

Focus effects on Korean floating quantifiers

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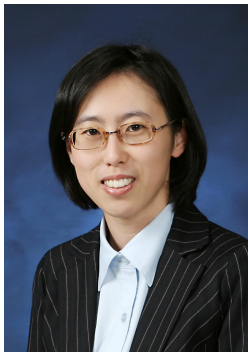
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International Circle of Korean Linguistics (ICKL)

국제한국언어학회

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www.dorothyahn.com/handouts



Prof. Heejeong Ko, SNU

Conservativity

A linguistic universal

The Conservativity Universal

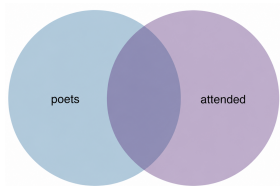
(Barwise & Cooper 1981; Keenan & Stavi 1986)

All generalized quantifiers that are expressed by a determiner in any language (*every, most, less than five, ...*) are conservative

Most poets attended.

[[**most**]]([[poets]])([[attended]])

Q (restrictor) (scope)



A linguistic universal

The Conservativity Universal

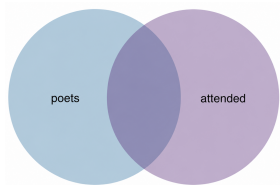
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[[most]]([[poets]])([[attended]])

Q (restrictor) (scope)



- (1) A quantifier $Q \in D_{\langle et, \langle et, t \rangle \rangle}$ is **conservative** if and only if for all $X, Y \subseteq U$, $Q(Y)(X) = Q(Y)(X \cap Y)$.
- most |[[poets]]| are |[[poets who attended]]|
 - |[[attended]]| doesn't matter

Violations of the Conservativity Universal

Apparent violations identified in the literature

1. *only* [von Fintel 1997; von Fintel & Keenan 2018]

(2) Only students smoke. |_{[[smoke]]}| matters

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2. *many* [Westerståhl 1985]

(3) Many Scandinavians have won the Nobel Prize in literature.

- a. Many of the Scandinavians won the Nobel Prize.
- b. Many Nobel Prize winners in literature are Scandinavians.

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(3) Many Scandinavians have won the Nobel Prize in literature.

- a. Many of the Scandinavians won the Nobel Prize.
- b. Many Nobel Prize winners in literature are Scandinavians.

→ Some determiners are non-conservative!

(Cohen 2001; Westerståhl 1985; Zuber 2004)

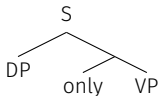
Violations of the Conservativity Universal

Approaches that maintain Conservativity

Adverbial Approach

Conservativity not applicable;
they are not determiners

- *only* is adverbial
[von Stechow 1997]
- *many* is a gradable
predicate [Romero 2015]

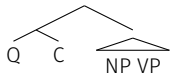


Adnominal Approach

Conservativity is met, but not in
a syntactically-determined way

[Herburger 1997, Ahn & Sauerland 2017]

- restrictor set determined
by *C* via focus [Rooth 1992]
- some movement for scope
over entire clause



Adnominal approaches

QR approach [Ahn & Sauerland 2017]

Observation: **relative measures** (30%) across languages (German, Georgian, French, Romanian, etc.) allow *non-conservative* reading.

(4) German

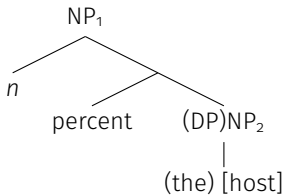
- a. 30 Prozent der Studierenden arbeiten.
30 percent-NOM the-GEN students-GEN work
'30 percent of the students work.' (conservative)
- b. 30 Prozent STUDierende arbeiten hier.
30 Percent-NOM studierende-NOM work here
'30 percent of workers here are students.' (non-conservative)

Adnominal approaches

QR approach [Ahn & Sauerland 2017]

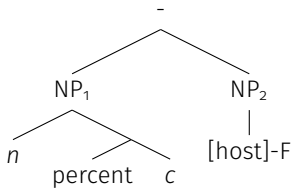
Analysis: Two different LFs

Conservative



30%([student])([VP])

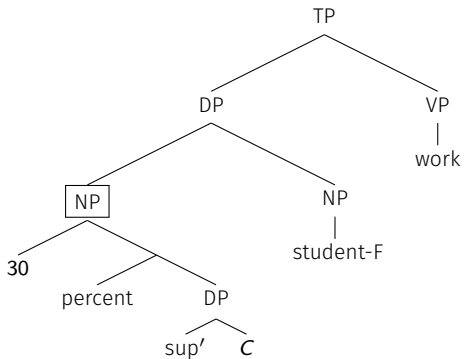
Non-conservative



30%(**C**)([student_F-VP])
(**C** = {student, adult, .. who VP})

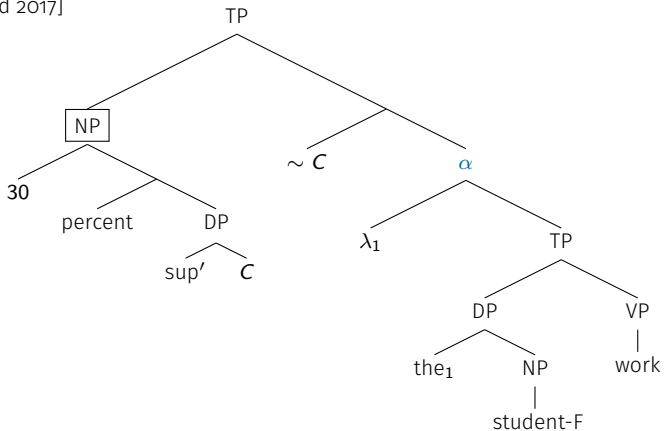
Derivation of non-conservative reading

[Ahn & Sauerland 2017]



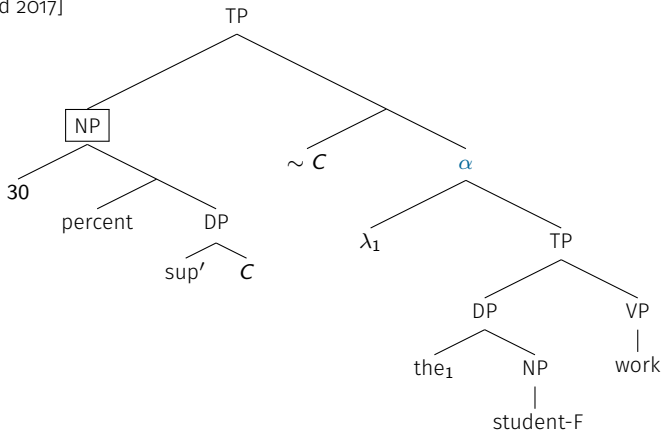
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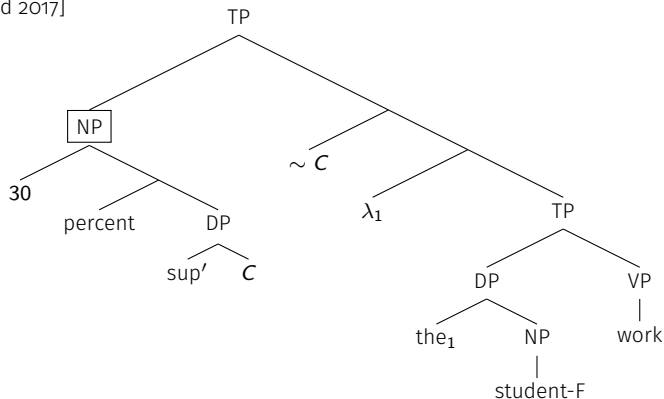


~ is where focus is interpreted [Rooth 1992, 1985]

(5) $[[\alpha]]^f = \{\text{the } \underline{\text{students}} \text{ who work, the } \underline{\text{adults}} \text{ who work, the } \underline{\text{children}} \text{ who work, ...}\}$

Derivation of non-conservative reading

[Ahn & Sauerland 2017]



(6) [30 percent sup' C] ~ C [λ_1 the₁ student_F work]

- a. sup C = the students who work \oplus the adults who work \oplus ... (all workers)
- b. 30 percent of workers are students who work

Evidence for movement

[Beck & Kim 1997]: Korean marks scope overtly

[Ahn & Sauerland 2017]: Korean non-conservative quantifiers involves a floating quantifier structure.

(7) [Kyoswu-(uy) isip-phulo]-ka wassta.
professor-GEN twenty-percent-NOM came
'20 percent of the professors came.' (conservative)

(8) KYOSWU-ka isip-phulo wassta.
professor_F-NOM twenty-percent came
'20 percent of those who came were professors.' (non-conservative)

[professor_F the_x] -NOM [20% SUP' C] ~ C [λ_1 [PROFESSOR_F THE₁] CAME]

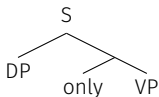
FQs in Korean

(recall:) Approaches that maintain Conservativity

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Korean FQ as evidence

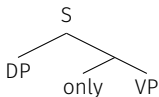
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taypwupwun as adverb

Adnominal Approach

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[Herburger 1997, Ahn & Sauerland 2017]



Korean FQ as evidence

Adverbial account of *taypwupwun*

[Park 2007]

taypwupwun (대부분; 'most') has a non-conservative reading when floated.

- (9) haksayng-tul-i taypwupwun soselchayk-ul sa-ss-eyo.
student-PL-NOM most novel-ACC buy-PAST-DECL
학생들이 대부분 소설책을 샀어요.
- a. Most students bought novels. (conservative)
- b. Most of the novel-buying involved students. (non-conservative)

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adverbial account: *taypwupwun* quantifies over events

$$\exists \varepsilon [\forall e \in \varepsilon [\text{novel-buying}(e)] \wedge \exists \varepsilon' [\varepsilon' \subseteq \varepsilon \wedge |\varepsilon'| \geq 1/2 |\varepsilon| \wedge \forall e' \in \varepsilon' [\text{AGENT}(e, \iota X. \text{STUDENTS}(X))]]]]$$

More than half of novel-buying events involved students

Floating quantifiers

- (10) a. [siin sey-myeng]-i wa-ss-ta.
poet 3-CL-NOM come-PAST-DECL
- b. [siin]-i sey-myeng wa-ss-ta.
poet-NOM 3-CL come-PAST-DECL
'Three poets came.'

- Many debates in syntax on whether floating quantifiers are adnominal vs. adverbial (Fitzpatrick 2006; Ishii 1998; Kang 2002; Ko 2005, 2014)

(11) **Adnominal Floating Quantification**

[_{CP} S_i [_{VP} [_{NP} t_i 3-CL] O V]]

(12) **Adverbial Floating Quantification**

[_{TP} S_i [_{αP} 3-CL] [_{VP} t_i O V]]

FQ in Korean

[Ko 2014]

Korean shows evidence for having **both adnominal and adverbial** floating quantifiers.

adnominal bare numeral quantifiers without focus

[siin]-i sey-myeng wa-ss-ta.

poet-NOM 3-CL COME-PAST-DECL

adverbial FQ with exhaustivity

*[siin]-i sey-myeng-**man** wa-ss-ta.*

poet 3-CL-ONLY COME-PAST-DECL

case-marked FQ

*[siin]-i sey-myeng-**i** wa-ss-ta.*

poet-ONLY 3-CL-NOM COME-PAST-DECL

lexically exhaustive FQ

*[siin]-i **motwu** wa-ss-ta.*

poet-ONLY ALL COME-PAST-DECL

Research Question

- Korean FQ involves both adnominal and adverbial types
- With relative measures, this has implications on conservativity

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- With relative measures, this has implications on conservativity

Are relative FQ adnominal or adverbial?

Diagnostics

- Definiteness of host noun [Study 1]
- ~~Intervention of low adverbs~~ [Study 2]

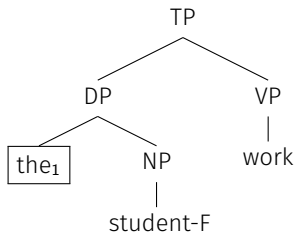
**Korean FQs: adnominal or
adverbial?**

Diagnostic 1: Definiteness

adnominal accounts: host noun must *not* be definite

[A&S'17]

1. trace is a definite determiner that (13)
composes with host noun



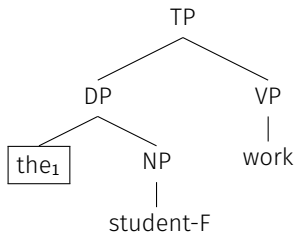
Diagnostic 1: Definiteness

adnominal accounts: host noun must *not* be definite

[A&S'17]

1. trace is a definite determiner that (13)
composes with host noun

2. definite host noun resists
conservative reading (German,
Italian, French, Romanian, ...)



(14) German

- a. 30 Prozent **der** Studierenden arbeiten.
30 percent-NOM **the-gen** students-GEN work

'30 percent of the students work.'

(conservative)

- b. 30 Prozent **STUD**ierende arbeiten hier.
30 Percent-NOM studierende-NOM work here

'30 percent of workers here are students.'

(non-conservative)

Diagnostic 1: Definiteness

adverbial accounts: no restriction on definiteness of host noun

(15) {The students/Students} mostly came.

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→ If relative measure involved in non-conservative readings is adnominal, expect the non-conservative reading to be *unavailable* if the host noun is definite.

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(15) {The students/Students} mostly came.

→ If relative measure involved in non-conservative readings is adnominal, expect the non-conservative reading to be *unavailable* if the host noun is definite.

- But how do we know when the host noun is definite?

Definite marking in Korean

- Demonstrative *ku* marks anaphoricity (strong familiarity)
[Lee 1992; Sohn 1994; Cho 2016]

Definite marking in Korean

- Demonstrative *ku* marks anaphoricity (strong familiarity)
[Lee 1992; Sohn 1994; Cho 2016]
- Plural marking obligatory with definite/anaphorically interpreted NPs: [Kim 2005; Kwon & Zribi-Hertz 2004; a.o.]

- (16) Minna-neun oneul achim-e chaeg se-gwon-gwa
Minna-TOP today morning-LOC book three-CL-AND
sinmun han-bu-leul sa-ss-da.
newspaper one-CL-ACC buy-PAST-DECL
민아는 오늘 아침에 책 세 권과 신문 한 부를 샀다.
'Minna bought three books and one newspaper this morning.'
- a. geu chaeg-*(tul)-eun naengjanggo-wi-e noh-yeo-iss-da.
DEM book-PL-TOP fridge-TOP-LOC lying-exist-DECL
그 책-*(들)은 냉장고 위에 놓여 있다.
'The books are on top of the fridge.'

Minimal pair

- (17) hoysa-eyse ipayk-myeng-uy yeca-eykey kongyen
company-FROM 200-CL_{PERSON}-GEN woman-DAT show
hongpo-lul hay-ss-ko, ...
advertisement-ACC do-PAST-CONJ
회사에서 200명의 여자에게 공연 홍보를 했고,
'The company advertised the show to 200 women, and ...'

- a. kongyen-ey **ku yeca-tul-i** sasip-myeng
show-DAT KU woman-PL-NOM 40-CL_{PERSON}
chamsekhay-ss-ta.
attend-PAST-DECL
공연에 **그** 여자들이 40명 참석했다.
'Forty of those women attended the show.'
- b. kongyen-ey **yeca-ka** sasip-myeng chamsekhay-ss-ta.
show-DAT woman-NOM 40-CL_{PERSON} attend-PAST-DECL
공연에 **여자가** 40명 참석했다.
'Forty women attended the concert.'

Study 1: Definiteness

Truth Value Judgment Task 2×2 design: [±DEF] × [±CON]

- [±DEF]: host noun (not) marked with *ku* and *tul*
- [±CON]: proportion compatible with (non-)conservative reading
 - proportion to noun set [+CON] or VP set [-CON]
- Asked to judge whether the target sentence is true given the context

Conditions


이번에 우리 회사에서 주최한 연말 공연 이메일 마케팅 효과를 알아봤다. 회사로부터 공연 관련 이메일을 받은 사람은 총 400명으로 그 중 남자는 200명, 여자는 200명이었다. 공연에 온 사람은 총 100명으로, 남자 20명, 여자 80명이었다.

This year my company evaluated the effect that email marketing has on the attendance at an end-of-the-year show. A total of 400 people received an email advertisement from the company, 200 of them men and 200 of them women. A total of 100 people attended the show, 20 of them men and 80 of them women.

회사에서 200명의 여자에게 공연 홍보를 했고,
'The company advertised the show to 200 women, and ...'

	[+DEF]	[-DEF]
[+CON]	연말 공연에 그 여자들이 40% 참석했다. ku woman-PL 40%	연말 공연에 여자가 40% 참석했다. woman 40%
[-CON]	연말 공연에 그 여자들이 80% 참석했다. ku woman-PL 80%	연말 공연에 여자가 80% 참석했다. woman 80%

Sample trial



이번에 우리 회사에서 주최한 연말 공연 이메일 마케팅 효과를 알아보았다.

회사로부터 공연 관련 이메일을 받은 사람은 총 400명으로 그 중 남자는 200명, 여자는 200명이었다.

공연에 온 사람은 총 100명으로, 남자 20명, 여자 80명이었다.

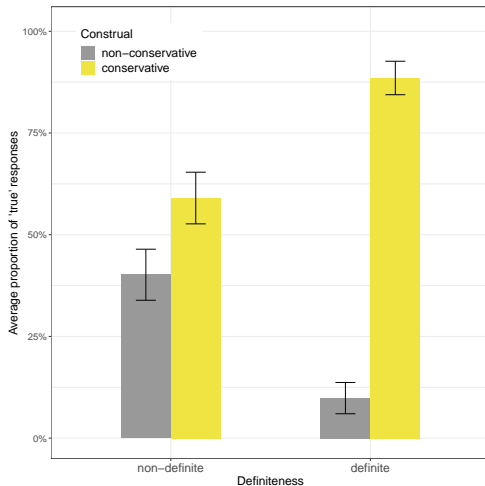
회사에서 **200명**의 여자에게 공연 홍보를 했고, 연말 공연에 그 여자들이 **40%** 참석했다.

참 거짓

A screenshot of a trial in [+DEF, +CON] condition

- 4 test trials; 4 fillers
- 61 native Korean speakers (SNU); PCIbex (Zehr & Schwarz 2018)
- 58 responses per condition

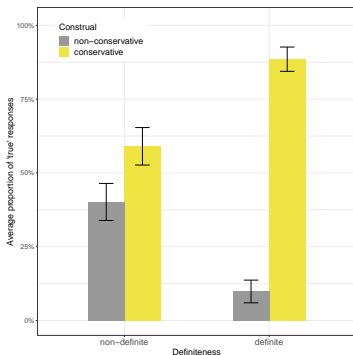
Results



Average proportion of 'true' responses by Definiteness and Construal (bars: SE)

Results

- main effect of construal: participants were significantly more likely to respond 'true' in [+CON]
- significant interaction between Construal and Definiteness ($Z = 4.767$, $p < 0.001$).



Discussion

The non-conservative construal is not available when the host noun is definite marked.

- Not predicted in adverbial accounts:

- (18) a. Only the students came to the party.
b. The students mostly bought the tickets.

adnominal accounts: [-DEF]



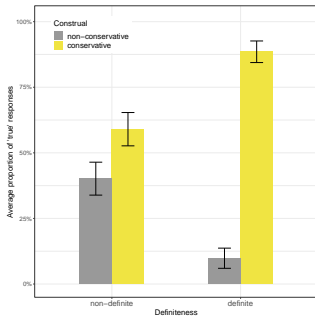
adverbial accounts: [\pm DEF]



Remaining questions

Acceptance rates for [-DEF] at around 50%

- no definitive evidence of availability of non-conservative reading
- though clear difference from [+DEF,-CON]



Teasing apart [-Def] condition

Ambiguity in [-DEF] condition:

- Conservative reading is predicted if: **VP is focused**

Teasing apart [-Def] condition

Ambiguity in [-DEF] condition:

- Conservative reading is predicted if: **VP is focused**

recall non-conservative reading:

(19) [30 percent sup' C] ~ C [λ_1 the₁ student_F work]

a. C = {the students who work, the adults who work ...} (all workers)

b. 30 percent of workers are students who work

Teasing apart [-Def] condition

Ambiguity in [-DEF] condition:

- Conservative reading is predicted if: **VP is focused**

recall non-conservative reading:

- (19) [30 percent sup' C] ~ C [λ_1 the₁ student_F work]
- a. C = {the students who work, the adults who work ...} (all workers)
- b. 30 percent of workers are students who work

if VP is focused

- (20) [30 percent sup' C] ~ C [λ_1 the₁ student work_F]
- a. C = {the students who work, the students who play ...} (all students)
- b. 30 percent of students are students who work

Effects of prosodic focus marking

[RQ] Does prosodic focus marking tease apart conservative and non-conservative readings for [-DEF] cases?

prosody study

[Youngho Lee]

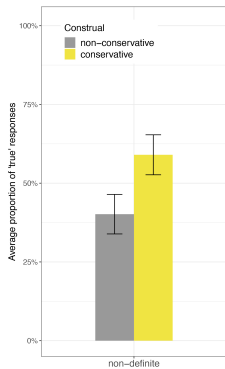
[-DEF] stimuli, audio-recorded with stress on noun, verb, or quantifier

FQ focus	작년 축제에 학생이 50% 참석했다.
NP focus	작년 축제에 학생 이 50% 참석했다.
VP focus	작년 축제에 학생이 50% 참석 했다.

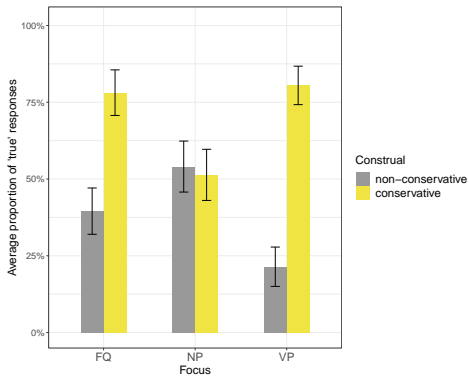
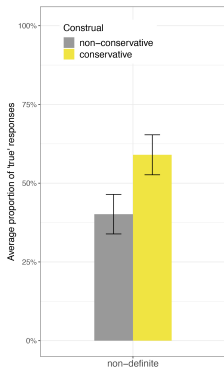
'Student 50% attended last year's festival.'

- Prediction:
 - NP focus to signal non-conservative reading
 - VP focus to signal conservative reading

Effects of prosodic focus marking

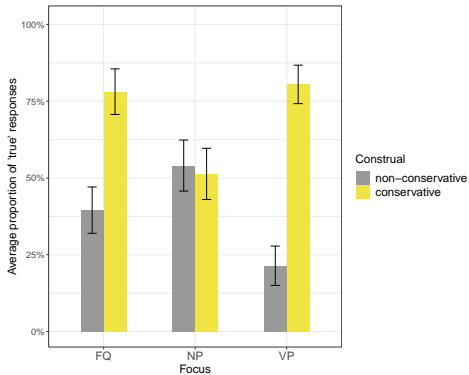
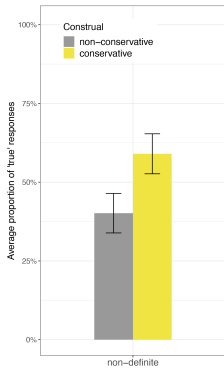


Effects of prosodic focus marking



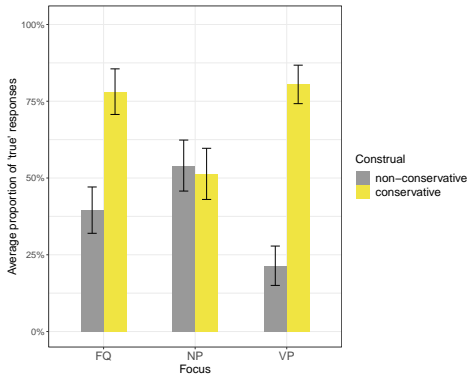
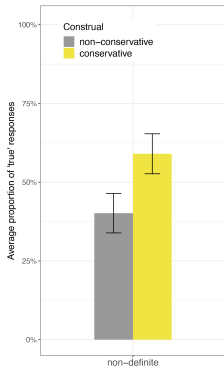
- NP focus: raises 'non-conservative' interpretation

Effects of prosodic focus marking



- VP focus: raises 'conservative' interpretation

Effects of prosodic focus marking



- FQ focus: without prosodic signal, participants prefer 'conservative'

General Discussion

Main takeaways

1. Non-conservative readings of relative measures exist
2. Diagnostics (definiteness, ~~adverb intervention~~) suggest that floating relative measures are **adnominal**, not **adverbial**
3. Prosody affects the resulting reading
 - General support for non-conservative quantifiers being focus sensitive [Herburger 1997]; support for QR-based account [Ahn & Sauerland 2017]
 - some (very) new problems:
If it's not QR (Tsoulas, *yesterday*) what could it be?

Thank you!

We would like to thank Youngho Lee (MA 2026, SNU) who helped us with stimuli design and recruitment. We would also like to thank the students and faculty at SNU and Rutgers University for their helpful feedback and time.



Youngho Lee

References

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Implications

Unifying ‘most’ with proportional quantifiers in Korean

- Same restrictions observed for *taypwupwun*

[see Park 2007 for an adverbial account]

- (21) **ku** kyowsu-**tul-i** taypwupwun wa-ss-ta.
DEM professor-textscpl-NOM most come-PAST-DECL
‘Most of the professors came.’ [conservative]
*‘Most of those who came were the professors.’ [non-conservative]
- (22) kyowsu-ka **capalcekulo** taypwupwun wa-ss-ta
professor-NOM voluntarily most came
‘Most of the professors came voluntarily.’ [conservative]
*‘Most of those who came voluntarily were professors.’ [non-conservative]

Implications

Why are non-conservative adnominal quantifiers so rare?

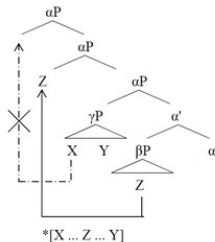
- Semantic and syntactic economy constraints?
 - event modification is simpler!
 - adjunction is free, movement needs to be licensed
- This might explain why, even in languages that allow adnominal floating quantifiers, stranding of an adnominal quantifier is rare compared to that of an adverbial quantifier (Ko 2014)

Diagnostic 2: Adverb intervention

- Independently motivated diagnostic for teasing apart adnominal vs. adverbial FQ in Korean [Ko 2005, 2014]

Edge Generalization [Ko 2014: 24]

If X and Y are dominated by a specifier γP of a Spell-out domain αP , X and Y cannot be separated by an αP -internal element Z that is not dominated by γP .



Edge Generalization: adnominal FQ

adnominal quantifiers:

cannot be separated from the subject by v P-internal elements like object or low adverbial; but can be intervened by a high adverbial.

low vs. high adverbial

- (23) a. ?***Haksayng-tul-i ilpwule sey-myeng** kong-ul
student-PL-NOM deliberately 3-CL ball-ACC
pat-ass-ta.
receive-PAST-DECL
'Three students received a ball deliberately.'
- b. **Haksayng-tul-i pwunmyenghi sey-myeng** kong-ul
student-PL-NOM evidently 3-CL ball-ACC
pat-ass-ta.
receive-PAST-DECL
'Evidently, three students received a ball.'
- [Ko 2014:45]

Edge Generalization: adverbial FQ

adverbial quantifiers:

such as case-marked FQ, exhaustive-marked FQ do not show intervention effects by low adverbials.

low adverbial *yelsimhi* ('diligently')

- (24) a. **Haksayng-tul-i yelsimhi twu-myeng-i** kong-ul
student-PL-NOM diligently 2-CL-NOM ball-ACC
cha-ss-ta.
kick-PAST-DECL
'Two students kicked a ball diligently.'
- b. **Haksayng-tul-i yelsimhi twu-myeng-man** kong-ul
student-PL-NOM diligently 2-CL-ONLY ball-ACC
cha-ss-ta.
kick-PAST-DECL
'Two students kicked a ball diligently.'

Diagnostic 2: Adverb intervention

intervention effects with low adverbials

adnominal accounts: ✓

adnominal FQ is base-generated
inside the DP

adverbial accounts: ✗

adverbial FQ is base-generated
inside the VP

→ If relative measure involved in non-conservative readings is adnominal, we would see low adverb intervention effects.

- We would expect the non-conservative reading to be *unavailable* when a low adverbial intervenes.

Minimal pair

- (25) a. uysa-tul-i **pwunmyenghi** isip-phulo
doctor-PL-NOM certainly twenty-percent
chamkahay-ss-ta.
participate-PAST-DECL
'Certainly, 20% of the doctors participated.' [+con]
'Certainly, 20% of those who participated were doctors.' [-con]
- b. uysa-tul-i **sengsilhi** isip-phulo
doctor-PL-NOM diligently twenty-percent
chamkahay-ss-ta.
participate-PAST-DECL
'20% of the doctors diligently participated.' [+con]

Study 2: Adverb intervention

Truth Value Judgment Task 2×2 design: [HIGH][LOW] × [±CON]

- [HIGH/LOW]: high vs. low intervening adverbial
 - [HIGH] *pwunmyenghi* ('certainly'), *hwaksilhi* ('surely'),
tahaynghito ('luckily'), *nollapkeyto* ('surprisingly')
 - [LOW] *sengsilhi* ('diligently'), *cayppalli* ('quickly'),
capalcekulo ('voluntarily'), *twinuckey* ('late')
- [±CON]: proportion compatible with (non-)conservative reading
 - proportion to noun set [+CON] or VP set [-CON]
- Asked to judge whether the target sentence is true given the context
- also grammaticality judgment task (6-point Likert)

Conditions

작년 여름, 예방접종 무상 지원을 위한 마라톤 대회에 {분명히} 많은 사람들이 {성실히} 참가했다.

Last summer, a marathon was hosted for free vaccination awareness, and {certainly} many people participated {diligently}.

전체 의사 숫자가 100명인데 마라톤 참가자는 총 50명이고 참가한 의사는...
[+CON]: 20명이다. [-CON]: 10명이다.

The total number of doctors is 100, and while a total of 50 people participated in the marathon, the number of doctors who participated was...

[+CON] 20. [-CON]: 10.

마라톤 대회에 의사들이...

[HIGH]	[LOW]
분명히 20% 참가했다.	성실히 20% 참가했다.
Certainly, 20% doctors participated in the marathon	20% doctors participated in the marathon diligently.

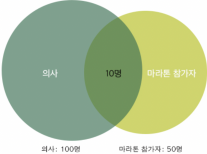
Methods

- 60 native, monolingual speakers of Korean
- same methodology as Study 1 for TVJ
- four test trials and four filler trials
- after TVJ, a 6-point Likert scale appeared for felicitousness rating

Sample trial

■ □

작년 여름, 예방접종 무상 지원을 위한 마라톤 대회에 분명히 많은 사람들이 참가했다.
전체 의사 숫자가 100명인데 마라톤 참가자는 총 50명이고 참가한 의사는 10명이다.



A Venn diagram with two overlapping circles. The left circle is teal and labeled '의사' (Doctors) with '100명' (100 people) below it. The right circle is yellow-green and labeled '마라톤 참가자' (Marathon runners) with '50명' (50 people) below it. The overlapping area is a darker green and labeled '10명' (10 people).

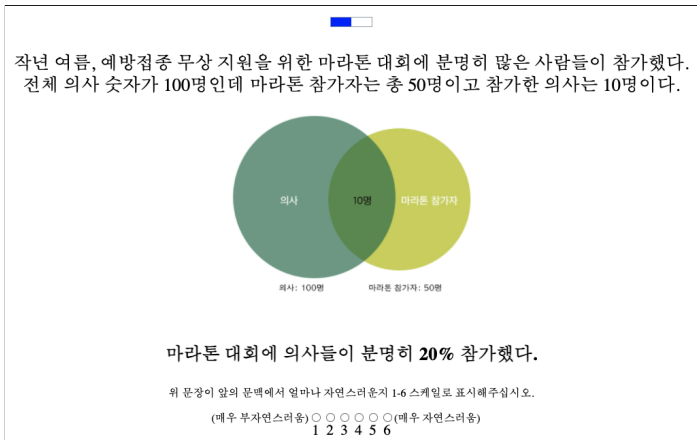
마라톤 대회에 의사들이 분명히 **20%** 참가했다.

위의 문장이 앞의 문맥을 비추어 보아 참인지 거짓인지 판단해 주세요.

참 거짓

A screenshot of the adverb trial in [HIGH, -CON] condition

Sample trial



A screenshot of the adverb trial in [HIGH, -CON] condition

Results

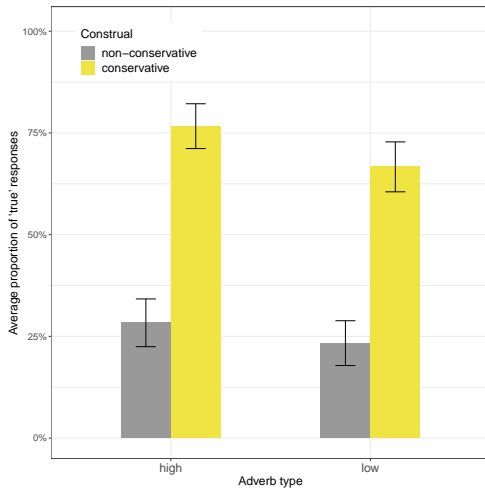
Ratings task

- generally rated low
- [HIGH]: [+CON] vs. [-CON]
($p=0.004$)

	[-CON]	[+CON]
[HIGH]	2.61 (1.33)	3.38 (1.51)
[LOW]	2.65 (1.45)	3.18 (1.56)

Results

TVJ

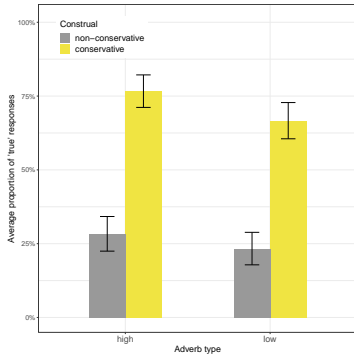


Average proportion of 'true' responses by adverb type and construal

Results

TVJ

- main effect of construal, no main effect of adverbial: participants significantly more likely to respond true in [+CON] ($Z = 5.091$, $p < 0.001$) in *both* [HIGH] and [LOW] conditions



Discussion

Non-conservative construal blocked when a low adverb intervenes.

adnominal accounts: ✓

adnominal FQ is base-generated
inside the DP

adverbial accounts: ✗

adverbial FQ is base-generated
inside the VP

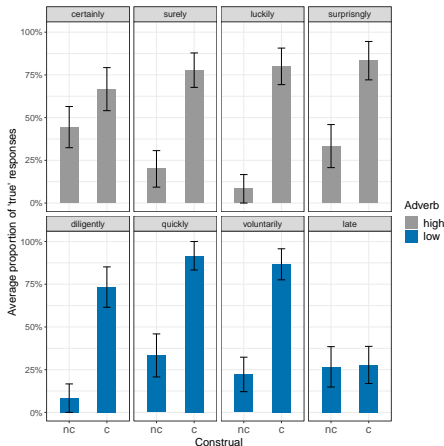
Remaining questions

1. Similar intervention for high adverbials due to scrambling?

Remaining questions

1. Similar intervention for high adverbials
2. Adverb-specific differences

due to scrambling?

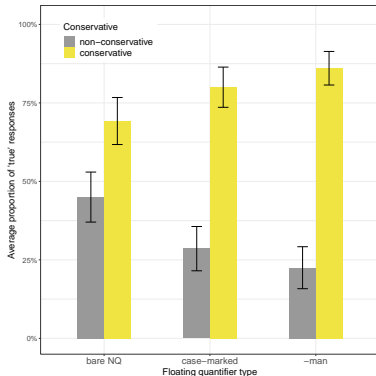


Average proportion of 'true' responses by adverb item

Effects of case-marking

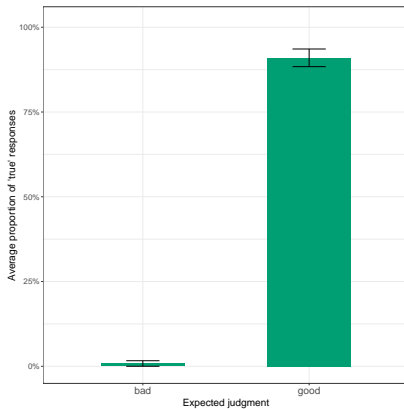
Recall: case-marked and *man*-marked FQs argued to be adverbial FQ [Ko 2014]

- case-marked and *man*-marked FQs contain *pro* that refers back to the restrictor
- Prediction: case-marked and *man*-marked FQs would only allow conservative readings
- This prediction is borne out:



Study 1: Fillers

- Fillers included 2 TRUE sentences and 2 FALSE sentences



TVJ on Fillers