

# \*Only Zero

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In a recent paper, [Bylinina & Nouwen \(2018\)](#) claim that sentences involving the numeral *zero* are subject to obligatory exhaustification. This claim falls out as a result of two assumptions: First, that the pluralization operator  $\times$  yields a full lattice structure, crucially including the bottom element  $\perp$ , which has cardinality 0. This falls out from the definition of  $\times$  given in (1).

$$(1) \quad \times Z = \{ \sqcup X \mid X \subseteq Z \} \qquad \text{Bylinina \& Nouwen 2018: p. 8}$$

Second, that numerals give rise to an *at least* reading basically; the exactly reading is derived via exhaustification relative to excludable alternatives where the numeral varies. The sentence *three philosophers attended the talk* is therefore mapped to the Logical Form in (2a). When subject to strengthening via exhaustification, the resulting Logical Form is as in (2b).

$$(2) \quad \begin{aligned} \text{a.} \quad & \exists x[\#x = 3 \wedge^\times \text{philosopher } x \wedge^\times \text{attendTheTalk } x] \\ \text{b.} \quad & \exists x[\#x = 3 \wedge^\times \text{philosopher } x \wedge^\times \text{attendTheTalk } x] \\ & \neg \exists y[\#y > 3 \wedge^\times \text{philosopher } y \wedge^\times \text{attendTheTalk } y] \end{aligned}$$

A consequence of these assumptions is that, prior to exhaustification, sentences involving the numeral *zero*, such as *zero philosophers attended the talk* will always be tautological, as in (3a). This is because every pluralized predicate contains the bottom element  $\perp$ . In order to express a contingent statement, the sentence must be exhaustified, as in (3b).

$$(3) \quad \begin{aligned} \text{a.} \quad & \exists x[\#x = 0 \wedge^\times \text{philosopher } x \wedge^\times \text{attendTheTalk } x] \\ \text{b.} \quad & \exists x[\#x = 0 \wedge^\times \text{philosopher } x \wedge^\times \text{attendTheTalk } x] \\ & \neg \exists y[\#y > 0 \wedge^\times \text{philosopher } y \wedge^\times \text{attendTheTalk } y] \end{aligned}$$

In the literature on grammatical exhaustification (see, e.g., [Chierchia 2004](#), [Fox 2007](#), [Magri 2009](#)), it is something of a mantra to claim that the exhaustivity operator  $\text{exh}$  is the covert counterpart of the focus-sensitive operator *only*. Both  $\text{exh}$  and *only* compose with a prejacent  $\alpha$  and negate the *excludable* alternatives to  $\alpha$ , based on the focus-structure of  $\alpha$ . For our purposes, we can take the *excludable* alternatives to  $\alpha$  to be those sentences  $\psi$  such that  $\psi$  is logically non-weaker than  $\alpha$ .

Here we make the novel observation that the numeral *zero* cannot associate with *only*, as illustrated by the infelicity of (4a). Other numerals *can* however associate with *only*, obligatorily giving rise to an *exactly* reading, as illustrated as in (4b). This is exactly what we expect if *only* and *exh* negate excludable alternatives. There are two possible ways to interpret this result. Most straightforwardly, it casts serious doubt on [Bylinina & Nouwen](#)'s claim that sentences with *zero* involve obligatory exhaustification. Alternatively, we could interpret this as yet more evidence that the putative parallel between *only* and *exh* breaks down upon further investigation (see, e.g., [Al Khatib 2013](#) and [Buccola 2018](#) for related observations), although for [Bylinina & Nouwen](#) this would still leave open the question of why *only* gives rise to an *exactly* reading with other numerals but apparently not *zero*.

- (4) a. #Only ZERO<sub>F</sub> philosophers attended the talk.  
b. Only THREE<sub>F</sub> philosophers attended the talk (#maybe more).

Furthermore, we observe that there is not an absolute ban on *only* associating with *zero*. This seems to be possible when *zero* doesn't pick out a scalar endpoint, such as with the scale of degrees of temperature.<sup>1</sup> (5a) entails that there is no  $n > 0$  such that the temperature has risen to  $n$  degrees. When *zero* does pick out a scalar endpoint however however, as in (5b), the sentence is again infelicitous.

- (5) a. The water here has only ever risen to ZERO<sub>F</sub> degrees.  
b. #The water here has only ever risen by ZERO<sub>F</sub> centimetres.

It seems natural to assume that the infelicity of *only* in (4a) is a special case of the generalization that, when *zero* picks out a scalar endpoint, it may not associate with *only*; here *zero* picks out the minimum of the cardinality scale. This does not fall out straightforwardly from [Bylinina & Nouwen](#)'s analysis.

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<sup>1</sup>Thanks to an anonymous reviewer for suggesting this characterization of the data.

## References

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