Disjunction and Alternative Conditionals in Korean

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-na: a disjunction AND conjunction marker?

- A-na B: disjunction

Example

*Angie-**na** Brad*-ka cikum Nagoya-ey issta.
Angie-NA Brad-NOM now Nagoya-in exist
'Angie or Brad is in Nagoya now.'

- A-na B-na: conjunction

Example

*Angie-**na** Brad-**na*** cikum Nagoya-ey issta.
Angie-NA Brad-NA now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

-na: a disjunction AND conjunction marker?

- cf. A-wa B: ordinary conjunction

Example

*Angie-**wa** Brad*-ka cikum Nagoya-ey issta.
Angie-WA Brad-NOM now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

- *A-na B-na* type of conjunction appears in more restricted contexts than ordinary conjunction does.

Questions

- What are the syntactic and semantic properties of *nana*-conjunction?
- How is the meaning of *nana*-conjunction derived compositionally?
- Why does the marker used to make a conjunction have the same form with a disjunctive marker?

Compatibility with an explicit case marker

- Ordinary conjunctions can be followed by a case marker

Example

*Angie-**wa** Brad-ka cikum Nagoya-ey issta.*
Angie-WA Brad-NOM now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

- *nana*-conjunctions cannot be followed by a case marker.

Example

*Angie-**na** Brad-**na**-(*ka) cikum Nagoya-ey issta.*
Angie-NA Brad-NA-(NOM) now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

Givenness

- The conjuncts in *nana*-conjunction are a set of compatible things given in the previous discourse.

Example

A: na-nun Angie-hako Brad-lul cohahay.
I-TOP Angie-and Brad-ACC like
'I like Angie and Brad.'

*B: Angie-**na** Brad-**na** cikum Nagoya-ey isse.*
Angie-NA Brad-NA now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

Givenness

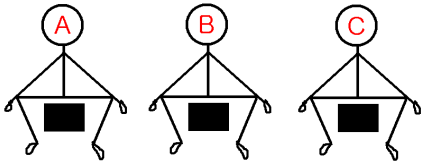
- The conjuncts in *nana*-conjunction are a set of compatible things given in the previous discourse.
  - e.g. *nana*-conjunction cannot be used to make the answer part to a question.

Example

A: nwuka cikum Nagoya-ey isse?
who.NOM now Nagoya-in exist
'Who are in Nagoya now?'

*B: #Angie-**na** Brad-**na** cikum Nagoya-ey isse.*
Angie-NA Brad-NA now Nagoya-in exist
'Angie and Brad are in Nagoya now.'

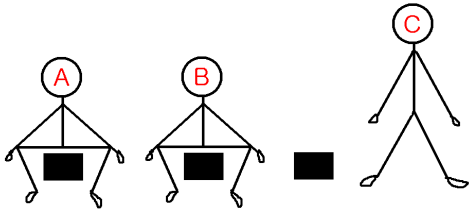
Exhaustivity



Example

*Andrew-**na** Brad-**na** Chris-**na** uica-ey ancaissta.*
Andrew-NA Brad-NA Chris-NA chair-in sit
'Andrew, Brad and Chris are sitting in a chair.'

Exhaustivity



- In *nana*-conjunction, every given alternative should be exhaustively listed.

Example

*#Andrew-**na** Brad-**na** uica-ey ancaissta.*
Andrew-NA Brad-NA chair-in sit
'(intended meaning: Both Andrew and Brad are sitting in a chair.)'

Distributivity

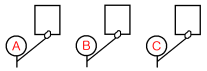
- ordinary conjunction: collective vs. distributive readings

Example

*Andrew-**wa** Brad-**wa** Chris-ka nonmwun-ul hana nayssta.*
Andrew-and Brad-and Chris-NOM paper-ACC one submit
'Andrew, Brad, and Chris have submitted a paper.'

- collective reading

- distributive reading

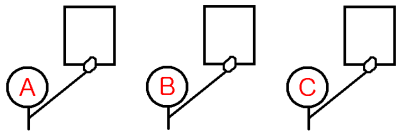


Distributivity

- *nana*-conjunction: only a distributive reading is possible

Example

*Andrew-**na** Brad-**na** Chris-**na** nonmwun-ul hana nayssta.*
Andrew-NA Brad-NA Chris-NA paper-ACC one submit
'Andrew, Brad, and Chris (each) have submitted a paper.'



Interim Summary I

- The properties of *nana*-conjunction:
  - Incompatibility with case markers
  - Givenness
  - Exhausitivity
  - Distributivity
- Where do they come from??

Alternative Conditionals

- Alternative Conditional (AC): another reapeated *-na* construction
  - *p-na q-na r* 'Whether p or q, r'

Example

John-i palphyo-ha-na Bill-i palphyoha-na
John-NOM presentation-do-NA Bill-NOM presentation-do-NA
Mary-nun yelsimhi tululkesita.
Mary-TOP attentively listen
'Whether John or Bill gives a presentation, Mary will be listening attentively.'

- In this sentence *-na* is a clausal ending rather than a nominal ending, and the two clauses marked by *-na* make a conditional-like adjunct clause together.

Conjunctive Meaning of Alternative Conditionals

- *p-na q-na r* 'Whether p or q, r' entails both 'If p, r' and 'If q, r'

Example

John-i palphyo-ha-na Bill-i palphyoha-na
John-NOM presentation-do-NA Bill-NOM presentation-do-NA
Mary-nun yelsimhi tululkesita.
Mary-TOP attentively listen
'Whether John or Bill gives a presentation, Mary will be listening attentively.'

→ 'If John gives a presentation, Mary will be listening attentively.'

→ 'If Bill gives a presentation, Mary will be listening attentively.'

- Both *p* and *q* provide sufficient condition for the occurrence of the event denotated by the main clause.

Conjunctive Meaning of Alternative Conditionals

- Then, what is the meaning of the clause *p-na q-na* itself?
- If we assume that the basic semantic interpretation of ACs is a conditional with a disjunctive antecedent, we can explain the conjunctive flavor of ACs in terms of logical properties of conditional and disjunction.
- SDA (simplification of disjunctive antecedent) (Loewer 1976)

SDA

$$(p \vee q) \supset r \equiv (p \supset r) \wedge (q \supset r)$$

The Semantic Representation of Alternative Conditionals

- The semantic representation of alternative conditionals

Example

$$[\![p_1\text{-na } p_2\text{-na } \cdots \ p_n\text{-na } q]\!] =$$
$$((p_1 \rightarrow q) \wedge (p_2 \rightarrow q) \wedge \cdots \wedge (p_n \rightarrow q))$$

nana-conjunction = Alternative Conditional with *pro*-drop

- Proposal: *nana*-conjunction is actualy an alternative conditional with *pro*-drop.

Example

*Annie-**na** Becky-**na** yeypputa.*
Annie-NA Becky-NA pretty
'Both Annie and Becky are pretty.'

Example

[e_i Annie-**na** e_i Becky-**na**] [e_i yeypputa] .
e_i.NOM Annie-NA e_i.NOM Becky-NA e_i.NOM pretty

- The nominals that appear before *-na* are actually predicates.
- The subjects of the nominal predicates and the co-indexed argument in the main clause is omitted.

nana-conjunction = Alternative Conditional with *pro*-drop

- semantic representation of *nana*-conjunction

Formula

$$\forall[(being\_A(x) \rightarrow pretty(x)) \textit{ and } (being\_B(x) \rightarrow pretty(x))]$$

- I assume that the nominals that appear before *-na* are actually one-place predicates, s.t. they take an individual argument and return true iff the individual is equivalent to the denotation of the nominal.
- We could assume an implicit copula verb between the nominal and *-na* (cf. Chung 1996).
- *-na* has an allomoph *-ina*, and the copula verb in Korean is *i*.
- The co-indexed null elements in the adjunct and main clauses introduce free variables in the semantic representation
- The alternative conditional marker *-na* makes a conditional
- A conditional introduces an unselective universal operator if no explicit quantification is provided in the context (Heim 1982)
- The universal operator binds the free variables

Properties of *nana*-conjunction: revisited

- Alternative conditionals show Givenness and Exhaustivity
  - all conditions are given
  - all given conditions should be listed

Example

John-i palphyo-ha-na Bill-i palphyoha-na
John-NOM presentation-do-NA Bill-NOM presentation-do-NA
Mary-nun yelsimhi tululkesita.
Mary-TOP attentively listen
'Whether John or Bill gives a presentation, Mary will be listening attentively.'

Properties of *nana*-conjunction: revisited

- Incompatibility with case markers
  - *na*-conjunctive nominals are not followed by case markers because they are actually adjunct clauses.
- Distributivity
  - by SDA (simplification of disjunctive antecedent)

Example

$$\forall[(Andrew(x) \textit{ or } Brad(x) \textit{ or } Chris(x)) \rightarrow submit\_paper(x)]$$
$$\equiv \forall[(Andrew(x) \rightarrow submit\_paper(x)) \textit{ and } (Brad(x) \rightarrow submit\_paper(x)) \textit{ and } (Chris(x) \rightarrow submit\_paper(x))]$$

- This property also could be related to the reason why *nana*-conjunction marker has the same form with a disjunction marker.

Interim Summary II

- The properties of *nana*-conjunction can be neatly explained by the alternative conditional approach.
  - Givenness and Exhausitivity are original properties of alternative conditionals.
  - Distributivity is explained by SDA.
  - Incompatibility with case markers is due to the clausal structure.

wh-na: distributive universal

- The alternative conditional approach to *nana*-conjunction can be extended to explain another puzzling expression, *wh-na*.
- *wh-na*: distributive universal

Example

*nwukwu-**na** aisu khulim-ul cohahanta.*
who-NA ice cream-Acc like
'Everyone likes ice cream.'

- The meaning of *-na* in previous works
  - question marker (Chung 1996)
  - concessive marker (Lee 2003, Yoon 2004)
  - disjunctive marker (Haspelmath 1995, Choi 2007)

wh-na and *nana*-conjunction

- *wh*-words: sets of individuals (Hamblin 1973)

Example

*nwukwu-**na** aisu khulim-ul cohahanta.*
who-NA ice cream-Acc like
'Everyone likes ice cream.'

*Annie-**na** Becky-**na** ··· Zelda-**na** aisu khulim-ul cohahanta.*
Annie-NA Becky-NA ··· Zelda-NA ice cream-Acc like

- The universal reading of *wh-na* comes from exhausitivity of alternative conditionals.

The semantic representation of *-na* revisited

- The semantic representation of alternative conditionals

Example

$[\![p_1\text{-na } p_2\text{-na } \cdots\ p_n\text{-na } q]\!] =$
$((p_1 \rightarrow q) \wedge (p_i \rightarrow q) \wedge \cdots \wedge (p_i \rightarrow q))$

- it was hard to extract the meaning of *-na* itself from this representation.

The semantic representation of *-na* revisited

- Now I assume that *-na* takes a set of condition propositions as argument, and it appears in the semantic representation only once, as in *wh-na*.
- The apparent multiple occurrence of *-na* could be spreading/concord effect.
- The semantic representation of alternative conditionals (revised)

Example

$[\![\{p_1, p_2, \cdots, p_n\}\text{-}na\ q]\!] = \forall p_i[(p_i \in \overline{p}) \supset (p_i \rightarrow q))]$,
where $\overline{p}$ is a set of propositions $\{p_1, p_2, \cdots, p_n\}$

- The semantic representation of *-na* in alternative conditionals

Example

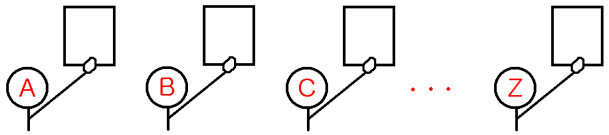
$[\![\text{-}na]\!] = \lambda\overline{p}\lambda q[\forall p_i[(p_i \in \overline{p}) \supset (p_i \rightarrow q))]]$,
where $\overline{p}$ is a set of propositions $\{p_1, p_2, \cdots, p_n\}$

distributivity of *wh-na*

- *wh-na* shows the same rigorous distributivity as *nana*-conjunction.

Example

*Nwukwu-**na** nonmwun-ul hana nayssta.*
who-NA paper-Acc one submit
'Everyone has submitted a paper.'



Compatibility with case markers of *wh-na*

- *wh-na* followed by a case marker is marginal, but doesn't seem impossible
- a Google search

nwukwu-na-ka (nominative)	181,000
nwukwu-na-lul (accusative)	10,500
nwukwu-na 'everyone'	11,500,000

- cf. *nana*-conjunction is incompatible with a case marker

ne-na na-na-ka (nominative)	1
ne-na na-na-lul (accusative)	0
ne-na na-na 'Both you and me'	40,300

- *wh-na* is in the process of grammaticalization (cf. Haspelmath 1995, Yoon 2004)? Possibly.

Conclusion

- *nana*-conjunction and *wh-na* both are originated from alternative conditionals.
- The alternative conditional approach gives a unified and neat explanation for the syntactic and semantic properties of both structures.

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