Attributive *wrong* in underspecified semantics

Manfred Sailer

Abstract Attributive *wrong* as in *Alex opened the wrong bottle* shows a non-local reading, that is, its meaning is not local to the noun phrase but interacts with the meaning of the rest of the sentence. I argue that previous accounts did not assume the correct semantics for attributive *wrong* and do not account adequately for its restriction to the definite article. I show that there is a second non-local reading and use data from Papiamentu to show that *wrong* noun phrases are semantic uniques. I present an analysis within a framework of underspecified semantics that (i) treats *wrong* as an ordinary adjective in how it combines with the head noun, (ii) captures its non-local readings, (iii) accounts for the definiteness restriction, and (iv) can address the parallels and differences between non-local and local readings.

Keywords definiteness restriction · Lexical Resource Semantics · non-local adjective · Papiamentu · underspecified semantics

M. Sailer, Goethe-University Frankfurt a.M., sailer@em.uni-frankfurt.de

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1 Introduction

Haïk (1985), Larson (2000), and Schwarz (2006) argue that attributive *wrong* systematically shows non-local readings. Schwarz' running example is given in (1), together with his paraphrase for the intended reading.

(1) I opened the wrong bottle of wine.
'I opened a bottle that it was wrong for me to open.'

Schwarz (2020) revises this to the following paraphrase.

(2) Liz underlined the wrong number.
'The number that Liz underlined is not the number she was supposed to underline.'

I will provide and justify a slightly different meaning of non-local *wrong*

in §2. In particular, I will argue for the existence of a so far unnoticed reading. I will also include aspects of the meaning of non-local *wrong* that have not been explicitly discussed in the literature: the discourse anaphoric potential noun phrases with *wrong*, the type of definiteness found with such noun phrases – for which point I will use data from a language with a different system of definiteness marking – and, finally, the type of modality attested associated with non-local *wrong*. I will, then, decompose attributive *wrong* into various parts: a set-inclusion statement, negation, a modal operator, and an iota-operator. The contributed operators show variable relative scope, which captures the two readings that I will argue for.

I will show that the readings I postulate are non-local in the sense of Schwarz (2020) in §3. I will discuss some challenges of previous approaches in §4. In §5, I will formulate my analysis in a framework of underspecified semantic combinatorics, *Lexical Resource Semantics* (LRS). This will allow me to treat *wrong* just like an intersective adjective from the point of view of the syntax-semantics interface. Following the literature, I will assume that non-local *wrong* is only found in definite noun phrases. I will, however, look at attribute *wrong* in indefinite noun phrases in §6, where I will try to connect non-local and local attributive *wrong*.

2 The meaning of non-local attributive *wrong*

In this section, I will propose a new semantic analysis of non-local attributive *wrong*. In particular, I claim that there are two readings, which I will call the *police reading* (P-reading) and the *Bluebeard reading* (B-reading), based on the subjects of the prototypical examples in (3) and (4).

(3) The police arrested the wrong person. (P)
'The person that the police arrested is not (among) the person(s) that the police should have arrested.'

(4) Bluebeard's wife opened the wrong door. (B)
'The door that Bluebeard's wife should not open is among the doors that Bluebeard's wife opened.'

In the P-reading in (3), there is a particular person that got arrested. There is also a (often singleton) set of persons that should have been arrested. The arrested person is not in this set.

The B-reading refers back to the French folktale *Bluebeard* (*Barbe bleue* in the original): Bluebeard allows his wife to go into all rooms of their palace except for one. She opens the door to exactly this room and finds the corpses of Bluebeard's former wives in it. In other words, in the B-reading in (4), there is a particular door that should not have been opened. However, this door is in the set of doors that got opened.

Previous discussions of non-local *wrong* only considered the P-reading. However, the example in (4) shows that the B-reading exists as well. The two readings can also be found with example (2), even though Schwarz (2020) only discusses the P-reading.

(5) Liz underlined the wrong number.
   a. 'The number that Liz underlined is not among the numbers Liz was supposed to underline.' (P)
   b. 'The number that Liz was not supposed to underline was among the numbers Liz underlined.' (B)

In this section, I will justify the existence of the P- and the B-readings by going through various aspects of their meaning: uniqueness, discourse-anaphoric potential, definiteness, and type of modal operator. Finally, I will present my formal rendering of the above paraphrases.

2.1 Uniqueness

For a sentence like (2), Schwarz (2020) looks at three sets: (i) the *actual set*, referring to the numbers that Liz underlines, (ii) the *required set*, which are the numbers that need to be underlined, and (iii) the *excluded set*, i.e., the numbers that must not be underlined. According to Schwarz, sentence (2) comes with a uniqueness and existence presupposition for the actual set and the required set, but not for the excluded set.

I will briefly summarize the arguments for the existence and uniqueness of the actual set for the P-reading and add the corresponding examples for the B-reading. Schwarz uses the convenient notation in (6), where the required set is underlined on the left side of the pipe, "|", and the actual set is underlined on the right side. I use "✓" when a sentence is true in the given scenario and "✗" when it is false. The symbol "#" marks an uninterpretable sentence, pointing to a violation of a presupposition.

(6) Liz underlined the wrong number. (P)

a. ✓4 7 <u>9</u> | 4 <u>7</u> 9
b. ✗4 7 <u>9</u> | 4 7 <u>9</u>
c. # 4 7 <u>9</u> | 4 7 9
d. # 4 7 <u>9</u> | 4 <u>7</u> <u>9</u>

The scenario in (6a) has a single underlined number, which is not the required number. As indicated, the sentence is true in (6a). The existence and uniqueness of the actual set is also given in (6b), where Liz underlines the number she is supposed to underline, which makes the sentence false. In (6c), the actual set is empty. According to Schwarz, the sentence is not interpretable in this scenario, which suggests a failure of an existence presupposition. In (6d), more than one number is underlined. Again, Schwarz argues that the sentence cannot be interpreted in such a constellation, which points to a violation of a uniqueness presupposition.

According to Schwarz (2020), the required set comes with an existence and a uniqueness presupposition as well. The scenario in (7a) has an empty required set. Indeed, the sentence is odd in this scenario, which points to a violation of an existence presupposition. In (7b), Liz is supposed to underline two numbers but underlines one number that is not required. According to my intuition, the sentence is true in (7b).

(7) Liz underlined the wrong number. (P)

a. # 3 4 7 9 | 3 <u>4</u> 7 9
b. ✓3 4 <u>7</u> <u>9</u> | 3 <u>4</u> 7 9

This intuition carries over to more natural cases such as (8).[1] I characterize the relevant scenario in square brackets. The police is supposed to arrest more than one person (i.e., there is a non-singleton required set), but a single person is arrested that is not in this set. The sentence is perceived as true in such a scenario.

(8) [We know that three criminals robbed a bank and should be arrested, but the police arrested a single, innocent bystander instead.] The police arrested the wrong person. (P)

[1] I am grateful to the CSSP 2019 audience for providing the example scenario in (8).

My judgements of (7b) and (8) point to an asymmetry between the presuppositions of the actual and the required set. Schwarz (2020) calls the combination of an existence and uniqueness presupposition a *definiteness presupposition*. Given my judgments, only the actual set has a definiteness presupposition under the P-reading.

We can now apply the same method to the B-reading. For this reading, the excluded set is relevant rather than the required set. It is important to note that there is no required set in the B-reading. In other words, Bluebeard's wife is not forced to open any of the doors at all in (4), she is just not allowed to open a particular one. For B-reading scenarios, I will use the same marking as above, but indicate what is allowed rather than what is obligatory. To avoid confusion, I will use "||" to separate the *permitted* set from the actual set. The scenarios relevant for testing existence and uniqueness for the actual set under the B-reading are given in (9).

(9) Liz underlined the wrong number. (B)

a. ✓4 7 9 || 4 7 9
b. ✗4 7 9 || 4 7 9
c. # 4 7 9 || 4 7 9
d. ✓4 7 9 || 4 7 9

In (9a), Liz underlined exactly the one number she was not allowed to underline. The actual set in (9b) is a singleton as well. As it does not contain the forbidden number it is judged as false. In (9c), Liz did not underline any number. The sentence is perceived as odd in this context, which indicates a violation of an existence presupposition. In (9d), Liz underlined two numbers, one of which being the forbidden number. According to my intuition, the sentence is true in this scenario under a B-reading.

What about the excluded set? Scenarios in which existence or uniqueness of the excluded sets is not given are shown in (10). In both cases, the sentences are odd under a B-reading.

(10) Liz underlined the wrong number. (B)

a. # 4 7 9 || 4 7 9 (no excluded number)
b. # 4 7 9 || 4 7 9 (more than one excluded number)

Given these observations, only the excluded set comes with a definiteness presupposition in the B-reading. The actual set is required to be non-empty, and the required set is irrelevant.

2.2 The referent of *the wrong N*

In this subsection, I will argue that the differences in definiteness presuppositions between the P- and the B-readings also have a reflex in the referent of noun phrases of the form *the wrong N* (*tw*NP). To show this, I will look at the anaphoric potential of such noun phrases

In (11), I use different continuations for sentence (1) above. The sentence could potentially provide two antecedents for a pronoun: the actually opened bottle (indexed as *a*) or the bottle (or bottles) that should have been opened (indexed as *b*).

(11) Alex opened the wrong bottle. (P)

a: the bottle that Alex opened

b: the bottle(s) that Alex should have opened.

a. Unfortunately, its$_a$ cork broke.

b. #Unfortunately, Alex didn't find it$_b$/them$_b$ in the cellar.

This shows that reference to the actually opened bottle is possible, see (11a). Reference to the required set is excluded, independently of whether this is done via a singular or a plural pronoun, see (11b).

For the B-reading, the pronominalization shows an analogous asymmetry, now between the excluded set and the actual set. This is a bit more difficult to show, as the excluded set is part of the actual set. Therefore, we can only find a difference in cases in which the actual set is non-unique.

I provide such a scenario for sentence (2) in (12). The continuations show that it is possible to refer to the forbidden number, (12a), but not to the underlined numbers, see (12b).

(12) Liz underlined the wrong number. (B)

4 7 9 || 4 7 9

a: the number Liz was forbidden to underline, i.e. *7*

b: the number(s) Liz actually underlined, i.e. *7* and *9*

a. It$_a$ was a prime number.

b. #It$_b$ was an odd number. / # They$_b$ were odd numbers.

These observations show that a *tw*NP refers to the entity on which it imposes a definiteness presupposition, i.e., the actual set in the P-reading and the excluded set in the B-reading.

We can relate this to a general property of adjectives. At least in English, adjectives cannot introduce an antecedent. This is illustrated by the contrast in (13). The noun phrases in subject position both refer to an envoy and require the existence of a president. However, only in (13a) can the president be used as the antecedent of a pronoun in the sentence. If the president is merely introduced inside the adjective *presidential*, such a coreference is impossible, see (13b).

(13) a. [The envoy of the president$_i$] ...
b. *[The president$_i$-ial envoy] ...
informed him$_i$ about the state of the negotiations.

The data in (13) are important for our discussion of *wrong*. If we assume that the set that lacks a uniqueness presupposition is contributed sub-lexically by *wrong*, the observed contrast in pronominalization follows by the generalization that is independently needed for adjectives.

2.3 The type of definiteness

I have shown in §2.1 that both readings come with a uniqueness and an existence presupposition on one element, i.e. both have one element that can be considered definite in the sense of Schwarz (2020). It is known that there are various types of definite: at least *strong* and *weak* (Schwarz 2009; Löbner 2011; Am-David 2014; Ortmann 2014). Simplifying, strong definites (or pragmatic uniques) typically refer to entities that have been introduced in the previous discourse. Weak definites (or semantic uniques) refer to entities that are given in the background.

English does not distinguish formally between strong and weak definites. In order to determine the type of definiteness that we find in *tw*NPs, I will use data from Papiamentu, a language in which such a distinction is found. Papiamentu is a Portuguese/Spanish/Dutch-based creole language spoken on Aruba, Bonaire and Curaçao (Maurer 2013). Papiamentu has both a definite article, *e*, and an indefinite article, *un*. The definite ar-

ticle is used for strong definites, i.e., primarily in anaphoric contexts, see (14). No article is used, however, with weak definites like *solo* 'sun' in (15).

(14) *Mi a kumpra un bolo. *(E) bolo a wòrdu kome den 10 minüt.*
I PERF buy a cake the cake PERF PASS eat in 10 minutes
'I bought a cake. The cake was eaten in 10 minutes.'
(Kester & Schmitt 2007: 119)

(15) *(*E) solo ta kima sin miserikordia.*
the sun PRES burning without mercy
'The sun is burning without mercy.' (Kester & Schmitt 2007: 113)

Papiamentu does not use the definite article with its equivalent of English *wrong* in the relevant uses. This is illustrated in (16) and (17).

(16) *Polis a arestá hende robes pa Interpol.*
police PERF arrest person wrong for Interpol
'The police has arrested the wrong person for Interpol.'[2]

(17) *Ta duel mi. Señor a yama number robes.*
PRES hurts me Mister PERF call number wrong
'I am sorry. You have the wrong number, Sir.'[3]

This shows that the noun phrases *hende robes* and *number robes* are weak definites. Consequently, their uniqueness and existence should be treated on par with that of other weak definites, i.e., it is presupposed in the context and need not be introduced explicitly. Therefore, I conclude *robes* 'wrong' has the effect of turning a noun into a weak definite.

I think it is legitimate to generalize this to English *wrong*. In English, weak definites are marked with the definite article. We, thus, have an explanation why non-local *wrong* requires the definite article in English. I will come back to this point in §4.

[2] `https://extra.cw/polis_a_aresta_hende_robes_pa_interpol/`, 2020/04/08.
[3] *Papiamento extended phrasebook*, Learningonlinexyz Inc. Accessed via googlebooks, 2020/04/08.

2.4 Modality

Every paraphrase of a sentence with *wrong* contains a modal expression. I will adopt the three dimensions of modality from Kratzer (1977; 1991) (modal force, modal base, and ordering source) to discuss the type of modality found with *wrong*. As far as the modal force is concerned, the terms *required* and *excluded* set in Schwarz (2020) indicate that we are dealing with a necessity modality in all cases. I will show that *wrong* is compatible with circumstantial (or root) modality, but not with epistemic modality.

Wrong can occur felicitously with circumstantial necessity. In (18a), the obligation is imposed by laws or regulations. In (18b), it comes from moral, ethical or other considerations rather than from strict rules.

(18) a. [The university obliges us to use a particular cloud service, but Alex is using a different one.]
So, Alex is using the wrong cloud service. (P)

b. [We all know that we should reduce CO_2 emission and move away from coal power generation. Nonetheless, the government has just approved a new coal-fired power station.]
So, the government supports the wrong type of energy. (B)

This contrasts with epistemic necessity. In (19), I provide contexts for a potential use of *wrong* with epistemic necessity. Below each example, I indicate the intended reading. As shown by the marking "#" such readings are not possible – neither for the P-reading nor for the B-reading.

(19) a. [From what I know about Alex and Kim, Alex must be on vacation now, but, in reality, Kim is.]
So, the wrong person seems to be on vacation. (P)
Intended: 'The person that is on vacation is not among the people who must be on vacation according to what I know.'

b. [I was sure that Alex would not pass the biology test. However, Alex did fairly well in it.]
So, Alex passed the wrong test. (B)
Intended: 'The test that Alex must fail according to my knowledge is among the tests that Alex passed.'

The examples of circumstantial modality above contained some possible ordering sources. While they suggest that the obligation is imposed on the grammatical subject of the sentence, this is not necessarily the case. We find the same readings when the logical subject is implicit, as in passives without overt *by*-phrase, see (20).

(20) a. [(18a)] So, the wrong cloud service is used.
b. [(18b)] So, the wrong type of energy is supported.

In bouletic modality, the person whose wishes or desires are at stake need not be overtly expressed. Nonetheless, we find cases of *wrong*, as in (21). In these examples, *wrong* relates to the wishes of Alex in a particular lottery, even though Alex is not mentioned explicitly in the sentence.

(21) a. [Alex would win in the lottery if the number *4* was drawn, but the number *7* was drawn.]
So, clearly, the wrong number was drawn. (P)
b. [Alex would win in the lottery unless the number *4* was drawn. However, this number was drawn.]
So, clearly, the wrong number was drawn. (B)

This preliminary discussion shows that *wrong* comes with (possibly all types of) circumstantial necessity, but not with epistemic modality.

2.5 Semantic representations

Taking together the observations from this section, we arrive at the semantic representations given in (22) and (23) for slightly simplified versions of sentences (3) and (4), respectively.

(22) Lestrade arrested the wrong person. (P)
$\neg((\iota_s x : \mathbf{pers}(x) \wedge \mathbf{arr}(\mathbf{l}, x)) \in \{x | \mathbf{pers}(x) \wedge \mathbf{OBL}(y, {}^{\wedge}\mathbf{arr}(\mathbf{l}, x))\}_{\geq 1})$

(23) Anne opened the wrong door. (B)
$(\iota_s x : \mathbf{door}(x) \wedge \mathbf{OBL}(y, {}^{\wedge}\neg\mathbf{op}(\mathbf{a}, x))) \in \{x | \mathbf{door}(x) \wedge \mathbf{op}(\mathbf{a}, x)\}_{\geq 1}$

I will first go through the representation of the P-reading in (22). The highest operator is the negation of the membership relation. There is an ι-expression that refers to the person that Lestrade arrested. Assuming a standard semantics for this operator, this reflects the existence and

uniqueness presupposition on the actual set discussed in §2.1 and provides a potential antecedent for pronominal reference in the discourse, see §2.2. I use the subscript "*s*" on the ι-operator to indicate semantic uniqueness (§2.3). The relevant set is the set of people that Lestrade should arrest. The choice of set-membership rather than identity expresses the non-uniqueness of the required set (§2.1). The subscript "≥ 1" abbreviates the presupposition that this set is not empty.

The modal operator **OBL** expresses a circumstantial modality (§2.4). Consequently, it has a propositional argument and an individual argument expressing whose obligation is considered. This individual argument need not be linked to an overt element in the sentence, but is determined contextually. This is expressed with a free variable, *y*, in (22).

The representation for the B-reading in (23) consists of the same ingredients as the one for the P-reading, but they are arranged differently. In the P-reading, the negation has wide scope over the set-membership, and the modal operator **OBL** occurs inside the set. In the B-reading, the set-membership is the highest operator. The modal operator does not occur inside the set and has scope over the negation. The ι-expression refers to the door that was required not to be opened, i.e., to the unique member of the excluded set. This entity is said to be a member of the actual set, which is not necessarily a singleton, though its non-emptyness is presupposed. I will leave out the subscripts "*s*" and "≥ 1" in the following.

The proposed semantic representations capture the data on the two readings of *wrong*. In the next section, I will demonstrate that both readings qualify as *non-local* in the sense of Schwarz (2020).

3 Non-locality of the readings

The P- and the B-readings of *wrong* can be considered non-local as the meaning of the verb appears embedded inside a meaning contribution of the adjective. This criterion has been generally applied in the literature, including Morzycki (2016). Schwarz (2020) proposes two entailment tests for non-local adjectival modifiers: *extensionality* and *monotonicity*. A non-local adjective allows for neither an extensional nor a monotone entailment in the way to be described below. I will first illustrate the two tests for the P-reading and, then, apply them to the B-reading.

I will use the two tests from Schwarz (2020), but modify some of his ex-

amples. I will contrast the local adjective *red* with non-local *wrong*. Let us assume a situation in which whenever someone underlines a number they also put a circle around it, i.e., in the current situation s, $[\![\textbf{underline}]\!]^s = [\![\textbf{circle}]\!]^s$. In this situation, sentence (24a) entails sentence (24b).

(24) a. Liz underlined the red number.
b. $\models$ Liz circled the red number.

Imagine a situation in which Liz was supposed to underline the number *4* but circle the number *7*, and in which she underlined (and circled) *7*. Then sentence (25a) is true, but (25b) is false. This shows that the P-reading is not extensional.

(25) 4 (7) 9 | 4 (7) 9 (P)
a. Liz underlined the wrong number.
b. $\not\models$ Liz circled the wrong number.

The second test looks at monotonicity. Underlining a number is a way of marking it. Consequently, sentence (26a) entails (26b).

(26) a. Liz underlined the red number.
b. $\models$ Liz marked the red number.

In (27), we replace the local adjective *red* with *wrong*. The entailment from (27a) to (27b) does not hold in general. In the scenario in (27), Liz was supposed to underline *4* and to cross out *7*. She underlined *7*. Consequently, sentence (27a) is true, but sentence (27b) is false – because *7* was among the numbers to be marked.

(27) 4 7 9 | 4 7 9 (P)
a. Liz underlined the wrong number.
b. $\not\models$ Liz marked the wrong number.

This shows that a *tw*NP in the P-reading does not conserve the monotonicity of a definite noun phrase of the form *the N* or *the red N*. From the results of these two tests, Schwarz (2020) concludes that *wrong* is a non-local adjective in the P-reading, which is the only one he discusses.

In the next step, I will show that the B-reading is equally non-local ac-

cording to these tests. The extensionality test is exemplified in (28). Let us assume, again, that underlining and circling have the same extension in our situation. Furthermore, Liz was only forbidden to underline the number *4*, but allowed to circle whichever numbers she likes. She actually underlined and circled *4*. Then (28a) is true, but (28b) is false.

(28) ④ ⑦ ⑨ ‖ ④ 7 9 (B)

a. Liz underlined the wrong number.
b. ⊭ Liz circled the wrong number.

For monotonicity, consider a scenario in which Liz was allowed to underline any number except for *4* and to cross out any number except for *7*. She underlined *4*. Then, (29a) is true. Sentence (29b), however, is undefined as there is no unique number that must not be marked.

(29) 4̸ 7 9̸ ‖ 4 7 9 (B)

a. Liz underlined the wrong number.
b. ⊭ #Liz marked the wrong number.

We can use a plural noun phrase to overcome this problem. The scenario in (30) is chosen in such a way that the excluded set for underlining consists of *4*, *7*, and *9*. The excluded set for marking only consists of *7* and *9*. Liz underlined exactly the numbers that she must not underline, which makes sentence (30a) true under the B-reading. However, sentence (30b) is false, as the number *4* is not in the excluded set for marking.

(30) 4̸ 7 8̸ 9 ‖ 4 7 8 9 (B)

a. Liz underlined the wrong numbers.
b. ⊭ Liz marked the wrong numbers.

This shows that both the P-reading and the B-reading as defined in §2 pass the tests for non-local adjectives in Schwarz (2020).

4 Challenges for previous approaches

An important issue in previous discussions of non-local *wrong* is the observation that we always find a definite article. This is even more puzzling under the classical paraphrase in (1) – repeated in (31) – as this paraphrase

does not contain a definite noun phrase.

(31) I opened the wrong bottle of wine.
'I opened a bottle of wine that it was wrong for me to open.'

Consequently, Abbott (2001) and Schwarz (2006) assume that a *tw*NP is semantically indefinite. In support of this, Abbott (2001: 12) provides example (32). While definites cannot occur in existential *there*-clauses, this seems to be possible for *tw*NPs.

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

This argument is not fully conclusive. First, there are occurrences of definites with existential *there*, as in (33) from COCA (Davies 2008–).

(33) There was my wife in the living room. (COCA)

Second, uses of *tw*NPs in *there*-clauses is far from common, if existing at all. For instance, there is no relevant hit parallel to (32) in COCA for the query '`there BE the wrong _nn*`' (2020/04/08).

In Schwarz (2006), *the wrong* is simply treated as one lexical item. It is, however, possible to find examples in which there is material between the article and the adjective, see (34).

(34) Archaeologists, who have spent decades digging at the apparently wrong location, will soon be moving to the new site.[4]

Morzycki (2016) shows that many non-local adjectives require a definite article, such as *average* in (35). He suggests that this is due to a kind reading of nouns with non-local adjectives. For kinds, the use of a definite article is to be expected.

(35) The average American has 2 children.

While this is plausible for *average*, Morzycki himself states that this explanation cannot be applied to non-local *wrong*. For example, sentence (2) is about a concrete number, not about kind of number, and (3) is about

[4] `https://tinyurl.com/y5fta3qw`, accessed 2020/09/07

a concrete person, not a kind of person, etc.

Instead, Morzycki (2016) claims that there is no definiteness requirement and that there are non-local readings of *a wrong N* as well. I will argue in §6 that such uses, indeed, are local readings.

Larson (2000) suggests that the definiteness requirement of *wrong* can be captured by assigning it a superlative semantics. As English superlatives come with a definite article, it should not be a surprise that the same holds for non-local *wrong*. However, Larson does not provide such a superlative-like semantics.

Based on Papiamentu data, I argued in §2.3 that *wrong*-noun phrases behave like unique nouns such as *sun*. This seems to be a cross-linguistically robust generalization, as in English, unique nouns require a definite article, and so do noun phrases with non-local *wrong*. Thus, Larson (2000) is correct in pointing out that superlatives and non-local *wrong* share an important semantic property which is responsible for the parallelism in definiteness marking. However, the relevant property is not the superlative semantics but the semantic uniqueness they both express.

Let us finally look at the proposal in Schwarz (2020). Schwarz works within a framework such as Heim & Kratzer (1998), in which functional application is the central device for computing the meaning of a complex expression. Consequently, non-local readings are a serious challenge as the adjective cannot be interpreted directly in its surface position. For this reason, syntactic operations are postulated to adjust the syntactic structure to the semantics. Schwarz eventually favours what he calls a *main functor analysis*, under which the adjective acts as the highest semantic functor in the clause. Following Morzycki (2016), there are two instances of Quantifier Raising to arrive at an interpretable syntactic structure, see (36). First, the noun phrase *the wrong number* is fronted. Then, the combination *wrong number* is fronted further, stranding the determiner.

(36) Liz underlined the wrong number.
QR1: [the [wrong number]] λ_2 [Liz underlined t_2]
QR2: [wrong number] λ_1 [[the t_1] λ_2 [Liz underlined t_2]]

While the movements in (36) are required within the particular framework, I think that there is little independent motivation for them. The ad-

jective *wrong* is in the surface position in which we find attributive adjectives, and determiners cannot be stranded in English, see (37). The Morzycki/Schwarz analysis might be a solution within their framework – still, I think that an approach stressing the parallels between *wrong* and "ordinary" adjectives is conceptually more attractive.

(37) *[Wrong number]$_1$ Liz underlined [the t_1]

In this section, I have mentioned challenges of previous approaches and, in part, already specified how they can be resolved in the analysis proposed in §2. In particular, the questions of whether non-local *wrong* is definite at all and is always definite have both received a positive answer in this paper and an explanation in terms of treating *wrong* as an adjective that creates semantic uniques. In the next section, I will formalize my analysis in a constraint-based syntax-semantics interface.

5 Underspecified semantics of *wrong*

In this section, I will present an integration of my analysis of non-local *wrong* into a formal framework of the syntax-semantics interface, *Lexical Resource Semantics* (LRS). I will present the basic ideas of this framework in §5.1 and develop my analysis in §5.2.

5.1 Framework: Lexical Resource Semantics

LRS is a formal system of the syntax-semantics interface. It is representational in the sense that it assumes that linguistic expressions have (at least) a syntactic and a semantic representation. Semantic representations can be expressions of any standard semantic representation language. In the present paper, I will use the ones from the previous sections.

LRS is a system of constraint-based underspecified semantic combinatorics. This means that words and phrases add constraints on what the eventual semantic representation of an utterance should be. It is underspecified in the sense that these constraints need not fix exactly one semantic representation but could be compatible with several readings. As such, LRS is in the tradition of underspecified semantic systems as characterized in Pinkal (1999) and Egg (2010).

LRS has mainly been used in Head-driven Phrase Structure Grammar (HPSG, Pollard & Sag 1994), as HPSG is a constraint-based grammar frame-

work that integrates all modules of grammar within one formalism. There are, however, LRS analyses that are independent of a particular grammar framework, including Sailer (2004a) and the present paper. A general introduction to LRS is given in Richter & Sailer (2004).[5] I will use a version of the compact notation introduced in Penn & Richter (2004).

LRS is lexical in the sense that only lexical items, i.e. words or phrasal lexical units, determine which constants, variables, and operators may occur in the semantic representation of an utterance (*contribution constraints*). Non-lexical items can only constrain how these should be combined to arrive at the overall semantic representation (*embedding constraints*). I will illustrate this with simple example sentences, such as (38). I indicate the constraints contributed by the words below the sentence.

(38) [S: Everyone [VP: didn't call]].

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

The constraint in (38a) is to be read in the following way: Whenever the word *call* occurs in an utterance, the semantic representation must contain an occurrence of the formula **call**(x).

Following Bos (1996), I assume a semantic meta-language. I use lowercase Greek letters for meta-variables ($\alpha, \beta, \ldots$). The constraint contributed by the negated auxiliary *didn't* in (38b) restricts its use to utterances whose semantic representation contain a negation. The scope of the negation is marked with the meta-variable α.

The word *everyone* has the most complex constraint. It specifies that whenever it occurs, there will be a universal quantifier that binds a variable and has an implication in its scope. The antecedent of this implication is of the form **person**(x), and its consequent is marked with a meta-variable, β, which means that it is not fully constrained by *everyone*. The notation $\beta[x]$ expresses that whatever expression β will be interpreted as, it must have an occurrence of x in it.

These words combine syntactically in the way indicated by the bracketing in (38). The VP *didn't call* collects the constraints from (38a) and (38b).

[5] See `https://www.lexical-resource-semantics.de` for further material on LRS.

In addition, a constraint is added that the meaning of *call* occurs in the scope of the negation contributed by *didn't*. This is written as $\alpha[\mathbf{call}(x)]$ All these constraints are collected in (39). There, a new meta-variable, γ, is introduced, which must be some formula that satisfies the three constraints given inside the square brackets.

(39) VP: $\gamma[\mathbf{call}(x), \neg\alpha, \alpha[\mathbf{call}(x)]]$

The S-node collects the constraints from the subject and the VP node. In addition, it adds the requirement that the meaning of *call* must occur in the consequent of the implication contributed by *everyone*, which can be expressed as $\beta[\mathbf{call}(x)]$. The overall constraint is given in (40), where I introduce a new meta-variable, δ.

(40) S: $\delta[\forall x(\mathbf{person}(x) \rightarrow \beta[x]), \gamma[\mathbf{call}(x), \neg\alpha, \alpha[\mathbf{call}(x)]], \beta[\mathbf{call}(x)]]$

Once all constraints are gathered, there is a closure constraint saying that semantic representation of an utterance can only contain the constants, variables, and operators that occur in the constraints contributed by lexical items and that it must respect all constraints contributed by the lexical and non-lexical items contained in the utterance.

We can arrive at the overall semantic representation of an utterance by assigning each contributed meta-variable some expression in such a way that all constraints are satisfied. Such a meta-variable assignment is called a *plugging* (Bos 1996). For ambiguous sentences, there should be more than one plugging, which then leads to more than one possible semantic representation. In our example, there are two possible pluggings that respect all constraints. These are given in (41). In (41a), the negation has narrow scope. In (41b), it has wide scope over the universal quantifier.

(41) Possible pluggings

a. $\alpha \equiv \mathbf{call}(x)$; $\beta \equiv \gamma \equiv \neg\alpha$; $\delta \equiv \forall x(\mathbf{person}(x) \rightarrow \beta)$
Reading 1: $\forall x(\mathbf{person}(x) \rightarrow \neg\mathbf{call}(x))$

b. $\alpha \equiv \gamma \equiv \delta \equiv \forall x(\mathbf{person}(x) \rightarrow \beta)$; $\beta \equiv \mathbf{call}(x)$
Reading 2: $\neg\forall x(\mathbf{person}(x) \rightarrow \mathbf{call}(x))$

This example illustrated how the lexical specifications determine the

resulting readings together with the additional constraints added at the phrases. In order to formulate the phrase-level constraints in a systematic way, we flag certain contributions. For the present paper, the relevant contributions are the *internal content* and the *external content*. The internal content, which I will mark as $\lceil\alpha\rceil$, signals the scopally lowest contribution in a phrase. The external content, indicated as $\underline{\alpha}$, is the representation associated with the overall phrase. In (42), I repeat the lexical entries from (38), augmented by the indication of internal and external content.[6]

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

With these two auxiliary notions, we can define the constraints that I had used in the first run through example (38). First, in every headed phrase, the internal content and the external content both percolate from the head daughter to the mother. Second, when a raising verb, such as the auxiliary *didn't*, combines with its verbal complement, the auxiliary inherits its complement's internal content. Consequently, the internal content of the VP *didn't call* is $\mathbf{call}(x)$, which leads to the above-mentioned constraint $\alpha[\mathbf{call}(x)]$. The third general constraint applies when a quantifier is the non-head in a phrase. In this constellation, the quantifier takes scope over the internal content of the head. This constraint has the effect that $\mathbf{call}(x)$ must be a component of β, i.e., $\beta[\mathbf{call}(x)]$.

As a second example, I will discuss (43), which contains an attributive adjective and the definite article.[7]

(43) [S: Alex [VP: opened [NP: the [N′: red bottle]]]].
a. *bottle*: $\lceil\mathbf{bottle}(x)\rceil$
b. *red*: $\underline{(\alpha[x] \wedge \beta[\lceil\mathbf{red}(x)\rceil])}$
c. *the*: $\underline{(\lceil\iota\rceil x : \phi[x])}$

[6]The specifications in (42) are simplifications. All all signs have an internal and an external content, but I have left out some of the required meta-variables.

[7]Given HPSG's lexical approach to argument linking, the discourse referents of the arguments of **open** are constrained to occur inside the appropriate argument slots. For the subject, I simplify this to **alex**. I am more explicit for the complement: the second argument of **open** is an expression χ containing the complement's discourse referent x.

d. *opened*: $[\mathbf{open}(\mathbf{alex}, \chi[x])^{]}$
e. *Alex*: $\underline{[\mathbf{alex}^{]}}$

First, the noun *bottle* combines with the adjective *red*. The external content of the adjective is a conjunction. The second conjunct contains the adjective's internal content, $\mathbf{red}(x)$. The combination of these two words is subject to the constraint in (44), introduced in Sailer (2004b).

(44) In a head-modifier combination, 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 external content is a subexpression of the head's external content.

In our example, this has the effect that the constraint $\alpha[\mathbf{bottle}(x)]$ is added, which leads to the overall constraint in (45).

(45) N′: $\alpha[^{[}\mathbf{bottle}(x)^{]}] \wedge \beta[\mathbf{red}(x)]$

Following the HPSG tradition, I assume that the determiner is the nonhead in the next combination. The constraint in (46) is relevant here, which embeds the noun's internal content inside the determiner's restrictor.

(46) When a determiner combines with a nominal head, the determiner and the head have the same external content, and the head's internal content is embedded in the determiner's restrictor.

Given this constraint, we arrive at (47) for the noun phrase.

(47) NP: $\underline{(\iota x : \phi[\alpha[^{[}\mathbf{bottle}(x)^{]}] \wedge \beta[\mathbf{red}(x)]])}$

The rest of the sentence does not require any new principles of grammar. As the definite noun phrase is not qunantificational, no embedding constraint will be added at the VP level. This leads to the overall constraint in (48).

(48) VP: $\gamma[^{[}\mathbf{open}(\mathbf{alex}, \chi[x])^{]}, (\iota x : \phi[\alpha[\mathbf{bottle}(x)] \wedge \beta[\mathbf{red}(x)]])]$

Finally, the subject is added. As the sentence is not ambiguous, there is only one plugging satisfying all constraints. This plugging is given in (49).

(49) $\alpha \equiv \mathbf{bottle}(x)$; $\beta \equiv \mathbf{red}(x)$; $\phi \equiv (\alpha \wedge \beta)$; $\chi \equiv (\iota x : \phi)$; $\gamma \equiv \mathbf{open}(\mathbf{alex}, \chi)$
Reading: $\mathbf{open}(\mathbf{alex}, (\iota x : \mathbf{bottle}(x) \wedge \mathbf{red}(x)))$

I showed with example (43) how intersective, attributive adjectives and definite noun phrases are handled in LRS.

Finally, I want illustrate the analysis of a semantically unique noun, based on Sailer & Am-David (2016). As a unique noun, *sun* introduces an ι-operator lexically, see (50).

(50) *sun*: $\underline{(\iota x : [\mathbf{sun}(x)])}$

All English singular count nouns require an overt determiner syntactically, therefore the noun *sun* selects a determiner. In particular, it can combine with the definite article, whose constraint we saw in (43c). This combination is subject to (46), i.e., the noun and the article have the same external content and the noun's internal content must be in the restrictor of the determiner, which is the body of the ι-expression. The result is given in (51). Assuming $\phi \equiv \mathbf{sun}(x)$, this reduces to the expression $(\iota x : \mathbf{sun}(x))$.

(51) [NP: the sun]: $\underline{(\iota x : \phi[\mathbf{sun}(x)])}$

It is important to note that both the noun and the determiner constrain the overall semantic representation to contain an ι-expression. There is nothing requiring, however, that there need to be two ι-expressions. This potential of *redundant semantic contributions* is one of the key properties of LRS and has been exploited in analyses of negative concord, tense marking, and others (Richter & Sailer 2006; Sailer 2004a).

All constraints used in this subsection were proposed in previous LRS papers. I will show below, that non-local *wrong* combines with the head noun in exactly the same way as *red*, and result in a semantically unique noun such as *sun*.

5.2 Analysis of non-local attributive *wrong*

We can now turn to the LRS formalization of the analysis of non-local *wrong* developped in §2. The constraint associated with the lexical entry of *wrong* is given in (52).

(52) Lexical constraints of attributive *wrong*:

$\zeta[\alpha[x] \wedge \beta[x]$, (i)
$\overline{(\iota x : \alpha \wedge \gamma') \in \{x|(\alpha \wedge \gamma'')\}}$, (ii)
$\neg\delta[\beta]$, (iii)
$\alpha \wedge \mathbf{OBL}(y, {}^{\wedge}\epsilon[\beta])]$ (iv)
and neither $\gamma' \equiv \neg\delta$ nor $\gamma''[\neg\delta]$

This constraint introduces a meta-variable, ζ, for which four components are specified. First, (i), the external content of the adjective is a conjunction just like the external content of an ordinary intersective adjective like *red* in (43b). The first conjunct, α, will eventually be the content of the head noun, the second conjunct, β, will be the content of the clause in which the noun phrase occurs. Second, (ii), there is a set-membership expression whose first argument is an ι-expression and whose second argument is a set. The body of the ι-expression is, again, a conjunction with α as its first conjunct and some expression γ' as its second conjunct. Similarly, the body of the set is of the form $\alpha \wedge \gamma''$. Third, (iii), there is a negation that takes scope over β. Fourth, (iv), there is another conjunction with α as its first conjunct and an obligation modal in its second conjunct which also takes scope over β

Finally, there is a further condition in (52) which determines that only pluggings are acceptable in which neither γ' is the negation $\neg\delta$ nor does γ'' contain the negation.

The constraint in (52) does not fully specify the relative scope of the four mentioned components of ζ. The membership relation specifies two conjunctions with α as their first conjunct, and there cannot be more occurrences of such conjunctions in ζ. Consequently, either $\beta \equiv \gamma'$ or $\beta \equiv \gamma''$. In the first case, we know that $\gamma'' \equiv \mathbf{OBL}(y, \epsilon)$, in the second case, $\gamma' \equiv \mathbf{OBL}(y, \epsilon)$. The negation is also restricted: it must have scope over β, but it may not be the second conjunct in the body of the ι-expression nor may it occur in side the body of the set. This leaves only two options: it can have wide scope over the set-membership expression, $\zeta \equiv \neg\delta$, or it can have narrow scope inside the second conjunct of the body of the ι-expression if there is another operator above it – which can only be the modal operator in our case. Taking these considerations together, we end up with exactly two possibilities, which are given schematically in (53). As indicated, these correspond to the P- and the B-reading.

(53) a. $\neg((\iota x : \alpha \wedge \beta) \in \{x|\alpha \wedge \mathbf{OBL}(y, {}^{\wedge}\beta)\})$ (P)
$\beta \equiv \gamma' \equiv \epsilon; \quad \gamma'' \equiv \mathbf{OBL}(y, \epsilon);$
$\delta \equiv (\iota x : \ldots) \in \{x|\ldots\}; \quad \zeta \equiv \neg\delta$

b. $(\iota x : \alpha \wedge \mathbf{OBL}(y, {}^{\wedge}\neg\beta)) \in \{x|\alpha \wedge \beta\}$ (B)
$\beta \equiv \gamma' \equiv \mathbf{OBL}(y, \epsilon); \quad \gamma'' \equiv (\alpha \wedge \beta);$
$\delta \equiv \beta; \quad \epsilon \equiv \neg\delta; \quad \zeta \equiv (\iota x : \ldots) \in \{x|\ldots\}$

I can now show how the two P- and the B-readings of an example similar to (1) can be derived. I will use the lexical entries from (43). As indicated in (54), I assume the same syntactic structure as in the case with a local intersective adjective.

(54) [S: Alex [VP: opened [NP: the [N′: wrong bottle]]]].

When *wrong* combines with the head noun *bottle*, the constraint in (44) applies. In other words, we combine the constraints from (43a) and (52) and add the constraint that the internal content of *bottle* be inside the first conjunct of the external content of the adjective, i.e., $\alpha[\mathbf{bottle}(x)]$.

I described the lexical entry of *the* in (43c) and the effect of it combining with a noun in (51). In the present example, the constraint in (55) is added.

(55) $\underline{\iota x : \phi[{}^{\lfloor}\mathbf{bottle}(x)^{\rfloor}]}$

When we combine the constraints of the three words occurring in the noun phrase and the ones added by the phrases, we arrive at (56).

(56) Accumulated constraints for *the wrong bottle*:
$\zeta[(\iota x : {}^{\lfloor}\mathbf{bottle}(x)^{\rfloor} \wedge \gamma'[\beta[x]]) \in \{x|\mathbf{bottle}(x) \wedge \gamma''[\beta]\},$
$\quad \underline{\mathbf{bottle}(x) \wedge \beta},$
$\quad \neg\delta[\beta]],$
$\quad \mathbf{bottle}(x) \wedge \mathbf{OBL}(y, {}^{\wedge}\epsilon[\beta]))$

Since both the adjective and the determiner contribute an ι-expression, we are in exactly the same situation as with unique nouns in (50). Both expressions constrain the overall semantic representation to contain an ι-expression, which is compatible with there being just one such expression in the overall representation.

In the next step, the noun phrase combines with the verb *opened*. Being

a definite noun phrase, it is not quantificational. Consequently, there is no new scopal constraint. We just add the lexical constraint of the verb from (43d), $\mathbf{open}(\mathbf{a}, \chi[x])$. To complete the sentence, there is only one meta-variable in the overall constraint that can be equated to this formula: β.

(57) Accumulated constraints for sentence (54):
$\zeta[(\iota x : \mathbf{bottle}(x) \wedge \gamma'[\lfloor \mathbf{open}(\mathbf{a}, x) \rfloor]) \in \{x | \mathbf{bottle}(x) \wedge \gamma''[\mathbf{open}(\mathbf{a}, x)]\},$
$\mathbf{bottle}(x) \wedge \mathbf{open}(\mathbf{a}, x),$
$\neg\delta[\mathbf{open}(\mathbf{a}, x)]],$
$\mathbf{bottle}(x) \wedge \mathbf{OBL}(y, {}^\wedge\epsilon[\mathbf{open}(\mathbf{a}, x)]))$

We saw in the abstract discussion of which pluggings are compatible with the lexical specification of non-local *wrong* that there are only two possibilities. These are given in (58) and (59) together with the resulting semantic representations, the P- and the B-reading respectively.

(58) $\neg((\iota x : \mathbf{bottle}(x) \wedge \mathbf{open}(\mathbf{a}, x)) \in \{x | \mathbf{bottle}(x) \wedge \mathbf{OBL}(y, {}^\wedge\mathbf{open}(\mathbf{a}, x))\}$
$\gamma' \equiv \epsilon \equiv \mathbf{open}(\mathbf{a}, x); \gamma'' \equiv \mathbf{OBL}(y, {}^\wedge\epsilon); \delta \equiv ((\iota x : \ldots) \in \{x | \ldots\}); \chi \equiv x$

(59) $(\iota x : \mathbf{bottle}(x) \wedge \mathbf{OBL}(y, {}^\wedge\neg\mathbf{open}(\mathbf{a}, x))) \in \{x | \mathbf{bottle}(x) \wedge \mathbf{open}(\mathbf{a}, x)\}$
$\gamma' \equiv \mathbf{OBL}(y, {}^\wedge\epsilon); \gamma'' \equiv \delta \equiv \mathbf{open}(\mathbf{a}, x); \epsilon \equiv \neg\delta; \chi \equiv x$

Note that throughout the derivation, the individual argument of the modal operator **OBL** is a free variable. As it is not a meta-variable, it will not be resolved by a plugging, but needs to be resolved in the context.

There are some important features of this analysis. First, there is no combinatorial difference – neither syntactically nor semantically – between the adjectives *red* and *wrong*. Both have an intersective core semantic contribution, their external content, and are subject to the constraint in (44) when combining with a noun.

In addition to this core semantic contribution, *wrong* also contributes other constraints. This is the material responsible for the non-local reading. It is scopally restricted within the lexical entry of the adjective, but irrelevant for the constraints contributed by the syntactic combinatorics.

Just as other definite noun phrases in English, a *tw*NP refers to an individual with an existence and uniqueness presupposition. In English, the definite article is semantically redundant for unique nouns, but fulfills this role in such noun phrases just as in any other definite noun phrase.

Consequently, we capture the parallelism to unique nouns in English and other languages. Finally, there is a single lexical constraint on non-local *wrong* which is underspecified with respect to the P- and the B-readings.

6 Local reading of attributive *wrong*

Previous studies of attributive *wrong* are restricted to non-local readings and have largely ignored local readings. However, I would like to stress the connection between local and non-local readings of attributive *wrong*.

Larson (2000) and Schwarz (2006) observe that *a wrong N* does not allow for non-local readings. This is also my impression, based on a cursory inspection of COCA hits for the query *a wrong N*. In (60), the speaker will answer if a number has been dialed that does not exist, i.e., if it is an unassigned number, not whenever it is not the number that one was supposed or intended to dial. Similarly, in (61), the decision is the one that should not have been made, not the one that should not be overturned.

(60) I also do other intercept messages, when you dial a wrong telephone number, or dial a number that's been disconnected, or you need to deposit 25 cents before making a call. That's me.
⇒ a telephone number that (necessarily) doesn't exists

(61) "Institutional integrity" turns out to mean the Court must not overturn a wrong decision if there has been angry opposition to it.
⇒ a decision that should not have been made

The basic idea pursued here is that, in the local reading, we infer what should have been done to the referent of the noun phrase. In (61), for example, an inferrable property should not hold of the decision. This is sketched in the simplified semantic representation in (62), which states that there is a decision such that it is not among the ones that should be made, $P(x)$, and that this decision is overturned.

(62) $\exists x((\mathbf{decision}(x) \wedge (x \in \{x|\mathbf{decision}(x) \wedge \mathbf{OBL}(y, {}^{\wedge}\neg P(x))\}))$
$\wedge \mathbf{overturn}(\mathbf{Court}, x))$, where P can be inferred

In (63), I provide the lexical semantic contribution of local attributive *wrong*. As indicated by the underlining, the entire expression is the external content. This makes it a *local* adjective in the sense that there is no

contribution of the adjective that contains its own external content.

(63) Lexical constraints of local *wrong*:
$\underline{(\alpha \wedge \beta[\mathbf{OBL}(\hat{}\epsilon[P(x)]), \neg\delta[P(x)]])}$, where P can be inferred.

With this lexical specification, local *wrong* is compatible with all determiners, including both the definite and the indefinite article, while non-local *wrong* only allowed for a redundant definite article. Nonetheless, the representation of the local readings shares major parts with that of the non-local readings: negation, and a modal operator. The constraint-based view of LRS allows us to say that the constraints of non-local and local *wrong* overlap to a large extend.

The inferred predicate P is an important difference between local and non-local *wrong*. P is not necessarily identical with the main predicate of the clause. In the non-local readings, the predicate in the scope of the modal operator **OBL** needs to be the same as the predicate in the clause. This latter identity is what gave rise to the impression that *wrong N* takes scope over a VP, as encoded syntactically in the analysis in Haïk (1985). This contrast follows from the fact that P is an object-level predicate in (63), whereas I used a meta-variable in the constraint on non-local *wrong* in (52). The meta-variable needs to be resolved in the plugging as an expression that occurs in the semantic representation, the object-level variable on the other hand will be assigned a value in context.[8]

Schwarz (2020) follows Morzycki (2016) in assuming that *a wrong N* can have a non-local reading, providing example (64). This sentence is true, for example, when Liz underlined the one number that she was supposed to underline and at least one forbidden number.

(64) Liz underlined a wrong number.
⇒ a number that Liz should not underline

However, I think that (64) shows a local reading. As the local readings depend on an inferred predicate, there is nothing wrong with inferring that predicate from the clause itself. Consequently, there would be a po-

[8]This is parallel to the treatment of the individual argument of **OBL** as a free object-level variable in the lexical specification of non-local *wrong* in (52).

tential overlap between the local and the non-local readings.

However, I think that indefinite attributive *wrong* is always local. To show this, I need to construct a context in which the non-local indefinite reading would be true – i.e. the reading in which the clause-mate predicate is what should not have happened – but the local indefinite reading is not. If, in such a context, the use of the indefinite *wrong* noun phrase is considered to make the sentence false, this shows that the non-local reading is not available.

In the scenario in (65), both the definite and the indefinite versions of a *wrong*-sentence are true.

(65) 4 ~~7~~ 9 | 4 7 9

a. ✓Liz underlined the wrong number. (P)

b. ✓Liz underlined a wrong number.

Once we make salient that it is just about marking a number and not about the difference between underlining and crossing out, the version with the definite article, (66a), may sound a bit off-topic. The version with the indefinite article in (66b), however, can no longer be considered true.

(66) A: Liz' task was very complex, so let's just say, we are happy if she marked the numbers *4* and *7* in whichever way.

a. B: ? Still, she underlined the wrong number.

b. B: ✗Still, she underlined a wrong number.

If a non-local reading of *wrong* was available in (66b), the sentence should be true or, at worst, be as off-topic as its definite counterpart. However, the sentence is false, which indicates that a non-local reading is not available.

This shows that an apparent indefinite use of non-local *wrong* as in (64) should be considered a local use in which the salient property *P* is provided by the information structure of the sentence itself.

I have argued in this section that local attributive *wrong* is not restricted to a particular determiner, whereas non-local *wrong* is, but by virtue of creating semantically unique nouns. Nonetheless, the two forms of attributive *wrong* share a number of semantic contributions, such as negation and the modal operator. However, a detailed study of other adjectives with local and non-local readings would be required to determine if we

can relate one reading to the other in a general and systematic way.

7 Conclusion

In this paper, I refined the semantics of non-local *wrong* in several respects. I identified the so-far unnoticed *Bluebeard*-reading, looked at the potential of *wrong* noun phrases as antecedents in discourse, and considered the types of necessity modality associated with *wrong*. I provided additional support for the claim that non-local *wrong* is restricted to definite noun phrases and derived this by specifying the type of definiteness as semantic uniqueness. This allowed me to explain the obligatoriness of the definite article in English and its absence in Papiamentu.

The formalization of my analysis in *Lexical Resource Semantics* has the advantages that a single lexical constraint for non-local *wrong* can capture both readings. Furthermore, a surface-oriented syntactic analysis is possible and the semantic combination of the head noun with non-local *wrong* is subject to exactly the same constraints as the combination of local, intersective adjectives.

Finally, I showed that local *wrong* differs from non-local *wrong* in looking for a contextually salient rather than for a clause-mate predicate in the scope of the necessity operator. As local *wrong* is not restricted to any particular determiner, there is a potential ambiguity when a definite determiner is used. However, I argued that, contrary to recent claims in the literature, only local *wrong* can combine with an indefinite article.

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