

# The Order of Demonstrative, Numeral, Adjective and Noun: An Alternative to Cinque

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1. Universal 20 of Greenberg (1963):

When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always in that order. If they follow, the order is either the same or its opposite.

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|---|--|
| <p>2. a. If they all precede the noun:</p> <p>Dem-Num-Adj-N (44)<br/>*Dem-Adj-Num-N (2)<br/>*Num-Dem-Adj-N (0)<br/>*Num-Adj-Dem-N (0)<br/>*Adj-Dem-Num-N (0)<br/>*Adj-Num-Dem-N (0)</p> | <p>b. If they all follow the noun</p> <p>N-Adj-Num-Dem (57)<br/>N-Dem-Num-Adj (3)<br/>*N-Adj-Dem-Num (11)<br/>*N-Dem-Adj-Num (4)<br/>*N-Num-Adj-Dem (7)<br/>*N-Num-Dem-Adj (1)</p> |
|---|--|

Asterisks indicates types excluded by Greenberg's universal.

Numbers indicate number of genera containing languages in my database of the given type.

- |   |   |
|---|---|
| <p>3. a. If two of them precede the noun</p> <p>Dem-Num-N-A (17)<br/>*Num-Dem-N-A (0)</p> <p>Dem-Adj-N-Num (6)<br/>*Adj-Dem-N-Num (0)</p> <p>Num-Adj-N-Dem (3)<br/>*Adj-Num-N-Dem (0)</p> | <p>b. If two of them follow the noun</p> <p>Adj-N-Dem-Num (2)<br/>Adj-N-Num-Dem (1)</p> <p>Num-N-Dem-Adj (3)<br/>Num-N-Adj-Dem (21)</p> <p>Dem-N-Num-Adj (3)<br/>Dem-N-Adj-Num (22)</p> |
|---|---|

4. Greenberg's formulation is too strong in that exceptions have been found, primarily with respect to the order when all three follow the noun. In fact, many types are more common than N-Dem-Num-Adj (Cd), which is allowed by Greenberg.

5. E.g., Akha (Burmese-Lolo, Tibeto-Burman): N-Adj-Dem-Num

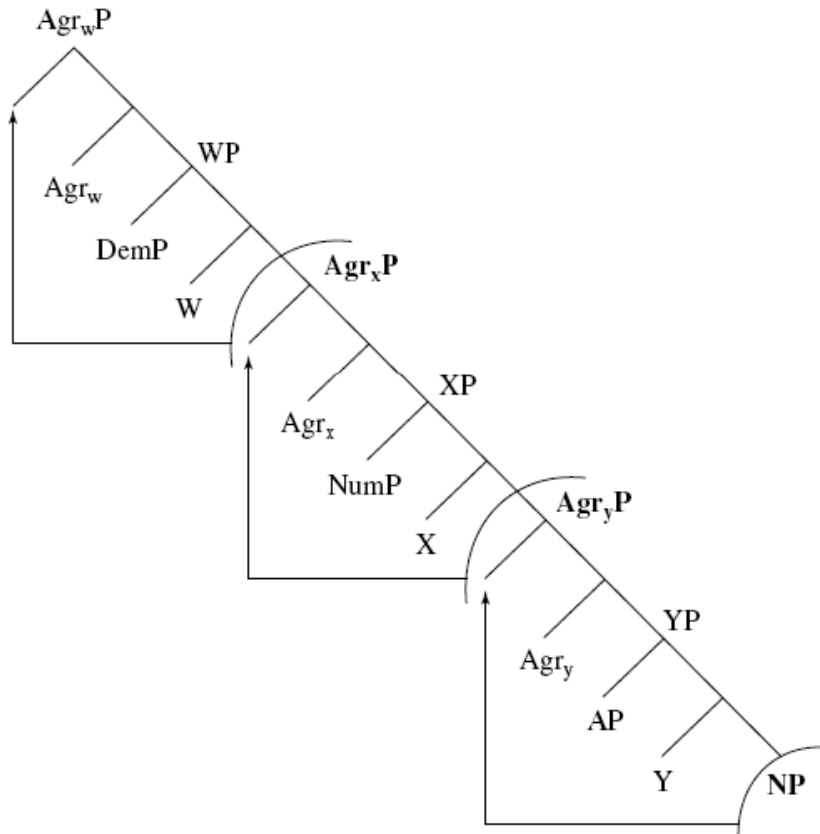
tshó-hà    jɔ-mỳ    xhø    njì    yà  
 person    good    those    two    CLSFR  
           N        Adj    Dem    Num  
 'those two good persons' (Hansson 2003: 241)

6. Overview of paper

- a. Comparison of the generative approach of Cinque (2005) to my own account
- b. My data is based on a sample of 341 languages
- c. Both approaches use a set of principles to account for the relative frequency of the different types
- d. A crucial difference is that Cinque's account is formulated in terms of syntactic categories while mine is an extragrammatical account in terms of semantic categories independent of the syntactic realization of these semantic categories

7. Approach of Cinque (2005):
- All languages are underlyingly Dem-Num-Adj-N, with the structure in (8).
  - Other types are achieved via movement.
  - All movement is leftward and upward.
  - Only constituents containing the noun move.
  - Different combinations of movements are less marked or more marked.

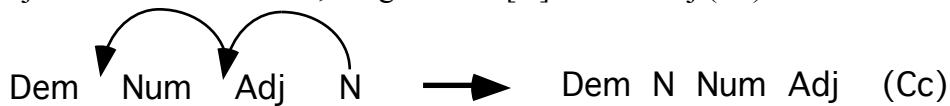
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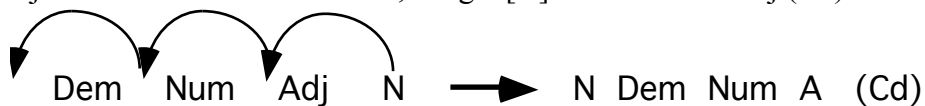
9. a. If nothing moves, then we get Dem+Num+Adj+N (Ca).  
 b. If just the N (or NP in Cinque's terms) moves once, we get Dem+Num+[N]+Adj (Cb)



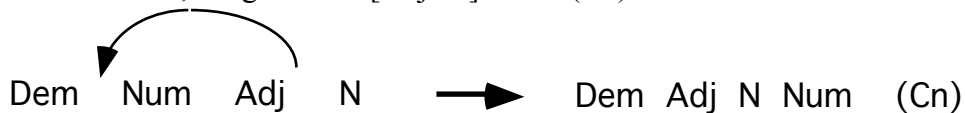
- c. If just the N moves twice, we get Dem+[N]+Num+Adj (Cc)



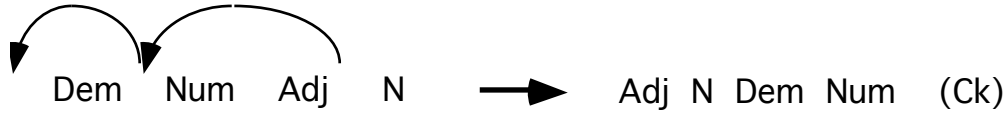
- d. If just the N moves three times, we get [N]+Dem+Num+Adj (Cd)



- e. If there is pied-piping, the N moves along with some constituent it is part of. If the Adj+N moves once, we get Dem+[Adj+N]+Num (Cn).

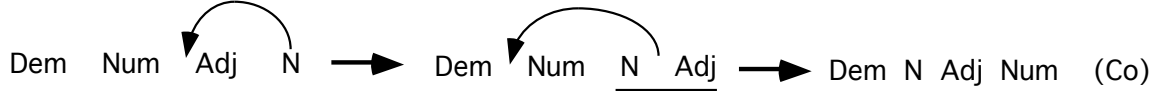


f. If the Adj+N moves twice, we get [Adj+N]+Dem+Num (Ck).

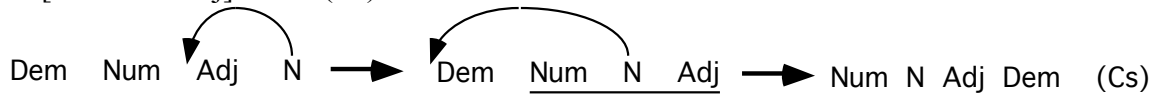


g. If there is pied-piping of Num+Adj+N, then we get [Num+Adj+N]+Dem (Cr).

h. If there is pied-piping of N+Adj after the N has moved past the Adj, then we get Dem+[N+Adj]+Num (Co) or [N+Adj]+Dem+Num (Cl).



i. If there is pied-piping of Num+N+Adj after the N has moved past the Adj, then we get [Num+N+Adj]+Dem (Cs).



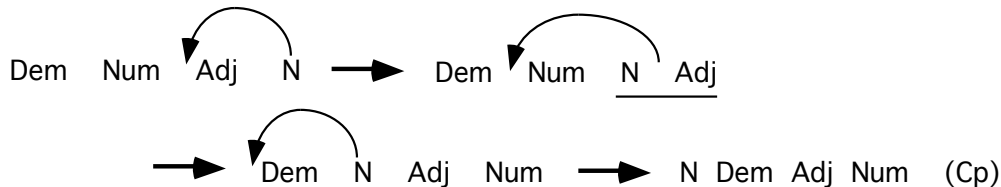
j. If there is pied-piping of N+Num+Adj after the N has moved past both the Adj and the Num, then we get [N+Num+Adj]+Dem (Ct).

k. If we pied-pipe Adj+N past Num yielding Dem+[Adj+N]+Num and then pied-pipe Adj+N+Num past Dem, we get Adj+N+Num+Dem (Cw)

l. If the N moves past the Adj, this can be considered as either movement of just the N or vacuous pied-piping of N and its nonexistent sisters.

m. If there is successive pied piping from Dem+Num+Adj+N to Dem+Num+[N]+Adj to Dem+[N+Adj]+Num and finally to [N+Adj+Num]+Dem (Cx), then we get the mirror image of Dem+Num+Adj+N.

n. If we move N past Adj and then pied-pipe N+Adj past Num, yielding Dem+N+Adj+Num, and then move just the N past Dem, we get N+Dem+Adj+Num (Cp).



10. How Cinque's approach predicts the nonexistence of the types he claims do not exist:

- a. The only possible order if all three modifiers precede the noun is Dem+Num+Adj+N, because if anything moves, something containing the N must move leftward, in which case we won't have three modifiers preceding the noun. Hence \*Ce, \*Ci, \*Cm, \*Cq, \*Cu.
- b. There is no way that we can get Num+Dem before the N, since the only way for Num to precede Dem is if some constituent containing both Num and N moves in front of Dem, in which case Dem will not precede the N. Hence \*Cf.
- c. The same explains why we cannot get Adj+Num or Adj+Dem before the N. Hence \*Cv and \*Cj.
- d. We cannot get Num+N+Dem+Adj (\*Cg) because for the Num+N to move past the Dem, the Adj would have to come with them, since only constituents can move.
- e. We similarly can't get N+Num+Dem+Adj (\*Ch) for an analogous reason. To get it, we would have to move N+Num past Dem without moving Adj, but then we wouldn't be moving a constituent.

11. Markedness principles that Cinque appeals to:
- No movement: unmarked
  - Movement of NP plus pied-piping of the whose-picture type: unmarked
  - Movement of NP without pied-piping: marked
  - Movement of NP plus pied-piping of the picture-of-who type: more marked
  - Total movement: unmarked vs. partial movement: marked

12.

	Deriv	#marked options	Cinque #lgs	Dryer #lgs #genera	
a.	Dem-Num-A-N	∅	0	very many	74 44
b.	Dem-Num-N-A	P0 (pm)	1	many	22 17
c.	Dem-N-Num-A	P0,N (pm)	2	very few	3 3
d.	N-Dem-Num-A	P0,N,N	1	few	4 3
e.	Num-Dem-A-N	*	*	*	0 0
f.	Num-Dem-N-A	*	*	*	0 0
g.	Num-N-Dem-A	*	*	*	5 3
h.	N-Num-Dem-A	*	*	*	1 1
i.	A-Dem-Num-N	*	*	*	0 0
j.	A-Dem-N-Num	*	*	*	0 0
k.	A-N-Dem-Num	P2,P8	2	very few	4 2
l.	N-A-Dem-Num	P0,P,P8	1	few	19 11
m.	Dem-A-Num-N	*	*	*	3 2
n.	Dem-A-N-Num	P2 (pm)	2	very few	11 6
o.	Dem-N-A-Num	P0,P (pm)	1	many	28 22
p.	N-Dem-A-Num	P0,P,S (pm)	2+	very few	6 4
q.	Num-A-Dem-N	*	*	*	0 0
r.	Num-A-N-Dem	P3	1?	very few	4 3
s.	Num-N-A-Dem	P0,P4 (pm)	2	few	38 21
t.	N-Num-A-Dem	P0,N,P5	1	few	9 7
u.	A-Num-Dem-N	*	*	*	0 0
v.	A-Num-N-Dem	*	*	*	0 0
w.	A-N-Num-Dem	P2,P6	1	very few	2 1
x.	N-A-Num-Dem	P0,P,P7	0	very many	108 57

N = movement of just the noun (or NP in Cinque's terms) (marked)

P = pied piping of NA (of the 'whose picture' sort) (unmarked)

P0= vacuous pied piping (of the 'whose picture' sort) of N around A (unmarked)

P2 = pied piping of AN (of the 'picture of who' sort) (very marked)

P3 = pied piping of Num-A-N (of the 'picture of who' sort) (very marked)

P4 = pied piping of Num-N-A (of the 'picture of who' sort) (very marked)

P5 = pied piping of N-Num-A (of the 'whose picture' sort) (unmarked)

P6 = pied piping of A-N-Num (of the 'picture of who' sort) (very marked)

P7 = pied piping of N-A-Num (of the 'whose picture' sort) (unmarked)

P8 = movement of NA or AN but not Num (no pied piping) (marked)

S = subextraction of N after pied piping of constituent containing N (extremely marked, and possibly not even possible)

pm = partial movement (marked)

13. Table in (12) repeated, but sorted in terms of frequency in terms of number of genera in Dryer database:

			Deriv	#marked options	Cinque #lgs	Dryer #lgs	Dryer #genera
1	x.	N-A-Num-Dem	P0,P,P7	0	very many	108	57
2	a.	Dem-Num-A-N	∅	0	very many	74	44
3	o.	Dem-N-A-Num	P0,P (pm)	1	many	28	22
<b>4</b>	<b>s.</b>	<b>Num-N-A-Dem</b>	<b>P0,P4 (pm)</b>	<b>2</b>	<b>few</b>	<b>38</b>	<b>21</b>
5	b.	Dem-Num-N-A	P0 (pm)	1	many	22	17
6	l.	N-A-Dem-Num	P0,P,P8	1	few	19	11
7	t.	N-Num-A-Dem	P0,N,P5	1	few	9	7
8	n.	Dem-A-N-Num	P2 (pm)	2	very few	11	6
<b>9</b>	<b>p.</b>	<b>N-Dem-A-Num</b>	<b>P0,P,S (pm)</b>	<b>2+</b>	<b>very few</b>	<b>6</b>	<b>4</b>
<b>10</b>	<b>g.</b>	<b>Num-N-Dem-A</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>5</b>	<b>3</b>
11	d.	N-Dem-Num-A	P0,N,N	1	few	4	3
12	r.	Num-A-N-Dem	P3	1?	very few	4	3
13	c.	Dem-N-Num-A	P0,N (pm)	2	very few	3	3
14	k.	A-N-Dem-Num	P2,P8	2	very few	4	2
<b>15</b>	<b>m.</b>	<b>Dem-A-Num-N</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>3</b>	<b>2</b>
16	w.	A-N-Num-Dem	P2,P6	1	very few	2	1
<b>17</b>	<b>h.</b>	<b>N-Num-Dem-A</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>1</b>	<b>1</b>
18	e.	Num-Dem-A-N	*	*	*	0	0
19	f.	Num-Dem-N-A	*	*	*	0	0
20	i.	A-Dem-Num-N	*	*	*	0	0
21	j.	A-Dem-N-Num	*	*	*	0	0
22	q.	Num-A-Dem-N	*	*	*	0	0
23	u.	A-Num-Dem-N	*	*	*	0	0
24	v.	A-Num-N-Dem	*	*	*	0	0

14. a. Three types that Cinque's theory predicts should not exist *do* exist (Cg, Ch, Cm)  
 b. Type Cs (Num-N-A-Dem) is much more common than Cinque's theory predicts  
 c. Type Cp (N-Dem-A-Num) is more common than Cinque's theory predicts  
 d. Apart from predicting the two most common types and the nonexistence of unattested types, Cinque's theory does not predict the relative ordering of the intermediate types much better than chance. The number of marked options, in decreasing frequency for these is 1, 2, 1, 1, 1, 2, 2+, 1, 1?, 2, 2, 1.

15. Types attested in my database that are excluded by Cinque's theory

Num-N-Dem-A (Cg): 5 lgs, 3 genera

KATUIC: Katu

OCEANIC: Kilivila, Teop, Drehu

YAPESE: Yapese

Dem-A-Num-N (Cm): 3 lgs, 2 genera

INDIC: Dhivehi

NAKH: Ingush, Chechen

N-Num-Dem-A (Ch): 1 lg, 1 genus

BANTOID: Haya

## 16. Dhivehi (Maldivian): Cm: Dem-A-Num-N

mi ra<sup>n</sup>gaļu tin fot  
 this good three book  
 'these three good books' (Cain and Gair 2000: 33)

## 17. Languages with two orders within NP

Macushi: Dem-Num-N-A (Cb) / Num-Dem-N-A (Cf)  
 Araona: Dem-N-A-Num (Co) / Num-Dem-N-A (Cf)

## An Alternative Approach

## 18. Principle 1: Symmetry Principle 1

The adjective and numeral tend to occur closer to the noun than the demonstrative when they (the adjective and the demonstrative and/or the numeral and the demonstrative) occur on the same side of the noun.

## Principle 2: Symmetry Principle 2

The adjective tends to occur closer to the noun than the numeral when they occur on the same side of the noun.

## Principle 3: Asymmetry Principle

The Symmetry Principles apply more strongly to prenominal modifiers than they do to postnominal modifiers; exceptions to the Symmetry Principles will occur only with postnominal modifiers.

## Principle 4: Greenberg's Universal 18

When the descriptive adjective precedes the noun, the demonstrative and the numeral, with overwhelmingly more than chance frequency, do likewise.

## Principle 5: Intra-Categorial Harmony

The demonstrative, numeral, and adjective tend to all occur on the same side of the noun.

## 20. ALL five principles have previously been independently proposed.

21. Table showing how each type conforms to each of the five principles, and the number of languages and genera of each type. (Note that if P1 or P2 are violated by prenominal modifiers, I treat this as also violating the Asymmetry Principle, but if P1 or P2 are violated by postnominal modifiers, then I treat this as consistent with the Asymmetry Principle.)

- P1 Symmetry Principle 1  
 P2 Symmetry Principle 2  
 P3 Asymmetry Principle  
 P4 Greenberg's Universal 18  
 P5 Intra-Categorical Harmony

			P1	P2	P3	P4	P5	#*s	#lgs	#genera
1	x.	N-A-Num-Dem	Y	Y	Y	Y	Y	0	108	57
2	a.	Dem-Num-A-N	Y	Y	Y	Y	Y	0	74	44
4	o.	Dem-N-A-Num	Y	Y	Y	Y	*	1	28	22
3	s.	Num-N-A-Dem	Y	Y	Y	Y	*	1	38	21
5	b.	Dem-Num-N-A	Y	Y	Y	Y	*	1	22	17
6	l.	N-A-Dem-Num	*	Y	Y	Y	Y	1	19	11
7	t.	N-Num-A-Dem	Y	*	Y	Y	Y	1	9	7
<b>8</b>	<b>n.</b>	<b>Dem-A-N-Num</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>	<b>*</b>	<b>*</b>	<b>2</b>	11	6
9	p.	N-Dem-A-Num	*	Y	Y	Y	Y	1	6	4
10	g.	Num-N-Dem-A	*	Y	Y	Y	*	2	5	3
11	d.	N-Dem-Num-A	*	*	Y	Y	Y	2	4	3
12	r.	Num-A-N-Dem	Y	Y	Y	*	*	2	4	3
13	c.	Dem-N-Num-A	Y	*	Y	Y	*	2	3	3
<b>14</b>	<b>k.</b>	<b>A-N-Dem-Num</b>	<b>*</b>	<b>Y</b>	<b>Y</b>	<b>*</b>	<b>*</b>	<b>3</b>	4	2
15	m.	Dem-A-Num-N	Y	*	*	Y	Y	2	3	2
16	w.	A-N-Num-Dem	Y	Y	Y	*	*	2	2	1
17	h.	N-Num-Dem-A	*	*	Y	Y	Y	2	1	1
18	e.	Num-Dem-A-N	*	Y	*	Y	Y	2	0	0
19	q.	Num-A-Dem-N	*	Y	*	Y	Y	2	0	0
20	f.	Num-Dem-N-A	*	Y	*	Y	*	3	0	0
21	i.	A-Dem-Num-N	*	*	*	Y	Y	3	0	0
22	u.	A-Num-Dem-N	*	*	*	Y	Y	3	0	0
23	j.	A-Dem-N-Num	*	Y	*	*	*	4	0	0
24	v.	A-Num-N-Dem	Y	*	*	*	*	4	0	0

22. Except for Types Cn and Ck:

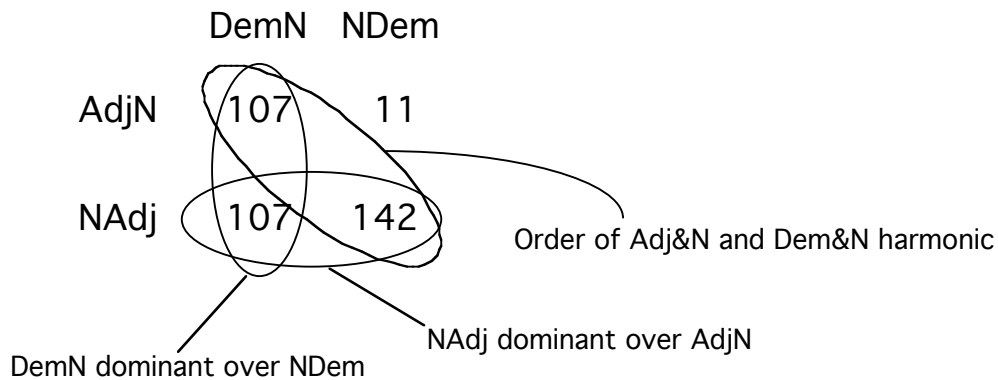
- a. 0 \*s: 44 genera or more  
 b. 1 \*: 4 to 22 genera  
 c. 2 \*s: 3 genera or less  
 d. 3 or 4 \*s: no languages

23. Linda (Ubangi): Ck: A-N-Dem-Num

- a. óró yāfē  
 beautiful woman  
 'beautiful woman' (Cloarec-Heiss 1986: 181)

- b. àndà lóyē bīfī  
 case this two  
 ‘these two cases’ (Cloarec-Heiss 1986: 200)

24. a. Principles 1 and 2 (The Symmetry Principles) probably reflect the same principles governing order among descriptive adjectives, whereby more inherent properties occur closer to the noun (e.g. *a beautiful black horse* vs. *??a black beautiful horse*).  
 b. I have no good explanation for Principle 3 (The Asymmetry Principle). In so far as Cinque offers an explanation, my approach falls short of his.  
 c. Principle 5, The Intra-Categorical Harmony Principle, has long been assumed. It was once thought to be part of the general correlations with the order of object and verb, but given that none of these three pairs of elements correlate in order with the order of object and verb (except possibly numeral and noun, but here it is NumN that correlates with VO and NNum that correlates with OV), this is not the case. But independent of the correlations with the order of object and verb, there is still a separate set of correlations within the noun phrase.
25. Explaining Principle 4: Consider first part: If the adjective precedes the noun, then the demonstrative will precede the noun as well.



26. a. DemN dominant over NDem  
 b. NAdj dominant over AdjN  
 c. Order of Adj&N and Dem&N harmonic

Syntax or Semantics?

27. Cinque’s approach assumes that the generalizations about the possible orders of demonstrative, numeral, adjective and noun can be described (and explained) in terms of syntactic categories.
28. I claim that the generalizations *cannot* be described (or explained) in terms of syntactic categories.
29. Rather, the relevant notions of demonstrative, numeral, and adjective are semantic notions which are realized syntactically in different ways in different languages.
30. a. In some languages, adjectives are a distinct word class.  
 b. In some languages, semantic adjectives are verbs grammatically and when modifying nouns are really relative clauses.  
 c. In some languages, semantic adjectives are verbs grammatically, but can still modify nouns directly without occurring as relative clauses.



- d. In some languages, semantic adjectives are really verbs in internally-headed relative clauses so that the noun (or noun phrase) is the subject and the semantic adjective is the predicate so that the semantic adjective is not modifying the noun at all.

31. Ojibwa (Rich Rhodes, p.c.)

- a. nini e- gnoozi-*d*  
man REL-tall-3SG  
'a tall man'
- b. nini e- ngamo-*d*  
man REL-sing-3SG  
'a man who is singing'

32. a. In some languages, numerals are a distinct word class.  
b. In some languages, numerals belong to the class of adjectives.  
c. In some languages, numerals exhibit head-like properties, implying that the noun is a dependent of the numeral.  
d. In some languages, numerals modify classifiers and these classifier phrases modify the noun.  
e. In some languages, numerals modify classifiers and these classifier phrases serve as heads of which the noun (and other modifiers) are dependents.  
f. In some languages, numerals are verbs grammatically and when modifying nouns are really relative clauses.  
g. In some languages, numerals are really verbs in internally-headed relative clauses so that the noun (or noun phrase) is the subject and the numeral is the predicate so that the numeral is not modifying the noun at all.

33. Rif Berber (Kossmann 2000)

- a. t̥lata [n t̥wɾar]  
three [GEN hill]  
'three hills'
- b. axxam [n w̥ɾyaz]  
house [GEN man]  
'the man's house'

34. a. In some languages, demonstratives pattern with articles (and perhaps possessive words), in which case they can be analysed as belonging to a category of determiners.  
b. In some languages, demonstratives do not pattern with the articles in the language, in which case they do not belong to the category of determiners.  
c. In some languages, there are no articles, and there is little motivation for positing a category of determiner, and demonstratives may be a distinct word class.  
d. In some languages, demonstratives are grammatically adjectives.  
e. In some languages, demonstratives and articles freely combine with constituents other than nouns (such as clauses), so that they are more head-like than nouns.

35. Welsh (Jones & Thomas 1977: 167)

- y t̥y 'na  
the house that  
'that house'

36. My claim is that the generalizations expressed by the five principles, resulting in the different frequencies of the 24 types, apply *regardless* of the syntactic realization of the semantic categories of demonstrative, numeral and adjective, that these generalizations cannot be expressed as generalizations over syntactic categories.
37. Crucially, the *data* regarding the relative frequency of the different types is based on classifying languages according to the *semantic* categories.
38. For example, the unattested and rare types are unattested and rare regardless of the syntactic realization of these semantic categories.
39. Cinque suggests [footnote 2] that in some languages that seem to be exceptions to his theory of what types are possible, in which adjectives appear outside numerals or even outside demonstratives, the “adjectives” are really verbs and hence are really relative clauses. He observes that relative clauses crosslinguistically tend to occur outside numerals and either inside or outside demonstratives, so that “adjectives” which are really relative clauses should occur outside numerals.
40. Cinque’s approach would seem to predict that we should find languages in which semantic adjectives are verbs and in which the semantic adjective precedes the demonstrative or numeral before the noun, such as Dem-Adj-Num-N or Adj-Dem-Num-N.

In many cases, even when semantic adjectives are verbs, they still conform to the same principles governing the position of adjectives relative to demonstratives and numerals.

41. Amis (Wu 2006: 96, 97)

- a. Mi-cakay cingra t-u tusa tata’ak-ay *kuhting-ay* a fafuy.  
 ACTOR-buy 3SG.NOM DAT-CN two big-FAC *black-FAC* LINK pig  
 Num Adj N  
 ‘He is going to buy two big black pigs.’
- b. \*Mi-cakay cingra t-u *kuhting-ay* tusa tata’ak-ay a fafuy.  
 ACTOR-buy 3SG.NOM DAT-CN *black-FAC* two big-FAC LINK pig  
 Adj Num N  
 ‘He is going to buy two big black pigs.’
- c. Ma-araw aku k-u-ya ta-tulu a tawinan  
 UNDERGOER-see 1SG.GEN NOM-CN-that PL-three LINK mother.animal  
 Num  
 a *mi-repel-an* n-i mayaw a kulong.  
 LINK *MI-catch-LA* GEN-PPN *Mayaw* LINK water.buffalo  
 Rel N  
 ‘I saw the three female water buffaloes caught by Mayaw.’
- d. Ma-araw aku k-u-ya *mi-repel-an* n-i mayaw a  
 UNDERGOER-see 1SG.GEN NOM-CN-that *MI-catch-LA* GEN-PPN *Mayaw* LINK  
 Rel  
 ta-tulu a tawinan a kulong.  
 PL-three LINK mother.animal LINK water.buffalo  
 Num N  
 ‘I saw the three female water buffaloes caught by Mayaw.’

42. In *Tukang Besi* (Donohue 1999) semantic adjectives are verbs, but they occur inside possessor NPs and in some cases inside possessor clitics while relative clauses occur outside possessor NPs and possessor clitics.

- a. o-mandawulu  
3REAL-beautiful  
'She is beautiful.' (Donohue 1999: 152)
- b. te ana morunga=su k<um>onta-'e na ana(a)  
CORE child young=1SG.POSS hold<SUBJ.REL>-3OBJ NOM child  
N Adj Poss Rel  
u riirii ba'i measo'e.  
GEN duck PREV REF.this  
'my young child who was holding that duckling' (Donohue 1999: 307)

43. In Nias (data from North dialect, Lea Brown, p.c.), both semantic adjectives and semantic numerals occur in relative clauses that follow the noun they modify (ignoring a distinct construction where the numeral precedes the noun, used when the NP is interpreted as indefinite). But adjective relative clauses occur inside the numeral relative clauses while other relative clauses occur outside numeral relative clauses.

- a. No u-bunu n-asu s=afusi si=dua rozi.  
PAST 1SG-kill ABS-dog REL=white REL=two CLSFR  
N Adj Num  
'I killed the two white dogs'
- b. \*No u-bunu n-asu si=dua rozi s=afusi.  
PAST 1SG-kill ABS-dog REL=two CLSFR REL=white  
N Num Adj  
'I killed the two white dogs'
- c. No u-bunu n-asu si=dua rozi si=mörö.  
PAST 1SG-kill ABS-dog REL=two CLSFR REL=sleep.  
N Num Rel  
'I killed the two dogs that were sleeping.'
- d. \*No u-bunu n-asu si=mörö si=dua rozi.  
PAST 1SG-kill ABS-dog REL=sleep REL=two CLSFR  
N Rel Num  
'I killed the two dogs that were sleeping.'

44. In *Mokilese*, semantic adjectives are verbs and all verbs can modify nouns in either of two ways, either in relative clauses that occur outside demonstratives or, if they consist of single words, as direct modifiers of nouns, occurring inside demonstratives. Harrison (1976) implies that the latter construction is more common with semantic adjectives than with other verbs. (Examples: Harrison 1976: 146, 256):

- a. jerimweinno poaloahdi suhkoa roairoai=o  
boy chop tree tall=the  
'The boy chopped down the tall tree.'

- b. li noaisikk=o johmwehuda.  
 woman bear.child=the sick  
 ‘The woman who bore a child got sick.’
- c. ngoah kang-la mwinge=hu (ma) koah kihdoahng ngoah-i  
 1SG eat-PERF food=that (REL) 2SG give 1SG-POSTPRED  
 aio  
 yesterday  
 ‘I ate the food that you gave me yesterday’

45. In Kham (Watters 2002: 111), semantic adjectives are verbs and are marked as relative clauses when modifying nouns, but they occur inside numerals, while other relative clauses occur outside numerals.
46. In Maybrat (Dol 1999, Brown 1990), semantic adjectives are clearly verbs, but they occur inside possessive phrases while relative clauses occur outside possessive phrases (Brown 1990: 47).
47. Hyslop (2001) analyses semantic adjectives in Northeast Lolovoli Ambae as a subclass of verbs, but they occur inside numerals while relative clauses occur outside numerals.
48. In Tuvaluan (Besnier 2000), most semantic adjectives are verbs (those that aren’t do not have prototypical adjectival meanings), but they occur immediately after the noun while relative clauses occur at the end, after demonstratives and possessors.

But

49. Yapese: Num-N-Dem-A (Cg)

rea kaarroo roog neey ba roowroow  
 SG car 1SG.POSS this be red  
 N Dem Adj  
 ‘this red car of mine’ (Jensen 1997: 168)

50. Slave: Dem-N-Num-A (Cc)

Michael hayi luge tat'e i lek'a i welu i wohsee.  
 Michael ?? fish three REL 3.fat REL 3.netted REL 1SG.OPT.boil  
 N Num Adj  
 ‘I will boil the three fat fish that Michael netted.’ (Rice 1989: 1316)

Similar considerations apply to Greenberg’s Universal 18 (‘If AdjN, then DemN and NumN’). There is evidence that this universal applies not only to languages in which adjectives are a separate word class, but also to languages in which semantic adjectives are verbs. For a subset of the languages in my database, I have data on whether semantic adjectives exhibit verbal properties.

51. Data for Greenberg’s Universal 18 (for demonstratives) (numbers represent number of genera):

	Verbal adjectives		Nonverbal adjectives		
	DemN	NDem	DemN	NDem	
AdjN	11	1	AdjN	32	1
NAdj	8	24	NAdj	25	22

52. Data for Greenberg's Universal 18 (for numerals) (numbers represent number of genera):

Verbal adjectives			Nonverbal adjectives		
	NumN	NNum		NumN	NNum
AdjN	9	3	AdjN	28	10
NAdj	9	32	NAdj	18	27

#### APPENDIX (341 languages)

N-A-Num-Dem (Cx): 108 lgs, 57 genera

EASTERN MANDE: Busa  
 WESTERN MANDE: Xasonga, Vai  
 NORTHERN ATLANTIC: Ndut  
 GUR: Koromfe  
 ADAMAWA: Samba Leko, Doyayo, Mbum, Day  
 KWA: Akan, Nkonya, Fongbe  
 NUPOID: Gwari  
 DEFOID: Yoruba  
 EDOID: Engenni  
 IGBOID: Igbo  
 PLATOID: Birom  
 CROSS RIVER: Leggbó  
 BANTOID: Tikar, Ndumu, Chichewa  
 SONGHAY: Koyraboro Senni, Koyra Chiini, Zarma  
 WESTERN SAHARAN: Kanuri  
 NILOTIC: Turkana  
 BIU-MANDARA: Malgwa  
 WEST CHADIC: Ngizim  
 EASTERN CUSHITIC: Oromo (Harar)  
 BAHNARIC: Stieng, Brao  
 KHMER: Khmer  
 PEARIC: Kasong  
 KAREN: Karen (Sgaw)  
 BODIC: Tibetan (Drokpa), Kham (Nangchen), Kham (Dege)  
 KUKI-CHIN: Lotha, Ao, Angami, Bawm  
 KAM-TAI: Thai  
 SULAWESI: Tukang Besi  
 BARITO: Malagasy  
 SUMATRA: Nias  
 CENTRAL MALAYO-POLYNESIAN: Buru, Nuaulu, Tugun, Leti  
 SOUTH HALMAHERA - WEST NEW GUINEA: Irarutu, Taba, Biak, Ambai  
 OCEANIC: Kairiru, Sio, Arop-Lokep, Maleu, Jabêm, Sudest, Amara, Nalik,

Loniu, Lenakel, Kosraean, Mokilese, Vinmavis, Mwotlap, Ambae (Lolovoli Northeast), Tamabo, Lewo, Rotuman, Ifira-Mele  
 FINISTERRE-HUON: Selepet, Nabak  
 CHIMBU: Golin  
 OK: Telefol  
 ANGAN: Menya  
 BINANDEREAN: Binandere, Orokaiva  
 KOIARIAN: Koita, Koiali (Mountain), Barai  
 MADANG: Siroi, Usan, Waskia, Anamuxra  
 MEK: Yale (Kosarek)  
 ALOR-PANTAR: Adang  
 BOSAVI: Edolo  
 DUNA: Duna  
 DAGAN: Daga  
 NORTH-CENTRAL BIRD'S HEAD: Abun, Maybrat  
 HATAM: Hatam  
 NORTH HALMAHERAN: Tidore  
 KRISA: I'saka  
 SERRA HILLS: Poko-Rawo  
 EAST BIRD'S HEAD: Meyah  
 WAPEI-PALEI: Au  
 MARIENBERG: Kamasau  
 YELLOW RIVER: Namia  
 PAMA-NYUNGAN: Kugu Nganhcara, Kuuk Thaayorre, Arrente (Mparntwe), Ngaanyatjarra  
 MUSKOGEAN: Choctaw  
 TALAMANCA: Bribri  
 MURA: Pirahã

Dem-Num-Adj-N (Ca): 74 lgs, 44 genera

KHOE (CENTRAL KHOISAN): Khoekhoe  
 NORTH OMOTIC: Gamo

EASTERN CUSHITIC: Sidaama  
 ARMENIAN: Armenian (Eastern)  
 INDIC: Torwali, Brokskat, Kashmiri,  
 Marathi, Urdu, Lamani, Panjabi,  
 Kumauni  
 IRANIAN: Ossetic, Pashto  
 GREEK: Greek (Modern)  
 GERMANIC: English  
 SLAVIC: Russian, Polish, Bulgarian,  
 Serbian-Croatian  
 UGRIC: Hungarian, Khanty  
 MONGOLIC: Dagur, Mangghuer  
 TUNGUSIC: Evenki, Udihe  
 TURKIC: Turkish, Uzbek, Bashkir, Tatar  
 KOREAN: Korean  
 JAPANESE: Japanese  
 YENISEIAN: Ket  
 KARTVELIAN: Georgian  
 AVAR-ANDIC-TSEZIC: Godoberi, Tsez,  
 Hunzib  
 LEZGIC: Archi  
 BURUSHASKI: Burushaski  
 NORTHERN DRAVIDIAN: Malto  
 SOUTH-CENTRAL DRAVIDIAN: Kuvi  
 SOUTHERN DRAVIDIAN: Kannada,  
 Tamil, Malayalam  
 CHINESE: Mandarin, Cantonese  
 BODIC: Chantyal, Kham, Hayu, Kinnauri,  
 Darma, Byansi  
 TSOUIIC: Rukai  
 PALAUAN: Palauan  
 OCEANIC: Tolai  
 EASTERN HIGHLANDS: Awa, Hua  
 SEPIK HILL: Sare, Alamblak  
 BILUA: Bilua  
 TIWIAN: Tiwi  
 TLINGIT: Tlingit  
 CENTRAL SALISH: Musqueam  
 MIXE-ZOQUE: Mixe (Ayutla)  
 MAYAN: Sipakapense  
 OTOMIAN: Otomí (Mezquital)  
 CAHITA: Yaqui  
 BARBACOAN: Awa Pit  
 QUECHUAN: Quechua (Huallaga)  
 AYMARAN: Jaqaru  
 TUCANOAN: Siona, Secoya  
 URU-CHIPAYA: Chipaya  
 ARAWAKAN: Resígaro

Dem-N-A-Num (Co): 28 lgs, 22 genera

SANDAWE: Sandawe

WESTERN MANDE: Jeli, Mandinka  
 (Gambian)  
 GUR: Nanerge  
 KWA: Anufo  
 NUBIAN: Nubian (Dongolese), Nubian  
 (Kunuz)  
 NILOTIC: Bari  
 WEST CHADIC: Miya  
 BODIC: Nar-Phu  
 QIANGIC: Pumi  
 rGYALRONG: Gyarong (Cogtse),  
 rGyalrong (Caodeng)  
 BODO-GARO: Garo  
 TANI: Apatani  
 OCEANIC: Tawala, Iduna, Sinaugoro,  
 Tahitian  
 CHIMBU: Kuman  
 KOIARIAN: Ömie  
 MADANG: Tauya  
 ALOR-PANTAR: Abui  
 TATE: Kaki Ae  
 RAM: Awtuw  
 YUCHI: Yuchi  
 TUCANOAN: Retuarã  
 PIAROA: Piaroa

Num-N-A-Dem (Cs): 38 lgs, 21 genera

NORTHERN ATLANTIC: Wolof  
 SEMITIC: Arabic (Egyptian)  
 BASQUE: Basque  
 CELTIC: Breton  
 VIET-MUONG: Vietnamese  
 BAHNARIC: Sre  
 HMONG-MIEN: Hmong Njua  
 KAM-TAI: Nung (in Vietnam)  
 SOUTH MINDANAO: Tboli  
 SULAWESI: Muna  
 NORTHWEST MALAYO-  
 POLYNESIAN: Tatana'  
 SAMA-BAJAW: Bajau (West Coast)  
 SUNDANESE: Sundanese  
 LAMPUNG: Lampung  
 SUMATRA: Batak (Karo)  
 MALAYIC: Indonesian, Acehnese  
 CENTRAL MALAYO-POLYNESIAN:  
 Manggarai  
 OCEANIC: Tungak, Tigak, Taiof, Sisiqa,  
 Roviana, Hoava, Kokota, Tinrin,  
 Woleaian, Longgu, Kwaio, Fijian,  
 Niuean, Tuvaluan, Rapanui  
 MIXTECAN: Mixtec (Jicaltepec)

CHINANTECAN: Chinantec  
(Comaltepec), Chinantec (Lealao)  
ZAPOTECAN: Chatino (Sierra  
Occidental), Zapotec (Isthmus)

Dem-Num-N-A (Cb): 22 lgs, 17 genera

SEMITIC: Chaldean (Modern)  
IRANIAN: Zazaki  
ROMANCE: French, Catalan, Spanish  
KHASIAN: Khasi  
OCEANIC: Hawaiian  
KUOT: Kuot  
ATHAPASKAN: Sarcee  
MAYAN: Mam  
PAMEAN: Pame  
TAKIC: Luiseño  
AZTECAN: Nahuatl (Huasteca)  
URARINA: Urarina  
NADAHUP: Hup  
TUCANOAN: Desano  
TUPI-GUARANI: Guaraní  
ARAWAKAN: Apurinã, Piro, Baure,  
Palikur  
PEBA-YAGUAN: Yagua

N-A-Dem-Num (Cl): 19 lgs, 11 genera

WESTERN MANDE: Maninka (Western)  
KWA: Ewe  
BANTOID: Aghem, Babungo  
BIU-MANDARA: Uldeme  
BODIC: Tibetan (Modern Literary),  
Tibetan (Standard Spoken)  
QIANGIC: Qiang  
BURMESE-LOLO: Lisu, Lalo, Akha, Hani  
SOUTH HALMAHERA - WEST NEW  
GUINEA: Warembori  
OCEANIC: Maisin, Takia, Kaulong, Port  
Sandwich  
MADANG: Kobon  
WESTERN DALY: Maranungku

N-Num-A-Dem (Ct): 9 lgs, 7 genera

MABAN: Maba  
NILOTIC: Luo, Lango  
EASTERN CUSHITIC: Oromo (Waata)  
OCEANIC: Kele, Buma  
MAKASAE-FATALUKU-OIRATA:  
Makasae  
SOUTH BIRD'S HEAD: Inanwatan

SULKA: Sulka

Dem-A-N-Num (Cn): 11 lgs, 6 genera (only in  
Tibeto-Burman and New Guinea)

BODIC: Kathmandu Newari, Tshangla,  
Tamang, Gurung, Purki  
KUKI-CHIN-NAGA: Lai  
MIRISH: Mising  
EASTERN HIGHLANDS: Yagaria, Foré  
PAWAIAN: Pawaian  
MIDDLE SEPIK: Ambulas

N-Dem-A-Num (Cp): 6 lgs, 4 genera

NORTHERN ATLANTIC: Noon, Diola-  
Fogny  
BANTOID: Nkore-Kiga, Runyankore  
ANEM: Anem  
PAMA-NYUNGAN: Pitjantjara

Num-N-Dem-A (Cg): 5 lgs, 3 genera

KATUIC: Katu  
YAPESE: Yapese  
OCEANIC: Kilivila, Teop, Drehu

N-Dem-Num-A (Cd): 4 lgs, 3 genera

KORDOFANIAN: Moro  
KULIAK: Ik, So  
KOMBIO-ARAPESH: Abu Arapesh

Num-A-N-Dem (Cr): 4 lgs, 3 genera

OCEANIC: Iai, Xârâcùù  
TSIMSHIANIC: Coast Tsimshian  
CREOLES: Ndyuka

Dem-N-Num-A (Cc): 3 lgs, 3 genera

MEK: Una  
ATHAPASKAN: Slave  
ARAWAKAN: Tariana

A-N-Dem-Num (Ck): 4 lgs, 2 genera

UBANGI: Munzumbo, Baka (in  
Cameroon), Linda  
BAI: Bai

Dem-A-Num-N (Cm): 3 lgs , 2 genera

INDIC: Dhivehi

NAKH: Ingush, Chechen

N-Num-Dem-A (Ch): 1 lg, 1 genus

BANTOID: Haya

A-N-Num-Dem (Cw): 2 lgs, 1 genus

UBANGI: Sango, Mayogo

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