

Ø-Agreement in Turkana

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Goals

- ▶ Develop a formalism which captures the interaction of \emptyset -agreement and scales as directly as possible
- ▶ Account for Quirky Inverse Marking in Turkana

Turkana Plural Suffixes

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = Overt Plural Suffix
■ = No Overt Plural Suffix

Turkana Hierarchy-Based Competition

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = Overt 1st Person Agreement ∅ 3rd Person Agreement
- = Overt 2nd Person Agreement ∅ 3rd Person Agreement
- = Overt Subject Agreement ∅ Object Agreement

Turkana Quirky Inverse Marking

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

■ = inverse k-
■ = ∅

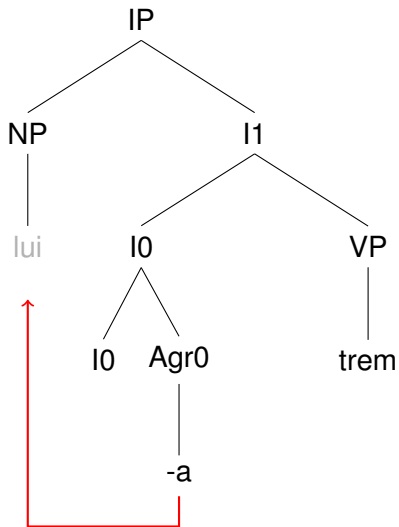
Structure of the Talk

- ▶ (Preliminaries)
- ▶ Number Suffixes
- ▶ Person Prefixes
- ▶ Inverse Prefixes

Basic Ideas

- ▶ Morphosyntactic Features must be realized by morphs
- ▶ Morphs can be \emptyset , \emptyset -morphs are preferred
- ▶ \emptyset must be licensed by Licensing Conditions
- ▶ Licensing Conditions derive from scales by schemata
- ▶ Scales and schemata are universal,
Licensing Conditions are language-specific,

Pro Licensing in Syntax (Rizzi, 1986)



Grammatical Architecture

- ▶ **Realizational Morphology:**

Morphology interprets abstract morphosyntactic features

(Halle & Marantz, 1993; Stump, 2001)

- ▶ **Piece-based System:**

Heads are spelled out by morpheme-like Vocabulary Items

(Halle & Marantz, 1993; Trommer, 2001)

- ▶ **Special Mechanism:**

VIs can be made invisible to Phonology after Insertion

Grammatical Architecture

Input:	[+1-3]	(Morphosyntactic heads)
Vocabulary Insertion:	a:[+1] i:[-3]	(Vocabulary Items)
Ø-Licensing	a:[+1] i:[-3]	(Licensing Conditions)
Phonological Interpretation	a	(Phonological Structure)

Prominence Scales

Person: $\left\{ \begin{array}{c} +1 \\ +2 \end{array} \right\} \succ +3$

Number: $\left\{ \begin{array}{c} \text{Plural} \\ \text{Dual} \end{array} \right\} \succ \text{Singular}$

Grammatical Function: Subject \succ Object

Case: Unmarked \succ Marked

Entailment Scales

Person: $\left\{ \begin{array}{c} +1 \\ +2 \end{array} \right\} \succ -3$

Number: Dual \succ Plural

Turkana

- ▶ Eastern Nilotic Language spoken by $\approx 350,000$ speakers in the east of Lake Turkana in Kenya
- ▶ Complex tonal and segmental morphology
- ▶ Main empirical source: Dimmendaal (1982)

Turkana Verb Agreement

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			k-a-		a-		
		pl			k-i-		k-i-		
	2	sg	k-i- -te				i- -te		
		pl							
	3	sg	k-a- -te	k-i- -te	k-i- -te		ε-		
		pl							

- = Number Suffixes
- = Inverse Prefix
- = Person Prefixes

Turkana Number Suffixes

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl		-∅					
	2	sg							
		pl	-te		-te				
	3	sg							
		pl	-te						

Turkana Number Suffixes

Subject	1	sg	-∅
		pl	
	2	sg	-te
		pl	
	3	sg	∅
		pl	-te

-te ↔ [+pl]

Problem: Why is plural of 1st person ∅?

∅-Licensing

- ▶ A vocabulary item is phonologically interpreted as ∅ iff it is ∅-licensed
- ▶ A vocabulary item is ∅-licensed iff there is at least one licensing condition which ∅-licenses it or one of its morphosyntactic features

Cumulative Complexity Licensing

Schema:

Condition:	F_1, F_2, \dots, F_n are maximal in S_1, S_2, \dots, S_n
Form:	F_2, \dots, F_n license $\emptyset F_1$ of the same input head

$[+p|]$ is maximal in $[+p|] \succ [-p|]$

$[+1]$ is maximal in $\left\{ \begin{array}{l} [+1] \\ [+2] \end{array} \right\} \succ [+3]$

Licensing Condition:

$[+1]$ licenses $\emptyset [+p]$ of the same input head

$[+1+p|]$

Spellout: Number

		1pl	2pl	3pl
		[+1+pl]	[+2+pl]	[+3+pl]
Insertion:		-te	-te	-te
Ø-Licensing:	[+1+pl]	-te	-te	-te
			-te	ta

Person Marking in Intransitive Forms

Subject	1	sg	a-
		pl	I-
	2	sg	I-
		pl	I-
	3	sg	ε-
		pl	ε-

a ↔ [+1]

I ↔ [-3]

ε ↔ [+3]

Problem 1: Why is **a-** zero in 1pl forms?

Cumulative Complexity Licensing

Schema:

Condition:	F_1, F_2, \dots, F_n are maximal in S_1, S_2, \dots, S_n
Form:	F_2, \dots, F_n license $\emptyset F_1$ of the same input head

$[+1]$ is maximal in $\left\{ \begin{array}{l} [+1] \\ [+2] \end{array} \right\} \succ [+3]$

$[+p|]$ is maximal in $[+p|] \succ [-p|]$

Licensing Condition:

$[+p|]$ licenses $\emptyset [+1]$ of the same input head

$[+p|+1]$

Spellout: Intransitive Person

		1pl	2sg
		[+1-3+pl]	[+2-3-pl]
Insertion:		a-i-	i-
Ø-Licensing:	[+pl+1]	a-i-	–
		i-	i-

Person Marking in Intransitive Forms

Subject	1	sg	a-
		pl	
	2	sg	ɪ-
		pl	
	3	sg	ε-
		pl	

a ↔ [+1]

ɪ ↔ [-3]

ε ↔ [+3]

Problem 2: Why is ɪ- zero in 1sg forms?

Entailment Licensing

Schema:

Condition:	Feature F_1 entails feature F_2
Form:	Overt F_1 licenses $\emptyset F_2$ of the same head

[+1] entails [-3]

Licensing Condition:

Overt [+1] licenses \emptyset [-3] of the same head

[+1-3]

Spellout: Intransitive Person

		1sg	2sg	3sg
		[+1-3-pl]	[+2-3+pl]	[+3-pl]
Insertion:		a-i-	i-	e-
Ø-Licensing:	[+1-3]	a-i-	–	–
		a-	i-	e-

Interaction of Entailment and Complexity Licensing

		1sg	1pl	2sg
		[+1-3-pl]	[+1-3+pl]	[+2-3-pl]
Insertion:		a-i-	a-i-	i-
∅-Licensing:	[+pl+1]	–	a-i-	–
	[+1][-3]	a-i-	–	–
		a-	i-	i-

⇒ **Crucial Ordering of Licensing Conditions**

Turkana Hierarchy-Based Competition

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			k-a-		a-		
		pl			k-i-		k-i-		
	2	sg	k-i-				i-		
		pl							
	3	sg	k-a-	k-i-	k-i-		ε-		
		pl							

Turkana Hierarchy-Based Competition

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			k-a-		a-		
		pl			k-i-		k-i-		
	2	sg	k-i-				i-		
		pl							
	3	sg	k-a-	k-i-	k-i-		ε-		
		pl							

Turkana Hierarchy-Based Competition

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = Overt 1st Person Agreement ∅ 3rd Person Agreement
- = Overt 2nd Person Agreement ∅ 3rd Person Agreement
- = Overt Subject Agreement ∅ Object Agreement

Generalizations

- ▶ Either subject or object trigger person agreement, but not both
- ▶ 1st and 2nd person argument always trigger agreement in the context of a 3rd-person argument
- ▶ Otherwise the subject triggers agreement

Superiority Licensing: Person

Schema:

Condition:	$F_1 \geq F_2$ for scale S
Form:	Overt F_1 in H_1 licenses $\emptyset F_2$ in H_2

[+1] \succ [+3] and [+2] \succ [+3]

Licensing Conditions:

Overt [+1] in H_1 licenses \emptyset [+3] in H_2
Overt [+2] in H_1 licenses \emptyset [+3] in H_2

[+1][+3] and [+2][+3]

Superiority Licensing: Grammatical Function

Schema:

Condition:	$F_1 \geq F_2$ for scale S
Form:	Overt F_1 in H_1 licenses $\emptyset F_2$ in F_2

[+Subject] \succ [+Object]

Licensing Condition:

Overt [+S] in H_1 licenses \emptyset [+O] in H_2

[+S][+O]

Spellout: 1sg ↔ 3sg

		1sg → 3sg		3sg → 1sg	
		[+1-3] _s	[+3] _o	[+3] _s	[+1-3] _o
Insertion:		a-i-	e-	e-	a-i-
Ø-Licensing:	[+1-3]	a-i-	e-	e-	a-i-
	[+1][+3]	a-i-	e-	i-e-	a-
	[+2][+3]		-		-
	[+S][+O]		-		-
		a-		a-	

Spellout: 2sg ↔ 3sg

		2sg → 3sg		3sg → 2sg	
		$[+2-3]_s$	$[+3]_o$	$[+3]_s$	$[+2-3]_o$
Insertion:		i-	e-	i-	e-
Ø-Licensing:	$[+1-3]$	–			–
	$[+1][+3]$	–			–
	$[+2][+3]$	i-	e-	e-	i-
	$[+S][+O]$	–			–
		i-			i-

Spellout: 1sg \leftrightarrow 2sg

		1sg \rightarrow 2sg		2sg \rightarrow 1sg	
		$[+1-3]_s$	$[+2-3]_o$	$[+2-3]_s$	$[+1-3]_o$
Insertion:		a-i-	i-	i-	a-i-
Ø-Licensing:	$[+1-3]$	a-i-	i-	i-	a-i-
	$[+1][+3]$		–		–
	$[+2][+3]$		–		–
	$[+S][+O]$	a-i-	i-	i-	a-i-
		a-		i-	

Turkana Quirky Inverse Marking

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg		k-a-		a-			
		pl		k-l-					
	2	sg	k-l-			l-			
		pl							
	3	sg	k-a-			ε-			
		pl							

Turkana Quirky Inverse Marking

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

■ = inverse k-

Is this Accidental Homophony?

No.

Other Nilotic languages show basically the same pattern
even though the morphophonological details are different

(Cysouw, 1998)

Quirky Inverse in Karimojong (Novelli, 1985)

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			aka-			a-	
		pl			ɔkɔ-			εkε-	iki-
	2	sg							ɪ-
		pl							
	3	sg							ε-
		pl							

Quirky Inverse: Analysis

- ▶ **k-** is an inverse/complex marker (specifying 2 feature structures) and at the same time a subject plural marker
- ▶ It is inserted in all transitive contexts, but phonologically \emptyset in direct configurations
- ▶ It is inserted in all plural subject contexts, but phonologically \emptyset when cooccurring with number suffixes

Necessary Condition for the Appearance of k-

- ▶ there is agreement with a plural argument **or**
- ▶ there is agreement with two singular arguments

Question: Why should this be a natural class?

The Iconic Representation of Number (Trommer, 2006)

Singular Plural



(in a two-way number system)

Representation of k-

			O							
			1		2		3		∅	
			sg	pl	sg	pl	sg	pl		
S	1	sg				[•] [•]	[•] [••]	[•] [•]	[•] [••]	[•]
		pl				[••][•]	[••][••]	[••][•]	[••][••]	[••]
	2	sg	[•] [•]	[•] [••]			[•] [•]	[•] [••]	[•]	
		pl	[••][•]	[••][••]			[••][•]	[••][••]	[••]	
	3	sg	[•] [•]	[•] [••]	[•] [•]	[•] [••]	[•] [•]	[•] [••]	[•]	
		pl	[••][•]	[••][••]	[••][•]	[••][••]	[••][•]	[••][••]	[••]	

k- ↔ [•]_s [•]

Possible Insertion of k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

■ = Insertion of k- according to lexical entry

Actual Realization of k-

			Object							
			1		2		3		∅	
			sg	pl	sg	pl	sg	pl		
Subject	1	sg								
		pl								
	2	sg								
		pl								
	3	sg								
		pl								

- = k- inserted and overt
■ = k- inserted and ∅

A Reminder: Turkana Number Suffixes

Subject	1	sg	-∅
		pl	
	2	sg	-te
		pl	
	3	sg	∅
		pl	-te

-te ↔ [+pl]

Realization of k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = k- inserted and overt
- = k- inserted and ∅ (in the context of plural -te)
- = k- inserted and ∅

Entailment Licensing

Schema:

Condition:	Feature structure F_1 entails feature structure F_2
Form:	Overt F_1 licenses $\emptyset F_2$ of the same head

$[\bullet\bullet]$ entails $[\bullet][\bullet]$

Licensing Condition:

Overt $[\bullet\bullet]$ licenses $\emptyset [\bullet][\bullet]$ of the same head

$[\bullet\bullet\bullet]$

Spellout: Number and Inverse

		1pl	2pl	3pl
		[+1●●]	[+2●●]	[+3●●]
Insertion:		k- -te	k- -te	k- -te
∅-Licensing:	[+1●●]	k- -te	–	–
	[●●●●]	–	k- -te	k- -te
		k-	-te	-te

Realization of Intransitive k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

■ = k- inserted and overt

■ = k- inserted and ∅ (entailment licensing)

Realization of k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = k- inserted and overt
- = k- inserted and ∅ (by entailment licensing)
- = k- inserted and ∅

Direct Licensing

Schema:

Condition:	M is complex, C_1, C_2 congruent scale contrasts
Form:	Linking under C_1, C_2 licenses \emptyset M

$[+1] \succ [+3]$ and $[+S] \succ [+O]$ are congruent scale contrasts

$[+2] \succ [+3]$ and $[+S] \succ [+O]$ are congruent scale contrasts

$[+3] \succ [+3]$ and $[+S] \succ [+O]$ are congruent scale contrasts

Licensing Conditions:

Linking under $[+1][+3]/[+S][+O]$ licenses \emptyset $[\bullet][\bullet]$
Linking under $[+2][+3]/[+S][+O]$ licenses \emptyset $[\bullet][\bullet]$
Linking under $[+3][+3]/[+S][+O]$ licenses \emptyset $[\bullet][\bullet]$

 $[\bullet][\bullet]_{[+S][+O]}^{[+1][+3]}$
 $[\bullet][\bullet]_{[+S][+O]}^{[+2][+3]}$
 $[\bullet][\bullet]_{[+S][+O]}^{[+3][+3]}$

Spellout: 1sg \leftrightarrow 3sg

			[+1•+S][+3•+O]
1sg \rightarrow 3sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•] ^{[+1][+3]} _{[+S][+O]}	k- [•] [•]
		[•][•] ^{[+2][+3]} _{[+S][+O]}	–
		[•][•] ^{[+3][+3]} _{[+S][+O]}	–

			[+3•+S][+1•+O]
3sg \rightarrow 1sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•] ^{[+1][+3]} _{[+S][+O]}	–
		[•][•] ^{[+2][+3]} _{[+S][+O]}	–
		[•][•] ^{[+3][+3]} _{[+S][+O]}	–
			k-

Spellout: 2sg \leftrightarrow 3sg

			[+2•+S][+3•+O]
2sg \rightarrow 3sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•] ^{[+1][+3]} _{[+S][+O]}	—
		[•][•] ^{[+2][+3]} _{[+S][+O]}	k- [•] [•]
		[•][•] ^{[+3][+3]} _{[+S][+O]}	—

			[+2•+S][+1•+O]
3sg \rightarrow 2sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•] ^{[+1][+3]} _{[+S][+O]}	—
		[•][•] ^{[+2][+3]} _{[+S][+O]}	—
		[•][•] ^{[+3][+3]} _{[+S][+O]}	—
			k-

Spellout: 1sg \leftrightarrow 2sg

			[+1•+S][+2•+O]
1sg \rightarrow 2sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•]	^{[+1][+3]} ^{[+S][+O]} —
		[•][•]	^{[+2][+3]} ^{[+S][+O]} —
		[•][•]	^{[+3][+3]} ^{[+S][+O]} —
			k-

			[+2•+S][+1•+O]
2sg \rightarrow 1sg	Insertion:		k- [•] [•]
	Ø-Licensing:	[•][•]	^{[+1][+3]} ^{[+S][+O]} —
		[•][•]	^{[+2][+3]} ^{[+S][+O]} —
		[•][•]	^{[+3][+3]} ^{[+S][+O]} —
			k-

Spellout: 1pl \leftrightarrow 3sg1pl \rightarrow 3sg

		[+1●●+S][+3●+O]
Insertion:		k:[●+S][●] k:[●+S][●]
Ø-Licensing:	[●][●]	[+1][+3] [+S][+O] k:[●+S][●] k:[●+S][●]
	[●][●]	[+2][+3] [+S][+O] —
	[●][●]	[+3][+3] [+S][+O] —
		k

3sg \rightarrow 1pl

		[+3●+S][+1●●+O]
Insertion:		k:[●+S][●]
Ø-Licensing:	[●][●]	[+1][+3] [+S][+O] —
	[●][●]	[+2][+3] [+S][+O] —
	[●][●]	[+3][+3] [+S][+O] —
		k

Realization of Transitive k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

- = k- inserted and overt
■ = k- inserted and ∅ (direct licensing)

Realization of Intransitive k-

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg							
		pl							
	2	sg							
		pl							
	3	sg							
		pl							

■ = k- inserted and overt

■ = k- inserted and ∅ (entailment licensing)

Realization of k- (Intransitive and Transitive)

			Object							
			1		2		3		∅	
			sg	pl	sg	pl	sg	pl		
Subject	1	sg								
		pl								
	2	sg								
		pl								
	3	sg								
		pl								

- = k- inserted and overt
■ = k- inserted and ∅

Types of Licensing

	Licensor	Ø-Licensee	Conditions
Cumulative Complexity	High	High	same head different scales
Superiority	High	Low	different heads same scale
Direct	Congruent Linking	Complex Marker	different heads same scale
Entailment	High	Low	same head same scale

Summary

- ▶ Transfer of \emptyset -Licensing to Morphology
- ▶ Maximally Simple Linking of Scales and \emptyset
- ▶ Natural Account of Quirky Inverse in Turkana

Toposa

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			à-kà-		à-		
		pl			kì-				
	2	sg	ì-kì-				ɪ-		
		pl							
	3	sg	à-kà-				è-		
		pl							

Teso

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg		ka-		a-			
		pl		ki-					
	2	sg	ki-			i-			
		pl							
	3	sg	ka-	ki-		ε-			
		pl							

Maasai

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			áá-		á-		
		pl			kí-				
	2	sg	kí-	í-			ɪ-		
		pl							
	3	sg	áa-	é-	kí-		é-		
		pl							

Päkot

			Object				
			1		2		sg
			sg	pl	sg	pl	
Subject	1	sg			-i:ni:	-a:kwa	
		pl			-e:ca:ni	-e:ca:kwa	
	2	sg	-a:ne:ni:	-e:ca:ni			
		pl	-a:nikwa	-e:ca:kwa:			
	3	sg	-a:nin	-e:ca:	-i:ni:	-a:kwa:	
		pl					

Nandi (Creider & Creider, 1989:98)

			Object						
			1		2		3		∅
			sg	pl	sg	pl	sg	pl	
Subject	1	sg			-í:n	-á:k			
		pl							
	2	sg	-á:	-e:c					
		pl							
	3	sg	-â	-ê:c	-îñ	âk			
		pl							