

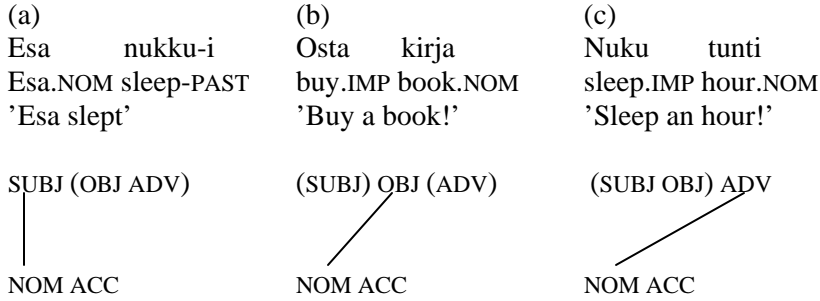
ADVERBIALS AND THE TYPOLOGY OF CASE

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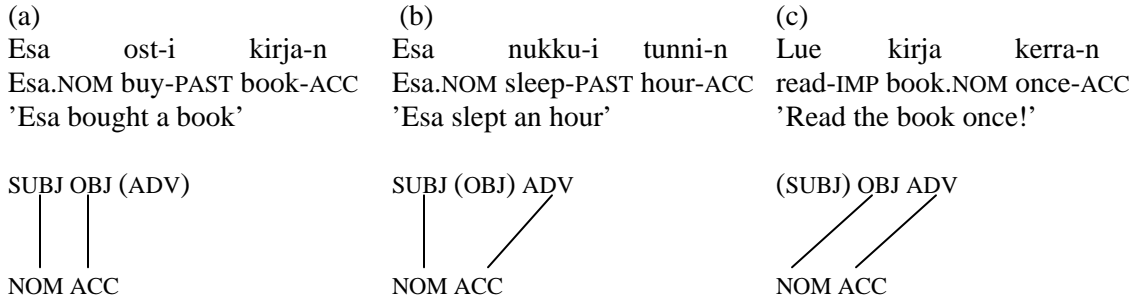
1. Case in tiers

- (1) In many languages, adverbials bear grammatical case, e.g. Chinese (Li 1990), Finnish (Maling 1993, Kiparsky 2001), Korean (Wechsler and Lee 1996, Maling 2004, Kim and Sells 2007), Polish (Przełiórkowski 1999), Russian (Pereltsvaig 2000), and Warumungu (Simpson 1991).
- (2) This applies especially to
 - (a) adverbs of duration, e.g. ‘sleep the whole day’
 - (b) adverbs of measure, e.g. ‘walk a mile’
 - (c) adverbs of frequency, e.g. ‘read once’
- (3) Such adverbials alternate in case like objects. Consider Finnish:
 - (a) Objects take PAR under negation:
Esa osti kirja-n Esa ei osta-nut kirja-a
Esa.NOM buy-PAST book-ACC Esa.NOM not buy-PCP book-PAR
‘Esa bought a book’ ‘Esa didn’t buy a book’
 - (b) Adverbials take PAR under negation:
Esa nukku-i tunni-n Esa ei nukku-nut tunti-a
Esa.NOM sleep-PAST hour-ACC Esa.NOM not sleep-PCP hour-PAR
‘Esa slept an hour’ ‘Esa didn’t sleep an hour’
- (4) How are grammatical case, grammatical relations, and semantic/thematic structure related? Two general possibilities (Levin and Rappaport Hovav 2005, Ch. 5):
 - (a) Case assignment refers to equivalence classes of arguments, defined in terms of the grammatical relations hierarchy, the thematic hierarchy, c-command, etc.
 - (b) Case assignment preserves prominence relations among arguments.
- (5) The Case-Tier Hypothesis (Maling 1993, 2004; Zaenen et al. 1985; cf. Goldsmith 1976):
 - (a) The grammatical function tier: SUBJ > OBJ > ADV
 - (b) The case tier: NOM > ACC
 - (c) Cases are mapped onto functions, one to one, left to right, spreading rightmost.
- (6) Prediction (Maling 2004): The cases of different NPs in the clause depend on each other. This prediction is confirmed by the patterning of nominative (NOM) and accusative (ACC) in Finnish.

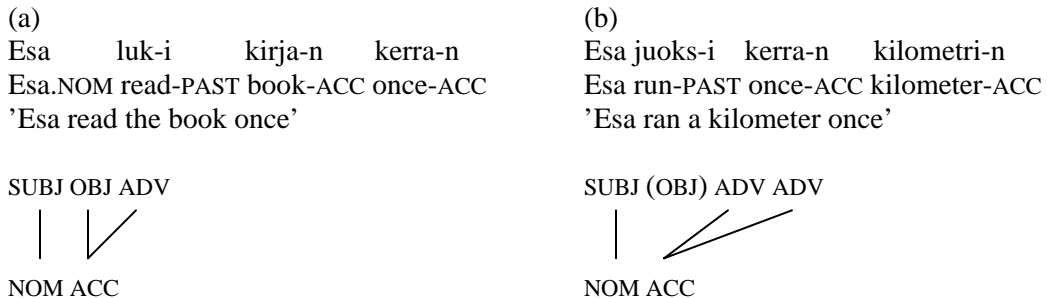
(7) One NP → NOM



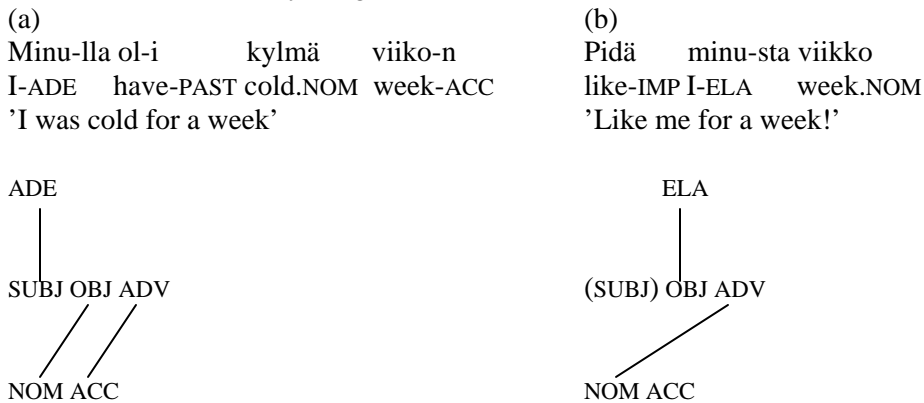
(8) Two NPs → NOM ACC ("Case Shift")



(9) Three NPs → NOM ACC ACC ("Case Spreading")



(10) Interaction with lexically assigned case (ADE = adessive, ELA = elative)



- (11) Goals of this talk
- (a) Reformulate the Case-Tier Hypothesis in Optimality Theory, building on e.g. Maling 1993, 2004; Legendre et al. 1993; Aissen 2003; de Hoop and Malchukov 2007.
 - (b) Derive the Finnish and Korean case patterns
 - (c) Explain some puzzling patterns of NOM ~ ACC variation in adverbials
 - (d) Discuss the implicational universals derived by the theory

2. An OT interpretation

- (12) What does case do? (see e.g. de Hoop and Malchukov 2007, Wunderlich and Lakämper 2001)
- (a) Distinguishing function: Cases distinguish arguments (= Case OCP).
 - (b) Corresponding function: Cases encode semantic/pragmatic properties of arguments.
- (13) OT Constraints:
- (a) OCP The highest function differs in case from all other functions.
 - (b) *MC/S Subjects resist marked case (= ACC).
 - *MC/SO Subjects and objects resist marked case.
 - *MC/SOA Subjects, objects, and adverbials resist marked case.

- (14) One NP: No rankings needed

		OCP	*MC/S	*MC/SO	*MC/SOA
S	→ nom				
	acc		1	1	1
O	→ nom				
	acc			1	1
A	→ nom				
	acc				1

- (15) Two NPs: Case Shift

		OCP	*MC/S	*MC/SO	*MC/SOA
SO	nom nom	1			
	acc nom		1	1	1
	→ nom acc				1
	acc acc	1	1	1	2
SA	nom nom	1			
	acc nom		1	1	1
	→ nom acc				1
	acc acc	1	1	1	2
OA	nom nom	1			
	acc nom			1	1
	→ nom acc				1
	acc acc	1		1	2

- (16) Case Shift ensures that the higher function differs from the lower function in case (OCP), and the higher function is unmarked for case (*MC/S, *MC/SO, *MC/SOA).

(17) Three NPs: Case Spreading

		OCP	*Mc/S	*Mc/SO	*Mc/SOA
SOA	nom nom nom	2			
	nom nom acc	1			1
	nom acc nom	1		1	1
	acc nom nom		1	1	1
	→ nom acc acc			1	2
	acc nom acc	1	1	1	2
	acc acc nom	1	1	2	2
	acc acc acc	2	1	2	3

(18) Case Spreading ensures that the highest function differs from all other functions in case (OCP).

(19) Ranking: OCP >> *Mc/SO, *Mc/SOA

3. Problems

(20) NOM ~ ACC variation in adverbials, especially with impersonal verbs.

(21) nii-tä polte-ttiin muutama vuosi ~ muutama-n vuode-n
 they-PAR burn-PASS.PAST a.few years.NOM ~ a.few years-ACC
 'They [lights] were burning for a few years'

(22) Työ-tä on teh-tä-vä koko aja-n, ei vain muutama vuosi.
 work-par is do-INF-PCP whole time-ACC not only a.few year.NOM
 'One must work all the time, not just for a few years'

(23) The NOM ~ ACC variation only occurs on adverbials, never on objects.

(a) Men-nään vielä kerta ~ kerra-n
 go-PASS still once.NOM ~ once-ACC
 'Let's go one more time!'

(b) Lue-taan vielä runo / *runo-n
 read-PASS still poem.NOM / *poem-ACC
 'Let's read one more poem!'

(24) Questions:

- (a) Why does variation emerge only in adverbials?
- (b) Is the variation free or (partly) predictable from something?

4. Korean

(25) The main generalizations about case on duration/frequency adverbials (Maling 2004:180):

- (a) ACC if the verb has an external argument.
- (b) NOM ~ ACC if no external argument underlyingly (e.g. unaccusatives)
- (c) NOM with simplex psychological predicates and adjectival predicates (e.g. 'dislike', 'be cute', 'be dark')

- (26) The main differences to Finnish (see Maling 2004:180):
- (a) O gets ACC: sakwa-lul mek-ela
apple-ACC eat-IMP
'Eat an apple!'
- (b) A gets ACC: hansikan-ul talli-ela
one.hour-ACC run-IMP
'Run an hour!'
- (c) Korean allows multiple nominatives
- (27) The following data show that thematic prominence is somehow involved. (Unless otherwise stated, all examples come from Kim and Sells 2007.)
- (28) Only NOM ACC if the verb has an external argument:
- (a) ku malathon-senswu-nun chopan tongan-*/i/ul ppalli talli-ess-ta
the marathoner-TOP first.half for-*/NOM / ACC fast run-PAST-DECL
'The marathoner ran fast in the first half'
- (b) Rice-nun Seoul-ey halwu tongan-*/i/ul iss-ess-ta
Rice-TOP Seoul-LOC one day for-*/NOM / ACC exist-PAST-DECL
'Rice stayed in Seoul for one day'
- (c) John-i sang-ul yelepen-*/i/ul pat-ass-ta
John-NOM award-ACC several.times-*/NOM / ACC receive-PAST-DECL
'John received awards several times'
- (d) John-un sensayngnim-kkey sey pen-*/i/ul yatan mac-ass-ta
John-TOP teacher-DAT(HON) three times-*/NOM / ACC be.scolded-PAST-DECL
'John was scolded by the teacher three times'
- (29) Variation NOM ~ ACC if the verb has no external argument underlyingly:
- (a) ku chayk-i twu sikan-i~ul ilk-hi-ess-ta
the book-NOM 2.hour for-NOM ~ ACC read-PASS-PAST-DECL
'The book was read for two hours'
- (b) ku khun kong-i two pen-i~ul kwul-ess-ta
the big ball-NOM two.times-NOM ~ ACC rotate-PAST-DECL
'The ball rotated twice'
- (c) pi-ka han sikan tongan-i~ul o-ass-ta
rain-NOM one hour for-NOM ~ ACC come-PAST-DECL
'It rained for one hour'
- (d) hay-ka twu sikan-i~ul pichi-ess-ta
sun two hours-NOM ~ ACC shine-PAST-DECL
'The sun shone for two hours'
- (e) pesu-ka achim-ey twu pen-i/?ul o-ass-ta
bus-NOM morning-LOC two times-NOM / ?ACC come-PAST-DECL
'Buses came twice in the morning'

- (f) ku elum cokak-i han sikan-?i/ul nok-ass-ta
that ice piece-NOM one hour-?NOM / ACC melt-PAST-DECL
'That piece of ice melted for one hour'
- (g) noyey.tul-i ku sem-ey ipayk nyen kan-?i/ul iss-ess-ta
slaves-NOM the island-LOC 200 years period-?NOM / ACC exist-PAST
'Slaves were on the island for 200 years'
- (h) haksayng-tul-i twu pen-?i/ul o-ass-ta
student-PL-NOM two times-?NOM / ACC come-PAST-DECL
'Students came (here and left) twice'
- (30) Only NOM NOM: simplex psychological predicates and adjectival predicates
- (a) John-i Tom-i/*ul silh-ta
John-NOM Tom-NOM / *ACC dislike-PRES-DECL
'John dislikes Tom'
- (b) i pang-un nac tongan-i/*ul etwup-ta
this room-TOP day time for-NOM / *ACC dark-DECL
'This room is dark during the day time'
- (c) yecin-i twu pen-i/*ul o-ass-ta
aftershock-NOM two times-NOM / *ACC come-PAST-DECL
'Aftershocks came twice'
- (d) ku malathonsenswu-nun chopan tongan-i/*ul ppal-ass-ta.
the marathoner-TOP first.half for-NOM / *ACC fast-PAST-DECL
'The marathoner was fast in the first half'
- (31) Goal: Extend the analysis to account for both Finnish and Korean, including the variable patterns.

5. A revised OT analysis

5.1 The new constraints

- (32) To account for the mappings <O, acc> and <A, acc> in Korean, we include a new constraint:
EXPR 'Express case morphologically on every NP'
- (33) In order to capture thematic prominence effects, we adopt the following numerology:
- (a) S1 (= subject, external argument) Kim runs.
S2 (= subject, internal argument) Kim sleeps.
S3 (= subject, dummy) It is raining.
O2 (= object, internal argument) Eat the apple!
A3 (= adverbial, non-argument) Walk a mile!
- (b) S1 O2 Kim ate apples.
S1 A3 Kim walked a mile.
S2 O2 Kim dislikes Sandy.
S2 A3 Kim slept an hour.
S3 A3 It was raining for an hour.
O2 A3 Read the book once!
- (c) S1 O2 A3 Kim walked Fido a mile.

- (34) Assume the following constraints that parallel the function constraints:
 *MC/1 The thematically highest NP resists marked case.
 *MC/12 The two thematically highest NPs resist marked case.
 *MC/123 The three thematically highest NPs resist marked case.
- (35) Rethinking Case-OCP: Distinguish highest role or distinguish highest function? Assume both for now and see if you can eliminate one in the end:
 OCP(function)
 OCP(thematic)
- (36) We will now explore the predictions of the proposed grammatical system:
 (a) What kinds of case systems are admitted?
 (b) What kinds of case systems are excluded?
 (c) How can the system explain variation?

5.2 Typology and variation

- (37) We start by examining the predicted case typology for clauses with exactly one NP.
- (38) We first compute the factorial typology for one-NP systems using OTSoft (Hayes et al. 2003). 6 distinct case systems are predicted.

	#1	#2	#3	#4	#5	#6
/S1/:	nom	nom	nom	nom	nom	acc
/S2/:	nom	nom	nom	nom	acc	acc
/S3/:	nom	nom	nom	acc	acc	acc
/O2/:	nom	nom	acc	nom	acc	acc
/A3/:	nom	acc	acc	acc	acc	acc

- (39) Language #1 has NOM everywhere, language #6 has ACC everywhere. But this is far from saying that everything is possible. The constraint system skews the case distribution in interesting ways.
- (40) An implicational universal: If S1 is mapped onto ACC, so is O2, but not vice versa.

	#1	#2	#3	#4	#5	#6
/S1/:	nom	nom	nom	nom	nom	acc
/O2/:	nom	nom	acc	nom	acc	acc

- (41) In contrast, no implicational universal relates S3 and O2.

	#1	#2	#3	#4	#5	#6
/S3/:	nom	nom	nom	acc	acc	acc
/O2/:	nom	nom	acc	nom	acc	acc

- (42) How does this matter to variation? Assumptions (Kroch 1989, Kiparsky 1994, Anttila 2007a):
 (a) Variation arises from multiple grammars within/across individuals.
 (b) The number of grammars predicting an output is proportional to its frequency of occurrence.

- (43) Example: Assume an individual with 6 grammars (one of each predicted type). This individual will exhibit NOM ~ ACC variation on both O2 and A3, with a quantitative bias. In the long run, the individual's rate of ACC will approximate 1/2 on O2 and 5/6 on A3.

	#1	#2	#3	#4	#5	#6
/O2/ :	nom	nom	acc	nom	acc	acc
/A3/ :	nom	acc	acc	acc	acc	acc

- (44) A quantitative universal: A3 exhibits a higher proportion of ACC than O2.

- (45) If we focus on languages where *MC/S >> {other constraints}, we get a smaller typology:

	#1	#2	#3
/S1/ :	nom	nom	nom
/S2/ :	nom	nom	nom
/S3/ :	nom	nom	nom
/O2/ :	nom	nom	acc
/A3/ :	nom	acc	acc

- (46) Observations:

- All the implicational universals in (43) continue to hold true in the subset (45).
- Some become vacuous, e.g. in <S1, acc> → <S2, acc> the antecedent is never satisfied.
- Rankings can only add implications. For example, (45) contains the additional language-specific implication <O2, nom> → <S3, nom>.

- (47) Terminology:

- TYPOLOGICAL ENTAILMENT (T-ENTAILMENT) is any implication between <input, output> pairs, either universal or language-specific.
- TYPOLOGICAL ORDER (T-ORDER) is the set of all typological entailments derived by a grammar.

- (48) How to work out the complete T-order?

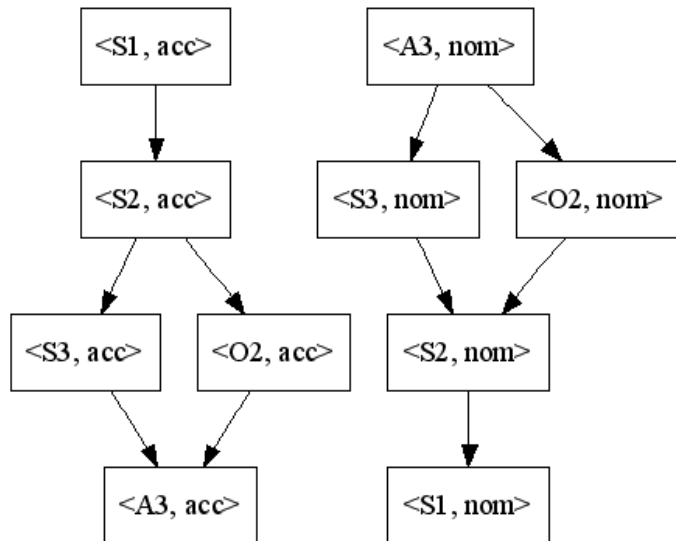
T-Order Generator (Anttila and Andrus 2006) is a free open-source Python program for computing and visualizing T-orders.

(49) The T-order for the grammar with no rankings contains 18 implicational universals:

(a) The 18 implicational universals as pairs of <input, output> pairs

<S2, acc> --> <A3, acc>	<A3, nom> --> <S1, nom>
<S1, acc> --> <S3, acc>	<S3, nom> --> <S1, nom>
<S2, acc> --> <S3, acc>	<S1, acc> --> <O2, acc>
<S2, nom> --> <S1, nom>	<S2, acc> --> <O2, acc>
<A3, nom> --> <S2, nom>	<A3, nom> --> <S3, nom>
<S1, acc> --> <S2, acc>	<S3, nom> --> <S2, nom>
<S1, acc> --> <A3, acc>	<S3, acc> --> <A3, acc>
<O2, nom> --> <S1, nom>	<A3, nom> --> <O2, nom>
<O2, nom> --> <S2, nom>	<O2, acc> --> <A3, acc>

(b) The same 18 implicational universals visualized as a directed graph



(50) Two ways of working out the T-order:

- (a) Figure out the entailments from the factorial typology.
- (b) Figure out the Elementary Ranking Conditions (ERCs) for each <input, output> mapping and the entailments among them (Prince 2002a, 2002b 2006).

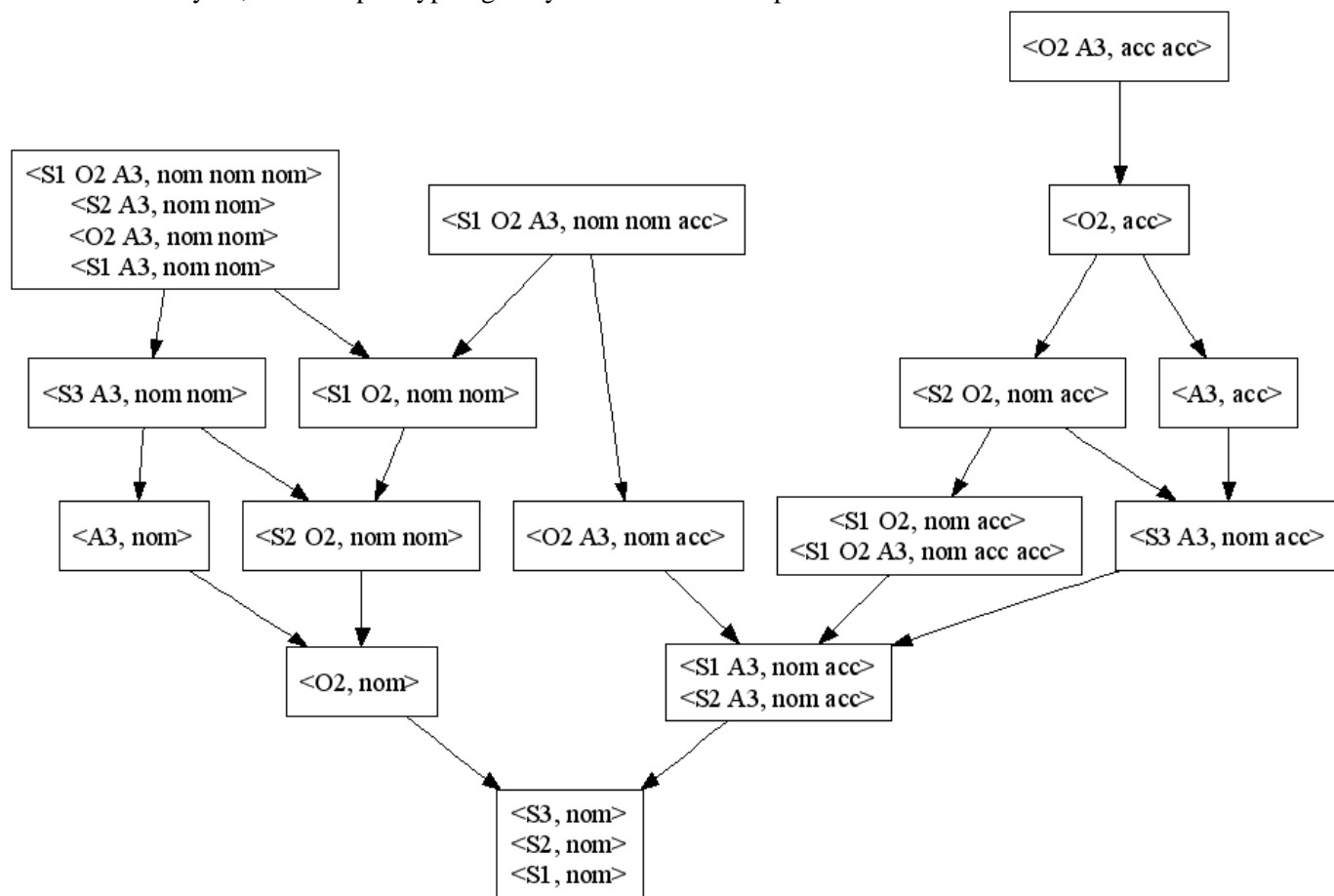
(51) T-orders appear in all domains of linguistics. Some examples of recent work:

- (a) gradient phonotactics (Anttila to appear; Dmitrieva and Anttila 2008; vander Wyk and McClelland 2007)
- (b) phonological variation (Anttila 2007b; Anttila, Fong, Benus, and Nycz to appear)
- (c) morphosyntactic variation (this talk)
- (d) syntactic variation (Anttila 2008; Anttila, Adams, and Speriosu 2008)
- (e) semantic ambiguity (Anttila and Fong to appear)

(52) Assuming the 12 inputs in (33) and the ranking *MC/S >> {other constraints}, we obtain a typology with 11 distinct languages (n = NOM, a = ACC).

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
/S1/:	n	n	n	n	n	n	n	n	n	n	n
/S2/:	n	n	n	n	n	n	n	n	n	n	n
/S3/:	n	n	n	n	n	n	n	n	n	n	n
/O2/:	n	n	n	n	n	n	n	n	n	a	a
/A3/:	n	n	n	n	n	n	a	a	a	a	a
/S1 O2/:	n-a	n-a	n-a	n-n	n-n	n-n	n-a	n-a	n-n	n-a	n-a
/S1 A3/:	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	n-a
/S2 A3/:	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	n-a
/S3 A3/:	n-a	n-a	n-n	n-a	n-n	n-n	n-a	n-a	n-a	n-a	n-a
/O2 A3/:	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	a-a
/S2 O2/:	n-a	n-n	n-n	n-n	n-n	n-n	n-a	n-n	n-n	n-a	n-a
/S1 O2 A3/:	n-a-a	n-a-a	n-a-a	n-n-a	n-n-a	n-n-n	n-a-a	n-a-a	n-n-a	n-a-a	n-a-a

(53) The complete T-order with 146 implicational universals. <input, output> pairs enclosed in a box form a cycle, i.e. each pair typologically entails each other pair.



6. Explaining specific patterns

6.1 Objects vs. adverbials

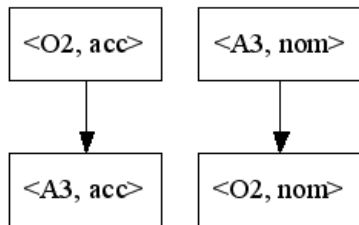
(54) In Finnish, why does NOM ~ ACC variation emerge in adverbials, but not in objects?

- (a) Men-nään vielä kerta ~ kerra-n
 go-PASS still once.NOM ~ once-ACC
 'Let's go one more time!'
- (b) Lue-taan vielä runo / *runo-n
 read-PASS still poem.NOM / *poem-ACC
 'Let's read one more poem!'

(55) Answer: ACC is universally better with A3 than with O2.

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
/O2/ :	n	n	n	n	n	n	n	n	n	a	a
/A3/ :	n	n	n	n	n	n	a	a	a	a	a

(56) Partial T-order



6.2 Double nominatives

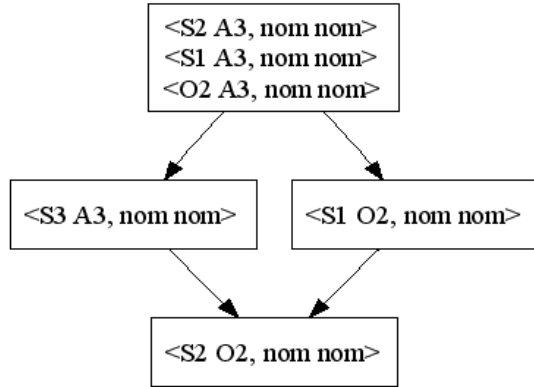
(57) In Korean, why does NOM NOM appear in verbs with no external argument (e.g. unaccusatives)?

- (a) John-i Tom-i/*ul silh-ta
 John-NOM Tom-NOM / *ACC dislike-PRES-DECL
 'John dislikes Tom'
- (b) i pang-un nac tongan-i/*ul etwup-ta
 this room-TOP day time for-NOM / *ACC dark-DECL
 'This room is dark during the day time'

(58) Answer: NOM NOM is universally better with /S2 O2/ than with any other two-NP input.

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
/S1 O2/ :	n-a	n-a	n-a	n-n	n-n	n-n	n-a	n-a	n-n	n-a	n-a
/S1 A3/ :	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	n-a
/S2 A3/ :	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	n-a
/S3 A3/ :	n-a	n-a	n-n	n-a	n-n	n-n	n-a	n-a	n-a	n-a	n-a
/O2 A3/ :	n-a	n-a	n-a	n-a	n-a	n-n	n-a	n-a	n-a	n-a	a-a
/S2 O2/ :	n-a	n-n	n-n	n-n	n-n	n-n	n-a	n-n	n-n	n-a	n-a

(59) Partial T-order



7. Evaluation

7.1 Finnish

- (60) The Finnish reality is generally consistent with the predicted typology. The adverbial case variation suggests that Finnish combines grammars #1 and #7.
- (61) A remaining problem: NOM ~ ACC variation in adverbials, especially with passives. Here the Case-Tier Hypothesis only predicts NOM (see also Hakulinen et al. 2004:926).
- (62) Variation NOM ~ ACC. Nominatives from *Aamulehti 1999*, but accusative seems also possible.
- (a) nii-tä polte-ttiin muutama vuosi ~ muutama-n vuode-n
they-PAR burn-PASS.PAST a.few years.NOM ~ a.few years-ACC
'They [lights] were burning for a few years'
- (b) Tö-i-tä paine-ttiin koko päivä ~ päivä-n
work-PL-PAR do-PASS.PAST whole day.NOM ~ day-ACC
'One was working the whole day'
- (c) Pushkin-in runo-j-a lausu-ttiin koko päivä ~ päivä-n
Pushkin-GEN poem-PL-PAR recite-PASS.PAST whole day.NOM ~ day-ACC
'Pushkin's poems were being read the whole day'
- (d) Seokse-n anne-taan muhi-a muutama päivä ~ muutama-n päivä-n
mixture-GEN let-PASS.PRES ferment-INF a.few day.NOM ~ a.few day-ACC
'The mixture is allowed to ferment for a few days'
- (63) Variation NOM ~ ACC. Accusatives from *Aamulehti 1999*, but nominative seems also possible.
- (a) Kirkonkello-j-a soite-ttiin koko päivä ~ päivä-n
church.bell-PL-PAR toll-PASS.PAST whole day.NOM ~ day-ACC
'The church bells were tolling the whole day'
- (b) hei-lle makse-taan palkka-a koko vuosi ~ vuode-n
they-ALL pay-PASS.PRES salary-PAR whole year.NOM ~ year-ACC
'They were paid salary the whole year'

- (c) Divaripallo-a näh-dään vielä kerta ~ kerra-n tänä vuonna
 division.football-PAR see-PASS.PRES still once.NOM ~ once-ACC this-ESS year-ESS
 'Division football can be watched once more this year'
- (d) Neuvottelu-j-a jatke-ttiin koko päivä ~ päivä-n
 negotiation-PL-PAR continue-PASS.PAST whole day.NOM ~ day-ACC
 'Negotiations continued the whole day'

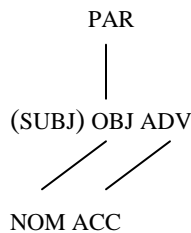
(64) Hypothesis 1: Variation-inducing verbs have an implicit argument that "steals" the nominative (cf. Kiparsky 2001).

(65) Some verbs that in their passive form allow NOM ~ ACC on the adverbial (see examples above):

poltta-	'cause to burn'	soitta-	'ring'
paina-	'push'	maksa-	'pay'
lausu-	'recite'	nähdä-	'see'
anta-	'allow'	jatka-	'continue'

(66) Hypothesis 2: In most of our examples, the argument above the adverbial (O2) bears the default case PAR (Anttila and Fong 2000, Vainikka 1989, Vainikka and Maling 1996), suggesting that

- (a) Unlike ADE and ELA in (10), PAR is not assigned lexically
 (b) Default cases are invisible to grammatical case assignment



(67) Invariant ACC adverbials are found with experiencer verbs, e.g. *nukutta-* 'feel sleepy', *väsyttä-* 'feel tired', *inhotta-* 'feel disgusted', *kadutta-* 'regret' where the experiencer always gets PAR. This is compatible with Hypothesis 2:

- (a) Minu-a nuku-tt-i koko päivä-n / *päivä
 I-PAR sleep-CAUS-PAST whole day-ACC / *day.NOM
 'I was sleepy the whole day'
- (b) Minu-a kadu-tt-i koko viiko-n / *viikko
 I-PAR regret-CAUS-PAST whole week-ACC / *week.NOM
 'I regretted (something) the whole week'

(68) Invariant NOM adverbials are found if there is no external argument or the highest function/argument gets a lexical/semantic case. This too is compatible with Hypothesis 2:

- (a) Sii-hen on aika-a enää muutama päivä / *muutama-n päivä-n
 it-ILL is time-PAR only a.few day.NOM / *a.few day-ACC.
 'It is only a few days away' (lit. 'Into it (there) is time only for a few days')
- (b) Tuoksu-taan hyvä-ltä viikko / *viiko-n
 smell.IMP good-ABL week.NOM / *week-ACC
 'Let's smell good for a week!'

7.2 Korean

- (69) I am aware of one implicational universal that appears not to hold for Korean:
<O2 A3, nom nom> → <O2, nom>
Korean allows the first, but not the second, e.g. in imperatives where we get <O2, acc>.
Possible solution: Korean imperatives have an implicit external argument?
- (70) Caveat: We have not considered multiple internal arguments (e.g. double objects) which in Korean yield triple nominatives in passives (Maling 2004:178):
- (a) Cheli-ka Mary-lul panci-lul senmul-ul ha-ess-ta
Cheli-NOM Mary-ACC ring-ACC gift-ACC do-PST-DEC
'Cheli presented Mary with a ring' (active)
- (b) Mary-ka panci-ka senmul-i toy-ess-ta
Mary-NOM ring-NOM gift-NOM become-PST-DEC
'Mary was presented with a ring' (passive)

8. Summary

- (71) I have outlined a theory of grammatical case that
- (a) relies on prominence relations among arguments
 - (b) separates the distinguishing function of case (= OCP) from its corresponding function
- (72) The analysis correctly handles the basic case patterns of Finnish and Korean and extends to some previously problematic patterns of case variation in adverbials.
- (73) Every OT grammar defines a set of implicational universals that are hard to work out with paper and pencil, but easy to find using recently developed software (Anttila and Andrus 2006).
- (74) Such implicational universals are of the highest theoretical importance because they constitute the core of any theory of typological and quantitative variation.

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Corpora

Some of the Finnish data in this paper come from newspaper corpora, in particular the morphologically annotated *Aamulehti 1999* corpus (16,608,843 word forms) compiled by the Research Institute for the Languages of Finland, the Department of General Linguistics at the University of Helsinki, and the Finnish IT Center for Sciences. The corpus is freely available for registered users at <http://www.csc.fi/>.

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