Adjectives and semantic composition

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Linguist 130a/230a: Introduction to semantics and pragmatics
The typology

An adjective $\text{ADJ}$ is intersective iff, for all $N$,
$\langle \text{ADJ} \, N \rangle = \langle \text{ADJ} \rangle \cap \langle N \rangle$

An adjective $\text{ADJ}$ is subsective iff, for all $N$,
$\langle \text{ADJ} \, N \rangle \subseteq \langle N \rangle$

An adjective $\text{ADJ}$ is nonsubsective iff $\text{ADJ}$ is not subsective, i.e.,
there is at least one $N$ such that
$\langle \text{ADJ} \, N \rangle \not\subseteq \langle N \rangle$

An adjective $\text{ADJ}$ is privative iff, for all $N$,
$\langle \text{ADJ} \, N \rangle \cap \langle N \rangle = \emptyset$
The typology

1. An adjective ADJ is intersective iff, for all N, $[\text{ADJ} \ N] = [\text{ADJ}] \cap [\text{N}]$
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1. An adjective ADJ is intersective iff, for all N, 
   \[ [\text{ADJ N}] = [\text{ADJ}] \cap [\text{N}] \]
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The typology

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Swedish
The typology

1. An adjective ADJ is intersective iff, for all N, \([ADJ \cap N] = [ADJ] \cap [N] \).
The typology

1. An adjective ADJ is intersective iff, for all N, \([ADJ \cap N] = [ADJ] \cap [N]\)
An adjective ADJ is intersective iff, for all N, \([\text{ADJ } N] = [\text{ADJ}] \cap [\text{N}]\)
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![Diagram of the typology](image)

- **skillful spy**
- **spy**
**The typology**

1. An adjective ADJ is intersective iff, for all N, $[\text{ADJ N}] = [\text{ADJ}] \cap [\text{N}]$.
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Intersective

Subsective

$A \cap B \subseteq A$

$A \cap B \subseteq B$
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Diagram:
- Intersective
- Subsective
- Nonsubsective
The typology

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alleged spy  
spy

subsective

intersective
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```
subsective          nonsubsective
intersective       privative
```
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If ADJ is intersective:

\[ \langle \text{ADJ} \rangle \cap \langle \text{N} \rangle \]

If ADJ is not intersective:

\[ \langle \text{ADJ} \rangle (\langle \text{N} \rangle) \]

Interpretation
Interpretation

If ADJ is intersective:

\[
\text{[[ADJ]]} \cap \text{[[N]]}
\]

\[
\text{[[ADJ]]} \quad \text{[[N]]}
\]
If ADJ is intersective:
\[
[[\text{ADJ}]] \cap [[\text{N}]]
\]

If ADJ is not intersective:
\[
[[\text{ADJ}}([[\text{N}])]\]
\]
Interpretation

1. If ADJ is intersective:

\[
[[\text{ADJ}]] \cap [[\text{N}]]
\]

2. If ADJ is not intersective:

\[
[[\text{ADJ}}(][[\text{N}])]
\]
Interpretation

1. If ADJ is intersective:
   
   \[
   \text{[[ADJ]]} \cap \text{[[N]]}
   \]

2. If ADJ is not intersective:
   
   \[
   \text{[[ADJ]](\text{[[N]]})} = ?
   \]
Adjectives as function
Adjectives as function

Inputs
Adjectives as function

The typology

Interpretation

Adjectives as functions

The limits of the intersective analysis

Compositionality

Inputs

Outputs
Adjectives as functions

Inputs

Modified N meanings
Adjectives as function

(subsective)
Adjectives as function

The limits of the intersective analysis

Compositionality

[subsective]
### Adjectives as function

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Adjectives as function

\[ \{ \text{adjectives} \} \quad \mapsto \quad \{ \text{resulting adjectives} \} \]

- \( \{ \text{first adjectives} \} \quad \mapsto \quad \{ \text{second adjectives} \} \)
- \( \{ \text{third adjectives} \} \quad \mapsto \quad \{ \text{fourth adjectives} \} \)
- \( \{ \text{fifth adjectives} \} \quad \mapsto \quad \{ \text{sixth adjectives} \} \)
- \( \{ \text{seventh adjectives} \} \quad \mapsto \quad \{ \text{eighth adjectives} \} \)

\( \text{(nonsubsective)} \)
Adjectives as function

\[
\begin{align*}
\{ & \text{Red, Grey, Blue, Green, Black} \} \mapsto \{ & \text{Red, Grey, Blue, Green, Black} \} \\
\{ & \text{Red, Blue} \} \mapsto \{ & \text{Red, Grey, Blue} \} \\
\{ & \text{Red} \} \mapsto \{ & \text{Red} \} \\
\{ & \text{Red, Grey, Blue} \} \mapsto \{ & \text{Red, Grey, Blue} \} \\
\{ & \text{Red, Grey, Blue, Green, Black} \} \mapsto \{ & \text{Green} \}
\end{align*}
\]

(nonsensective)
## Adjectives as function

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### Compositionality

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\(\text{nonsubsective}\)
Adjectives as function

(privation)
Adjectives as functions

\[
\begin{align*}
\{\text{red, blue, green, black}\} & \implies \{\text{red, blue, green, black}\} \\
\{\text{red, blue, green}\} & \implies \{\text{green}\} \\
\{\text{red, blue}\} & \implies \{\text{red, blue}\} \\
\{\text{red}\} & \implies \{\text{red}\} \\
\emptyset & \implies \emptyset
\end{align*}
\]

(privative)
The limits of the intersective analysis
The limits of the intersective analysis

**TRUE:** Bart Simpson is a *skillful* skateboarder
The limits of the intersective analysis

TRUE: Bart Simpson is a skillful skateboarder
The limits of the intersective analysis

**TRUE:** Bart Simpson is a *skillful* skateboarder

**TRUE:** Bart is a student

**skillful skateboarder**
The limits of the intersective analysis

**TRUE**: Bart Simpson is a *skillful* skateboarder

**TRUE**: Bart is a student
The limits of the intersective analysis

TRUE: Bart Simpson is a **skillful** skateboarder

TRUE: Bart is a student

FALSE: Bart is a **skillful** student.
The limits of the intersective analysis

TRUE: Bart Simpson is a skillful skateboarder
TRUE: Bart is a student
FALSE: Bart is a skillful student.
The limits of the intersective analysis

TRUE: Bart Simpson is a *skillful* skateboarder
TRUE: Bart is a student
FALSE: Bart is a *skillful* student.
The limits of the intersective analysis

**TRUE:** Bart Simpson is a *skillful* skateboarder

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The limits of the intersective analysis

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The limits of the intersective analysis

TRUE: Bart Simpson is a *skillful* skateboarder
TRUE: Bart is a student
FALSE: Bart is a *skillful* student.
TRUE: Bart is a *skillful* student.
The limits of the intersective analysis

**TRUE:** Bart Simpson is a *skillful* skateboarder

**TRUE:** Bart is a student

**FALSE:** Bart is a *skillful* student.

**TRUE:** Bart is a *skillful* student.

wrong move!

skillful

student
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**Compositionality**
Compositionality

Compositional structure:
- **alleged**
  - **female**
  - **Swedish**
  - **spy**
Compositionality

alleged

female

Swedish

spy
Compositionality

The diagram illustrates the compositionality of the term "alleged female Swedish spy." The structure shows how the term is composed of individual elements, with "alleged," "female," "Swedish," and "spy" as its components.
Compositionality

Compositionality

alleged

female

Swedish

spy
Compositionality

The typology
Interpretation
Adjectives as functions
The limits of the intersective analysis
Compositionality

alleged
female
Swedish
spy

\[
\text{alleged} = \begin{array}{c}
\text{female} \\
\text{Swedish} \\
\text{spy}
\end{array}
\]
Compositionality
Compositionality

- alleged
  - female
    - Swedish
    - spy

\{ \text{female} \} \\
\{ \text{Swedish spy} \}

\{ \text{alleged female} \}

\{ \text{alleged Swedish spy} \}
Compositionality

The alleged female Swedish spy
Compositionality

The typology

Interpretation

Adjectives as functions

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Compositionality

alleged

female

Swedish

spy

Compositionality

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Compositionality
Compositionality

[[alleged]]

alleged

female

Swedish

spy
Compositionality

\[
\text{\{alleged\}} = \begin{pmatrix}
\text{\{female\}} \\
\text{\{Swedish\}} \\
\text{\{spy\}}
\end{pmatrix}
\]
Compositionality

\[ [\text{alleged}] \]

\[ = \]

\[ \text{Swedish spy} \]

\[ \text{female} \]

\[ \text{alleged} \]
Compositionality

\[
\text{[alleged]} = \begin{cases}
\{\text{female} \} & \leftrightarrow \{\text{Swedish} \} \\
\{\text{spy} \} & \leftrightarrow \{\text{alleged} \}
\end{cases}
\]
Compositionality

Compositional analysis of "alleged female Swedish spy"

\[
\text{[alleged]} = \left\{ \begin{array}{c}
\text{alleged} \\
\text{female} \\
\text{Swedish} \\
\text{spy}
\end{array} \right. 
\]
The typology
Interpretation
Adjectives as functions
The limits of the intersective analysis
Compositionality

Compositionality

alleged
female
Swedish
spy

[[alleged]]

[[alleged]] =

\[
\begin{array}{c}
\{ \text{alleged} \} \\
\{ \text{female} \} \\
\{ \text{Swedish} \} \\
\{ \text{spy} \}
\end{array}
\]