopis/*mamii]
na-**oowatoo**-m-wa [ann-yi akoopis-yi/mamii-yi]
PST-**eat.TI**-DIR-PRX DEM-OBV soup.IN-OBV/*fish.AN-OBV
'S/he ate that soup.' (Ritter and Rosen 2010:134)

(3) naoyiw (mamii/akoopis)
na-**ooyi**-wa (mamii/akoopis)
PST-**eat.AI**-PRX (fish.AN/soup.IN)
'S/he ate (fish/soup).' (Ritter and Rosen 2010: 134)

These verb stems differ in the animacy of the complements they may take; subjects of transitive verbs in Blackfoot must always be animate (Frantz 2009). TA verbs occur with objects of animate gender, such as *mamii* 'fish' in (1), but cannot occur with objects of inanimate gender, such as *akoopis* 'soup'.[3] Conversely, the object of TI verbs must be inanimate, as in example (2). AI+O verbs allow complements of either gender, as in (3).

The three stem types also differ in their morpho-syntax. TA and TI verbs are formally transitive in that they contain direct/inverse morphology, often called a THEME SIGN (Bloomfield 1946; Frantz 2009). The form of the theme sign depends on the person and proximate/obviate status of both the subject and object (Bliss 2005). Examples (4) and (5) differ minimally: the object of (4) is third person and the object of (5) is first person. This affects the form of the theme suffix, showing that the object is indexed on TA/TI verbs.

(4) kitsíínowaa
kit-iino-**aa**-wa
2-see.TA-**DIR**-PRX
'You saw him/her.'

(5) kitsíínookᵢ̨
kit-iino-**oki**
2-see.TA-**INV**
'You saw me.'

AI+O verbs are semantically bivalent but formally intransitive: the object is not indexed on the verb with a theme sign, as seen in (3). They have the same morphology as semantically monovalent verbs with animate subjects (AI verbs), such as *sspitaa* 'tall' (6).

(6) ííiksspitaa
iik-isspitaa-wa
VX-tall.AI-PRX
'S/he is tall.'

The formation of new TA, TI, and AI+O stems is extremely productive. While the form of many stems is not predictable, novel stems are often productively formed by our consultant using the derivational suffixes *-at* (TA), *-atoo* (TI), and *-aki* (AI+O) (see also Armoskaite 2011). Therefore almost all bivalent stems have three surface forms.

PREVIOUS ANALYSES

The literature provides two ideas about what drives the choice between verb stems, a syntactic account (Ritter & Rosen 2010) and a syntax-semantics account (Bliss 2013). We discuss each previous analysis in the following two sub-sections.

Syntactic explanation

The syntactic account relies on the observation that TA/TI verbs allow different types of complements than AI+O verbs do (Frantz 2009; Ritter & Rosen 2010). TA and TI stems occur with DP complements, in which the nominal is preceded by a demonstrative, while AI+O stems occur with morphologically bare NPs or with null complements. Ritter & Rosen (2010) argue that TA and TI stems license DP objects while AI+O stems do not. Their generalizations are summarized in Table 1.

TABLE 1 Morpho-syntactic correlations between verb stem and complement type

TYPE OF COMPLEMENT	TA/TI STEMS	AI+O STEMS
DP	✓	×
Bare NP	×	✓
Null complement	×	✓

New data in Bliss (2012, 2013) show that bare plural NPs (NPs with plural morphology

which lack a demonstrative) can also occur with AI+O verbs,[4] showing that the allowed complement types are more varied than previously assumed. We will show below that complement types are not in complementary distribution between TA/TI and AI+O verb stems. We argue that a syntactic explanation of stem types cannot be upheld, because NPs modified by a numeral can occur with all three stem types.

Pseudo-incorporation explanation

Bliss (2013) shows that bare NP complements to AI+O verbs exhibit several semantic differences from DP complements to TA/TI verbs. She shows that bare NPs are tightly bound to the verb (they remain *v*'-internal), number-neutral[5], and non-specific in the sense of Enç (1991), and they have obligatory narrow scope under quantifiers and other operators. Based on these criteria, she argues that bare NP complements are pseudo-incorporated in the sense of Massam (2001). Bliss (2013) also notes that bare plurals may occur as complements to AI+O verbs, but that these are semantically and syntactically distinct from bare NPs. Bare plurals are not number neutral. They are also a slightly larger morpho-syntactic unit and contain a suffix which marks plurality and (in)animacy.

Bliss assumes that bare plurals are also pseudo-incorporated, and suggests that all AI+O complements combine with the verb via Restrict (Chung & Ladusaw 2004). This predicts that bare plurals will take narrow scope under quantifiers and other operators. We will show below that this prediction is not borne out, and that unlike bare NPs, bare plurals may take either wide or narrow scope with respect to clause-mate quantifiers.

In the next section we present a fuller account of the complement types allowed by TA/TI vs. AI+O stems. After that, we turn to the semantic properties of the complements.

DISTRIBUTION OF COMPLEMENT TYPES

We investigate a fuller range of post-verbal complement types than discussed in Ritter & Rosen (2010) and Bliss (2013), including 'certain' NPs, bare plurals, and NPs modified by a numeral.[6] DPs and 'certain' NPs include a demonstrative, while the other complement types do not. The word translated as 'certain' by our consultant is built on a demonstrative root *(ann-),* but differs from other demonstratives in morphological complexity (e.g., it includes the morpheme *-hka* INVS) and semantics. 'Certain' NPs can designate specific indefinites in out-of-the-blue contexts (such as the beginning of a narrative) while other DPs cannot, as shown in (7) and (8). In (7) the speaker is discussing a particular mouse they have in mind but which the hearer does not know. Example (8) contains an ordinary DP, but is only licit in out of the blue contexts if the speaker can point to the mouse.

(7) Matónni nitsíínoaa [anááhkayi kánaisskiina]
matonni nit-iino-aa-wa [**ann**-wa-hka=ayi kánaisskiina-wa]
yesterday 1-see.TA-DIR-PRX **DEM-**PRX-INVS=OBV.SG mouse.AN-PRX
'Yesterday I saw a (certain) mouse.'

(8) #Matónni nitsíínoaa [óma kánaisskiina]
matonni nit-iino-aa-wa [**om**-wa kánaisskiina-wa]
yesterday 1-see.TA-DIR-PRX **DEM-**PRX mouse.AN-PRX
#'Yesterday I saw that mouse.'
SPEAKER'S COMMENT: you can only say *óma* if the mouse is in the room with you and you are pointing at it.

We found that 'certain' NPs occur as complements to TA and TI verbs, but never to AI+O verbs. This is shown in (9), versus (10) for the verb 'see'.

(9) iinoyíiyaa [anískayi píita]
iino-yii-yi=aawa [**ann**-yi-hka=ayi píita-yi]
see.TA-DIR-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG eagle.AN-OBV
'They all saw an eagle.'

(10) *iyáápiiya [anískayi píita]
iyaapi-yi=aawa [**ann**-yi-hka=ayi píita-yi]
see.AI-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG eagle.AN-OBV
Intended: 'They saw an eagle.'

Similarly, a ‘certain’ NP can occur as the complement to the TI verb *iihkiitatoo* ‘bake’ in (11), but not as the complement to the AI+O counterpart *iihkiitaa* ‘bake’ in (12).

(11) iihkíítatoomya [aníihkayi napayín]
iihkiitatoo-m-yi=aawa [**ann**-yi-hka=ayi napayin-yi]
bake.TI-DIR-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG bread.IN-OBV
‘They baked a certain bread.’

(12) *iihkíítaa [aníihkayi napayín]
iihkiitaa-yi=aawa [**ann**-yi-hka=ayi napayin-yi]
bake.AI-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG bread.IN-OBV
Intended: ‘They baked a certain bread.’

We also confirmed Bliss’s (2013) observation that bare plurals can occur as complements to AI+O verbs but not to TA or TI verbs, as demonstrated in (13). We also provide examples with TI and AI+O stems for ‘read’ in (15) and (16).

(13) *iinoyíiya [píítaiks]
iino-yii-yi=aawa [piitaa-iksi]
see.TA-DIR-PL=PRX.PL eagle-AN.PL
Intended: ‘They saw eagles.’

(14) iyáápiya [píítaiks]
iyaapi-yi=aawa [piitaa-iksi]
see.AI-PL=PRX.PL eagle-AN.PL
‘They saw eagles.’

(15) *iikstóómya [sináákia'tsists]
iikstoo-m-yi=aawa [sinaakia'tsis–istsi]
read.TI-DIR-PL=PRX.PL book-IN.PL
Intended: ‘They read books.’

(16) iikstákiiya [sináákia'tsists]
iikstaki-yi=aawa [sinaakia'tsis-istsi]
read.AI-PL=PRX.PL book-IN.PL
‘They read books.’

We also investigated NPs modified by a numeral but no demonstrative (‘Numeral NPs’), which were not included in previous studies. Numeral NPs can appear with both TA/TI verbs and AI+O verbs, as shown in (17) and (18).

(17) á'pistotsimya [niókskayi itáísóyo'pists]
a'pistotsi-m-yi=aawa [niookska-yi itaisooyo'p-istsi]
build.TI-DIR-PL=PRX.PL three.IN-PL table-IN.PL
'They built three tables.'

(18) á'pistotakiiya [niókskayi itáísóyo'pists]
a'pistotaki-yi=aawa [niookska-yi itaisooyo'p-ists]
build.AI-PL=PRX.PL three.IN-PL table-IN.PL
'They built three tables.'

The distribution of types of complements is summarized in Table 2. AI+O verbs can never take a DP complement. TA/TI stems can appear with DP complements (including 'certain' NPs) or with Numeral NPs. Without further assumptions, a purely syntactic explanation cannot account for the fact that Numeral NPs are compatible with all stem types. Our proposal that the choice of stem type is sensitive to semantic, not syntactic, criteria predicts that when Numeral NPs occur with TA/TI stems, they should exhibit different semantic attributes than when they occur as complements to AI+O stems. We turn to the evidence for this in the next section.

TABLE 2 Distribution of complement types

COMPLEMENT TYPE	TA/TI STEMS	AI+O STEMS
DP	✓	×
'Certain' NP	✓	×
Bare NP	×	✓
Bare plural NP	×	✓
Null complement	×	✓
Numeral NP	✓	✓

VERB STEM REFLECTS SEMANTIC TYPE

Our proposal is that complements to TA and TI verbs are of type *e*, while AI+O complements are of a non-referential semantic type: either quantificational (type $\langle\langle e,t\rangle,t\rangle$) or predicative (type $\langle e,t\rangle$). Complements to TA/TI verbs introduce free-variable choice functions, and combine with the verb via Functional Application.

We will give two types of evidence for our proposal. First, we show that TA/TI complements display exceptionally wide 'scope', even scoping outside clause boundaries. This behavior is a hallmark of referential elements, including specific indefinites (Fodor and Sag 1982). Complements to AI+O verbs cannot escape clause boundaries. Second, we show that TA/TI complements never scope below a quantifier within the same clause, except in cases of 'pseudo-scope' (Kratzer 1998). Bare NP complements to AI+O verbs, on the other hand, must take narrow scope with respect to a clause-mate quantifier, which is predicted for arguments of type <*e,t*>. Finally, we show that bare plural and Numeral NP complements to AI+O verbs can scope either above or below a clause-mate quantifier.

Exceptional wide-scope behavior

Quantifiers occur as prefixes on the verb and can associate semantically with DP subjects or objects within their clause. This is shown in (19) with a TI verb.

(19) Nit**ohkaná**óhpommatoo'pinnaaniaawa
nit-**ohkana**-ohpommatoo-'p-innaan-yi=aawa
1-**all**-buy.TI-DIR-1PL-PL=PRX.PL
'We all bought them.' OR 'We bought all of them.' (Frantz 2009:85)

However, quantifiers are clause-bound in conjunct clauses (embedded clauses marked with the clause-typing suffix *-hs* CNJ, Déchaine & Wiltschko 2010). In (20), *ayak-* 'both' presupposes that the argument it quantifiers over contains only two entities. Embedded *ayak-* can only associate with clause-mate arguments, not with matrix clause arguments. These data indicate that conjunct clauses are scope islands in Blackfoot.

(20) nitsíksstaahpinnaan [kitááhk**ayak**siistapoohsoaayi]
nit-ik-sstaa-hpinnaan [kit-aahk-**ayak**-iistap-oo-hs-oaa-yi]
1-DEG-want.AI-1PL 2-might-**both**-away-go-CNJ-2PL-OBV
✓ 'We want you both to go away.' Context: There are three of us and two of you.
'We both want you to go away.' Context: There are two of us and three of you.
(adapted from Bliss 2012:12)

We will now investigate the conjunct-clause-escaping properties of complements to verbs of various stem types. We will show that complements to TA/TI verbs can "escape" semantic islands, while complements to AI+O verbs cannot. As discussed by Fodor and Sag (1982) among others, island-escaping behavior – and in particular island-escaping behavior to take only *widest,* not *intermediate,* scope – suggests that the relevant noun phrases are of type *e*. These phrases appear to take widest scope, but in reality are scopeless because they are directly referential. The three relevant readings to investigate – widest, intermediate, and narrowest – are illustrated for an English example in (21).

(21) Those girls all want [to buy **a dog**].

Widest: **∃*y*(dog(*y*))** [∀x(girl(*x*)) [*x* wants [*x* buys *y*]]]
Intermediate: ∀*x*(girl(*x*)) **[∃y(dog(*y*))** [*x* wants [*x* buys *y*]]]
Narrowest: ∀*x*(girl(*x*)) [*x* wants **[∃y(dog(*y*))** [*x* buys *y*]]]

Example (22) shows a DP complement to a TA verb within an embedded conjunct clause. It only has the widest scope reading, as we expect under our analysis of TA complements as type *e*.

(22) ómiksi aakííkoaiks ikohkanáísstaya [omááhkohpommataahsa ómi imita]

om-iksi aakiikoan-iksi ik-ohkana-issta-yi=aawa
DEM-AN.PL girl-AN.PL VX-all-want.AI-PL=PRX.PL

[o-m-aahk-ohpommat-aa-hsi=aawa **om**-yi imita-yi]
3-3-might-buy.**TA**-DIR-CNJ=PRX.PL **DEM-**OBV dog.AN-OBV
'Those girls all want to buy that dog.'

✓ Widest: for one particular dog *x*, all the girls want to buy *x*
Intermediate: for each girl, there is a different dog which she wants to buy
Narrowest: all the girls want to buy a dog, any dog

This widest-only behavior is not limited to DP complements, but is true for all allowed complement types to TA and TI verbs (e.g. DPs, 'certain' NPs, and Numeral NPs). For space reasons, we do not include all the relevant examples here, but see Weber & Matthewson (2014) for a fuller data set.

In contrast, AI+O complements in embedded clauses can$_{NOT}$ escape a conjunct clause. In example (23), the only possible reading is one where each of the girls has the desire to buy a dog, but none of them have a particular dog in mind.

(23) ómiksi aakííkoaiks íkohkanaisstaya [omááhkohpommaahsa imita]

om-iksi aakiikoan-iksi ik-ohkana-issta-yi=aawa
DEM-AN.PL girl-AN.PL VX-all-want.AI-PL=PRX.PL

[o-m-aahk-ohpommaa-hsi=aawa imita]
3-3-might-buy.AI-CNJ=PRX.PL dog.AN
'Those girls all want to buy a dog.'

Widest: for one particular dog *x*, all the girls want to buy *x*
Intermediate: for each girl, there is a different dog which she wants to buy
✓Narrowest: all the girls want to buy a dog, any dog

Similarly, bare plural and Numeral NP complements within AI+O conjunct clauses must take narrowest scope, as shown in (24). Recall that Numeral NPs may also appear as complements to TA/TI verbs, where they display widest-only scope. The different behavior of Numeral NPs as complements to TA/TI vs. AI+O verb stems is one of our strongest arguments in favor of a semantic analysis.

(24) ómiksi aakííkoaiks ikohkanáísstaya [omááhkohpommaahsa (nióókskami) imitáiks]

om-iksi aakiikoan-iksi ik-ohkana-issta-yi=aawa
DEM-AN.PL girl-AN.PL DEG-all-want.AI-PL=PRX.PL

[o-m-aahk-ohpommaa-hsi=aawa (**niookskam**-yi) imita-**iksi**]
3-3-might-buy.AI-CNJ=PRX.PL (**three.AN**-PL) dog-**AN.PL**
'Those girls all want to buy (three) dogs.'

Widest: there is one particular set of (3) dogs that all the girls want to buy
Intermediate: for each girl, there is a different set of (3) dogs she wants to buy
✓Narrowest: all the girls want to buy (3) dogs, any (3) dogs

The exceptional scope data are summarized in Table 3. All complements to TA/TI verbs are interpreted as if they took widest scope, but the absence of intermediate readings shows that these complement types are in reality scopeless (cf. Fodor and Sag 1982). Bare

NP, bare plural, and Numeral NP complements to AI+O verbs, on the other hand, are clause-bound, which shows they are NOT of type e.

TABLE 3 Island-escaping properties of complements to different verb stems

STEM TYPE	COMPLEMENT	SCOPE?
TA/TI	DP	Widest
TA/TI	'Certain' NP	Widest
TA/TI	Numeral NP	Widest
AI+O	Bare NP	Narrowest
AI+O	Bare plural	Narrowest
AI+O	Numeral NP	Narrowest

An important point is that Numeral NPs behave differently depending on whether they are complements to TA/TI verbs or AI+O verbs. This shows that the choice of verb stem reflects semantic properties of the complement, not syntactic ones. The choice between TA/TI and AI+O verbs reflects the semantic type of the complement (type *e* or not type *e*). In the next section we provide more semantic evidence for this proposal.

Clause-internal scoping data

In this section we examine the scoping behavior of complements with respect to clause-mate quantifiers. We show that TA/TI complements always take wide scope with respect to quantifiers, which is expected if they are of type *e*. Complements to AI+O verbs show two different behaviors: bare NPs always take narrow scope, while bare plurals and plurals modified by a numeral can take either wide or narrow scope. We use the strong quantifiers *ayak-* 'both', *a'tsoot-* 'both' and *iihkana-* 'all' in the examples below, which always occur as verbal prefixes. Weak quantifiers such as 'many' may occur either as verbal prefixes or as a separate modifier, but we have not considered these in this paper.

The TA/TI data are shown in (25)–(27), with an animate DP, an inanimate 'certain' NP,

and a Numeral NP. The results are summarized in Table 4.

(25) áyákohpommatsiiya [ómi isttoán]
ayak-ohpommat-yii-yi=aawa [**om**-yi isttoan-yi]
both-buy.TA-DIR-PL=PRX.PL **DEM-OBV** knife.AN-OBV
'They both bought this knife.'
✓ They bought this same knife (together).
They bought one knife each.

(26) á'tsootokstoomya [aníhkayi sináákia'tsis]
a'tsoot-okstoo-m-yi=aawa [**ann**-yi-hka=ayi sinaakia'tsis]
both-read.TI-DIR-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG book.IN
'They both read a certain book.'
✓ They read the same book.
They each read a different book.

(27) áyaká'pistotsimya [nióókskayi itáísóyo'pists]
ayak-a'pistots-m-yi=aawa [**niookska**-yi itaisooyo'p-istsi]
both-build.TI-DIR-PL=PRX.PL **three**-PL table-IN.PL
'They both built three tables.'
✓ They both worked on the same three tables.
Piitaaki made two and Saako made one. (Three tables total.)
They each made three tables. (Six tables total.)

TABLE 4 Scope of different TA/TI complements with respect to quantifiers

COMPLEMENT	WIDE SCOPE?	NARROW SCOPE?
DP	✓	×
'Certain' NP	✓	×
Numeral NP	✓	×

On the other hand, bare NP complements to AI+O verbs must take narrow scope. This is illustrated with an animate complement in (28) and an inanimate in (29).

(28) iihkanááyaapiiya [píita]
iihkana-yaapi-yi=aawa [píita]
all-see.AI-PL=PRX.PL eagle.AN
'They all saw an eagle.'
Three birdwatchers all saw the same eagle.
✓ Three birdwatchers split up and they each saw a different eagle.

(29) iihkanáókstakiiya [sináákia'tsis]
iihkana-okstaki-yi=aawa [sinaakia'tsis]
all-read.AI-PL=PRX.PL book.IN
'They all read a book.'
They all read the exact same book.
✓ Each of them read a different book.

Bare plural nouns may either scope high or low, as demonstrated in (30) and (31).

(30) iihkanááyaapiiya [píítaiks]
iihkana-yaapi-yi=aawa [piitaa-**iksi**]
all-see.AI-PL=PRX.PL eagle-**AN.PL**
'They all saw eagles.'
✓ Three birdwatchers are together and they saw eagles.
✓ Three birdwatchers split up and they each saw different eagles.

(31) áyakohpommayaa [sópa'tsists]
ayak-ohpommaa-yi=aawa [sopa'tsis-**istsi**]
both-buy.AI-PL=PRX.PL chair-**IN.PL**
'They both bought some chairs.'
✓ The shopowner dishonestly (re)sold the same set of chairs to two people.
✓ Two people each bought some chairs separately.

Numeral NP complements to AI+O verbs also scope high or low, as in (32) and (33).

(32) anááhk píítaaki ki anááhk sáako áyaka'pistotakiiya [nióókskayi itáísóyo'pists]
ann-wa-hka píítaa-aakii ki ann-a-hka sáako
DEM-OBV-INVS eagle-woman CONJ DEM-OBV-INVS saako
ayak-a'pistotaki-yi=aawa [**niookska**-yi itaisooyo'p-istsi]
both-build.AI-PL=PRX.PL **three.IN**-PL table-IN.PL
'Piitaakii and Saako both built three tables.'
✓ They both worked on the same three tables.
✓ They each made three tables. (Six tables total.)

(33) nitohkanáóhpommaahpinnaan [nióókska sináákia'tsists]
nit-ohkana-ohpommaa-hp-innaan [**niookska**-yi sinaakia'tsis-istsi]
1-all-buy.AI-IND-1Pl **three.IN**-PL book-IN.PL
'We all bought three books.'
✓ We pooled our money to buy three books.
✓ We each bought three books.

The AI+O complement scoping facts are summarized in Table 5. We confirmed Bliss's (2013) observation that bare NPs must scope under quantifiers. However, bare plurals and Numeral NPs cannot be pseudo-incorporated in the same manner as bare NPs, contra Bliss

(2013), because they do not obligatorily take narrow scope under quantifiers.

Table 5:Scope of different AI+O complements with respect to quantifiers

COMPLEMENT	WIDE SCOPE?	NARROW SCOPE?
Bare NP	×	✓
Bare plural	✓	✓
Numeral NP	✓	✓

In the next two sections we present our analysis of these facts.

TA/TI COMPLEMENTS ARE WIDE-SCOPE CHOICE FUNCTIONS

We argue that all complements to TA and TI verbs introduce choice-function variables. The choice function applies to the set denoted by the nominal predicate and returns one individual from that set (Reinhart 1997). The entire DP is thus of type *e*, denoting one (possibly plural) individual. Following Kratzer (1998), we assume that the choice functions are left free. This predicts that the relevant noun phrases can escape from islands and display clause-internal widest-scope behavior, just as we showed is the case for Blackfoot TA/TI complements. The analysis is illustrated in (35) for the sentence in (34) (repeated from (26)). We assume that the 'certain' demonstrative introduces a choice function variable, and the verbal stem morphology presupposes that the complement is of type *e*.

(34) á'tsootokstoomya [aníhkayi sináákia'tsis]
a'tsoot-okstoo-m-yi=aawa [**ann**-yi-hka=ayi sinaakia'tsis]
both-read.TI-DIR-PL=PRX.PL **DEM-OBV**-INVS=OBV.SG book.IN
'They both read a certain book.'
✓ They read the same book.
They each read a different book.

(35) $[[\textit{á'tsootokstoomya pro}_3\ \textit{aníhkayi}_4\ \textit{sináákia'tsis}]]^g$ is defined only if $|g(3)| = 2$.
If defined, $[[\text{á'tsootokstoomya pro}_3\ \text{aníhkayi}_4\ \text{sináákia'tsis}]]^g$
$= \forall x\ [x \in g(3) \rightarrow \text{read}\ (x, g(4)(\text{book}))]$

Sentence (35) asserts that they each read the element which is chosen from the set of

books by the contextually salient choice function. This correctly predicts that they both read the same book.

Our analysis makes a further prediction, again inherited from the analysis of Kratzer (1998) (and its variant in Matthewson 1999, used for similar facts in St'át'imcets): if there is a bound pronoun inside the relevant complement, apparent narrow scope will arise (Kratzer's 'pseudo-scope'). This is because there can be a different choice function for each individual. This prediction is borne out, as shown in (36). Sentence (37) asserts that each girl *x* is holding the pen which is chosen from the set of *x*'s pens by the choice function. Since there is a different set of *x*'s pens for each value of *x*, there can be two different pens.[7]

(36) ómiksi náátsitapiks aakííkoaiks (áyaká)áyinniiya (ómiksi) otó'ohtaisinaaki'ihpowai(ks)

om-iksi naat-itapi-iksi aakiikoan-iksi
DEM-AN.PL two-person-AN.PL girl.AN.PL

(ayak-)a-yinn-yii-yi=aawa (om-iksi) ot-ohtaisinaakiyihp-owaa-yi/-iksi
(both-)IPFV-hold.TA-DIR-PL=PRX.PL (DEM-AN.PL) 3-pen-3PL-OBV(SG)/-AN.PL
'They are holding **their own** pen(s).'
Non-widest scope available: for each girl *x*, *x* is holding *x*'s pen(s)

(37) [[*ómiksi náátsitapiks aakííkoaiks (áyak) áyinniiya pro*$_3$ (ómiksi$_4$) otó'ohtaisinaaki'ihpowai(ks)]]^g
= $\forall x[x \in g(3) \rightarrow \text{hold}(x, g(4)(x\text{'s pen(s)}))]$

Further cases of pseudo-scope are given in Weber & Matthewson (2014). This pattern, whereby indefinite noun phrases display widest-scope effects which are mitigated by bound variable pronouns, provides strong support for a free-variable choice function analysis of Blackfoot TA/TI complements.

AI+O COMPLEMENTS ARE NON-REFERENTIAL, BUT NOT ALL PREDICATIVE

Recall that unlike TA/TI complements, AI+O complements cannot escape semantic islands. We can therefore conclude that no AI+O complements are of type *e*. But because

complements to AI+O verbs show two different behaviors with respect to scoping around quantifiers, we propose that AI+O complements come in two types. Morphologically bare NPs, which must take narrow scope with respect to quantifiers, are pseudo-incorporated and are of type <*e*,*t*>. They compose with the verb via Restrict, and Existential Closure then applies (Bliss 2013; Chung and Ladusaw 2004). On the other hand, plural AI+O complements may scope either above or below quantifiers. This is explained by analyzing plural complements as existential quantifiers (of type <<*e*,*t*>,*t*>). This also correctly predicts that plural NPs cannot escape the clause to take exceptionally wide scope. For Numeral NPs (the one type of complement which is grammatical with both types of verb stem), our analysis correctly predicts differential scope behavior, depending on whether the Numeral NP appears as complement to a TA/TI verb, or an AI+O verb.

CONCLUSION

In this paper we have argued that the choice of Blackfoot verb stem is semantically, not syntactically driven. A primary piece of evidence for the proposal comes from Numeral NPs, which can occur as complements to both TA/TI and AI+O verbs, but with different semantic behavior. Blackfoot overtly encodes referential objects (via TA/TI stem morphology) versus non-referential objects (via AI+O morphology). We note that a similar distinction of complement types is maintained in other Algonquian languages via two parallel series of inflectional morphology: the ABSOLUTE inflection (used with indefinite objects), and the OBJECTIVE (used with definite objects or null pronouns; Goddard 2007 and sources therein). While reflexes of both inflectional paradigms exist in Blackfoot, the absolute/objective contrast is no longer productive. Instead, the distinction between referential and non-referential complement types is expressed via stem morphology.

We also showed that complements to AI+O verbs are semantically non-uniform, and that only bare NP complements are pseudo-incorporated (contra Bliss 2013). Furthermore, the two proposed semantic types for AI+O complements correlate in a plausible way with the content of the complements themselves. It is unsurprising from a cross-linguistic perspective that it is the bare NPs which are pseudo-incorporated. Objects with typical pseudo-incorporated properties (such as obligatory narrow scope) are frequently number-neutral, just like Blackfoot bare NPs but unlike Blackfoot bare plurals and Numeral NPs (Chung & Ladusaw 2004; Dayal 2011; Farkas & de Swart 2003; van Geenhoven 1998).

A number of issues remain for future research. One question concerns whether AI+O complements are discourse transparent (can be anaphorically referred back to in subsequent sentences). The literature on pseudo-incorporation shows that there is cross-linguistic variation with respect to whether an incorporated noun is discourse transparent (e.g. Mithun 1984). Research suggests that the ability of pseudo-incorporated nouns to allow anaphoric reference depends in part on whether the language allows both singular and plural incorporated nominals, whether the anaphor is covert or overt, and whether the sentence is telic or atelic (Dayal 2011; Farkas & de Swart 2003). Future research should explore where Blackfoot fits in this typology with respect to anaphora.

NOTES

1. Special thanks to Beatrice Bullshields for her laughter and patience and for sharing her language. *Nitsíkohtaahsi'takihpinnaan!* Thanks to audiences at UBC, the 45th Algonquian Conference, and SULA 8, and to Meagan Louie and two anonymous reviewers. This research was supported in part by SSHRC grant #410-2011-0431.

2. In our data, we use the orthographic conventions of Frantz (1978, 2009), except that we overtly mark devoicing of word-final vowels with the IPA diacritic X̥. Examples from other

sources include the original transcription and free translation, but we have sometimes amended the gloss line for consistency. Abbreviations which are not in the Leipzig Glossing Rules: AI = animate intransitive, AN = animate, CNJ = conjunct order, CONJ = conjunction, DEG = degree marker, DIR = direct, II = inanimate intransitive, INVS = invisible, INV = inverse, IN = inanimate, MEANS = means/instrumental, OBV = obviative, PRX = proximate, TA = transitive animate, TI = transitive inanimate.

3. Animacy in Blackfoot is grammatical. The (in)animacy of a noun usually corresponds with real-world (non)sentience, but a subset of non-sentient referents are grammatically animate, such as *pokón* 'ball', *íssk* 'pail', and *isttoán* 'knife' (Bliss 2005; Frantz 2009).

4. This seems to be a recent change. Frantz (p.c. to Heather Bliss) says that older data show bare plurals are not allowed as AI+O complements.

5 Bare NPs may not be number-neutral for our consultant; she typically rejects bare NPs in plural contexts. Investigation of number-neutrality goes beyond the scope of this paper.

6. Complements may also appear pre-verbally, with concurrent differences in verbal agreement and focus. We restrict our investigation here to post-verbal complements.

7. The pens in (36) can be marked by the singular suffix *-yi* if each girl is only holding a single pen. However, the plural suffix *-iksi* is also valid or even preferred in this context. This morphological plurality may be a dependent plural effect (de Mey 1981).

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