

# Determiner vs. adjectival numerals and nominal number

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## 1 Two types of numerals and restrictions on nominal number

Borer (2005): ch. 7 notes that cardinal numeral ‘one’ in Hebrew has different syntax than the rest of the cardinal numerals. It alone appears post-nominally and shows robust gender agreement, properties it shares with adjectives, and it alone combines with singular-marked nouns. The other cardinal numerals are determiner-like in that they appear pre-nominally and lack strict gender agreement, and they all combine with plural-marked nouns. The chapter, entitled “*One* is the loneliest number”, discusses the significance of these facts for the morpho-syntax of numerically-quantified noun phrases in Hebrew and several other languages. Of particular interest for us here is the link between nominal number and the adjectival vs. determiner status of numerals in a cross-linguistic perspective.

Borer (2005) provides an explanation (to be elaborated on in §2) of why in Hebrew determiner numerals are incompatible with singular-marked nouns and can only combine with plural-marked nouns. On her account, it follows that ‘one’ could not be a determiner and still combine with singular-marked nouns. There is a work-around: because ‘one’ in Hebrew is an adjectival modifier rather than a determiner, it evades the problem that determiner numerals encounter, and can combine with singular-marked nouns.

Borer’s conclusions about the link between nominal number and the syntax of numerals are further reinforced by the behavior of numeral ‘two’ in Hebrew and in Arabic. Although Hebrew has dual-marking, ‘two’ may not combine with dual-marked nouns, but only with plural-marked ones (Borer 2005: 208-210). ‘Two’ is also not adjectival: it appears pre-nominally, as a determiner, rather than post-nominally, and allows for variation in gender agreement. Being a determiner, it is incompatible with dual number, for the same reason that it, and the other numerals apart from ‘one’, are incompatible with singular number. In Standard (and Lebanese) Arabic, on the other hand, numeral ‘two’ is adjectival and it combines with dual-marked nouns, just like adjectival ‘one’ in the language combines with singular-marked nouns (Ouwayda 2014: §1.3.3). Thus, both ‘one’ and ‘two’ in Arabic are exceptional: they alone are adjectives, and this allows them to combine with non-plural marked nouns, singular- and dual-marked, respectively. Borer’s (2005) generalization in (1) is thus maintained.

- (1) Only adjectival numerals are compatible with singular and dual nominal number.

Yet Arabic also poses a question to this generalization. While numerals ‘three’ to ‘ten’ combine with plural nouns, numerals ‘eleven’ and up<sup>1</sup> combine with what appear to be singular-marked nouns (Ouwayda 2014, 2017, a.o.). However, these trans-decimal numerals are not adjectival, unlike ‘one’ and ‘two’. In §3 we discuss the issues that arise with the attempt to fit trans-decimal determiner numerals within the view outlined so far, leading us to consider another perspective on the link between (un)exceptional

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\* I have had the great fortune of being Hagit’s colleague at USC for 11 years. Along the way she became a role model, an unofficial mentor, and a friend. I cannot even begin to express how much I have learned from her, and not just about linguistics. Thank you, Hagit!

<sup>1</sup>The numerals themselves are not ordered, the numbers at their core are.

numerals and nominal number. Like Borer (2005), Schwarzschild (2006) also arrives at the conclusion that determiner numerals may not combine with singular-marked nouns, but he does so on the basis of different premises that are semantic in nature (to be elaborated on in §4). He too suggests that it is the adjectival syntax of ‘one’ in Hebrew that allows it to combine with singular-marked nouns, and his analysis also predicts the facts of Hebrew and Arabic numeral ‘two’ and its (in)compatibility with dual number. However, trans-decimal numerals in Arabic present a problem for this semantic account as well.

What then are we to make of the link between the determiner vs. adjectival syntax of numerals and nominal number that Borer (2005) identifies? I suggest that an analysis, developed for Bulgarian in Pancheva (2018, 2021) (described in §5.1), is applicable more broadly and can account for the observed differences, with respect to nominal number, between determiner and adjectival numerals on the one hand, and between determiner numerals within and across languages on the other. I suggest that determiner numerals are able to combine with singular-marked nouns in principle, and restrictions on such combinations in some languages result from the inventory of the measure expressions that are available as linkers between determiner numerals and nouns (as further elaborated on in §5.2). Thus, in line with the spirit of Borer (2005), the syntax of determiner numerals determines their compatibility with nominal number. And as for exceptional numerals, in §5.3 I show that ‘one’ must be adjectival, even in languages that allow (some or all) determiner numerals to combine with singular-marked nouns. It is indeed “the loneliest number” (Borer 2005). ‘Two’, on the other hand, need not be exceptional: as a determiner, it may combine with singular- or plural-marked nouns. But ‘two’ should be able to combine with dual-marked nouns only if it is adjectival, as also predicted by Borer (2005). We thus arrive at a system that captures the essence of Borer’s (2005) empirical generalization and theoretical explanation, links it to Schwarzschild’s (2006) semantic constraint, and also accounts for variation within and across several types of languages.

## 2 Borer (2005) on numerically-quantified noun phrases

Put in the most general terms, and side-stepping many otherwise important details of Borer’s system, two aspects of her analysis are of particular relevance for the link between the syntax of numerals and nominal number. First, singular and dual number are possible values of a Number (#) functional head in the extended nominal structure, while plural is not; instead plural inflection instantiates a lower, Division (DIV) functional head, responsible for the creation of count nominals. The schematic structure can be seen in (2). The singular and dual morphemes are first merged in DIV, and then in #; the plural morpheme is only suitable for DIV. Even though they surface in different syntactic positions, singular/dual and plural do not co-occur, because singular and dual value both DIV and #.

- (2) a. [DP D [#P #<sub>[SG/DUAL]</sub> [DivP DIV<sub>[SG/ÐUAT]</sub> [NP N ]]]  
 b. [DP D [#P # [DivP DIV<sub>[PL]</sub> [NP N ]]]

Second, determiner and adjectival numerals have different syntax. Determiner numerals surface in #, as heads or specifiers, and they too assign value to #. This makes them incompatible with singular and dual number, (3a). On the other hand, no issue arises with respect to the co-occurrence of numerals and plural marking, given that the latter instantiates the lower head DIV, (3b). Adjectival numerals appear lower than #, and so they can co-occur with singular or dual number, (3c).

- (3) a. \* [DP D [#P numeral<sub>det</sub> #<sub>[SG/DUAL]</sub> [DivP DIV<sub>[SG/ÐUAT]</sub> [NP N ]]]  
 b. [DP D [#P numeral<sub>det</sub> # [DivP DIV<sub>[PL]</sub> [NP N ]]]  
 c. [DP D [#P #<sub>[SG/DUAL]</sub> [DivP DIV<sub>[SG/ÐUAT]</sub> [NP numeral<sub>adj</sub> [NP N ]]]]

This account explains the exceptional status of ‘one’ and the fact that ‘two’ cannot combine with dual number in Hebrew. We illustrate this next, with examples from Borer (2005).





- (12) a. [DP D [#P ‘forty’ # [DivP N-DIV<sub>[CL]</sub> [NP N ]]]]  
 b. [DP D [#P ‘four’ # [DivP N-DIV<sub>[PL]</sub> [NP N ]]]]

The analysis of nouns, quantified by trans-decimal numerals in Arabic, as not being marked for number is similar to the account put forth in Borer (2005): 116-117 about Hungarian.

One question that arises for Arabic in particular, however, is why the structure in (12a) is not available for numerals ‘one’ and ‘two’. As we saw, Hungarian ‘one’ can appear in such a structure, (10b). For Hebrew ‘one’ it could be argued that the structure with a null classifier in DIV is simply not available in the language, but Arabic is claimed to have this structure. The answer for Arabic then must be that ‘one’ and ‘two’ are independently adjectival and that, indeed, they could have been determiners just as well, and could have combined with number-less nouns that on the surface look like they are singular-marked.

Another question concerns interpretation. Ouwayda (2014, 2017) suggests that all nouns that combine with determiner numerals, whether they are made count by a classifier as in (12a) or by plural-marking as in (12b) are interpreted as predicates of atomic individuals. Semantic plurality, when present, is contributed independently of the nominal inflection. Furthermore, singular-marked count nouns, with which adjectival numerals combine, also denote predicates of atomic individuals. This means that the link between determiner vs. adjectival status of numerals and nominal number morphology must be a purely syntactic one. ‘One’ is an adjectival modifier combining with singular-marked nouns, ‘four’ is a determiner combining with plural-marked nouns, and ‘forty’ is a determiner combining with number-less nouns, but in all these cases, the nouns are interpreted identically, as predicates of atomic individuals. Clearly, the number semantics of the nouns that numerals, whether adjectival or determiner, combine with, does not play a decisive role on this account.

These questions lead us to consider an alternative explanation for the link between the determiner vs. adjectival status of numerals and nominal number, which is semantically motivated. As we will eventually see, insights from both syntax and semantics are needed to account for the cross-linguistic facts.

## 4 Schwarzschild (2006)’s Monotonicity Constraint

Schwarzschild (2006) shows that the interpretation of several different kinds of measure expressions varies systematically with their structural position within the nominal phrase. The pseudo-partitive measure phrase in (13a) describes the total weight of the plurality of cherries, while the attributive measure phrase in (13b) describes the weight of individual cherries. Q(antity)-‘adjectives’ like *much* have pseudo-partitive syntax and differ interpretation-wise from (at least some) attributive lexical adjectives in much the same way, as seen in (14a)-(14b).

- (13) a. two pounds of cherries *total weight*  
 b. two-pound cherries *weight per unit*
- (14) a. too much paper *total weight*  
 b. heavy paper *weight per unit*

Schwarzschild (2006) suggests that the regulated property of the dimension of measurement – here weight – is (non-) monotonicity on the part-whole relation in the domain given by the noun phrase: total weight monotonically increases/decreases with quantity, whereas weight per unit does not. Thus, it can be said that the pseudo-partitive structure imposes a monotonic interpretation on the measure function expressed by the measure expression, while the attributive structure is compatible with a non-monotonic interpretation. Schwarzschild (2006) in fact proposes a stronger non-monotonic requirement on attributive measure expressions, but in McKinney-Bock & Pancheva (2019) we demonstrate that such expressions

are compatible with both monotonic and non-monotonic interpretations. For instance, both the pseudo-partitive Q-adjective *many* and the attributive adjective *numerous* are interpreted with respect to total cardinality, (15). The monotonicity constraint is thus a constraint on pseudo-partitive structures, and attributive adjectives are not regulated by it.

- |      |                      |                     |
|------|----------------------|---------------------|
| (15) | a. many cherries     | <i>total number</i> |
|      | b. numerous cherries | <i>total number</i> |

Of particular relevance for us here is that the pseudo-partitive vs. attributive syntax of measure expressions imposes restrictions on nominal number. Schwarzschild (2006) notes that pseudo-partitive measure phrases are prohibited with singular count nouns and allowed with plural nouns, with a collective interpretation, as illustrated in (16). On the other hand, attributive measure phrases are compatible with both singular-marked nouns and plural marked nouns, (17).

- |      |                                |  |                           |
|------|--------------------------------|--|---------------------------|
| (16) | a. * two pounds of coffee bean |  | c. two pounds of coffees  |
|      | b. * two pages of poem         |  | d. two pages of poems     |
| (17) | a. a two-pound coffee bean     |  | c. two-pound coffee beans |
|      | b. a two-page poem             |  | d. two-page poems         |

The link with number marking follows from the monotonicity constraint on pseudo-partitive structures. Singular-marked count nouns denote predicates of atomic individuals and so do not have the requisite part-whole structure to satisfy the requirement that pseudo-partitive measure expressions be interpreted monotonically. Plural-marked nouns do have the needed part-whole structure, assuming they denote predicates of atoms and their sums<sup>5</sup>, and when interpreted collectively, they can meet the monotonicity requirement. The co-occurrence restrictions on pseudo-partitive measure expressions and nominal number in (16) are thus explained. Attributive measure expressions, on the other hand, need not be interpreted monotonically, and so they are compatible with singular-marked nouns denoting predicates of atoms, and also with plural-marked nouns, denoting predicates of atoms and their sums. The facts of (17) follow.

Schwarzschild (2006)'s generalizations have a direct consequence for the link between the syntax of numerals and nominal number. Determiner numerals pattern with pseudo-partitive measure phrases and Q-adjectives, as can be seen in (18), except that determiner numerals, like Q-adjectives, do not appear with an overt pseudo-partitive *of* in English.

- |      |  |
|------|--|
| (18) | a. two pounds of two-pound/heavy cherries. |
|      | b. many two-pound/heavy cherries.          |
|      | c. two two-pound/heavy cherries.           |

Given their pseudo-partitive syntax, the monotonicity constraint requires determiner numerals to combine with semantically plural nouns. Only adjectival numerals, given their attributive syntax, should be able to combine with semantically singular nouns, i.e., with predicates of atoms. This prediction is indeed met in Hebrew, as Schwarzschild (2006) notes. He does not discuss dual number, but his analysis would predict the facts of Hebrew and Arabic numeral 'two' and its (in)compatibility with dual number, on the assumption that dual-marked nouns denote predicates that are true of pairs of atoms. Like singular-marked nouns, dual-marked nouns do not have the needed part-whole structure to satisfy the monotonicity requirement, and so they should be incompatible with determiner numerals, as verified by Hebrew, and

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<sup>5</sup>This is the meaning of an 'inclusive' plural; 'exclusive' plurals denote predicates of sums. See Bale et al. (2011); Bale & Khanjian (2014), Martí (2020), a.o., for discussion of this issue in the context of numerals.

compatible with adjectival numerals, as verified by Arabic. We thus arrive at the generalization established by Borer (2005), in (1), from a different direction, thus providing independent support for it.

But Arabic trans-decimal numerals continue to be problematic. Even if the nouns that they combine with are morpho-syntactically number-less, rather than singular-marked, if they denote predicates of atomic individuals, as argued by Ouwayda (2014, 2017), the monotonicity constraint would be violated.

## 5 A role for measure expressions linking determiner numerals and nouns

Arabic numerals in particular highlight the need for a more nuanced generalization about the restrictions on nominal number imposed by determiner numerals. I suggest that determiner numerals are able to combine with singular-marked nouns in principle, and prohibitions on such combinations in some languages have a syntactic basis. Where singular-marked nouns are permitted, a violation of the monotonicity constraint is avoided, because the noun (or more precisely, its extended projection, a Number Phrase) first combines with a null measure expression, which effectively pluralizes it before it combines with the numeral. The idea of a dedicated functional head linking numerals and nouns (in languages without obligatory classifiers) is common (e.g. Hackl 2000, Martí 2020, Scontras 2022; see Bylina & Nouwen 2020 for a recent overview); the key idea here is that there are two such null measure expressions: one, MEAS<sub>1</sub>, combines with plural-marked nouns, interpreted as predicates of atoms and their sums, the other, MEAS<sub>2</sub>, combines with singular-marked nouns, interpreted as predicates of atoms. Languages differ as to whether they have MEAS<sub>1</sub>, MEAS<sub>2</sub> or both. Languages where MEAS<sub>2</sub> is available allow singular-marked nouns in structures with determiner numerals, and languages that only have MEAS<sub>1</sub> do not.

### 5.1 Two measure expressions in a gender-split system

The idea that two null measure expressions are responsible for variation in nominal number was first suggested in Pancheva (2018, 2021). This idea was key for the analysis of a gender-based split in nominal marking in numerically-quantified structures in Bulgarian. Like Arabic, Bulgarian has both singular- and plural-marked nouns combining with determiner numerals, but variation is not with respect to the numeral but with respect to the gender of the noun. Masculine nouns in combination with determiner numerals are accusative and singular.<sup>6</sup> Feminine and neuter nouns are plural, in combination with the same determiner numerals. Numeral ‘one’ alone agrees in gender (and also has a plural form, meaning ‘some’), similarly to adjectives, and it always combines with singular-marked nouns, irrespective of gender. The patterns are illustrated in (19)-(20) with a masculine and a feminine noun, respectively.

- |      |    |          |           |    |                   |    |           |           |
|------|----|----------|-----------|----|-------------------|----|-----------|-----------|
| (19) | a. | edin     | korab     | b. | deset korab-a     | c. | mnogo     | korab-i   |
|      |    | one.M.SG | ship.M.SG |    | ten ship.M-ACC.SG |    | many/much | ship.M-PL |
| (20) | a. | edna     | lodk-a    | b. | deset lodk-i      | c. | mnogo     | lodk-i    |
|      |    | one.F.SG | boat.F-SG |    | ten boat.F-PL     |    | many/much | boat.F-PL |

The analysis of the Bulgarian gender split in Pancheva (2021) posits two null measure expressions, MEAS<sub>1</sub> and MEAS<sub>2</sub>, each of which combines with a predicate, *P*, (the denotation of the Number Phrase

<sup>6</sup>The nominal morphology is not transparently singular, and traditionally, it is considered a type of plural. See Pancheva (2021) for several arguments in support of the singular analysis. Here we reproduce one argument: the singulative suffix *-in* must be omitted in plural nouns, but it is retained in structures with numerals:

- |     |    |          |              |    |                         |    |           |              |
|-----|----|----------|--------------|----|-------------------------|----|-----------|--------------|
| (i) | a. | edin     | graždan-in   | b. | deset graždan-in-a      | c. | mnogo     | graždan-i    |
|     |    | one.M.SG | citizen-M.SG |    | ten citizen-M.SG-ACC.SG |    | many/much | citizen-M.PL |

in the extended projection of the noun), and a number,  $n$ , (the denotation of the determiner numeral) and returns a predicate of individuals whose cardinality is  $n$ , (21). The two MEAS functional heads differ in whether they introduce a pluralizing operator (the  $*$  of Link 1983), which, when it combines with a predicate of atomic individuals, returns a predicate of atoms and their sums (a weak plural). MEAS<sub>1</sub> doesn't, and so in order to meet the monotonicity requirement of Schwarzschild (2006), it needs to combine with an already semantically plural predicate. MEAS<sub>2</sub> combines with predicates of atomic individuals, and weakly pluralizes them, via the  $*$  operator, making them suitable for combination with determiner numerals, and satisfying the monotonicity constraint.

- (21) a.  $\llbracket \text{MEAS}_1 \rrbracket = \lambda P \lambda n \lambda x. P(x) \ \& \ |x| = n$   
 b.  $\llbracket \text{MEAS}_2 \rrbracket = \lambda P \lambda n \lambda x. *P(x) \ \& \ |x| = n$

MEAS<sub>1</sub> has no morpho-syntactic selectional restrictions with respect to its nominal argument; for the semantic reasons just outlined, it suitably combines only with plural-marked nouns, (22a). MEAS<sub>2</sub>, as in (22b), selects for masculine nouns, (23), (and licenses accusative case); it also imposes a semantic requirement of atomicity on its nominal argument.<sup>7</sup>

- (22) a. ...  $[\text{MeasP numeral}_{det} \text{ MEAS}_1 \text{ [NumP Num}_{[PL]} \text{ [ NP ]}]$   
 b. ...  $[\text{MeasP numeral}_{det} \text{ MEAS}_2 \text{ [NumP Num}_{[SG]} \text{ [ NP ]}]$

- (23) MEAS<sub>2</sub>  $[sel: M]$

A number of authors have proposed that number is encoded higher than the numeral, rather than lower, e.g., Sauerland (2003), Scontras (2013, 2022), Ionin & Matushansky (2018), Martí (2020). The account in Pancheva (2021) adopts the idea of a high Number Phrase, but does so in conjunction with the low Number Phrase that is a complement to the two measure expressions, (24a)-(24b). The high Number is valued plural in both types of numerically-quantified nominal phrases.<sup>8</sup> The plural feature is realized on demonstratives that are merged higher than determiner numerals, and is responsible for external plural agreement.

- (24) a.  $[\text{NumP Num}_{[PL]} \text{ [MeasP numeral}_{det} \text{ MEAS}_1 \text{ [NumP Num}_{[PL]} \text{ [ NP ]}]]$   
 b.  $[\text{NumP Num}_{[PL]} \text{ [MeasP numeral}_{det} \text{ MEAS}_2 \text{ [NumP Num}_{[SG]} \text{ [ NP ]}]]$

All number features, low and high, are semantically interpreted, (25). Count nouns, before they are marked for number, are assumed to denote predicates of atoms and their sums.

- (25) a.  $\llbracket \text{SG} \rrbracket = \lambda P \lambda x. P(x) \ \& \ x \text{ is an atom}$   
 b.  $\llbracket \text{PL} \rrbracket (P)$ : defined iff  $P$  is a predicate of atoms and their sums  
 $\llbracket \text{PL} \rrbracket (P) = P$  when defined

## 5.2 Determiner numerals

The account presented above is applicable cross-linguistically. Nominal number is linked to MEAS<sub>1</sub>, which combines with plural-marked nouns, interpreted as predicates of atoms and their sums, and MEAS<sub>2</sub>, which combines with singular-marked nouns, interpreted as predicates of atoms. Variation arises depending on whether MEAS<sub>1</sub> and MEAS<sub>2</sub> are available in a given language. Further restrictions are also possible with

<sup>7</sup>It remains to be seen whether the morpho-syntactic and semantic restriction are in any way related.

<sup>8</sup>In the structure with MEAS<sub>1</sub>, the values of the high and low number features match as the value of the lower number feature is copied onto the higher one under Agree. In the structure with MEAS<sub>2</sub>, the values of the two number features are independent of one another.

respect to either the nominal argument of the measure expressions (e.g., gender splits) or with respect to the numeral argument (e.g., high/low splits).

Determiner numerals are not incompatible with singular-marked nouns. Rather, restrictions on such combinations in some languages result from the inventory of the measure expressions that are available as linkers between determiner numerals and nouns. In languages such as Hebrew or English, there is only one such measure expression, MEAS<sub>1</sub>. Languages like Estonian and Finnish, where all determiner numerals combine with singular-marked nouns (Norris 2014, Brattico 2010), can be said to only have MEAS<sub>2</sub> in their lexical inventory. In Arabic, variation in number marking between numerals ‘three’-‘ten’ and trans-decimal numerals is due to the availability of both MEAS<sub>1</sub> and MEAS<sub>2</sub>, as in Bulgarian, but the split in Arabic is not according to the gender of the nominal argument of the measure expressions, but according to the value of their numeral argument. Example (26a) illustrates the numeral restriction in Arabic as a presupposition on the numeral arguments of MEAS<sub>1</sub> and MEAS<sub>2</sub>, deriving the fact that numerals ‘three’-‘ten’ combine with plural-marked nouns and trans-decimal numerals combine with singular-marked nouns.<sup>9</sup>

- (26) a.  $\llbracket \text{MEAS}_1 \rrbracket = \lambda P \lambda n : 3 \leq n \leq 10 \lambda x. P(x) \ \& \ |x| = n$   
 b.  $\llbracket \text{MEAS}_2 \rrbracket = \lambda P \lambda n : n > 10 \lambda x. *P(x) \ \& \ |x| = n$

The question arises of whether languages may have yet another type of measure expression that combines with dual-marked nouns. The answer is that such a measure expression would be disallowed, because it would violate the monotonicity constraint. Its nominal argument, a predicate of pairs of individuals, does not provide the necessary part-whole structure to satisfy monotonicity. The Hebrew determiner numeral ‘two’ supports this conclusion, given its incompatibility with dual-marked nouns. Only MEAS<sub>1</sub> and MEAS<sub>2</sub> are possible linking measure expressions, deriving the fact that determiner numerals may combine only with plural-marked or with singular-marked nouns.

### 5.3 Adjectival numerals

Are any numerals incompatible with MEAS<sub>1</sub> and MEAS<sub>2</sub> in principle? Hebrew ‘one’ and Arabic ‘one’ and ‘two’ have the syntax of adjectives and the semantics of attributive modifiers, but could they have been determiners instead?

Independently of the language, a determiner numeral ‘one’ would not be able to combine with MEAS<sub>1</sub>, and thus with a plural-marked noun, because the system of feature matching between the low and high Number would ensure that the high Number is valued plural, and yet its complement is a predicate of individuals with a cardinality of 1, which violates the presupposition of the plural feature, (25b). Thus, universally, ‘one’ should not be able to combine with MEAS<sub>1</sub>. Ruling out MEAS<sub>2</sub> in the case of ‘one’ is less straightforward, because the two are not semantically incompatible. However, MEAS<sub>2</sub> would, unnecessarily, pluralize the nominal predicate, and perhaps this is a sufficient reason to preclude it in principle. ‘One’, therefore, must be adjectival, even in languages that allow (some or all) determiner numerals to combine with singular-marked nouns, like Arabic and Bulgarian.

Numeral ‘two’, on the other hand, need not be exceptional: as a determiner numeral it may be an argument of MEAS<sub>1</sub>, as in Hebrew, and thus combine with plural-marked nouns, or of MEAS<sub>2</sub> as in Estonian and Finnish, and thus combine with singular-marked nouns, or indeed of both MEAS<sub>1</sub> and MEAS<sub>2</sub>, as in Bulgarian, and thus combine with both singular- and plural-marked nouns. But ‘two’ is predicted to be able to combine with dual-marked nouns only if it is adjectival, as in Arabic, since a third type of measure expression, selecting for dual-marked nominals, is ruled out for semantic reasons, as suggested in §5.2.

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<sup>9</sup>I put aside the question of whether it is possible to have only one of the measure expressions encode a presupposition on its numeral argument and derive the distributional facts through competition between the two measure expressions.

## 6 Conclusions

This paper examines the link between the syntax of numerals and nominal number, inspired by an original observation and analysis in Borer (2005). The ultimate account involves a modification of Borer’s (2005) generalization, as in (27a), while (27b) is retained.

- (27) a. Determiner numerals may combine with singular-marked nouns via MEAS<sub>2</sub> (when available)  
b. Only adjectival numerals may combine with dual-marked nouns

The account links Borer’s (2005) empirical generalization and theoretical explanation to Schwarzschild’s (2006) monotonicity constraint, and accounts for variation within and across several languages.

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