Plural Insertion is Constructed Plural

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Harbour (2003) on Feature Insertion in Kiowa

Ø ➔ [–singular]

Diagnostics of Non-singular

Agent or Goal	Object sg	du	pl	inv
neither [–singular]	*ɔ	**Nasal**		***Coda**
either [–singular]	ɔ	*Nasal		Coda

Forms with 2sg Goals

Agent	Goal	Object sg	du	pl	inv
–/1sg	**2sg**	gyá	nén	yán	gɔ́
other (3sg,1pl,. . .)	**2sg**	gɔ	**d**ét	gyá	gɔ́**t**

Colloquial Ainu (Shibatani, 1990)

eci-un-kore ‘you (pl.) give us’
2pl-O1p-give

*ku-e-	’I ➔ you (sg.)’	*ci-e-	’we ➔ you (sg.)’	⇒ **eci-**
*ku-eci-	’I ➔ you (pl.)’	*ci-eci-	’we ➔ you (pl.)’	

Nocte (Gupta, 1990)

	Sg	Pl
1	rang-ka-**ang**	rang-ka-**e**
2	rang-ka-**o**	rang-ka-**an**
3	rang-ka-**a**	

(‘to go’)

	Direct	**Inverse**	
1sg → 2sg	hetho-**e**	hetho-**h** -ang	**2sg → 1sg**
	teach-**1pl**	teach-**Inv**-1sg	
1sg → 3sg	hetho-ang	hetho-**h**-ang	**3sg → 1sg**
	teach-1sg	teach-**Inv**-1sg	
2sg → 3pl	hetho-o	hetho-**h**-o	**3sg → 2sg**
	teach-2sg	teach-**Inv**-2sg	

(‘to teach’)

Apparent Process

1sg ➔ 1pl / ____2sg

Problem: Arbitrary Feature Manipulation

Solution

$$1 + 1 = 2$$

$$\text{singular} + \text{singular} \Rightarrow \text{plural}$$

Outline

1 Minimalist DM

2 Ambiguous Exponents

3 Representation of Number

4 Constructed Plural in Nocte

Distributed Morphology (Halle & Marantz, 1993)

- Syntax manipulates abstract heads without phonological content
- Morphology interprets the output of Syntax
- Many types of morphological operations
  - **Impoverishment:** deletes morphosyntactic features
  - **Fission:** dissect one head into different separate heads
  - **Fusion:** fuses different lexical items into one
  - **Vocabulary Insertion:** inserts VIs into lexical items, restricted by Elsewhere Condition and Feature Hierarchies

Minimalist Distributed Morphology (Trommer, 1999, 2003a,b)

Only 1 Morphological Operation: Vocabulary Insertion

Vocabulary insertion: If *M* is a VI with syntactic features α and phonological features β, and *S* is a head with features γ, where α is a subset of γ, then delete the features of α in γ and add β to the phonological representation of *S*

Georgian Verb Agreement

a. g-xedav
O2-see
'I see thee'

b. g-xedav-en
O2-see-S3p
'they see thee'

c. g-xedav-t
O2-see-PL
'I see you (pl.)'

d. g-xedav-en/*g-xedav-t-en
O2-see-S3p
'they see you (pl.)'

Derivation in Standard Distributed Morphology

	2pl ← 1sg	**2pl ← 3pl**
Syntax	[+2+pl] V	[+2+pl] V [+3+pl]
Fission	[+2] V [+pl]	[+2] V [+3+pl] [+pl]
Impoverishment	[+2] V [+pl]	[+2] V [+3+pl] Ø
Vocabulary Insertion	*g-* *-t*	*g-* *-en*

Minimalist DM

Impoverishment is Zero Insertion:

- All vocabulary insertion consumes features
- Deletion bleeds further insertion
- Impoverishment = zero vocabulary insertion

Fission is Multiple Insertion

- Multiple Insertion obviates fission
- Fission is only restricted by obligatory feature consumption
- Standard Case: Feature deletion blocks fission

Minimalist Derivation

	2pl ← 1sg	**2pl ← 3pl**
Syntax	[+2+pl] V	[+2+pl] V [+3+pl]
V. Insertion	*g-* [+2] V [+pl]	*g-* [+2] V [+3+pl] [+pl]
V. Insertion	V [+pl]	V [+3+pl] [+pl] Ø
V. Insertion	V [+pl] *-t*	V [+3+pl] *-en*

Ambiguous Inclusive in Belhare (Bickel, 1995)

S/O	1sg	Excl:NS	Inc:NS	2sg	2du	2pl
1sg				-na	-na-chi	-nan-i
Excl:Du						
Excl:Pl						-na-chi-ŋa
Incl:Du						
Incl:Pl						
2sg	**ka-** -ga	maʔi- -ga				
2du	**ka-** -chi-ga	maʔi- -chi-ga				
2pl	**ka-** -i-ga	maʔi- -i-ga				
3sg	mai-	maʔi-	**ka-**	N- -ga	N- -chi-ga	N- -i-ga
3du	ma-ŋ- -chi	maʔi- -chi	**ka-**ŋ- -chi			
3pl	ma-ŋ-		**ka-**ŋ-			

Ambiguous Inclusive in Belhare (Bickel, 1995)

ka$_1$- [+Acc +1 +2] [+Nom] (inclusive Object)

ka$_2$- [+Acc +1] [+Nom +2] (2nd person Object + 1st person Subject)

Ambiguous Inverse: The Dumi Marked Scenario Affix

"This pattern reflects a pronominal markedness hierarchy . . .. The Dumi marked forms express all scenarios involving a first or second person actant except those with a first person agent or subject." (van Driem, 1993:123)

a-	**–**
2 → 1	1 → 2
3 → 1	1 → 3
3 → 2	3 → 3
2 → 3	1
2	3

Ambiguous Inverse: The Dumi Marked Scenario Affix

marked		unmarked	
2$_s$ → **1**$_o$	[+Nom –1]$_s$[–3]$_{s,o}$	**1**$_s$ → **2**$_o$	*[+Nom –1][–3]$_{s,o}$
3$_s$ → **1**$_o$	[+Nom –1]$_s$[–3]$_o$	**1**$_s$ → 3	*[+Nom –1][–3]$_s$
3$_s$ → **2**	[+Nom –1]$_s$[–3]$_o$	**3**$_s$ → 3	[+Nom –1]$_s$*[–3]
2$_s$ → 3	[+Nom –1]$_s$[–3]$_s$	**1**$_s$	*[+Nom –1][–3]$_s$
2$_s$	[+Nom –1]$_s$[–3]$_s$	**3**$_s$	[+Nom –1]$_s$*[–3]

[+Nom –1] /____[–3]

[+Nom –1] / [____–3]

Ambiguous Zero: Sierra Populuca (Müller, 2005)

VIs

n	↔	[+v]	
a	↔	[+1]	
i	↔	**[–1]**	
m	↔	[+2]	/ [-v]
t	↔	[+2]	/ [+2]

[–1] → Ø/[_____–2–v]

[–1] → Ø/_____[–2–v]

T (Abs)	
[+1–2–v]	a
[+1+2–v]	t-a
[–1+2–v]	m-i
[▨–2–v]	–

v (Erg)	
[+1–2+v]	a-n
[+1+2+v]	t-a-n
[–1+2+v]	i-n
[–1–2–v]	i

T (Abs)	v (Erg)	
[+1–2–v]	[▨+2+v]	a-n
[▨+2–v]	[+1–2+v]	m-a-n
[▨–2–v]	[–1–2+v]	i
[▨–2–v]	[+1–2+v]	a-n
[▨–2–v]	[–1+2+v]	i-n
[+1–2–v]	[▨–2+v]	a
[▨+2–v]	[–1–2+v]	m-i

New Notation for VI Contexts

P	$\leftrightarrow$	$F_1 \ldots F_m$	/	$[C_1 \ldots C_n]$	$F_1 \ldots F_m$ in the context of $C_1 \ldots C_n$ where $F_1 \ldots F_m$ is in Head H_1, $C_1 \ldots C_n$ are in head H_2 and $H_1 \neq H_2$
P	$\leftrightarrow$	$F_1 \ldots F_m$	/	$C_1 \ldots C_n$	$F_1 \ldots F_m$ in the context of $C_1 \ldots C_n$ where $F_1 \ldots F_m$ is in Head H_1, $C_1 \ldots C_n$ are in head H_2 and $H_1 = H_2$
P	$\leftrightarrow$	$F_1 \ldots F_m$	/	$\{C_1 \ldots C_n\}$	$F_1 \ldots F_m$ in the context of $C_1 \ldots C_n$ where $F_1 \ldots F_m$ is in Head H_1, and $C_1 \ldots C_n$ are in head H_2
Generally:					$Ref(F_1 \ldots F_m) \not\cap Ref(C_1, \ldots, C_n)$

Unifying Ambiguous Exponents

Belhare

[+Acc +1 +2] [+Nom]

[+Acc +1] [+Nom +2]

$\Rightarrow$ ka $\leftrightarrow$ [+Acc +1] / {+2}

Dumi

[+Nom –1] /_____[–3]

[+Nom –1] / [_____–3]

$\Rightarrow$ a $\leftrightarrow$ [+Nom –1] / {–3}

Sierra Populuca

[–1] ➔ Ø/_____[–2–v]

[–1] ➔ Ø/[_____–2–v]

$\Rightarrow$ Ø$\leftrightarrow$ [–1] /{–2–v}

Representation of Number in Harley & Ritter (2002)

Two-way number system

Singular	**Plural**
#	#
|	|
Minimal	Group

Three-way number system

Singular	**Plural**	**Dual**
#	#	#
|	|	|
Minimal	Group	Minimal/Group

Evidence for Number Geometry

A language will not have a dual
if it does not have a plural number (Greenberg, 1963)

Constructed Dual in Hopi (Corbett, 2000)

Singular

(1) Pam **wari**
that ran(sg.)
'He/she man ran'

Plural

(2) **Puma** yu?tu
those ran(pl.)
'They (pl.) ran'

Dual

(3) **Puma wari**
those ran(sg.)
'They (2) ran'

The Representation of Number in Cowper (2003)

a. Two-way number system

Singular	**Plural**
#	#
	|
	>1

b. Three-way number system

Singular	**Dual**	**Plural**
#	#	#
	|	|
	>1	>1
		|
		>2

The Interpretation of Number in Cowper (2003)

Struct. topped by		denote sets of card.			Struct.		denote sets of card.		
#	⇔	1	2	more	#	⇔	1	2	more
>1	⇔		2	more	# – >1	⇔		2	more
>2	⇔			more	# – >1 – >2	⇔			more

Remove denotations
also present in complexer structures

Three-way system

Structures		denote sets of card.		
#	⇔	1	[redacted]	
# – >1	⇔		2	[redacted]
# – >1 – >2	⇔			more

The Interpretation of Number in Cowper (2003)

Struct. topped by		denote sets of card.
#	⇔	1 2 more
>1	⇔	2 more
>2	⇔	more

Struct.		denote sets of card.
#	⇔	1 2 more
# – >1	⇔	2 more
# – >1 – >2	⇔	more

Remove denotations
also present in complexer struct.

Two-way system

Structures		denote sets of card.
#	⇔	1 [redacted]
# – >1	⇔	2 more

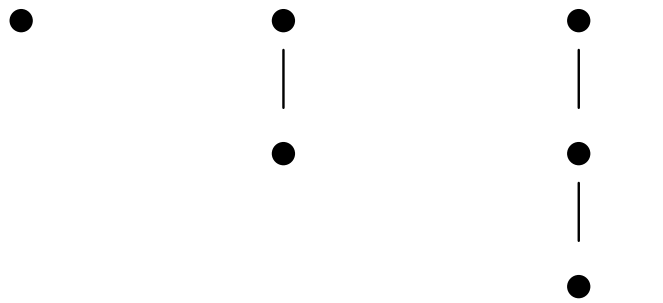
The Iconic Representation of Number

a. Two-way number system

Singular **Plural**

b. Three-way number system

Singular **Dual** **Plural**



The Interpretation of Iconic Number

Struct. with periph.		**denote sets of card.**
•	⇔	1 2 more
•–•	⇔	2 more
•–•–•	⇔	more

Struct.		**denote sets of card.**
•	⇔	1 2 more
•–•	⇔	2 more
•–•–•	⇔	more

Remove denotations
also present in complexer structures

Three-way system

Structures		**denote sets of card.**
•	⇔	1 [redacted]
•– •	⇔	2 [redacted]
•–•–•	⇔	more

The Interpretation of Iconic Number

Strucures with periph.		**denote sets of card.**			
•	⇔	1	2		more
•–•	⇔		2		more
•–•–•	⇔				more

Structures		**denote sets of card.**			
•	⇔	1	2		more
•–•	⇔		2		more
•–•–•	⇔				more

Remove denotations
also present in complexer structures

Two-way system

Structures		**denote sets of card.**	
•	⇔	1	[redacted]
•–•	⇔	2	more

Nocte Intransitive Forms

	Sg	Pl
1	rang-ka-**ang**	rang-ka-**e**
2	rang-ka-**o**	rang-ka-**an**
3	rang-ka-**a**	

VIs

-e	↔	[+1 •] / {–3 •}
-an	↔	[+2 ••]
-ang	↔	[+1]
-o	↔	[+2]
-a	↔	[+3]

1sg

[+1 –2 –3 •]

-e	↔	[+1 •] / {–3 •}
✔ -ang	↔	[+1]

1pl

[+1 –2 –3 • •]

✔ -e	↔	[+1 •] / {–3 •}
-ang	↔	[+1]

Nocte Plural Insertion as Constructive Number

1	→	2				
[Nom –3–2+1 •]		[Acc–3+2–1•]	✔-e	↔	[+1 •] / {–3 •}
[Nom –3–2]		[Acc+3–2–1•]	-ang	↔	[+1]

Nocte Transitive Forms: Inverse Marking

	Direct	Inverse	
1sg → 2sg	hetho-e	hetho-**h**-ang	**2sg → 1sg**
	teach-1pl	teach-**Inv**-1sg	
1sg → 3sg	hetho-ang	hetho-**h**-ang	**3sg → 1sg**
	teach-1sg	teach-**Inv**-1sg	
2sg → 3pl	hetho-o	hetho-**h**-o	**3sg → 2sg**
	teach-2sg	teach-**Inv**-2sg	

	Direct			Inverse	
	Subj	**Obj**		**Subj**	**Obj**
1 → 2	[+1-2–3]	[–1+2–3]	**2 → 1**	[**–1**+2–3]	[+1–2**–3**]
1 → 3	[+1-2–3]	[–1–2+3]	**3 → 1**	[**–1**–2+3]	[+1–2**–3**]
2 → 3	[–1+2–3]	[–1–2+3]	**3 → 2**	[**–1**–2+3]	[–1+2**–3**]

VI

-h ↔ [-1 Nom] / [–3 Acc]

Nocte Transitive Forms: Hierarchy-based Competition

1 → 2	⇒	1	⇐	**2 → 1**	-ang/-e	
1 → 3	⇒	2	⇐	**3 → 1**	-ang	
2 → 3	⇒	3	⇐	**3 → 2**	-o	

VIs

Ø	↔	[+3] / [–3]
Ø	↔	[+2] / [+1]

3	**→**	**1**				
[Nom +3–2–1]		[Acc–3–2+1]	-h	↔	[–1 Nom]	/ [–3 Acc]
[Nom +3–2Nom]		[Acc–3–2+1]	Ø	↔	[+3]	/ [–3]
[Acc–2]		[Acc–3–2+1]	-ang	↔	[+1]	
[–2]		[Acc–3–2Acc]				

Blocking -e for 2sg → 1sg

VIs

Ø	↔	**[•] / +1 Acc {–3 •}**
-h	↔	[–1 Nom] / [–3 Acc]
-e	↔	[+1 •] / {–3 •}
Ø	↔	[+3] / [–3]
Ø	↔	[+2] / [+1]
-an	↔	[+2 ••]
-ang	↔	[+1]
-o	↔	[+2]
-a	↔	[+3]

2sg	→	**1sg**
[Nom –3+2–1 •]		[Acc–3–2+1•]
[Nom –3+2–1 •]		[Acc–3–2+1]
[–3+2 •]		[Acc–3–2+1]
[–3 •]		[Acc–3–2+1]
[•]		[Acc–3–2]

Ø	↔	**[•] / +1 Acc {–3 •}**
-h	↔	[–1 Nom] / [–3 Acc]
Ø	↔	[+2] / [+1]
-ang	↔	[+1]

Full derivation for 1sg ➔ 2sg

VIs

Ø	↔	[•] / +1 Acc {–3 •}
-h	↔	[–1 Nom] / [–3 Acc]
-e	↔	[+1 •] / {–3 •}
Ø	↔	[+3] / [–3]
Ø	↔	[+2] / [+1]
-an	↔	[+2 ••]
-ang	↔	[+1]
-o	↔	[+2]
-a	↔	[+3]

1sg	➔	**2sg**			
[Nom –3–2+1 •]		[Acc–3+2–1•]	-e	↔	[+1 •] / {–3 •}
[Nom –3–2 +1]		[Acc–3+2–1•]	Ø	↔	[+2] / [+1]
[Nom –3–2]		[Acc–3 +2 –1•]			

Constructed Dual in Hopi (Corbett, 2000)

Singular

(4) Pam **wari**
that ran(sg.)
'He/she man ran'

Plural

(5) **Puma** yu?tu
those ran(pl.)
'They (pl.) ran'

Dual

(6) **Puma wari**
those ran(sg.)
'They (2) ran'

Minimal Analysis

VIs

puma	↔	[D ••]
pam	↔	[D]
yuutu	↔	[V •••]
wari	↔	[V]

Singular

[D •]		[V •]	
[D]	pam	[V]	wari

Plural

[D •••]		[V •••]	
[D ••]	puma	[V •••]	yuutu

Dual

[D ••]		[V ••]	
[D ••]	puma	[V]	wari

Summary

- Minimalist Account of Ambiguous Exponence
- Minimal Iconic Geometry for Number
- Plural Insertion does not necessitate Feature Insertion