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CHURCH'S AND GÖDEL'S SLINGSHOT ARGUMENTS*

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I-Introduction

The idea that sentences are semantically analogous to proper names is advocated by Frege in two of his classical papers, “*Funktion und Begriff*” (1891) and “*Über Sinn und Bedeutung*” (1892). Actually, Frege holds three controversial (and independent) claims in these articles. First, that sentences behave semantically like proper names. Second, that although some sentences merely express a sense (or a thought, like, e.g., ‘Pegasus is flying over Rio de Janeiro’), some of them (those employed in scientific contexts) also have a reference. And, third, that if a sentence refers at all, its reference is the corresponding truth-value. Each one of these claims (and the corresponding argument offered by Frege) has been the subject of much discussion in the philosophical literature; in this paper I shall be focussing only on the arguments offered for the third claim. Frege’s argument in “*Über Sinn und Bedeutung*” is based on the connection between the semantic value of terms constitutive of sentences and the value that these are said to have in scientific contexts, namely, they have value only if they are true or false. Since truth or falsity are that feature of sentences that drives our attention from the sense to the reference of their constitutive expressions, and since the reference of the parts of the sentence are supposed to build up the reference of the whole sentence, Frege concludes that we should take as reference of a sentence the corresponding truth-value.

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Frege's claim regarding the reference of sentences has been much criticized in the literature. Michael Dummett, for example, describes Frege's move here as "an almost unmitigated disaster" for his philosophy of language (Dummett 1973, p. 196). However, a number of philosophers after Frege produced some ingenious arguments in order to show the plausibility, and even the necessity, of Frege's claim that sentences refer to truth-values (and not to facts or situations). These arguments are all very short, and based on few simple and quite plausible assumptions. And because they try to establish a very powerful semantical thesis employing a minimum of philosophical artillery, they were called "slingshot arguments" by Barwise and Perry (1975). We should notice that, although Frege himself does not formulate the arguments, he could have done so, since the principles from which each one departs are present in his thought. More recently, the defenders of facts or situations have criticized these arguments. In particular, they were criticized by Barwise and Perry (1975) and by Chateaubriand (2001). In this paper, I shall first briefly review the arguments proposed by Alonzo Church and by Kurt Gödel.² Next, I will show how Russell's theory of definite descriptions can avoid its conclusion. Then I will explain the main critical points raised by Barwise and Perry³. I shall argue that none of the objections raised by these authors represents a serious problem for the slingshot. As I see it, some of the criticisms raised are based on choices that are at least as problematic as the premises involved in the slingshots.

² There are other versions of the slingshot normally discussed in the literature which were originally proposed by Davidson and Quine. I shall not discuss these other versions in this paper. Although it is not normally recognized as such in the literature, there is a rather short argument presented by Carnap in *Meaning and Necessity* that is similar in spirit to the slingshots. It goes like this: two n -ary predicates ' P ' and ' Q ' are said to have the same extension if and only if ' $(x_1)(x_2)...(x_n)(Px_1 x_2... x_n \equiv Qx_1 x_2 ... x_n)$ ' is true. Now if we apply this criterion for n -ary predicates in general, it seems plausible to apply it for predicates of degree zero (sentences) as well, and hence two sentences ' S_1 ' and ' S_2 ' have the same extension iff ' $S_1 \equiv S_2$ ' is true, i.e., if both have the same truth-value. We are hence very close to regarding truth-value as the extension of sentences. One could perhaps object to the extension of the above criterion for predicates of degree zero. But it is not clear that this objection can be made without somehow presupposing the denial of Carnap's thesis, being therefore circular.

II-Church's Slingshot

Alonzo Church formulated the best-known slingshot argument in his *Introduction to Mathematical Logic* (1956). It is based solely the following two Principles:

- (R) When in a complex expression a constituent expression is replaced by another one with the same reference, the reference of the former is not changed.
- (S) Synonymous sentences have the same reference.

The argument goes as follows. Consider the sentences (in which we have some definite descriptions underlined):

- (C1) Sir Walter Scott is the author of *Waverley*
- (C2) Sir Walter Scott is the man who wrote twenty-nine Waverly novels altogether
- (C3) Twenty-nine is the number, such that Sir Walter Scott is the man who wrote that many Waverly novels altogether
- (C4) Twenty-nine is the number of counties in Utah

According to principle R, C1 and C2 must have the same reference, since the latter results from the former by replacing a description ('the author of *Waverley*') by another ('the man who wrote twenty-nine Waverly novels altogether') with the same reference (i.e., Scott). The same applies to C3 and C4, since we obtain the latter from the replacement in C3 of a description ('the number, such that Sir Walter Scott is the man who wrote that many Waverly novels altogether') by another one ('the number of counties in Utah') that supposedly refer to the same object (the number twenty-nine). Now C2 and C3 are, according to Church, 'if not synonymous...is at least

³ For a discussion specifically of Chateaubriand's objections, see my (forthcoming).

so nearly so as to ensure its having the same denotation” (1956, p. 25). That is to say, they are very close in meaning, and hence have the same reference according to principle S. It follows that C1 and C2, C2 and C3, and C3 and C4 have the same reference when taken pairwise, and consequently C1 and C4 must have the same reference. But what is this common reference? We must exclude here something like a situation or a state of affairs, since C1 and C4 seem to describe completely different situations. The only thing that both propositions have in common is their truth-value (they are both true). It seems natural to identify their common reference with this truth-value. (The same reasoning would apply to false sentences.) We should keep in mind that the argument is not meant to be a deductive one, in which each sentence follows from the previous one by rules of logical inference. What we have here is that reasons are given for taking each sentence as co-referential with the previous one.

Now Church does not say that Frege’s alternative is the only possible here. He says that “elaboration of examples of this kind leads us quickly to the conclusion, as at least plausible, that all true sentences have the same denotation” (1956, p. 25). Church is as careful here as Frege was when he called his main thesis a ‘hypothesis’ (“*Vermutung*”) in “*Über Sinn und Bedeutung*”. The conclusion of Church’s argument is in part limited by the fact that it deals only with identities between names and definite descriptions, and it is not immediately obvious how it could be generalized to other forms of sentences. Although Church does not explicitly mention it, it has the following implicit assumption:

(D) Definite descriptions (i.e., expressions of the form ‘ $(\iota x)(F(x))$ ’) denote the unique object that instantiates Fx .

D corresponds to Frege’s view of definite descriptions. It is worth noticing that Church’s argument does not establish that propositions (or sentences) do have a reference, or that they behave like proper names. He assumes, for the sake of brevity and simplicity of his semantics, that sentences behave like proper names (*ibid.*, p. 24). The argument above might actually be seen as having a conditional form: if sentences have a reference at all, then all true sentences are co-referential, and the same holds for all false sentences. But, of course, one could still avoid Frege’s thesis by either denying that sentences do in fact refer (i.e., by denying the parallel between sentences and proper names) or by selecting a different sort of object as the reference of all true (or of all false) sentences.

Frege tries to exclude the first way of avoiding the conclusion in “*Über Sinn und Bedeutung*”. He says that “the reference of a sentence may always be sought, whenever the reference of its components is involved, and this is the case when and only when we are inquiring after the truth-value” (1892, p. 33). But Frege’s claim here does not seem correct. For consider the situation in which someone points at a pipe and says ‘This is something that Sherlock Holmes likes’. We need to know the reference of the demonstrative ‘this’ in order to understand the sense of the sentence in question, although we do not normally take it as having a reference, since it belongs to fiction. To take another example not coming from fiction (originally from Barwise and Perry), if we hear ‘Smith believes his neighbor is a fool’, we might be interested in the reference of ‘his neighbor’, without caring about the truth of the embedded sentence.⁴

⁴ Carnap takes the second way out in *Meaning and Necessity*. The true is identified by him with a proposition - i.e., the intension of a sentence - that is logically true, and the false with a proposition that is logically false.

III-Gödel’s Slingshot

In his essay “*Russell’s Mathematical Logic*” (1944) Gödel suggests a different argument for the same thesis. The argument occurs in the context of Gödel’s discussion of Russell’s theory of descriptions, and the point that Gödel actually makes is that this theory could avoid the conclusion of the suggested argument. The argument assumes the following principles:

(D) Definite descriptions (i.e., expressions of the form ‘ $(\iota x)(F(x))$ ’ denote the unique object that instantiates Fx .

(R) When in a complex expression a constituent expression is replaced by another one with the same reference, the reference of the former is not changed.

(A)-Every true sentence has an equivalent form that ‘speaks about something’, i.e., an equivalent of the form ‘ $F(a)$ ’.

(B)-The sentences ‘ $F(a)$ ’ and ‘ $a = (\iota x)(F(x) \ \& \ x=a)$ ’ denote the same thing.

(C)-For any two objects a and b , there is a true sentence of the form ‘ $H(a,b)$ ’ (e.g., ‘ $a=b$ ’ or ‘ $a \neq b$ ’).

(D and R are the same as in Church’s slingshot. A, B and C are new.)

The argument then goes like this. Let ‘ P ’ and ‘ Q ’ be any two true sentences, and consider the following sequence of sentences.

(G1) P (original sentence)

(G2) $F(a)$ (A)

(G3) $a=(\iota x)(x=a \ \& \ F(x))$ (B)

(G4) $a=(\iota x)(x=a \ \& \ H(x,b))$ (R)

(G5) $H(a,b)$ (B)

(G6) Q (new sentence)

- (G7) $G(b)$ (A)
- (G8) $b=(\iota x)(x=b \& G(x))$ (B)
- (G9) $b=(\iota x)(x=b \& H(a,x))$ (R)
- (G10) $H(a,b)$ (B)

Again, this is not meant to be a deductive argument in which each sentence follows from the previous one. What we have after each sentence is the principle according to which it is said to be co-referential with the sentence from the previous line. Hence, G1 is, by principle A, equivalent with G2, since ' P ' must be equivalent to ' $F(a)$ '. From principle B we have that ' $F(a)$ ' is co-referential with ' $a=(\iota x)(x=a \& F(x))$ '. And since ' $H(a,b)$ ' is true, we can substitute the description ' $(\iota x)(x=a \& F(x))$ ' by ' $(\iota x)(x=a \& H(x,b))$ ' in G3, obtaining G4, which must be, by R, co-referential with G3. The partial conclusion is that ' P ' (G1) is co-referential with ' $H(a,b)$ ' (G4). We can now start an analogous reasoning for ' Q ' (G6), which will lead to the conclusion that it has the same reference as $H(a,b)$. Conclusion: both ' P ' and ' Q ' have the same reference as ' $H(a,b)$ ', and hence have the same reference. But since the only thing they seem to have in common is their truth-value, the latter seems to be their reference. An analogous argument can be built for false sentences, so that they refer to the same object as well. Gödel's version of the slingshot seems to be more elaborated from a formal point of view and based on principles less controversial than those employed by Church. Notice that Principle B represents a much weaker claim than Church's Principle S, since B does not claim that *any* two synonymous sentences are co-referential, but only that two synonymous of the form ' $F(a)$ ' and ' $a = (\iota x)(F(x) \& x=a)$ ' are. And Principle A apparently makes Gödel's argument more general than Church's, since now we can deal not only with identities, but with any sentence.

If one accepts the metaphysical assumption that any fact involves some object a and also the (equally metaphysical) assumption that, in one way or another, this object is related to any other object b in the world (i.e., there is at least one relation holding between a and b), no matter how remote this object is from the fact in question, then there seems to be some plausibility in Church’s and Gödel’s argument, as the following consideration shows. Take any sentence describing the fact involving a . We could rearrange this sentence that describes the original fact in terms of a so that it describes this fact not only in terms of a , but also in terms of b and the relation R that holds between both. Then b got into the picture, with all its properties. The sentence can again be rearranged as an identity involving b , and this identity can, again, be rearranged, picking b through some other property that it has in virtue of being part of another fact. And then we have changed completely the subject, going from one sentence to the next, and these sentences are nevertheless all equivalent. It is as if each fact in the world implies all other facts, if we accept that any two objects are related one way or another, even if they do not take part in the same ‘local’ fact. One way of interpreting the conclusion of the slingshot would be this: if sentences refer to facts, then they refer simultaneously to all facts of the universe. Or maybe there is one single ‘big’ fact to which all sentences refer, although each sentence refers to this ‘big’ fact by referring to an aspect of it (a ‘local’ fact). If we are willing to talk of facts as reference of sentences, we might end up concluding that there is only one single (‘big’) fact.⁵

⁵ Although several author (including Barwise and Perry) tend to identify Frege as the origin of the slingshots, there are fundamental differences between the line of reasoning implicit in these arguments, and the framework within which Frege proposes his arguments. As Burge (1986, pp. 108-9) notices, although Frege accepts both the premises and the conclusion of Church’s and Gödel’s argument, it is incorrect, however, to see him as anticipating or as somehow having implicit the argument. For his argument appeals to the normative dimension of logic, i.e., to the main point of doing logic or of worrying about the reference of terms at all. According to Frege’s view, logic can only be normative if the notion of truth is seen as its main goal. Therefore, the whole point of doing logic, and the whole point of asking for the reference is our concern with truth. As Burge comments, ‘In making truth values the primary functional values of the Composition Principle [...] Frege was simply uniting his formal apparatus with the conception that motivates logical theory’ (1986, p. 10). Nothing like this occurs in Church’s or Gödel’s slingshot. Church himself wrongly attributes the argument to Frege. In his review of Carnap’s *Introduction to Semantics* (1943), he presents a version of his slingshot, and then comments that ‘According to Frege [...] a sentence (*Behauptungssatz*) expresses a proposition [...] but denotes or designates a truth-value [...]. His argument in support of this distinction lends itself to reproduction in more exact form by means of Carnap’s semantical terminology, and this is what we have just done’ (1943, p. 301). That is to

IV-Russell’s Theory of Descriptions and the Slingshot

Russell’s theory of descriptions blocks the slingshot since it does not allow C1 or G3 to be treated as identities between genuinely referring terms. This is so because, in Russell’s view, definite descriptions are not singular terms properly speaking, but rather incomplete expressions, i.e., they do not refer in isolation, but must first be incorporated into a sentence, and only this sentence as a whole has a meaning. Sentences C1 and C2 of Church’s argument are, according to Russell’s analysis, actually the following:

(C1’) $\exists x((x \text{ is author of } Waverley \ \& \ \forall y(y \text{ is author of } Waverley \rightarrow y=x)) \ \& \ x=\text{Scott})$

(C2’) $\exists x((x \text{ wrote twenty nine } Waverly \text{ novels altogether} \ \& \ \forall y(y \text{ wrote twenty nine } Waverly \text{ novels altogether} \rightarrow y=x)) \ \& \ x=\text{Scott})$

The claim that C1’ and C2’ have the same reference would depend on the substitution of a singular term that does not really exist. The properties referred to by *x is author of Waverley* and *x wrote twenty nine Waverly novels altogether* are different ones, and hence the inference of C2’ from C1’ (i.e., that they are co-referential) cannot be guaranteed by R anymore. Similarly in Gödel’s argument, sentence G3 and G4 would be, according to Russell’s analysis, respectively

(G3’) $\exists x((x=a \ \& \ F(x)) \ \& \ \forall y((F(y) \ \& \ y=a) \rightarrow y=x)) \ \& \ x=a)$

say, their arguments are developed within a purely semantic framework, while Frege’s argument is impregnated with value - theory. This is in part a natural consequence of the meaning of the term ‘*Bedeutung*’ in German. It has a double connotation. On the one hand, it has a purely semantical meaning, as when Frege presents the examples of ‘the morning star’ and ‘the evening star’ as sharing the same *Bedeutung*. On the other hand, it has a meaning that suggests value, as when he talks about the value that

$$(G4') \exists x((x=a \& x \neq b) \& \forall y((y=a \& y \neq b) \rightarrow y=x)) \& x=a$$

Again, the properties represented by ' $x=a \& F(x)$ ' and ' $x=a \& x \neq b$ ' are different, hence we cannot infer that $G3'$ and $G4'$ are co-referential based on Principle R.

There is an important detail here. Russell’s analysis of definite descriptions can only block the slingshot if we assume that properties with the same extension like *x is author of Waverley* and *x wrote twenty nine Waverly novels altogether* can be different. This is an assumption that Frege does not make: he has an extensional criterion of identity for properties. For him, if two properties have the same extension, they are the same. Therefore, Frege could, in principle, accept Russell’s analysis above and still carry out the slingshot, for $C1'$ and $C2'$ (and $G3'$ and $G4'$) say exactly the same for Frege.

V-Barwise and Perry on the Slingshot

Barwise and Perry (1975, 1983) developed an alternative semantics according to which sentences refer to what they call *situations*. Situations, according to them, consist ‘not only in objects, properties and relations, but of objects having properties and standing in relations to one another’ (1975, p. 370). Of course Frege’s thesis, if true, would render it impossible for sentences to refer to anything other than truth-values. Hence Barwise and Perry critically review in their paper the different slingshots, and argue that each one of them is wrong. I shall here concentrate on their discussion of Church’s and Gödel’s arguments, and shall not go into any detail of Barwise and Perry’s own semantics.

sentences have for us in scientific contexts, as opposed to artistic contexts (in which they are supposed to have a different sort of value).

Despite some superficial differences, both arguments can be seen as relying on two basic principles of designation-preservation for sentences, which Perry (2000) calls *Substitution* and *Redistribution*:

(*Substitution*): Substitution of co-referential terms for one another within a sentence does not affect the reference of the sentence.

(*Redistribution*): Rearrangement of the parts of the sentence does not affect the reference of it, as long as the truth-conditions remain the same.

Now Barwise and Perry have basically two objections to both slingshots. The first, which I shall call the *multiple perspectives* objection, comes from the fact that there are, according to them, two ways of looking at C1. One way (call it *perspective I*) sees C1 as describing a situation of which Scott is the only constituent (since Scott is the referent both of the name and of the definite description). That is to say, this is a perspective according to which descriptions are interpreted by the objects that they happen to discriminate (and, hence, the predicate does not contribute to the situation described). This perspective overlooks the differences between ‘the author of Waverley’ and ‘the man who wrote the 29 Waverly novels altogether’, as well as that between ‘the number, such that Sir Walter Scott is the man who wrote that many Waverly novels altogether’ and ‘the number of counties in Utah’. The second (call it *perspective II*) sees C2 as describing a situation that has Scott, the authorship relation, and Waverley as constituents. That is to say, from this perspective, not only the object described, but also *how* it is described, is regarded as part of the semantical contribution of the description. The two treatments of descriptions, that are on the basis of **perspective I** and **II** above, are what Barwise and Perry call “value-loaded” and “value-free” views, respectively. There is a clear parallel between these two views and the famous distinction made by Donnellan (1966) between referential and attributive use of definite descriptions. The shift from C1 to C2 and from C3 to C4 illustrates the use of

definite descriptions in which the properties mentioned do not really matter, as long as they help to single out the object one intends to talk about. It is ‘value-loaded’ because it is committed to some object, no matter whether this object satisfies the describing property or not. This is an example of what Donnellan would call the referential use of descriptions. (Donnellan’s famous example is the description ‘the man drinking a martini’ to refer to someone actually holding a glass of water: it refers to that person, although no one falls under this description.) And the shift from C2 to C3 involves taking the properties into consideration (otherwise the shift would make no sense). Descriptions here are ‘value-free’ because they are not committed to any object: they lay down a condition, and refer to whatever satisfies it. The perspective involved in this shift illustrates Donnellan’s attributive use of definite descriptions.

From **perspective I**, C1 and C2 are both equivalent to the identity ‘*Scott = Scott*’, while C3 and C4 are equivalent to ‘*29 = 29*’. But if this is so, in this perspective the step from C2 to C3 does not seem to work, because there was a radical change in the subject matter (i.e., the situation described). From **perspective II**, on the other hand, C2 and C3 do indeed describe the same situation (though in different ways, but the difference is not relevant here). However, C1 and C2 have different truth-conditions, and hence the step from C1 to C2 does not work. Neither does the step from C3 to C4. Using the distinction between both perspectives, Barwise and Perry finally formulate their diagnosis of what they think is going wrong with the slingshot:

The argument is like an ambiguous figure or an Escher drawing. If you are aware of situations, you have to keep shifting perspective to let the argument trick you. From one perspective, the first and last steps are fine, but the middle step is all wrong. From a second perspective the middle step is reasonably good, but the first and last steps are completely unfounded. (1975, p. 376)

[T]his [Gödel’s] version of the slingshot, and every version of it, simply turns on shifts from value-free to value-laden interpretations. We value-load the definite description for the first step, take them as value-free for the next, and then load again to finish the argument. (ibid., p. 377)

Hence, the problem, according to them, is that from one perspective, the first and the last step are correct, but the middle one is not. From another perspective, the middle step is legitimate, but not the first and the last. And the argument only appears to work because we shift perspectives along the way.

The second problem, which I shall call the *unstable aboutness* objection, concerns the principle of redistribution. The point is that, in redistributing the parts of a sentence, we might end up generating another sentence that is logically equivalent to the original one, but that may have lost sight of what the original sentence was about. For instance, while C2 is normally seen as being about Scott, C3 is about the number twenty-nine. To take another example, 'John is in the garden' seems to be about John, but the logically equivalent 'John is in the garden and Mary is in the kitchen or Mary is not in the kitchen' seems to be not only about John, but also about Mary. Hence, Perry concludes, logical equivalence is not a good guide for co-referentiality, since logical equivalence may not preserve the "aboutness" of sentences.

As I see it, no one of the objections raised by Barwise and Perry's are convincing. First of all, it is not exactly clear why they think that the property expressed in 'is the author of *Waverley*' is so radically different from 'is the man who wrote the twenty-nine *Waverley* novels altogether'. For one could coherently think that the property *being the author of Waverley* might have a deeper structure so that it is actually (or perhaps implies) the property *writing twenty-nine Waverly novels altogether*. Here we could contrast the picture of concepts (or properties) that they seem to have with Frege's. According to Frege's realist perspective, the sense of a linguistic expression is its cognitive value, and it is wrong to equate it with the linguistic meaning. Barwise and Perry seem to think that the lexical meaning of '*x is author of Waverley*' and '*x is a man who wrote twenty-nine Waverly novels altogether*' yields everything that we can know about both

properties and their structures. Someone holding a realistic conception of meaning could object to this.

Second, Barwise and Perry claim that the situation described in sentences C1 and C2 is one in which there is only one object involved, namely, Scott, while in C3 and C4 only the number twenty nine is involved (that is to say, the situation described in 1 and 2 is that Scott is self-identical, while the situation described in C3 and C4 is that 29 is self-identical), and this is why the shift from C2 to C3 would be illegitimate. But this is a cogent objection only if one takes situations seriously as the reference of sentences, and this is something that neither Church nor Frege would be willing to do. Hence, there seems to be some circularity in the whole objection.

Third, if we pause to think about how the slingshot relates to Frege's thought, there is a kind of consideration that may indicate that the whole discussion carried out by Barwise and Perry concerning definite description might be pointless. Let us remember that the diagnosis of the mistake both in Church's and in Gödel's slingshot is based on the distinction between value-laden and value-free descriptions. They claim that the slingshot is misleading, since one has to change the perspective from value-laden to value-free use of descriptions, and then back to value-laden. If this is so, the diagnosis of the slingshot would not work for a class of descriptions that are both things at once, i.e., descriptions that are used both attributively and referentially. The fact that there can be descriptions that are purely referential (i.e., in which the property might not be true of the object intended as reference) and that there can be descriptions that are purely attributive does not imply that there cannot be descriptions that are both referential and attributive at once: it singles out one object by specifying a property which this object uniquely satisfies. That is to say, the success in the attributive use is the condition for a successful referential use.

In my view, this picture is closer to Frege's original thought about definite descriptions. Frege saw a definite description as a device primarily for picking objects (hence as referential),

but the condition for it being so was that it could be demonstrated first that there is one object falling under the condition and, second, that this object is unique. Description with the sharpness required of them were only possibly met in strictly scientific contexts, that is to say, in those contexts in which these two claims could be demonstrated. This is possible only in a very narrow field of truths, namely, in that field of truths within deductive sciences, namely, logic and mathematics.⁶ The two different uses of definite descriptions pointed out by Donnellan and explored by Barwise and Perry in their criticism seem to merge into one single kind of use within logic and mathematics, and that is why maybe the slingshot, if restricted to these sciences, seems to be immune to this kind of objection.

Finally, regarding the **unstable aboutness**, it is not clear that the notion of aboutness implicit in the objection makes much sense. If I say 'John is one of Jesus' twelve apostles', what is the sentence *about*? Is it about John? Or Jesus? Or the number twelve? Or the concept *apostle*? Or is it perhaps about the ordered pair composed of the individual John and the property *being one of the Jesus' twelve apostles*? Or maybe about the second-order property *being one of John's properties*? There seems to be no point in isolating one entity as *the* one the sentence is *about*. Notice that the point here is not that natural language is unclear, for we would have the same multiple possibilities if we were dealing with a sentence in a formalized system (e.g., ' $a=b$ ' can be seen as being about a , or about b , or about the ordered pair, or about the identity-relation, etc.) As Frege points out, a thought may be analyzed in different ways, and no one of these different analysis can claim priority over the others. That is to say, a sentence *per se* is not about one thing or another, but only a sentence combined with a particular way of analyzing it. By changing the

⁶ Frege explains in his posthumous "*Über Scoenflies: Die logischen Paradoxien der Megelehre*" (1906) that a proper name (including definite descriptions) has a purpose in science, but it must be have a 'justification' ("*Berechtigung*") to fulfill this purpose. Then he adds: 'How things work in everyday language, is not of our concern here.' (*Nachgelassene Schriften*, p. 193). That is to say, the class of true sentences, for Frege, includes only those whose proper names, including definite descriptions, are provably referential. And for this class of names, the attributive and the referential use are one and the same.

analysis, we might change its aboutness. Hence, I do not see that Barwise and Perry's claim can be of much force against Church or Gödel, since it requires something that the notion of synonymy cannot possibly have.

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