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Katharina Felka

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Focus Effects in Number Sentences Revisited

Katharina Felka

There are easy arguments for numbers: Arguments that derive the existence of numbers in a few, simple steps from uncontroversial premises like the premise that I have ten fingers. In recent literature some authors have argued that easy arguments rely on a mistaken linguistic analysis of number sentences like "The number of my fingers is ten": While such sentences are traditionally considered as identity sentences, they are rather specificational sentences. However, Barlew (2017) has disputed this line of argument: He argues that *in easy argument contexts* the pertinent number sentences function as identity sentences even though they function as specificational sentences *in their standard use*. Hence, Barlew concludes, the rebuttal of easy arguments fails. The aim of the present paper is to defend the linguistic objection to easy arguments against Barlew's criticism.

When philosophers discuss whether numbers exist, they usually assume that they discuss a hard question that does not have an easy answer. However, surprisingly, there seem to be very easy arguments for the existence of numbers. Just look! I have ten fingers. If I have ten fingers, then the number of my fingers is ten. Hence, there is a number! Or look at my legs! I have two legs. If I have two legs, then the number of my legs is two. Hence, there is a number! In such arguments the existence of numbers is derived from completely uncontroversial premises, like the premise that I have ten fingers or that I have two legs. That makes the arguments very puzzling: How can it be that philosophers have discussed for thousands of years whether numbers exist if the existence of numbers can be derived from completely uncontroversial premises in a few, simple steps?

In recent literature some authors have argued that easy arguments fail to establish the existence of numbers on linguistic grounds. They argue that easy arguments rely on a mistaken linguistic analysis of number sentences like

"The number of my fingers is ten" or "The number of my legs is two": While such sentences are traditionally considered as identity sentences in which the number words "ten" and "two" appear in singular term position, they are rather specificational sentences in which the number words appear in determiner position.[1] However, in a recent paper Barlew (2017) has disputed this line of argument: He argues that *in easy argument contexts* the pertinent number sentences do function as identity sentences even though they function as specificational sentences *in their standard use*. Hence, Barlew concludes, the rebuttal of easy arguments fails. The aim of the present paper is to defend the linguistic objection to easy arguments against Barlew's criticism.

The structure of the paper is as follows. Section 1 sketches the linguistic objection against easy arguments. Section 2 presents Barlew's (2017) argument to the effect that number sentences function as identity sentences rather than as specificational sentences in easy argument contexts, in contrast to what opponents of easy arguments have claimed. Section 3 argues that Barlew's argument fails and, thus, that it is warranted to object to easy arguments on linguistic grounds.

1 A Rebuttal of Easy Arguments

Paradigmatic easy arguments start from a fairly uncontroversial assumption that does not say anything about numbers. For instance, it is commonly assumed that Mars has two moons and, thus, that sentence (1) is true:

(1) Mars has two moons.

If sentence (1) is true, then sentence (2) is true as well:

(2) The number of moons of Mars is two.

But, so the argument goes, sentence (2) is true only if numbers exist. Hence, numbers exist!

Apart from the assumption that sentence (1) is true, the argument relies on the following two assumptions:

(P1) If sentence (1) is true, then sentence (2) is true.

1 See Felka (2014, 2016) and Moltmann (2013). The first elaborated criticism of the traditional analysis of the pertinent number sentences, however, is due to Hofweber (2005). But, in contrast to Felka and Moltmann, he does not defend a specificational analysis of those sentences.

(P2) The truth of sentence (2) requires the existence of numbers.

(P2) is based on a certain linguistic analysis of the pertinent number sentence that was most famously proposed by Gottlob Frege. In his *Foundations of Arithmetics* Frege writes:

> [T]he proposition "Jupiter has four moons" can be converted into "the number of moons of Jupiter is four." Here the word "is" should not be taken as a mere copula, as in the proposition "the sky is blue" [...] Here "is" has the sense of "is identical with" or "is the same as." (Frege 1980, sec.57)

Frege, thus, assumes the following:

> ID. Sentences of the form "The number of *F*s is *n*," where "*n*" is a placeholder for a number word, are identity sentences in which "*n*" functions as a singular term.

(ID) Sentences of the form "The number of *F*s is *n*," where "*n*" is a placeholder for a number word, are identity sentences in which "*n*" functions as a singular term.

If (ID) is correct, then the number word "two" contained in sentence (2) functions as a singular term. Since sentences containing singular terms can be true only if the singular terms refer, (2) can be true only if numbers exist.

However, in recent literature some authors have rejected (ID) (Felka 2014, 2016; Hofweber 2007, 2016; Moltmann 2013). Some of them have argued that sentence (2) is a so-called specificational sentence while specificational sentences are the elliptical remainders of question-answer pairs (Felka 2014, 2016; Moltmann 2013). According to this analysis, sentence (2) is analysed as follows:[2]

(2*) [~~What~~ the number of moons of Mars ~~is~~] is [~~Mars has~~ two ~~moons~~.]

If this analysis is correct, then the number word "two" is the elliptical remainder of sentence (1). Since the number word functions in sentence (1) as a determiner, it functions in sentence (2) as a determiner as well. Hence, it

2 Following Barlew, I focus here on the question-answer analysis proposed in Felka (2014, 2016). See Moltmann (2013) for a different variant. For the present discussion it does not matter what specificational analysis we rely on.

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does not function as a singular term and, thus, does not bring it about that the truth of sentence (2) requires the existence of numbers, as proponents of easy arguments assume.[3]

2 Barlew's Defence of Easy Arguments

Barlew (2017) concedes that number sentences of the form "The number of *F*s is *n*" function as specificational sentences *in their standard use*. However, he argues that *in easy argument contexts* the number sentences function as identity sentences and, thus, that easy arguments go through. In the following I will first explain a distinction between narrow and broad focus on which Barlew relies in his argument and then explain how he uses this distinction to establish his claim.

2.1 *Narrow and Broad Focus*

Intuitively, the focus of an utterance of a sentence is that part of information conveyed with the utterance that is most important in the utterance context.[4] Take, for instance, the sentence

(3) Paul shattered the china.

When the question under discussion is "Who shattered the china?", the focus is on the information provided by "Paul." When the question under discussion is "What did Paul shatter?", the focus is on the information provided by "the china."

There are different ways to mark the focus of an utterance. Firstly, we can mark it by putting intonational stress on some part of the utterance (here marked with bold letters):

(4) PAUL shattered the china.
(5) Paul shattered THE CHINA.

3 One might argue that the definite description still induces that (2) is true only if numbers exist. However, it has been argued that it only induces a *pragmatic* presupposition and, thus, that "Mars has two moons" can be a true answer to the question even if numbers do not exist Brogaard (2007).

4 See Hofweber (2016) for a more detailed explanation as well as the pertinent references from the linguistic literature.

(4) marks the information provided by "Paul" as the focus of the utterances; (5) the information provided by "the china." Secondly, we can mark the focus of an utterance by choosing a specific syntactic structure. Consider:

(6) It was the china that Paul shattered.

(6) marks the information provided by "the china" as the focus of the utterance due to its syntactic structure. Sentences that exhibit such an intonation-independent structural focus are called *focus constructions*.

A striking feature of focus constructions is that they give rise to a specific question-answer behaviour which allows us to check (i) whether some sentence is a focus construction and (ii) what part exactly carries the information marked as the focus. In relation to (i), consider the following exchanges:

(7) Who shattered the china? # It was the china that Paul shattered.
(8) What did Paul shatter? It was the china that Paul shattered.

The question-answer behaviour of (6) makes obvious that the sentence marks the information provided by "the china" as the focus. For since this information is marked as the focus and, thus, as particularly important, the sentence cannot felicitously be uttered to answer the first question that does not ask about it. In contrast, it can felicitously be uttered to answer the second question. In relation to (ii), notice that the expression that carries the information marked as the focus constitutes an appropriate short answer to question (9):

(9) What did Paul shatter?
(6) It was the china that Paul shattered.
(10) The china.

Thus, we can check what short answers are appropriate in order to determine what expression exactly carries the information marked as the focus.

The example sentence considered above is a case of narrow focus in which the focus is on a *single* constituent ("the china"). Barlew points out that there are also cases of broad focus in which the focus is on the complete utterance. For illustration, consider a context in which (11) ist the question under discussion:

(11) What happened?
(3) Paul shattered the china.
(10) # The china.

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In this utterance context the focus of an utterance of sentence (3) is not on a single constituent like "the china." Rather, it is on the complete utterance. Accordingly, no single constituent will be an appropriate short answer to the question under discussion; we have to utter the complete sentence to answer the question appropriately. This is a case of broad focus.

2.2 *The Number Sentences in Easy Argument Contexts*

Both opponents of easy arguments and their critic Barlew assume that specificational sentences are copular sentences that are distinguished by exhibiting a structural focus on the post-copular expression.[5] They also agree that at least in their standard use number sentences of the form "The number of *F*s is *n*" exhibit a structural focus on the post-copular expression.[6] The latter claim is based on the question-answer behaviour of the number sentences. Consider:

(12) Who has ten fingers? # The number of my fingers is ten.
(13) What is the number of your fingers? The number of my fingers is ten. // Ten.

An utterance of the number sentence (or simply the number word "ten") is an appropriate answer to a question that asks about the information provided by the number word while it is not an appropriate answer to a question that does not ask about that information. Since this is to be expected if the number sentence exhibits a structural focus on the post-copular expression, both opponents of easy arguments and Barlew assume that the sentence exhibits such a focus and, thus, functions as a specificational sentence in its standard use.

However, following Higgins (1973) and others, Barlew points out that many copular sentences allow for different uses. Therefore, Barlew says, it is "essential to determine which reading of [the number sentence] arises" in easy argument contexts (Barlew 2017, 421). According to Barlew, easy argument contexts are not "contexts where the interlocutors are wondering about numbers of moons or planets" since "a philosopher making the easy argument doesn't actually care how many moons [Mars] has" (Barlew 2017, 421). Rather,

5 See, e.g., Higgins (1973), Heycock (1995), Mikkelsen (2005) for this view. In the philosophical literature, a detailed defence can be found in Felka (2014, 2016).

6 This observation is due to Hofweber (2005) and is employed in Felka (2014, 2016) to argue for the claim that the pertinent number sentences function as specificational sentences.

they are contexts in which philosophers discuss the entailments of ontologically innocent sentences like "Mars has two moons."[7] Thus, Barlew says, we have to determine how number sentences of the pertinent kind are used in contexts in which philosophers discuss the entailments of ontologically innocent sentences.

In order to do so, Barlew presents the following example of such a context:

(C) Al and Betty are philosophers. Al is also an amateur astronomer with a decent telescope but not much background knowledge. After a night of star gazing Al tells Betty: "Guess what, Mars has two moons." Betty replies: "Hmm, I wonder what we can infer from this, or what other sentences we might say that are true in virtue of this."

According to Barlew, this is an easy argument context since the question under discussion is (14):

(14) What are the entailments of "Mars has two moons"?

However, Barlew observes, an utterance of the number word "two" is not an appropriate answer to the question under discussion, while an utterance of the complete sentence (2) is:

(2) The number of moons of Mars is two.
(15) # Two.

Thus, Barlew concludes, in the present context the focus is not on the number word "two" (or any other single constituent); rather, the focus is on the complete utterance. We thus have a case of broad focus, rather than a case of narrow focus on the number word (or any other constituent of the sentence).

If Barlew's consideration were correct, it would present a major difficulty for the objection to easy arguments presented above. As we have seen, the objection crucially relies on the claim that number sentences of the form "The number of *F*s is *n*" are specificational sentences. But if in easy argument contexts the number sentences do not exhibit narrow focus on the post-copular term, they do not function as specificational sentences in such contexts. Rather, they function as identity sentences, just like proponents of easy arguments assume.

7 The distinction between "ontologically innocent" and "ontologically loaded" sentences is due to Hofweber (2007).

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3 Rebuttal of Barlew's Defence

Barlew's defence of easy arguments is successful only if he manages to establish (i) that the (allegedly special) philosophical use of the sentence "The number of moons of Mars is two" he considers is the one pertinent for easy arguments and (ii) that the sentence functions as an identity sentence in that use. In the following I will argue that Barlew fails on both counts.

3.1 *What Are the Pertinent Uses of the Number Sentences?*

As presented above, Barlew concedes that the number sentence "The number of moons of Mars is two" functions as a specificational sentence in its standard use. But, he argues, in the uses pertinent for easy arguments the sentence functions as an identity sentence and, thus, the arguments go through. According to Barlew, the pertinent uses are uses of the sentence in contexts in which metaphysicians are concerned with the entailments of ontologically innocent sentences rather than with astronomical facts concerning Mars and its moons. That is, they are uses in *philosophical* rather than in *ordinary* contexts.

However, Barlew's assumption that easy arguments target uses of the number sentence in philosophical contexts is mistaken. There certainly are contexts in which metaphysicians discuss entailments of ontologically innocent sentences rather than astronomical facts concerning Mars and its moons. And in these contexts metaphysicians are concerned with uses of number sentences. But this does *not* imply that the uses of number sentences they discuss are uses in philosophical contexts: Surely, in a given context C_1, one can discuss features of sentences (including their apparent entailments) *as they are used in a different context* C_2. And this is exactly what is going on in easy argument contexts: In such contexts, metaphysicians discuss features of number sentences as they are used by ordinary speakers in non-philosophical contexts. Proponents of easy arguments take every opportunity to emphasise this. Here is a representative quotation from Thomasson:

> [...] the relevant conditions of existence are determined by the application [...] conditions for the terms speakers use [...] the truths [...] uncovered by metaphysicians are just ways of making explicit the ontological implications of the rules we master in learning to use expressions. (2009, 450)

As Thomasson emphasises in this quotation, in easy argument contexts metaphysicians take expressions in their standard use by ordinary speakers and investigate their existence entailments in that very use.

Barlew might want to try the following defence strategy:

> It is correct that proponents of easy arguments like Thomasson focus on standard uses of number sentences by ordinary speakers. However, a more successful strategy to argue for the existence of numbers in an easy way is to focus on philosophical uses of such sentences since philosophical uses of number sentences are identity rather than specificational uses.

The next subsection shows that this defence strategy fails as well, since Barlew is unable to establish that the philosophical use of the number sentence he considers is a non-standard identity rather than a standard specificational use.

3.2 *A Case of Broad Focus?*

Let us consider whether Barlew has established that the philosophical use of the number sentence he considers is a non-standard identity rather than a standard specificational use. Recall that in the context he presents the question under discussion is supposed to be (14):

(14) What are the entailments of "Mars has two moons"?

To this question, Barlew claims, sentence (2) is an appropriate answer:

(2) The number of moons of Mars is two.

This could not be the case if the sentence were exhibiting a structural focus on the number word "two" since then an utterance of the sentence could only be an appropriate answer to a question that asks about the information provided by the number word. Thus, Barlew says, the sentence does not exhibit such a focus and, hence, does not function as a specificational sentence since such sentences are distinguished by exhibiting a structural focus on the post-copular term.

However, Barlew's claim that sentence (2) is an appropriate answer to the question under discussion is mistaken. For the question under discussion

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requires *examples of sentences*. In particular, it requires examples of sentences that are entailed by the sentence "Mars has two moons." But an utterance of sentence (2) does not give an example of such a sentence: An utterance of sentence (2) does not say anything about sentences or other linguistic expressions; it only says something about Mars and its moons. Therefore, it does not constitute an answer to the question under discussion. In contrast, an utterance of sentence (2_Q) does constitute an answer to the question under discussion:

(2_Q) "The number of moons of Mars is two."

An utterance of sentence (2_Q) is the short version of the following complete answer to the question under discussion, which, indeed, is also an appropriate answer to (14):

(2_L) "Mars has two moons" entails "The number of moons of Mars is two."

But from the observation that (2_L) constitutes an appropriate answer to the question under discussion we cannot derive anything about the information structure of some other sentence. In particular, we cannot derive anything about the information structure of sentence (2), with which opponents of easy arguments are concerned.

To drive my point home, consider the following argument that is analogous to the one that Barlew presents. In the previous section we considered the sentence "It was the china that Paul shattered" as an example of a focus construction that marks the information provided by "the china" as the focus. One might now try to establish that in some contexts the sentence does not mark the information provided by "the china" as the focus. Take, for instance, a context in which the question under discussion is (16):

(16) What is an example of a focus construction?

To this question, one might argue, an utterance of sentence (6) is an appropriate answer while an utterance of (10) is not:

(6) It was the china that Paul shattered.
(10) # The china.

Thus, so the argument would go, the sentence "It was the china that Paul shattered" does not mark the information provided by "the china" as the focus

in the present context since then an utterance of the sentence could only be an appropriate answer to a question that asks about that information. But, again, the argument fails since it relies on the mistaken assumption that an utterance of sentence (6) is an appropriate answer to the question under discussion while in fact only an utterance of sentence (17) or of its short version (18) is—and it is exactly *since* sentence (6) marks the information provided by "the china" as the focus:

(17) An example of a focus construction is "It was the china that Paul shattered."
(18) "It was the china that Paul shattered."

For the very same reason Barlew's argument fails to establish that the sentence "The number of moons of Mars is two" does not mark the information provided by "two" as the focus in the specified context. Therefore, it also fails to establish that sentence (2) functions as an identity sentence in that context.

Let me finally point out that Barlew might try to rescue his point by modifying the question under discussion such that it does not ask for examples of sentences anymore. For instance, the question could also be:

(19) What follows from the fact that Mars has two moons?

However, an utterance of sentence (2) is not an appropriate answer to this question either; eventually only "(From the fact that Mars has two moons it follows that) the number of moons of Mars is two" is. But, again, from the observation that the latter sentence is an appropriate answer to question (19) we cannot derive anything about the information structure of sentence (2). The same holds for every other question one might want to try to bring to Barlew's rescue I can think of. I thus conclude that Barlew's argument fails.

4 A More General Reply

Finally, let me give a more general reply to Barlew's criticism that is independent of the subtleties of the previous discussion. As pointed out at the outset, our easy argument relies on the following two premises:

(P1) If sentence (1) is true, then sentence (2) is true.
(P2) The truth of sentence (2) requires the existence of numbers.

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Proponents of easy arguments usually rely on standard uses of sentence (2) in the premises (P1) and (P2). But if they rely on standard uses, then premise (P2) fails. For the justification of (P2) is based on the assumption that number sentences like (2) are identity sentences. But in their standard use such sentences function as specificational rather than as identity sentences.

One may now follow Barlew and try to argue that there are also non-standard—perhaps special philosophical—uses of the number sentence in which it does function as an identity sentence. Indeed, one may simply stipulate that one takes the sentence in the sense of "The number of moons of Mars = the number two." But if proponents of easy arguments rely on such a special non-standard use of the sentence, then premise (P1) of the easy argument becomes highly unobvious. For the justification of premise (P1) is based on the observation that *ordinary speakers* take the two sentences to be truth-conditionally equivalent. Since the pertinent speakers' intuition relies on standard uses of the number sentences, premise (P1) loses its justification if one does not rely on such uses.

Thus, if one agrees that number sentences like (2) function as specificational sentences in their standard use (like Barlew does), then it does not matter whether there are any further non-standard uses of the sentences in which they function as identity sentences. For if one relies on such non-standard uses, then premise (P1) of the easy argument loses its justification and the argument fails nevertheless.

5 Conclusion

Barlew recently argued that in easy argument contexts number sentences like "The number of moons of Mars is two" are used in a non-standard way: They are used as identity rather than as specificational sentences. Thus, Barlew claims, a rebuttal of easy arguments on linguistic grounds is unconvincing. The present paper defended the linguistic objection to easy arguments against Barlew's criticism. In particular, it has been argued that (i) the uses that are pertinent for easy arguments are standard uses and (ii) Barlew's considerations do not even show that there are non-standard uses of the number sentences in which they function as identity sentences. Since Barlew's defence of easy arguments thus fails, the linguistic objection against easy arguments stands. Arguing from "Mars has two moons" to "The number of moons of Mars is two" is no quick and easy way to establish the existence of numbers, since

such an argument has to rely on a mistaken linguistic analysis of the pertinent number sentence.*

Katharina Felka
0000-0002-4921-8815
University of Graz
katharina.felka@uni-graz.at

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