A new diagnostic for antonym decomposition*

Ido Benbaji, Omri Doron & Ruoan Wang

Massachusetts Institute of Technology

1.   Introduction

In the study of antonymy in the semantic literature, an adjective like *short* is often taken to denote a predicate that can also be expressed by negating its antonymic pair *long*; i.e. ⟦short⟧ and ¬⟦long⟧ are assumed to be equivalent. This can be cashed out in different ways. One approach, termed the "lexical negation theory of antonymy" by Heim (2008), assumes that two members of an antonymic pair are related in their lexical semantics by predicate negation, but that each member is an opaque unit as far as syntax is concerned. The alternative "syntactic negation theory of antonymy" posits that one member of an antonymic pair is syntactically composed of the opposite member and a negation morpheme (Rullmann 1995; Büring 2007a,b; Heim 2008). In this paper, we advocate for a *hybrid* account of antonymy, according to which some antonymic pairs are related by a syntactically accessible negation morpheme, while others are only lexically related. This novel approach will solve a puzzle regarding Hebrew adjectival reduplication, and will be shown to yield maximal empirical coverage of the data we put forward.

Our starting point is the following puzzle: In Modern Hebrew, the meaning that results from applying morphological reduplication to an adjective can differ across the members of an antonymic pair. For certain pairs, one pair member attenuates under reduplication, while the other intensifies (1); for other pairs, reduplication results in attenuation of both pair members (2).

(1)   a.   aʁoχ 'long' > aʁaχ-ʁaχ 'long-ish'
       b.   katsaʁ 'short' > ktsaʁ-tsaʁ 'very short'

(2)   a.   yaveʃ 'dry' > yevaʃ-vaʃ 'dry-ish'
       b.   ʁatuv 'wet' > ʁetav-tav 'wet-ish'

Our proposal for the effects of reduplication is the following. For antonymic pairs whose meanings diverge under reduplication (as in (1)), one member is syntactically composed of a negation morpheme and the other. For antonymic pairs whose meanings converge under reduplication (as in (2)), pair members are related to the other by negation in their lexical semantics. We can then take reduplication to uniformly denote an attenuation operator, and assume that intensification comes about when this attenuation operator scopes between an adjective and its negation morpheme at Logical Form (LF).

If we are correct that Hebrew adjectives fall into two categories – decomposable and non-decomposable – we should expect this distinction to come into play beyond the realms of reduplication. And, indeed, we show that it does. As predicted by the hybrid approach, adjectives whose behavior under reduplication indicates the absence of syntactic decomposition cannot appear in certain comparative constructions whose acceptability has been analyzed as contingent upon its adjectives decomposing. The constructions we examine are *cross-polar anomalies* (cf. Kennedy 1999) and *Rullmann ambiguities* (cf. Seuren 1979; Rullmann 1995), both of which have been argued by Heim (2006, 2008) and Büring (2007a,b) to be acceptable only when the adjectives they contain introduce a syntactically accessible negation morpheme.

We further examine the implications for our account of a recent analysis of evaluativity, which adopts the syntactic theory of antonymy and derives evaluative inferences (and lack thereof) by appealing to competition between adjectives that contain syntactic negation and those that do not (Moracchini 2019). *Prima facie*, the two accounts are at odds, as antonymic pairs that behave differently with respect to reduplication and the relevant comparative constructions, all give rise to the same evaluative inferences. We discuss a way to modify our account to make them compatible.

The paper is organized as follows. In section 2 we present the puzzle of adjectival reduplication in Hebrew. In section 3, we propose an analysis of reduplication, and illustrate how it accounts for the effects of reduplication, when paired with the assumption that antonymic pairs can differ with respect to syntactic decomposability. In section 4, we discuss, and test, the predictions our analysis makes with respect to comparative constructions. Section 5 examines the interaction of our approach with theories of evaluativity. Section 6 concludes and discusses questions for further investigation.

2.   Reduplicated adjectives in Hebrew

In Modern Hebrew, certain gradable adjectives productively undergo partial reduplication. We consider the following two reduplication templates for triconsonantal roots (3) and for biconsonantal roots (4).

(3) $C_1VC_2VC_3 \rightarrow C_1VC_2aC_3\text{-}C_2aC_3$
       e.g. *ka*tsaʁ 'short' $\rightarrow$ *k*tsaʁ-tsaʁ 'very short'

(4) $C_1VC_2 \rightarrow C_1VC_2V_iC_2$
       e.g. *kal* 'light' $\rightarrow$ *kal-il* 'very light'

Assuming that members of an antonymic pair make use of the same adjectival scale, we use the terminology *positive vs. negative* to mark the difference between two members. For example, 'long' is positive while 'short' is negative. We adopt this terminology from previous literature, and remain agnostic about how to diagnose polarity.

When an adjective is reduplicated, the result is a change in meaning in one of two possible directions. Reduplication can either attenuate or intensify the meaning of the adjective it combines with. Consider the following pair: when the positive adjective *aʁoχ* 'long' is reduplicated, the result *aʁaχ-ʁaχ* has the attenuated meaning 'long-ish' (5). However, when the negative adjective *katsaʁ* 'short' is reduplicated, the result *ktsaʁ-tsaʁ* has the intensified meaning 'very short' instead (6).

(5)   a.   aʁoχ 'long'
          b.   aʁaχ-ʁaχ 'long-ish'

(6)   a.   katsaʁ 'short'
          b.   ktsaʁ-tsaʁ 'very short'

Thus, we see that the meanings diverge under reduplication: positive adjectives are attenuated, while their negative counterparts are intensified. This non-uniform effect is quite general and can be seen in several other pairs (7–14).[1]

(7)   a.   gadol 'big'
          b.   gdal-dal 'big-ish'

(8)   a.   katan 'small'
          b.   ktan-tan 'very small'

(9)   a.   χazak 'strong'
          b. %χazak-zak 'strong-ish'

(10)   a.   χalaʃ 'weak'
          b.   χalaʃ-luʃ 'very weak'

(11)   a.   ʃamen 'fat'
          b.   ʃman-man 'fat-ish'

(12)   a.   ʁaze 'thin'
          b.   ʁaz-ʁuz 'very thin'

(13)   a.   kaved 'heavy'
          b.   kvad-vad 'heavy-ish'

(14)   a.   kal 'light'
          b.   kal-il 'very light'

At first blush, it seems that the effect of reduplication is partially determined by the polarity of the adjective. Positive adjectives are attenuated under reduplication, while negative ones are intensified. However, this preliminary generalization is too limited, as there are certain adjectives which fall outside its scope. Consider the pairs in (15–20). In this class of pairs, reduplication uniformly attenuates, regardless of adjectival polarity.

(15)   a.   yaveʃ 'dry'
          b.   yevaʃ-vaʃ 'dry-ish'

(16)   a.   ʁatuv 'wet'
          b.   ʁetav-tav 'wet-ish'

(17)   a.   namuχ '(vertically)[2] short'
          b.   nemaχ-maχ 'short-ish'

(18)   (the word for vertical height
          lacks a reduplicated form)

---

[1]% indicates that the forms are judged marginal; nonetheless, speakers have strikingly clear and similar intuitions about their meanings, evincing that reduplication is a productive process.

[2]The distinction between *katsaʁ* and *namuχ* is not obvious. While it seems that *namuχ* can only refer to vertical measurement, *katsaʁ* varies with respect to the dimensions it can apply to.

(19) a. χam 'hot'   (20) a. kaʁ 'cold'
      b. χam-im 'hot-ish/warm'   b. kaʁ-iʁ 'cold-ish'

We end up with the following explicanda. First, what is the semantics involved so that the very same process of reduplication results in diverging outcomes in (7–14)? Second, why are certain antonymic pairs exempt from this semantics, so that reduplication instead results in converging outcomes in (15–20)? We will argue that the solution lies in positing two distinct classes of antonyms. These two classes differ in whether the negative polarity adjective is syntactically decomposable into a negation morpheme and its positive counterpart or not.

3.   Analysis

To explain the divergence pattern of the adjectives in (7–14), we adopt Büring's (2007) and Heim's (2008) idea that in each antonymic pair, one member decomposes into a negation morpheme applied to the other (21). Following Heim (2008), we will call this negation morpheme LITTLE and give it the semantics in (22), which is essentially that of negation over degree predicates (type $\langle dt \rangle$).[3]

   We further posit that the basic semantics of reduplication is that of an attenuation operator. We implement this notion as subtraction of a contextually-given degree (23). First, REDUP takes an implicit attenuation factor, a contextually saturated degree argument d'; it then modifies the degree predicate by subtracting the attenuation factor from its degree argument.[4]

(21) a. short = [LITTLE [long]]
      b. small = [LITTLE [big]]

(22) ⟦LITTLE⟧ = $\lambda A_{dt}.\lambda d_d . \neg Ad$

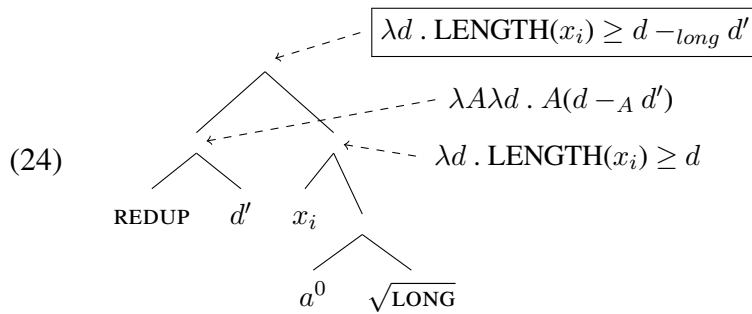(23) ⟦REDUP⟧ = $\lambda d'_d.\lambda A_{dt}.\lambda d_d. A(d -_A d')$

These definitions straightforwardly account for the attenuated meaning of the reduplicated positive adjectives, as illustrated below for aʁaχ-ʁaχ 'long-ish':

---

[3]For simplicity of exposition, we assume that adjectives are of type $\langle e, dt \rangle$ and that LITTLE (as well as the reduplication morpheme) attach above the e-type argument. This is not essential to our argument, however.
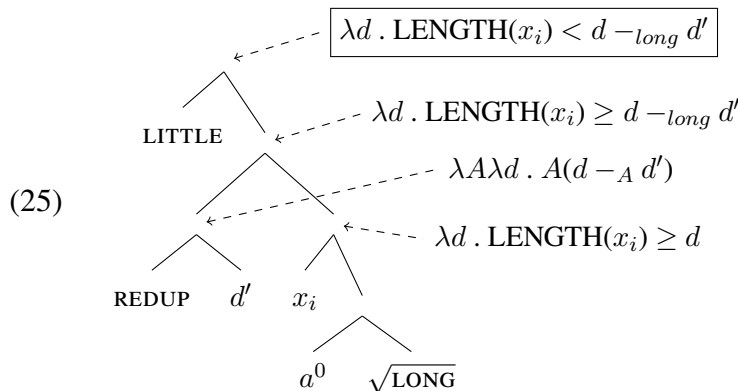
[4]We crucially presuppose that there is no default way to attenuate degrees independently of the ordered set they are extracted from. In our case, this means that the nature of the "direction" of the subtraction process in the meaning of REDUP depends on its prejacent degree predicate's monotonicity. More formally, let there be a scale S and a degree predicate A which applies to degrees on S. (For simplicity, we assume that degrees correspond to points on S, although this is not a crucial assumption.) We define a linear order $\leq_A: S \times S \to \mathbb{T}$ such that for any $d_1, d_2 \in S$ it holds that $d_1 \leq_A d_2$ iff for any $x \in D_e$, $A(d_1)(x) \to A(d_2)(x)$. We further assume that S comes with a metric $m : S \times S \to \mathbb{R}$ and that it contains a zero-point p_0. We then define:
   $d_1 +_A d_2 := \iota d(m(d_1, d) = m(d_2, p_0) \text{ \& } d_1 \leq_A d)$
   $d_1 -_A d_2 := \iota d(m(d_1, d) = m(d_2, p_0) \text{ \& } d \leq_A d_1)$

(24)

$$\lambda d . \text{LENGTH}(x_i) \geq d -_{long} d'$$

$$\lambda A \lambda d . A(d -_A d')$$

$$\lambda d . \text{LENGTH}(x_i) \geq d$$
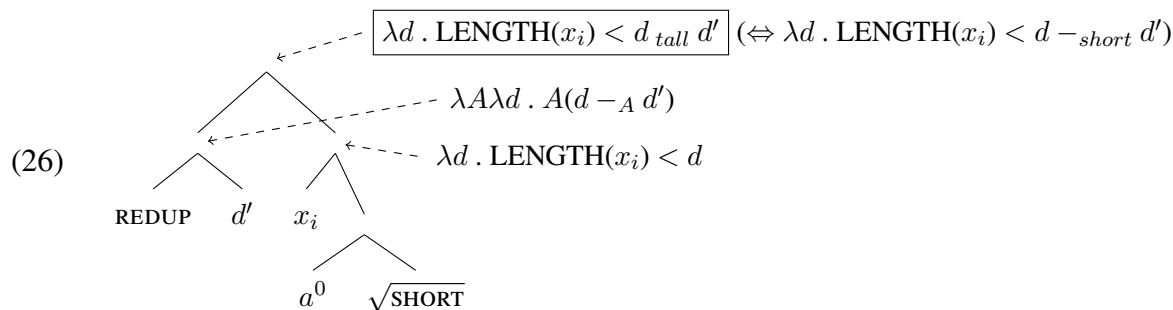
REDUP d' x_i

a^0 $\sqrt{\text{LONG}}$

The more interesting case is the one in which adjectives intensify under reduplication. To account for this effect, we posit that LITTLE takes scope over REDUP in the internal structure of the adjective, as shown below for *ktsaʁ-tsaʁ* 'very short' (25). Negating the attenuated, logically weaker, meaning that REDUP creates yields an intensified, logically stronger, meaning.

(25)

$$\lambda d . \text{LENGTH}(x_i) < d -_{long} d'$$

$$\lambda d . \text{LENGTH}(x_i) \geq d -_{long} d'$$

LITTLE

$$\lambda A \lambda d . A(d -_A d')$$

$$\lambda d . \text{LENGTH}(x_i) \geq d$$

REDUP d' x_i

a^0 $\sqrt{\text{LONG}}$

The mechanism we have presented thus far accounts for the adjectives in (5–14), i.e. the antonymic pairs in which the positive member attenuates under reduplication, while the negative one intensifies. We are left with the puzzle of the adjectives in (15–20), the pairs in which both members attenuate under reduplication. Since nothing seems to be different in the reduplication of those adjectives, we need to posit some inherent difference between the two classes of adjectives.

We suggest that the distinguishing factor lies in the availability of scoping REDUP below LITTLE. While in the negative members of the antonymic pairs in (5–14), LITTLE must be higher than REDUP, such a structure is not available in the negative members of the pairs in (15–20). We suggest that this is because LITTLE is absent from the structure of the negative adjectives in (15–20). This is demonstrated in (26), which represents the structure of *nemaχ-maχ* 'short-ish'. We therefore posit two classes of antonyms in Hebrew. We term the diverging antonymic pairs like the ones in (5–14) *true antonyms*, since their antonymy is structurally manifested. Conversely, we term the converging pairs like the ones in (15–20) *fake antonyms*.

(26)

$$\lambda d \, . \, \text{LENGTH}(x_i) < d \,_{tall} \, d' \quad (\Leftrightarrow \lambda d \, . \, \text{LENGTH}(x_i) < d -_{short} d')$$

$$\lambda A \lambda d \, . \, A(d -_A d')$$

$$\lambda d \, . \, \text{LENGTH}(x_i) < d$$

REDUP d' x_i

a^0 $\sqrt{\text{SHORT}}$

We find ourselves in a somewhat sad state of affairs. While our analysis accounts for the Hebrew reduplication data, it does so at a heavy cost. For the analysis to work we must resort to a stipulation according to which some adjectives in Hebrew decompose, while others do not, and even worse, our division between the two classes of adjectives is arbitrary. There does not seem to be a semantic difference between the adjectives in each class, as is illustrated by the fact that the two Hebrew for adjectives 'short' – *kat*saʁ and *namu*χ – fall into different classes. Luckily, this stipulation, when taken together with certain theories of comparative constructions, makes testable predictions and we turn to those next.

4.   Predictions

According to our analysis, reduplication in Hebrew is a diagnostic for antonym decomposition, in the sense that the meaning of a negative adjective under reduplication indicates whether it decomposes in the syntax or not. We therefore predict that adjectives which are non-decomposable according to this diagnostic will not be able to appear in any construction whose acceptability is contingent upon its adjectives decomposing. Two comparative constructions in particular – *Rullmann ambiguities* (Seuren 1979, Rullmann 1995, Heim 2006, Büring 2007b) and *cross-polar anomalies* (Kennedy 1999, Büring 2007a, Heim 2008) – have been argued to require decomposition of their adjectives. In what follows, we present decomposition analyses of each construction, adapted from Heim (2006, 2008), formulate the prediction that each analysis makes when paired with our account of Hebrew reduplication, and show that the predictions are in fact borne out.
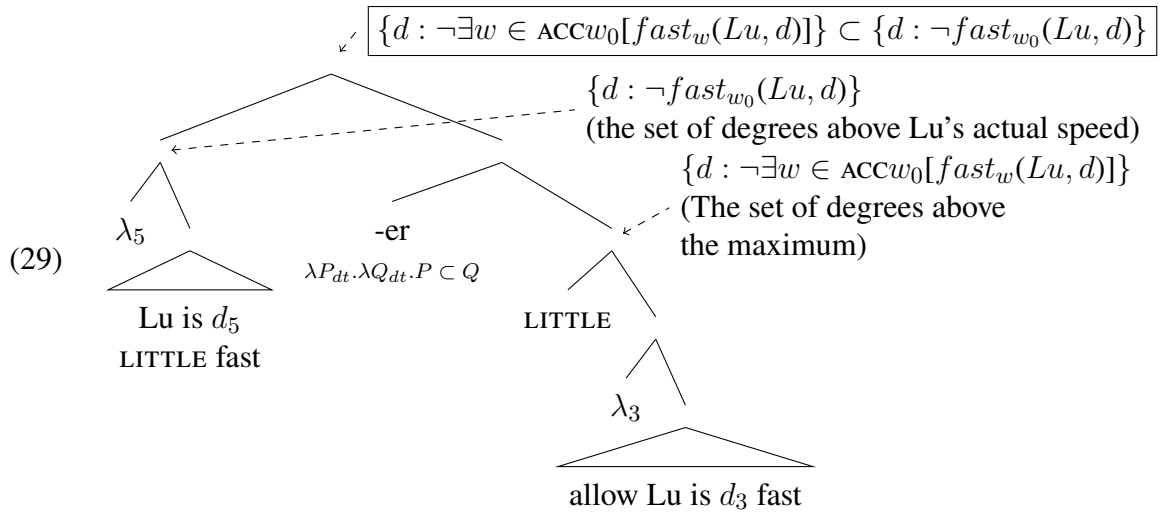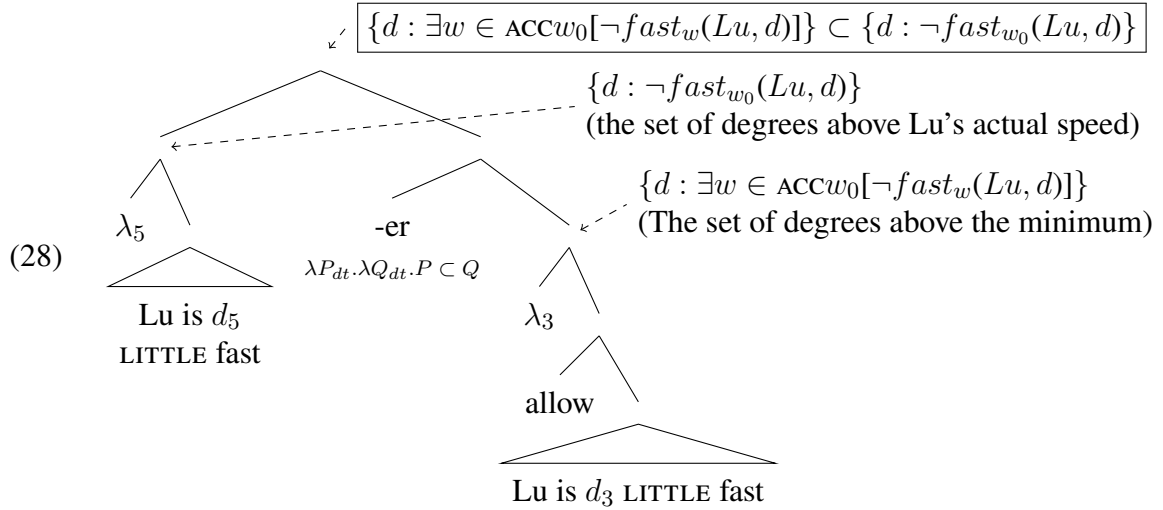
4.1   Rullmann Ambiguities

Seuren (1979) and Rullmann (1995) observe that examples like (27) are ambiguous in a context that places both an upper and a lower limit on speed. For instance, consider (27) in a context in which the law requires drivers to stay within the 35-85 mph limit. The two readings which we term *below-lower-limit* and *below-upper-limit* are specified below.

(27)   Lucinda is slower than she is allowed to be.

    a.   Reading #1: Lucinda's speed is impermissibly low.   *below-lower-limit*
    b.   Reading #2: Lucinda's speed is below the upper limit.   *below-upper-limit*

Heim (2006) argues that this ambiguity results from scopal interaction of a negation morpheme and the modal *allow*. Given that on the syntactic negation theory of antonymy, the adjective *slow* decomposes into LITTLE+*fast*, the adjective introduces a syntactically accessible negation morpheme. When *allow* scopes above that morpheme, we derive reading #1 (28). When it scopes below that morpheme, we derive reading #2 (29).

(28)

$$\{d : \exists w \in \text{ACC}w_0[\neg fast_w(Lu, d)]\} \subset \{d : \neg fast_{w_0}(Lu, d)\}$$

$\{d : \neg fast_{w_0}(Lu, d)\}$
(the set of degrees above Lu's actual speed)

$\{d : \exists w \in \text{ACC}w_0[\neg fast_w(Lu, d)]\}$
(The set of degrees above the minimum)

λ_5

-er
$\lambda P_{dt}.\lambda Q_{dt}.P \subset Q$

Lu is d_5
LITTLE fast

λ_3

allow

Lu is d_3 LITTLE fast

(29)

$$\{d : \neg \exists w \in \text{ACC}w_0[fast_w(Lu, d)]\} \subset \{d : \neg fast_{w_0}(Lu, d)\}$$

$\{d : \neg fast_{w_0}(Lu, d)\}$
(the set of degrees above Lu's actual speed)

$\{d : \neg \exists w \in \text{ACC}w_0[fast_w(Lu, d)]\}$
(The set of degrees above
the maximum)

λ_5

-er
$\lambda P_{dt}.\lambda Q_{dt}.P \subset Q$

Lu is d_5
LITTLE fast

LITTLE

λ_3

allow Lu is d_3 fast

Of course, this account requires a negation morpheme (i.e. LITTLE) that can scopally interact with the modal to be accessible at LF. If negation had not been accessible at LF (say, if negation was encoded in a negative adjective's lexical entry), the modal would not have been able to scope between negation and the adjective, and the LF in (29) would have been impossible to generate. Therefore, pairing this account with our theory of Hebrew reduplication predicts that a Rullmann sentence with an adjective that attenuates under reduplication (and is therefore non-decomposable), will lack the *below-upper-limit* reading.

We test the prediction by construing Rullmann sentences with the two Hebrew adjectives for 'short' – *kaʦsaʁ* ('short') and *namuχ* ('vertically short'). The former intensifies under reduplication (6) and is therefore decomposable, while the latter attenuates (17), and is therefore non-decomposable. Consider (30) in a context in which a certain amusement park ride is only open to people with heights between 130cm and 180cm.

(30)   Yael nemuχa joter mi-   ʃe-   mutaʁ   la   lihjot.
        Yael short.FSG more than- COMP- allowed for.her to.be
        'Yael is shorter than is she is allowed to be...
        ✓... she has to grow a little before she can go on the ride.'
        #... even if she was taller, she would still be able to go on the ride.'

As predicted, the sentence is unambiguous: it can only mean that Yael is too short to go on the ride. The reading that gives wide scope to LITTLE relative to the modal is unavailable. In (31), where the decomposable version of 'short' is used, we detect an ambiguity along the lines of (27). Consider this sentence under the assumption that to qualify for a certain short story competition, a story must be between two and five pages long.

(31)   ha- sipuʁ katsaʁ joteʁ mi-   ʃe-   mutaʁ   lo   lihjot.
        the- story short   more than- COMP- allowed for.it to.be
        'The story is shorter than it is allowed to be...
        ✓... you must add some text to qualify for the competition.'
        ✓... you can add some text and still qualify for the competition.'

Further cases that corroborate the prediction are provided in the appendix, but one case merits a separate discussion: Hebrew speakers differ in their interpretation of the reduplicated form of the adjective χadaʃ 'new'. For some, the form χadaʃ-daʃ means 'very new' and for others, 'new-ish' (32). Its opposite pair member yaʃan 'old' attenuates across the board (33).

(32) a. χadaʃ 'new'   (33) a. yaʃan 'old'
      b. χadaʃ-daʃ   b. yeʃan-ʃan 'old-ish'
          %'new-ish'/%'very new'

In this case, the predictions we make differ across speakers. Those who attribute an intensified meaning to χadaʃdaʃ are predicted to detect an ambiguity in a Rullmann sentence containing this adjective, while such sentences are predicted to be unambiguous for those who attribute an attenuated meaning. A small pool of consultants confirmed the prediction when presented with the sentence in (34), considered in the context of a literary competition for which a novel can qualify only if it was published between January 1 and December 31.

(34)   ha- sefeʁ ʃelaχ   χadaʃ joteʁ mi-   ʃe-   mutaʁ   lo   lihjot.
        the- book your.FSG new   more than- COMP- allowed for.it to.be

'Your book is newer than it is allowed to be...
✓... it does not qualify for the competition.'
%... even if it were published earlier, it would still qualify for the competition.'

Of five native speakers, two attributed χadaʃdaʃ an intensified meaning and detected an ambiguity, while three attributed an attenuated meaning and failed to detect an ambiguity.

4.2 Cross-polar anomalies

As discussed by Kennedy (1999, 2001, *a.o.*), the polarity of an adjective plays a role in the wellformedness of subcomparatives. For instance, while the subcomparatives in (35a–b) are well-formed, the one in (35c) is deviant. To account for this deviance, Kennedy conceptualizes degrees as intervals in a way that distinguishes between two kinds: positive degrees, which extend from the scalar origin to a certain point on the scale, and negative degrees, which extend from some point on the scale to infinity (cf. Solt 2015). The details are tangential to the discussion below. What does matter, though, is that this conceptualization results in cases like (35c) giving rise to contradictory truth conditions. We describe the generalization that emerges in (36).
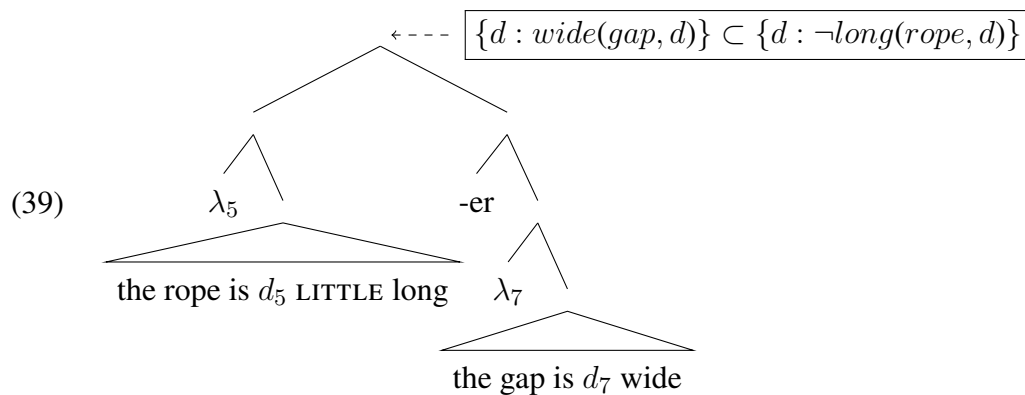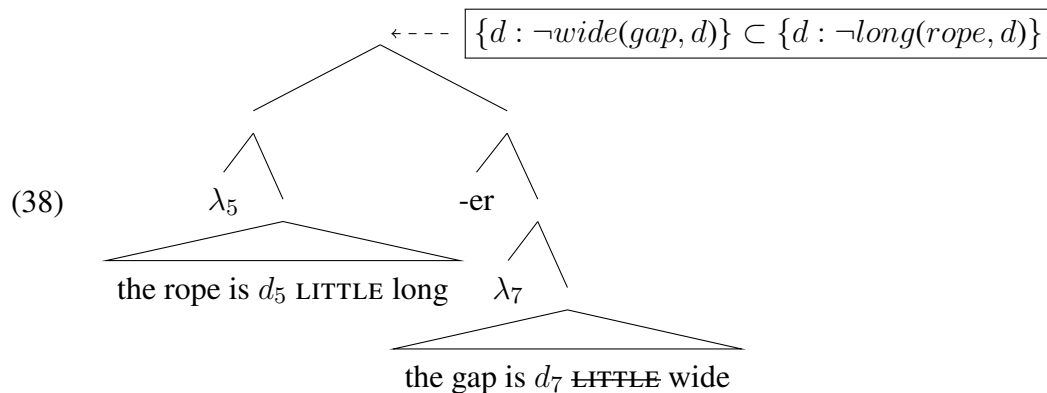
(35)   a.   The rope is <u>long</u>er than the gap is <u>wide</u>.   POS-POS
         b.   The rope is <u>short</u>er than the gap is <u>narrow</u>.   NEG-NEG
         c.   *The rope is <u>long</u>er than the gap is <u>narrow</u>.   *POS-NEG

(36)   *Generalization for comparatives:* Comparatives are ill-formed if they compare degrees of different kinds.

However, this account undergenerates cases like (37), which also seems to involve comparison between negative and positive degrees, yet is judged as well-formed (Büring 2007a).

(37)   The rope is <u>short</u>er than the gap is <u>wide</u>.   ✓NEG-POS

This need not be taken as an indication that (36) is wrong, though. Heim (2008) proposes that NEG-POS subcomparatives spell out two distinct LFs; one conforms to (36), while the other does not. In its well-formed LF (38), the adjective in the *than*-clause of (37) only appears to be positive because the LITTLE morpheme that accompanies it is elided. Ellipsis is licensed by the presence of a LITTLE morpheme in the matrix clause, whose decomposable negative adjective can provide a suitable antecedent. The sentence is thus not anomalous at all; it is just a run-of-the-mill NEG-NEG subcomparative.

On its ill-formed LF (39), the sentence is a genuine NEG-POS subcomparative. It compares the degree to which the gap is wide with the degree to which the rope is *not* long, claiming that the former is a proper subset of the latter. But the former is a positive degree (the interval $(0, x]$), while the latter is a negative degree (the interval (y, ∞)), and the LF therefore gives rise to contradictory truth conditions.

(38)

$$\{d : \neg wide(gap, d)\} \subset \{d : \neg long(rope, d)\}$$

λ_5 the rope is d_5 LITTLE long -er λ_7 the gap is d_7 ~~LITTLE~~ wide

(39)

$$\{d : wide(gap, d)\} \subset \{d : \neg long(rope, d)\}$$

λ_5 the rope is d_5 LITTLE long -er λ_7 the gap is d_7 wide

If Heim's account is correct, NEG-POS subcomparatives in Hebrew should *only* have the ill-formed LF if the negative adjective in their matrix clause does not decompose. In that case, there is no suitable antecedent to license ellipsis of LITTLE in the *than*-clause, resulting in a genuine anomaly. Again, we use Hebrew's adjectives for 'short' to illustrate that the prediction is borne out. Compare the following sentences, uttered in a context in which Dina is stuck in a pit, and attempts are being made to help her out. The first subcomparative, with the non-decomposable adjective in its matrix clause, is deviant. The second one, whose matrix adjective is decomposable, is felicitous.

(40)   *Dina nemuχa joteʁ me- ʃe-   ha- boʁ amok.
       Dina short.FSG more than- COMP- the- pit deep
       Intended: 'Dina is shorter than the pit is deep.'

(41)   ha- χevel katsaʁ joteʁ me- ʃe-   ha- boʁ amok.
       the- rope short more than- COMP- the- pit deep
       'The rope is shorter than the pit is deep.'

We use the utterance in (42) to illustrate that the deviance in (40) is not due to the specific antonymic pair to which the matrix adjective belongs. When we use the positive counterpart of *namuχ*, *gavoha* ('tall'), the subcomparative becomes acceptable.

(42) Dina gvoha joteʁ me- ʃe- ha- boʁ amok.
     Dina tall.FSG more than- COMP- the- pit deep
     'Dina is taller than the pit is deep.'

5.   Implications for theories of evaluativity

Many theories of evaluativity in natural language derive evaluative inferences by appealing to competition between marked and unmarked forms of adjectives: adjectives that give rise to evaluative inferences are assumed to be more marked than adjectives that do not (Rett 2008, 2015; Lassiter & Goodman 2013; Moracchini 2019; Bumford & Rett 2020). Recent work by Moracchini (2019) proposes that we can reduce the notion of markedness in the adjectival domain to the notion of structural complexity, as long as we adopt the syntactic negation theory of antonymy, in which the structure of one pair member is by definition properly contained in the structure of the other. According to the conventional definition, a construction is *evaluative* if it implies that some degree exceeds a contextual standard (Rett 2015). For instance, degree questions with a negative adjective are evaluative (43), while degree questions with a positive one are not (44).

(43)   How short is Jane?   ⤳ *Jane's height exceeds a contextual standard of shortness*

(44)   How tall is Jane?   ⤳̸ *Jane's height exceeds a contextual standard of tallness*

A number of constructions give rise to evaluativity, with the apparent generalization that within each antonymic pair, the negative member yields evaluative inferences across all constructions, while the positive member does not. We will now briefly illustrate how an appeal to markedness is used to account for these inferences across theories of evaluativity.

Rett's (2008) *markedness competition account* assumes negative adjectives are marked relative to their positive counterparts, and introduces a silent operator that contributes evaluativity. The degree questions above are equally informative, and so, the non-evaluative parse of the question with the negative adjective is barred due to a general principle disallowing the marked construction when an unmarked, equally informative construction is available. Rett's (2015) *manner implicature account* derives evaluative inferences as a manner implicature via a pragmatic principle that associates marked meanings with marked forms. A more recent game-theoretic account, the *Rational Speech Act account* (Lassiter & Goodman 2013, Bumford & Rett 2020) models evaluative inferences as implicatures arrived at when a listener is required to resolve the vagueness introduced by gradable adjectives.

What is relevant for our discussion here is that the assumption that negative adjectives are marked relative to positive ones is common to all accounts. This is required, because all accounts derive evaluative inferences by way of competition between truth-conditionally equivalent alternatives, one of which is marked while the other is not. Yet this markedness is often assumed as a primitive, rather than derived. Moracchini (2019), on the other hand, attempts to cash out the notion of "markedness" in terms of structural complexity. She assumes that negative adjectives are syntactically decomposable into a negation morpheme

and their positive counterpart, similarly to what we assume for our "true" antonyms, and are therefore more structurally complex.

Given our hybrid account of Hebrew adjectives, Moracchini's account predicts that Hebrew adjectives would diverge with respect to evaluativity along the lines of the other phenomena we have examined. In other words, it predicts that "true" negative adjectives would give rise to evaluative inferences, while "fake" ones would not. While many of the constructions that are evaluative in English, e.g. (43–44), are marginal or yield fuzzy judgements in Hebrew, one construction in particular seems to yield judgements which are fairly sharp. As illustrated in (45–46), it is clear that both "true" and "fake" antonyms give rise to the same evaluativity pattern.

(45)   a.   ha- χevel paχot aroχ me- ha- makel.
            the- rope less   long than- the- stick
            'The rope is less long than the stick.'   ↛ *The rope is long*

       b.   ha- χevel paχot katsar me- ha- makel.
            the- rope less   short than- the- stick
            'The rope is less short than the stick.'   ↝ *The rope is short*

(46)   a.   Dana paχot gvoha mi- Rina.
            Dana less   tall than- Rina
            'Dana is less tall than Rina.'   ↛ *Dana is tall*

       b.   Dana paχot nemuχa mi- Rina.
            Dana less   short than- Rina
            'Dana is less short than Rina.'   ↝ *Dana is short*

If (45–46) indeed represent the general case, then the predictions of our account, coupled with Moracchini (2019), are wrong. *Prima facie*, that suggests that Moracchini's account is not compatible with ours. But there might be a way to reconcile the two accounts. In Section 3, we assumed, somewhat arbitrarily, that the inavailability of scoping LITTLE above REDUP in "fake" negative adjectives stems from the fact that they lack LITTLE altogether. However, we could have also assumed that while "fake" adjectives do contain LITTLE in their structure, some independent syntactic property prevents LITTLE from scoping above REDUP. But more must be said in order to make our account more compatible with Moracchini (2019). In particular, if negative members of "fake" antonymic pairs also contain a LITTLE morpheme, we must explain what prevents it from constituting a suitable antecedent for ellipsis in the case of cross-polar anomalies. We leave this for future research.

6.   Conclusion

The behavior of Hebrew adjectives under reduplication led us to the hypothesis that Hebrew has two classes of antonymic pairs. "True" antonyms are those whose meanings diverge under reduplication; we claim that their members are *structurally* distinguished by the absence or presence of LITTLE. "Fake" antonyms are those whose meanings converge

under reduplication; we claim that their members are only *lexically* distinguished. While the division of antonyms into two classes seemed initially arbitrary, we have shown that this division is supported by a diverse set of linguistic phenomena. Specifically, it yields correct predictions with respect to two ostensibly unrelated comparative constructions – Rullmann ambiguities and cross-polar anomalies. The presence of LITTLE has been analyzed independently as a crucial factor for the felicity of those constructions in certain contexts, either by allowing scopal interaction between LITTLE and a modal (in the case of Rullmann ambiguities), or functioning as an antecedent for ellipsis in the *than*-clause (in the case of cross-polar anomalies). We showed that only "true" antonyms, whose negative members decompose into a LITTLE morpheme accessible at LF, may appear felicitously in these constructions, to the exclusion of "fake" ones.

Our conclusion is that Hebrew contains two kinds of antonymic pairs—ones that are structurally connected to each other by the presence of an antonymy morpheme, and ones that are connected to each other only by their semantics. If this conclusion is correct, it hints at the possibility that other languages might show similar division of their antonyms into two classes. While we leave that hypothesis for future research, we believe that our hybrid account sheds new light on the general representation of antonyms.

7.   Appendix: Rullmann sentences with Hebrew adjectives

- Context: Dan organizes wild parties and wants his guests to be drunk enough to have fun, but not drunk enough to require medical attention. He therefore decides to only serve drinks with at least 6% alcohol, but with no more than 20%.

(47)   ha- maʃke χalaʃ joteʁ mi- ʃe-   mutaʁ lo   lihjot.
        the- drink weak more than- COMP- allowed for.it to.be
        'The drink is weaker than it is allowed to be...
        ✓... you must add some alcohol to serve it at the party.'
        ✓... you can add even more alcohol and still be able to serve it at the party.'

- Context: Major League Baseball bats are required to weigh between 2 and 3.4 pounds.

(48)   ha- maχbet kal joteʁ mi- ʃe-   mutaʁ lo   lihjot.
        the- bat   light more than- COMP- allowed for.it to.be
        'The bat is lighter than it is allowed to be...
        ✓... we cannot use it in the match tonight.'
        ✓... even a slightly heavier one would qualify for the match tonight.'

- Context: The temperature of a refrigerator must be between 0 and 4 Celsius. Anything more than 4C will spoil the food, while anything less than 0C will freeze it.

(49)   ha- mekaʁeʁ   kaʁ joteʁ mi- ʃe-   mutaʁ lo   lihjot.
       the- refrigerator cold more than- COMP- allowed for.it to.be
       'The refrigerator is colder than it is allowed to be...
       ✓... we must raise its temperature before we store our food.'
       #... we can store our food in it without it freezing.'

References

Bumford, D. and Rett, J. (August 2020). Rationalizing evaluativity. UCLA.

Büring, D. (2007a). Cross-polar nomalies. In *Semantics and Linguistic Theory*, volume 17, pages 37–52.

Büring, D. (2007b). More or less. In *Proceedings from the annual meeting of the Chicago Linguistic Society*, volume 43, pages 3–17. Chicago Linguistic Society.

Heim, I. (2006). *Little*. In Gibson, M. and Howell, J., editors, *Proceedings of SALT 16*, pages 35–58.

Heim, I. (2008). Decomposing antonyms? In *Proceedings of Sinn und Bedeutung*, volume 12, pages 212–225.

Kennedy, C. (1999). *Projecting the adjective: The syntax and semantics of gradability and comparison*. Routledge.

Kennedy, C. (2001). Polar opposition and the ontology of 'degrees'. *Linguistics and Philosophy*, 24(1):33–70.

Lassiter, D. and Goodman, N. (2013). Context, scale structure, and statistics in the interpretation of positive-form adjectives. In *Semantics and Linguistic Theory*, volume 23, pages 587–610.

Moracchini, S. (2019). *Morphosyntax and semantics of degree constructions*. PhD thesis, Massachusetts Institute of Technology.

Rett, J. (2008). A degree account of exclamatives. In *Semantics and Linguistic Theory*, volume 18, pages 601–618.

Rett, J. (2015). Measure phrase equatives and modified numerals. *Journal of Semantics*, 32(3):425–475.

Rullmann, H. (1995). *Maximality in the semantics of wh-constructions*. PhD thesis, University of Massachusetts at Amherst.

Seuren, P. (1979). Meer over minder dan hoeft. *Nieuwe (De) Taalgids Groningen*, 72(3):236–239.

Solt, S. (2015). Measurement scales in natural language. In *Language and Linguistics Compass*, volume 9, pages 14–32.

Ido Benbaji, Omri Doron, and Ruoan Wang
ibenbaji@mit.edu, omrid@mit.edu, rmwang@mit.edu