

Attributive *Wrong* in Underspecified Semantics

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Introduction

Non-local reading of attributive *wrong*:

(1) I opened the wrong bottle of wine.

'I opened a bottle that it was wrong for me to open.'

(Larson, 2000; Schwarz, 2006)

- Decomposition: identity statement, negation and obligation – with variable relative scope
- Account for restriction to definite article in English.
- Underspecified semantics will allow combinatorial treatment of non-local *wrong* as intersective adjective.
- Difference and similarity to local attributive *wrong*

Overview

- 1 The meaning of *wrong*
- 2 Challenges for previous approaches
- 3 Underspecified semantics of *wrong*
- 4 Local readings of attributive *wrong*
- 5 Conclusion

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Ambiguity

- (2) Alex opened the wrong bottle.
'Alex opened a bottle that it was wrong for Alex to open.'

Ambiguity

- (2) Alex opened the wrong bottle.
'Alex opened a bottle that it was wrong for Alex to open.'
- a. The bottle that Alex opened was not the bottle Alex was supposed to open. (P)
- (3) The police arrested the wrong person.
NOT > **Identity** > **SHOULD**
The person that the police arrested is not the person that the police is should have arrested.

Ambiguity

- (2) Alex opened the wrong bottle.
'Alex opened a bottle that it was wrong for Alex to open.'
- a. The bottle that Alex opened was not the bottle Alex was supposed to open. (P)
 - b. The bottle that Alex opened was the bottle Alex was not supposed to open. (B)
- (3) Bluebeard's wife opened the wrong door.
Identity > SHOULD > NOT
The door that Bluebeard's wife opened is the door that Bluebeard's wife should not have opened.

Police vs. Bluebeard reading

(4) The police arrested the wrong person. (P)

NOT > Identity > SHOULD

- a. Uniqueness 1: There is a unique person x that the police arrested.
- b. Uniqueness 2: There is a unique person x' that the police should arrest.
- c. asserts: x is not x' .

(5) Bluebeard's wife opened the wrong door. (B)

Identity > SHOULD > NOT

- a. Uniqueness 1: There is a unique door x that Bluebeard's wife opened.
- b. Uniqueness 2: There is a unique door x' that Bluebeard's wife should not open.
- c. asserts: x is x' .

Justifying the proposed readings

- Justify the uniqueness requirements.
 - ▶ Uniqueness is (at least) a presupposition
 - ▶ It can project in S-family contexts (y/n-question, negation)
 - ▶ Violation leads to oddness (“#”).
- Justify the claimed asserted content.

Presuppositions of *wrong*

- (6)
- a. Did the police arrest the wrong person?
 - b. The police didn't arrest the wrong person.
- Uniqueness 1: There is a unique person x that the police arrested.
Uniqueness 2: There is a unique person x that the police should arrest.
- (7)
- a. Did Bluebeard's wife open the wrong door?
 - b. Bluebeard's wife didn't open the wrong door.
- U1: There is a unique door x that Bluebeard's wife opened.
U2: There is a unique door x that Bluebeard's wife should not open.

Uniqueness requirement (P)

- (8) Scenario: There were two bottles of red wine and two bottles of white wine. Alex was supposed to open both bottles of red wine, but opened a white wine.
Sentence: #Alex opened the wrong bottle of wine.
- Uniqueness 1: There is a unique bottle x that Alex opened.
 - Uniqueness 2: #There is a unique bottle x' that Alex should open.
 - Assertion: x is not x'

Uniqueness requirement (P) (cont.)

- (9) Scenario: There was one bottle of red wine and there were two bottles of white wine. Alex was supposed to open the red wine, but opened all two bottles of white wine.

Sentence: # Alex opened the wrong bottle of wine.

- U1: #There is a unique bottle that Alex opened.
- U2: There is a unique bottle that Alex should open.
- Assertion: x is not x'

Uniqueness requirement (B)

- (10) Scenario: There were two bottles of red wine and two bottles of white wine. Alex was forbidden to open a bottle of white wine, but opened a white wine.
- Sentence: #Alex opened the wrong bottle of wine.
- U1: There is a unique bottle x that Alex opened.
 - U2: #There is a unique bottle x' that Alex should not open.
 - Assertion: x is x'

Uniqueness requirement (B) (cont.)

- (11) Scenario: There was one bottle of red wine and there were three bottles of white wine. Alex was supposed to open the red wine, but opened two bottles of white wine.

Sentence: # Alex opened the wrong bottle of wine.

- a. U1: #There is a unique bottle x that Alex opened.
- b. U2: There is a unique bottle x' that Alex should open.
- c. Assertion: x is x'

At issue

- P asserts non-identity: $\neg(x = x')$
B asserts identity: $x = x''$
- Test for at-issueness: Direct rejectability in discourse (Henderson, 2014)

(12) A: The police arrested the wrong person.

B: That's not true, ...

- #the police didn't arrest anyone at all.
- the police arrested the right person.
the arrested person is the culprit.

(13) A: Bluebeard's wife opened the wrong door.

B: That's not true, ...

- #she didn't open any door at all.
- she opened a door that she was allowed to open.
the opened door is not the forbidden one.

Semantic representations

(14) Lestrade arrested the wrong person. (P)

NOT > Identity > SHOULD

$\neg(\iota x : \mathbf{pers}(x) \wedge \mathbf{arr}(\mathbf{l}, x)) = (\iota x : \mathbf{pers}(x) \wedge \mathbf{SHOULD}(\mathbf{arr}(\mathbf{l}, x)))$

(15) Anne opened the wrong door. (B)

Identity > SHOULD > NOT

$(\iota x : \mathbf{door}(x) \wedge \mathbf{op}(\mathbf{a}, x)) = (\iota x : \mathbf{door}(x) \wedge \mathbf{SHOULD}(\neg \mathbf{op}(\mathbf{a}, x)))$

Asymmetry between the two definite descriptions

- (16) Alex opened the wrong bottle. (P)
a: the bottle that Alex opened
b: the bottle that Alex should have opened.
a. Unfortunately, its_a cork broke.
b. #Unfortunately, Alex didn't find it_b in the cellar.
- (17) The police arrested the wrong man. (P)
a. He_a is completely innocent.
b. #He_b is still running around freely, waiting for his next victim.

(As the B-reading asserts identity, we cannot use it.)

Asymmetry between the two definite descriptions

- (16) Alex opened the wrong bottle. (P)
- a*: the bottle that Alex opened
b: the bottle that Alex should have opened.
- a. Unfortunately, its_{*a*} cork broke.
b. #Unfortunately, Alex didn't find it_{*b*} in the cellar.

Adjectives cannot introduce antecedents sub-lexically:

- (17) a. The envoy of the president_{*i*} ...
b. *The president_{*i*}-ial envoy ...
informed him_{*i*} about the state of the negotiations.

- *a* is the discourse referent of *the wrong N*
- *b* is a sub-lexical discourse referent.

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Is non-local *the wrong N* indefinite?

- Abbott (2001), Schwarz (2006): *the wrong N* is indefinite

(18) There was the wrong address on the envelope.

- But: some occurrences of definites with existential *there*:

(19) There was my address written on the note. (www)

- No COCA-occurrence of: there BE the wrong N

Obligatory definite article

- Schwarz (2006): *the wrong* is one lexical item
 - (20) Archaeologists, who have spent decades digging at the apparently wrong location, will soon be moving to the new site. (www)
 - (21) Has it ever happened that you've stood and watched somebody pick the absolute wrong person in the lineup and ... (COCA)
- Morzycki (2014): kind reading of nouns with non-local adjectives:
 - (22) The average American has 2 children.But: no kind-reading in our examples.
- Larson (2000): *wrong* has a superlative semantics

Papiamentu: definitenes

- Portuguese-Spanish-Dutch-based creole of the ABC-Islands
- Kester & Schmitt (2007), van Putte & van Putte-de Windt (2014)
- Definite article *e*, indefinite article *un*
- No definite article with unique nouns (23-a) (semantic definites, Löbner (2011))
- Definite article with anaphoric definites (23-b) and superlatives (24)

- (23) a. (*E) solo ta kima sin misericordia.
'The sun is burning without mercy.'
- b. Mi a kumpra un bolo. *(E) bolo a wòrdu kome den 10 minüt.
'I bought a cake. The cake was eaten in 10 minute.'
- (24) a. El a tuma [**(e)* mihó desishon].
S/he took the best decision/
- b. El a tuma [**(e)* desishon mas importante]
S/he took the decision most important
'S/he made the best/most important decision.'

Papiamentu: *wrong*

No article for non-local *robes* 'wrong':

- (25) Polis a arestá hende robes pa Interpol. (www)
Police has arrested person wrong for Interpol
'The police has arrested the wrong person for Interpol.'
- (26) Ta duel mi. Señor a yama number robes. (www)
Hurts me. Mister has called number wrong
'I am sorry. You have the wrong number'

Definiteness requirement

- Determinerless weak definites in Papiamentu only for inherent semantic definiteness, i.e., for elements with presupposed uniqueness.
 - Definiteness is contributed by the adjective, the determiner is semantically empty or redundant.
 - *wrong N* is a unique noun
 - not an idiom, a kind expression, or a superlative
- ⇒ English: definite article; Papiamentu: no article

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Lexical Resource Semantics (LRS)

- Constraint-based underspecified semantic combinatorics
- Mainly used in Head-driven Phrase Structure Grammar (HPSG)
- General framework: Richter & Sailer (2004)
- Phenomena:
 - ▶ negative concord (Richter & Sailer, 2006; Iordăchioaia & Richter, 2015)
 - ▶ information structure (Hasegawa & Koenig, 2011)
 - ▶ inverse linking (Sailer, 2015)
 - ▶ *different* (Lahm, 2016; Richter, 2016)
 - ▶ gapping (Park et al., 2018)
- Representational: utterances have a syntactic and a semantic representation.
- Semantic representation: expression of some standard semantic language (predicate logic etc)
- Words and phrases express constraints on readings

Lexical Resource Semantics

- Semantic meta-language for constraints
- Lexical items (words or phrasal lexical units) determine which constants and operators may occur.

(27) [S: Everyone [VP: didn't call]].
everyone: $\forall x(\mathbf{person}(x) \rightarrow \beta[x])$
didn't: $\neg\alpha$ *call*: $\mathbf{call}(x)$

- Phrases can constrain scoping: $\alpha[\mathbf{call}(x)]$ $\beta[\mathbf{call}(x)]$
- Readings (“pluggings”):
 - ▶ $\forall x(\mathbf{person}(x) \rightarrow \neg\mathbf{call}(x))$ ($\alpha \equiv \mathbf{call}(x)$; $\beta \equiv \neg\alpha$)
 - ▶ $\neg\forall x(\mathbf{person}(x) \rightarrow \mathbf{call}(x))$ ($\alpha \equiv \forall x(\mathbf{person}(x) \rightarrow \beta)$; $\beta \equiv \mathbf{scall}(x)$)

A bit more technically

- Contributions relevant for combinatorics:
 - ▶ **internal content**: scopally lowest contribution in a phrase
 - ▶ external content: semantics associated with a phrase/utterance

- (28)
- a. *everyone*: $\forall x(\mathbf{person}(x) \rightarrow \beta[x])$
 - b. *didn't*: $\neg\alpha$
 - c. *call*: $\mathbf{call}(x)$

- Constraints:
 - ▶ Internal content is identical on mother and head; external content is identical on mother and head.
 - ▶ Raising verbs have the same internal content as their verbal complement

- (29) *didn't call*: $\alpha[\mathbf{call}(x)]$

- ▶ Quantifier non-heads have scope over the head's internal content:

- (30) *everyone didn't call*: $\beta[\mathbf{call}(x)]$

Alex opened a red bottle.

- (31) a. *bottle*: **bottle**(*x*)
b. *red*: $\frac{(\alpha[x] \wedge \beta[\mathbf{red}(x)])}{}$
c. *a*: $\frac{\exists x(\phi[x] \wedge \psi[x])}{}$
d. *opened*: **open**(**alex**, *x*)
e. *Alex*: **alex**
- (32) A-N (*red bottle*):
- (33) Det-N (*a red bottle*):
- (34) VP (*opened a red bottle*):

Alex opened a red bottle.

- (31) a. *bottle*: **bottle(x)**
b. *red*: $\frac{\alpha[x] \wedge \beta[\mathbf{red}(x)]}{}$
c. *a*: $\frac{\exists x(\phi[x] \wedge \psi[x])}{}$
d. *opened*: **open(alex, x)**
e. *Alex*: **alex**

- (32) A-N (*red bottle*): If the external content of the modifier is of the form $\alpha \wedge \beta$, the head's internal content is a subexpression of α and the modifier's ext.cont. is in the head's ext.-cont.
 $\alpha[\mathbf{bottle}(x)]$

- (33) Det-N (*a red bottle*):

- (34) VP (*opened a red bottle*):

Alex opened a red bottle.

- (31) a. *bottle*: **bottle**(*x*)
b. *red*: $(\alpha[x] \wedge \beta[\mathbf{red}(x)])$
c. *a*: $\underline{\exists x(\phi[x] \wedge \psi[x])}$
d. *opened*: **open**(**alex**, *x*)
e. *Alex*: **alex**
- (32) A-N (*red bottle*): If the external content of the modifier is of the form $\alpha \wedge \beta$, the head's internal content is a subexpression of α and the modifier's ext.cont. is in the head's ext.-cont.
 $\alpha[\mathbf{bottle}(x)]$
- (33) Det-N (*a red bottle*): N's internal content is part of Det's restrictor and N and Det have the same external content:
 $\underline{\exists x(\phi[\mathbf{bottle}(x)] \wedge \psi[x])}$, $\underline{\exists x(\phi[(\alpha \wedge \beta)] \wedge \psi)}$
- (34) VP (*opened a red bottle*):

Alex opened a red bottle.

- (31) a. *bottle*: **bottle**(*x*)
b. *red*: $(\alpha[x] \wedge \beta[\mathbf{red}(x)])$
c. *a*: $\underline{\exists x(\phi[x] \wedge \psi[x])}$
d. *opened*: **open**(**alex**, *x*)
e. *Alex*: **alex**

(32) A-N (*red bottle*): $\alpha[\mathbf{bottle}(x)]$

(33) Det-N (*a red bottle*):

$$\underline{\exists x(\phi[\mathbf{bottle}(x)] \wedge \psi[x])}, \quad \underline{\exists x(\phi[(\alpha \wedge \beta)] \wedge \psi)}$$

(34) VP (*opened a red bottle*): $\psi[\mathbf{open}(\mathbf{alex}, x)]$

Alex opened a red bottle.

- (31) a. *bottle*: **bottle**(x)
b. *red*: $(\alpha[x] \wedge \beta[\mathbf{red}(x)])$
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d. *opened*: **open**(**alex**, x)
e. *Alex*: **alex**

(32) A-N (*red bottle*): $\alpha[\mathbf{bottle}(x)]$

(33) Det-N (*a red bottle*):
 $\exists x(\phi[\mathbf{bottle}(x)] \wedge \psi[x]), \quad \exists x(\phi[(\alpha \wedge \beta)] \wedge \psi)$

(34) VP (*opened a red bottle*): $\psi[\mathbf{open}(\mathbf{alex}, x)]$

(35) S *Alex opened a red bottle*:

- a. $\alpha \equiv \mathbf{bottle}(x)$
b. $\beta \equiv \mathbf{red}(x)$
c. $\phi \equiv (\mathbf{bottle}(x) \wedge \mathbf{red}(x))$
d. $\psi \equiv \mathbf{open}(\mathbf{alex}, x)$

$\exists x((\mathbf{bottle}(x) \wedge \mathbf{red}(x)) \wedge \mathbf{open}(\mathbf{alex}, x))$

Three layers of semantic representation

- Lexical semantics (Sailer, 2003):
 - ▶ constrain syntactic and semantic arguments
 - ▶ linking, selectional restrictions
 - ▶ expressed in the lexical entries
- Combinatorial semantics (Richter & Sailer, 1997):
 - ▶ operator scope
 - ▶ internal/external content
 - ▶ expressed in constraints on phrases
- “non-local semantics” (Lahm, 2016):
 - ▶ additional semantic material
 - ▶ operators that take scope over the external content

$$(36) \quad \textit{noone}: \neg\alpha[\exists x(\textit{person}(x) \wedge \beta[x])]$$

- ▶ expressed in the lexicon and constrained by general, global principles

Lexical constraint of attributive *wrong*

(37) Lexical constraints of attributive *wrong*:
$$\gamma[(\iota x : \alpha[x] \wedge \beta[x]) = (\iota x : \alpha \wedge \mathbf{SHOULD}(\epsilon[\beta]))],$$
$$\neg\delta[\beta]]$$

- External content of an intersective modifier.
- **SHOULD** is in the second argument of “=”
- “¬” can either take wide scope over “=” or be in the scope of **SHOULD**.
- ι -operators contributed by the adjective
- Multiple uses of α and β .

wrong bottle

External content of an intersective modifier.

$$(38) \quad \text{wrong bottle: } \alpha[\mathbf{bottle}(x)]$$

(39) Accumulated constraints:

$$\gamma[\frac{(\iota x : \mathbf{bottle}(x) \wedge \beta[x])}{\neg\delta[\beta]}] = (\iota x : \mathbf{bottle}(x) \wedge \mathbf{SHOULD}(\epsilon[\beta])),$$

the wrong bottle.

(40) *the*: $\iota x : \phi[x]$

(41) *the wrong bottle*: $\iota x : \phi[\mathbf{bottle}(x)]$

(42) Accumulated constraints for *the wrong bottle*:

$$\gamma[\underbrace{(\iota x : \mathbf{bottle}(x) \wedge \beta[x])}_{\neg\delta[\beta]}] = (\iota x : \mathbf{bottle}(x) \wedge \mathbf{SHOULD}(\epsilon[\beta])),$$

- The NP's external content is that of the determiner and the modifier's external content is inside the head's external content.
- The determiner makes a redundant semantic contribution ("concord")
- Therefore, the first ι -expression is the external content of the NP, i.e. the description of the element referred to by the NP!

I opened the wrong bottle.

$$(43) \quad \gamma[(\iota x : \mathbf{bottle}(x) \wedge \beta[x]) = (\iota x : \mathbf{bottle}(x) \wedge \mathbf{SHOULD}(\epsilon[\beta])), \\ \neg\delta[\beta], \\ \mathbf{open}(I, x)]$$

- The definite NP is not a quantifier, therefore, the verb's internal content is not constrained.
- However, β is the only slot for it! $\beta[\mathbf{open}(I, x)]$

$$(44) \quad \text{Accumulated constraints for } I \text{ opened the wrong bottle.:} \\ \gamma[(\iota x : \mathbf{bottle}(x) \wedge \mathbf{open}(I, x)) = (\iota x : \mathbf{bottle}(x) \wedge \\ \mathbf{SHOULD}(\epsilon[\mathbf{open}(I, x)])), \\ \neg\delta[\mathbf{open}(I, x)]]$$

I opened the wrong bottle.

(45) Accumulated constraints for *I opened the wrong bottle.*:

$$\gamma[(\iota x : \mathbf{bottle}(x) \wedge \mathbf{open}(I, x)) = (\iota x : \mathbf{bottle}(x) \wedge \mathbf{SHOULD}(\epsilon[\mathbf{open}(I, x)])), \\ \neg\delta[\mathbf{open}(I, x)]]$$

- Relative scope of negation and identity is not specified.
- P-reading: **NOT** > **Ident** > **SHOULD**

$$(46) \quad \gamma \equiv \neg\delta, \quad \delta \equiv (\iota x : \dots) = (\iota x : \dots), \quad \epsilon \equiv \mathbf{open}(I, x)$$

- B-reading: **Ident** > **SHOULD** > **NOT**

$$(47) \quad \gamma \equiv (\iota x : \dots) = (\iota x : \dots), \quad \epsilon \equiv \neg\delta, \quad \delta \equiv \mathbf{open}(I, x).$$

Analysis summary

(48) Lexical constraints of attributive *wrong*:
$$\gamma[(\iota x : \alpha[x] \wedge \beta[x]) \wedge \neg \delta[\beta]] = (\iota x : \alpha \wedge \mathbf{SHOULD}(\epsilon[\beta])),$$

- Semantic combinatorics: just like for other intersective/subsective adjectives.
- Combinatorically irrelevant material responsible for non-local reading!
- Referent of *the wrong N*: first ι -expression \Rightarrow Pronominalization data!
- English: only (redundant) definite article possible, just as with semantically unique nouns.
- P-/B-readings follow from underspecification or relative scope

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Local readings of attributive *wrong*

Larson (2000), Schwarz (2006): a *wrong* N can only have a local reading.

(49) “Institutional integrity” turns out to mean the Court must not overturn a *wrong* decision if there has been angry opposition to it.
(COCA)

⇒ a decision that should not have been made.

(50) Lexical constraints of local *wrong*:

$$\frac{(\alpha[x] \wedge \beta[x \in \{x | \alpha \wedge \mathbf{SHOULD}(\epsilon[P(x)])\}])}{\neg \delta[P(x)]},$$

where P can be inferred.

- “local”: there is no meaning contribution that contains the external content.
- P is contextually inferred whereas β is contributed in the clause itself!

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Conclusion

- New semantics for attributive *wrong*
- Semantic combinatorics of non-local adjectives just as for local adjectives
- Non-local semantics = semantic contribution beyond the external content
- Other non-local semantics: negation for *nobody*
- Ambiguity follows from decomposition and underspecified relative scope of lexically contributed operators.

Future research

- More on the similarities between local and non-local attributive *wrong*
- Correspondences of (non-)local *wrong* in other languages
- Extension to other non-local adjectives (Lahm (2016) for *different*)
- Other expressions with lexically underspecified scope?
(*few* as **NOT** > **Many** and **Many** > **NOT** in Sailer (2007))

Thank you for your attention!

<https://www.lexical-resource-semantics.de>

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