

**EPISTEMIC AND CONCESSIVE
INTERPRETATIONS OF AT LEAST**

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1. Two Kinds of *At least*

Epistemic *at least*
(Krifka 1999, Geurts and Nouwen 2007, Büring 2008)

(1) Mary wrote **at least** four novels.
The speaker is uncertain about exactly how many novels Mary wrote

(2) Mary won **at least** a silver medal.
The speaker is uncertain about what medal Mary won

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Another use of *at least*: Concessive *at least*

(3) Mary didn't win a gold medal, but **at least** she won a silver medal.
(roughly) Although winning a silver medal is less preferable than winning a gold medal, a silver medal is satisfactory

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At least is associated with a **scale**:

A set of contrastive expressions of the same category

- ◆ **Non-entailment (Hirschberg 1985)**
E.g. gold medal > silver medal > bronze medal
- ◆ **Entailment (Horn 1972)**
E.g. n > ... > 3 > 2 > 1

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Outline

- ◆ Distinguishing properties
- ◆ The semantics of *at least*
- ◆ Application to the data

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2. Distinguishing Properties

Syntactic diagnostic

(4)

a. Mary won at least a silver medal.	<i>only E</i>
b. Mary at least won a silver medal.	<i>E or C</i>
c. At least Mary won a silver medal.	<i>prefer C</i>
d. Mary won a silver medal at least .	<i>E or C</i>

In the following,

- ◆ Epistemic: (4a) (prenominal *at least*)
- ◆ Concessive: (4c) (sentence-initial *at least*)

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I Compatibility with false higher scalar values

Epistemic: odd when higher values are known to be false
 Concessive: no problem when higher values are known to be false

(5) **Scale: gold medal > silver medal > bronze medal**
E: # Mary didn't win a gold medal,
 but she won **at least** a silver medal.

C: Mary didn't win a gold medal,
 but **at least** she won a silver medal.

(6) **Scale: n > ... > 3 > 2 > 1**
E: # Mary doesn't have three children,
 but she has **at least** two.

C: Mary doesn't have three children,
 but **at least** she has two.

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II Entailment with non-entailment scales

Epistemic: does not entail the truth of the target proposition
 Concessive: entails the truth of the target proposition

(7) *E*: Mary is **at least** an associate professor.
 → does not entail "Mary is an associate professor"

C: **At least** Mary is an associate professor.
 → entails "Mary is an associate professor"

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III Preferability

Epistemic: no preference
 Concessive: values higher on the scale are preferable

- (8) *E*: Mary fired **at least** five employees.
 → no preference
- C*: **At least** Mary fired five employees.
 → better to fire more employees

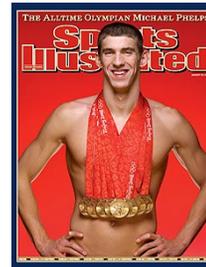
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IV “Settling for less”

Epistemic: neutral interpretation
 Concessive: has a “settle for less” interpretation

- (9) *E*: Phelps won **at least** eight gold medals.
 → neutral

C: #**At least** Phelps won eight gold medals.
 → winning eight gold medals falls short of an intended goal or standard



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V Scalar Implicature (SI)

Epistemic: the regular SI is not available
 Concessive: the regular SI is available

- (10) Mary wrote four novels.
SI: Mary didn't write more than 4 novels
- (11) *E*: Mary wrote **at least** four novels.
No SI
- C*: **At least** Mary wrote four novels.
SI: Mary didn't write more than 4 novels

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VI Lexical differentiation

- ◆ English

(12) <i>at least</i>	E or C
<i>(at the very least)</i>	only E)
- ◆ Dutch

(13) <i>tenminste</i>	E or C
<i>minstens, op z'n minst</i>	only E
- ◆ Japanese

(14) <i>sukunaku-to-mo</i>	E or C
<i>-dake-demo</i>	only C

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Summary

	Epistemic	Concessive
I False higher scalar values	Odd with false higher values	No restriction
II Entailment with non-entailment scale	Does not entail the target proposition	Entails the target proposition
III Preferability	Irrelevant	Relevant
IV “settle for less”	No	Yes
V Scalar Implicature (SI)	SI unavailable	SI available

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3. The Semantics of *At Least*

Assumption 1
 Krifka’s (1999) Compositional Projection Rules

E.g. gold medal > silver medal > bronze medal

↓

Mary won a gold medal >
 Mary won a silver medal >
 Mary won a bronze medal

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Assumption 2
At least is a sentential operator

(15) Surface: Mary won **at least** a silver medal.

LF: **at least** [Mary won a silver medal]

Scale: Mary won a gold medal >
Mary won a silver medal >
 Mary won a bronze medal

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Epistemic at least
 (Based on Krifka 1999, Geurts and Nouwen 2007, Büring 2008)

Truth conditions
 $\exists q \in C[q \geq p \wedge q(w)=1]$
 “there is a proposition q which ranks higher than or as high as the target proposition p, and which is true”

Conventional implicature
 $\exists w' [Epist(w, w') \wedge \exists q \in C[q > p \wedge q(w')=1]]$
 “it is epistemically possible that some proposition q that ranks higher than p is true”

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(16) Surface: Mary won **at least** a silver medal.
 LF: **at least** [Mary won a silver medal]

Scale: Mary won a gold medal >
Mary won a silver medal >
 Mary won a bronze medal

Truth conditions
 ‘Mary won a silver medal’ or ‘Mary won a gold medal’ is true

Conventional implicature
 The speaker considers it possible that ‘Mary won a gold medal’ is true

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Concessive at least

Truth conditions
 $p(w)=1$
 “the target proposition p is true”

Conventional implicatures

- i. $\forall r, r' \in C[r > r' \leftrightarrow r'$ is preferred to r]
 “The scalar ranking reflects a preference ranking”
- ii. $\exists q \in C[q > p]$
 “There is a proposition q that ranks higher than p”
- iii. $\exists q \in C[q < p]$
 “There is a proposition q that ranks lower than p”

→ p is better than some other alternatives but not the best (i.e. “settle for less”)

(17) Surface: **At least** Mary won a silver medal.
 LF: **at least** [Mary won a silver medal]

Scale: Mary won a gold medal >
Mary won a silver medal >
 Mary won a bronze medal

Truth conditions
 p (= ‘M won a silver medal’) is true

Conventional implicatures

- i. ‘M won a gold medal’ is preferred to p, etc.
- ii. there is a proposition that ranks higher than p
- iii. there is a proposition that ranks lower than p

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(18) Surface: **At least** Mary fired five employees
 LF: **at least** [Mary fired five employees]

Scale: ... >
 Mary fired 6 employees >
Mary fired 5 employees >
 Mary fired 4 employees >
 ...

Truth conditions
 p (= ‘Mary fired five employees’) is true

Conventional implicatures

- i. ‘Mary fired 6 employees’ is preferred to p, etc.
 = the more employees Mary fires, the better
- ii. there is a proposition that ranks higher than p
- iii. there is a proposition that ranks lower than p

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Comparison of epistemic and concessive *at least*

I Compatibility with false higher scalar values

Epistemic: odd when higher values are known to be false

Concessive: no problem when higher values are known to be false

- (19) *E*: #Mary didn't win a gold medal,
but she won **at least** silver.
C: Mary didn't win a gold medal,
but **at least** she won silver.

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Conventional implicature of epistemic *at least*

"it is epistemically possible that some proposition *q* that ranks higher than *p* is true"

Mary won gold >
Mary won silver >
Mary won bronze

- Cf. (20) *E*: Mary didn't win a gold medal,
but she won **at least** bronze.

Concessive at least makes no reference to the truth value of higher ranked alternatives

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II Entailment with non-entailment scale

Epistemic: does not entail the truth of the target proposition

Concessive: entails the truth of the target proposition

- (21) *E*: Mary is **at least** an associate professor.
→ does not entail "Mary is an associate professor"
C: **At least** Mary is an associate professor.
→ entails "Mary is an associate professor"

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Truth conditions of epistemic *at least*

"there is a proposition *q* which ranks higher than or as high as the target proposition *p* and which is true"

- 'Mary is an associate professor' may or may not be true

Truth conditions of concessive *at least*

The target proposition is true

- 'Mary is an associate professor' must be true

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III Preferability

Epistemic: no preference
 Concessive: values higher on the scale are preferable

- (22) *E*: Mary fired **at least** five employees.
C: **At least** Mary fired five employees.

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Conventional implicature of epistemic *at least*
 No reference to preference

Conventional implicature of concessive *at least*
 The scalar ranking reflects a preference ranking

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IV “Settling for less”

Epistemic: neutral interpretation
 Concessive: has a “settle for less” interpretation

- (23) *E*: Phelps won **at least** eight gold medals.
C: #**At least** Phelps won eight gold medals.

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Conventional implicatures of concessive *at least*
 The target proposition is better than some other alternatives
 but not the best (hence merely satisfactory)

→ inconsistent with the fact that ‘Phelps won
 8 gold medals’ is a great achievement

Epistemic *at least* has no such implicature

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V Scalar Implicature (SI)

Epistemic: the regular SI is not available

Concessive: the regular SI is available

- (24) *E*: Mary wrote **at least** four novels.
No SI

C: **At least** Mary wrote four novels.
SI: Mary didn't write more than 4 novels

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Epistemic *at least* asserts that either the target proposition *p* or a proposition ranked higher than *p* is true (Krifka 1999)

Concessive *at least* asserts that the target proposition *p* is true

Conversational implicature of *p*

$\forall q \in C[q > p \rightarrow q(w)=0]$

“every proposition *q* that ranks higher than *p* is false”

Prediction: (a) and (b) have the same assertion, thus same SI

- (a) Mary wrote four novels.
 (b) **At least** Mary wrote four novels.

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Additional data

Neither epistemic nor concessive *at least* can be associated with an element that is at the bottom of the scale

- (25) [Mary was in a swimming race. There were eight competitors including her.]
- a. *E*: #Mary was **at least** eighth.
 - b. *C*: #**At least** Mary was eighth.

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Truth conditions of epistemic *at least*

there is a proposition *q* which ranks higher than or as high as the target proposition *p*, and which is true

→ (25a) is uninformative

Conventional implicature of concessive *at least*

“There is a proposition *q* that ranks lower than *p*”

→ In (25b), ‘Mary was the eighth’ is at the bottom of the scale

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4. Summary

- ◆ Two types of *at least*: epistemic & concessive
- ◆ Their distinguishing properties can be explained by their semantics

Epistemic:	speaker's epistemic uncertainty
Concessive:	concessivity ("settle-for-less") based on a preference ranking

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