

MISFIRED SLINGSHOTS: A CASE STUDY ON THE CONFUSION OF METAPHYSICAL AND SEMANTIC CONSIDERATIONS

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ABSTRACT: Most philosophers today will acknowledge the pitfalls of confusing metaphysical and semantic issues. Many are also familiar with the classic semi-formal argument that has come to be known as 'the Slingshot' and the various philosophical ends to which this argument has been deployed. The combination of the argument's relatively simple theoretical machinery and its wide range of applications make it ripe for abuse. The slingshot was originally conceived as a semantic argument about designation; what it suggests, but does not prove, is that the closest analogue to singular term reference for any expression is that expression's semantic extension. In order to derive more metaphysically robust conclusions, however, many classical deployments of the argument make use of several methodologically suspicious tactics. By cataloguing the more frequent abuses of the argument, we may remind ourselves of a valuable philosophical lesson.

KEYWORDS: the Slingshot argument, facts, common nouns, semantic extension, referent, metaphysics

1. Introduction

There is a familiar argument whose formal presentation is due originally to Alonzo Church¹ and independently to Kurt Gödel² that has been used for a number of philosophical purposes. In its first form, in his review of Carnap's *Introduction to Semantics*,³ Church presented the argument as a rigorous proof against the view that sentences refer to propositions.⁴ Others, like Donald Davidson⁵ and W.V.

¹ Alonzo Church, "Review of *Introduction to Semantics* by Rudolf Carnap," *Philosophical Review* 52 (1943): 298–304, Alonzo Church, *Introduction to Mathematical Logic: Volume 1* (Princeton: Princeton University Press, 1956), 24–25.

² Kurt Gödel, "Russell's Mathematical Logic," in *The Philosophy of Bertrand Russell*, ed. Paul Arthur Schilpp (Evanston and Chicago: Northwestern University Press, 1971). (Originally published in 1944).

³ Rudolf Carnap, *Introduction to Semantics* (Cambridge: Harvard University Press, 1959). (Originally published in 1942).

⁴ Church, "Review of *Introduction to Semantics*."

Quine,⁶ have employed similar arguments in attempts to undermine various philosophical theses. If successful these arguments would have startling results. First, all true sentences corefer (and so too with all false sentences); second, if sentences refer to facts, then there is but one “Eleatic” fact; and third anyone who has a true belief, believes everything that is true (and similarly anyone who believes anything false, believes everything false) or finally four, that all true sentences are necessarily true. Unsurprisingly, this argument has gone by several different names: the Frege-Church-Gödel argument – as the argument has been thought to have its roots in the work of Frege – collapsing arguments, and perhaps most famously the Slingshot.

The most comprehensive work to date on slingshot-arguments is Stephen Neale’s *Facing Facts*,⁷ which discusses some of the more prominent versions of slingshots as well as their philosophical significance, paying special attention to a version Gödel outlines in discussion of Russell’s theory of descriptions. Ultimately, Neale concludes with Gödel that in order to avoid the argument’s intended conclusion of a metaphysical “collapse” of all facts into one, one must “give up either (i) an intuitive and straightforward Fregean Principle of Composition or (ii) the idea that definite descriptions are expressions that purport to stand for things.”⁸ Since giving up compositionality would appear too high a price to pay, one can give up the view that definite descriptions refer. In other words, if one adopts a Russellian treatment of definite descriptions, a theory for which there is, as Neale maintains, independent motivation to accept, then one has the means to avoid Eleatic metaphysical collapse.⁹

⁵ Donald Davidson, “The Logical Form of Action Sentences,” in Donald Davidson, *Essays on Actions and Events*, 2nd edition (Oxford: Clarendon Press, 2001) (Originally published in 1967), “True to the Facts,” and “Truth and Meaning,” both in Donald Davidson, *Inquiries into Truth and Interpretation*, 2nd edition (Oxford: Clarendon Press, 2001) (Originally published in 1969, respectively 1967).

⁶ W.V. Quine, *Word and Object* (Cambridge: MIT Press, 1960), W.V. Quine, “Reference and Modality,” in his *From a Logical Point of View*, 2nd ed. (Cambridge: Harvard University Press, 1961) (Originally published in 1953), W.V. Quine, “Three Grades of Modal Involvement,” in his *The Ways of Paradox* (Cambridge: Harvard University Press, 1975), 177–187 (Originally published in 1953).

⁷ Stephen Neale, *Facing Facts* (Oxford: Oxford University Press, 2001).

⁸ Neale, *Facing Facts*, 128.

⁹ Recall that Russell gives definite descriptions of the form, \lceil the ϕ \rceil , a quantificational analysis. Thus a Russellian analysis of “the author of *The Brothers Karamozov*” will have the following structure:

$$(\exists x)[Kx \ \& \ (\forall y)(Ky \rightarrow x=y)]$$

Although much ink has been spilled discussing various deployments of the slingshot, this now classic argument is widely abused. The Slingshot was so-dubbed by Barwise and Perry¹⁰ due to its relatively simple philosophical machinery, and its apparent giant-slaying abilities. What's more, the combination of its simplicity and its quasi-formal character make the slingshot ripe for abuse. Careful scrutiny, however, reveals several highly methodologically dubious strategies, which I will detail below, that significantly weaken prominent slingshot deployments. The Slingshot suggests, but does not prove, that the closest analogue to singular term reference for any expression is that expression's semantic extension. In order to derive more metaphysically substantive conclusions, many famous slingshots (i) provide unsound arguments; (ii) build substantive metaphysical premises into their assumptions; or (iii) invoke an abductive assumption at the end, which is then expected to carry serious theoretical weight. This last move, (iii), is especially interesting since few (if any) seem to acknowledge its role, despite the fact that both Frege and Church explicitly invoke it. Moreover, the move can be invoked in a less metaphysically suspicious way, i.e. the way that Frege and Church use it.

My plan will be as follows. In section 2, in order to understand the original Fregean-inspired motivations behind the slingshot, it will be useful to examine it in its earliest forms; doing this will require briefly going back to Frege, since Church, Gödel, Quine and Davidson, like so many were inspired by his work. In section 3 I shall examine several contemporary slingshots, one proposed by Quine,¹¹ one by Donald Davidson,¹² and a more recent one discussed by Nathan Salmon.¹³ Section 4 is devoted to a brief discussion of various principles of substitution. Finally, in section 5, I will catalogue a number of mistakes commonly employed in slingshot-style argumentation with an aim to reminding us of a larger philosophical lesson: to use caution when drawing metaphysical conclusions from linguistic arguments. Although this lesson has been taught before, slingshots in

This can be read as saying that there is one and only one individual who authored *The Brothers Karamozov*, where 'K' stands for the predicate 'is author of *The Brothers Karamozov*.' The reason why Gödel thought the slingshot's conclusion could be avoided with a Russellian theory is that this quantificational analysis doesn't treat descriptions as genuinely referring expressions. And since the slingshot relies on the assumption that one may substitute constituent coreferring singular terms *salva designate*, such a substitution will count as illegitimate by Russell's lights.

¹⁰ Jon Barwise and John Perry, "Semantic Innocence and Uncompromising Situations," *Midwest Studies in the Philosophy of Language* VI (1981): 387–403.

¹¹ Quine, "Reference and Modality."

¹² Davidson, "True to the Facts," Davidson, "Truth and Meaning."

¹³ Nathan Salmon, *Reference and Essence*, 2nd ed. (Amherst: Prometheus Books, 2005).

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the cases I discuss are illustrative examples of the mistake of confusing language and metaphysics.

2. Historical Background: Frege, Church, and Gödel¹⁴

2.1. *Sinn* and *Bedeutung* and Frege's "Slingshot"

The extent to which there is anything one can call a formalized slingshot in the work of Frege is somewhat controversial.¹⁵ Regardless of whether we can correctly attribute to Frege a slingshot argument, it will be worthwhile – especially since both Church and Gödel took themselves to be articulating Frege's implicit reasoning – if we examine his motivations.

Recall that Frege's solution to his now eponymous puzzle hinged on distinguishing between the *sense* of a singular term from its *reference*, and that by positing these two distinct semantic values for the class of singular terms, it would appear quite natural to extend this distinction to other expressions as well.¹⁶ For

¹⁴ I shall use the terms "referent" and "designation," along with their plural versions, interchangeably throughout.

¹⁵ As one (re)reads *On Sense and Reference*, one does get a feeling of sorts that a slingshot-style argument is precisely what Frege had in mind, although the question of whether there is an actual slingshot argument in that essay is a question for Frege scholarship. Answering this question definitively will have no effect on the outcome of the current essay.

¹⁶ The distinction between *sense* and *reference* makes its first appearance in "Function and Concept" (1891), and was later developed in more detail in "On Sense and Reference" (1892). In the former, the distinction gets invoked in connection with discussions of mathematical statements concerning the identity sign, "=". At the time, there was debate about how to interpret the identity symbol for an expression like " $2 + 5 = 3 + 4$," where some favored the view that this sentence expresses an *equality*, but not a strict *identity*. Frege explicitly disagrees with this assessment, claiming that the expressions flanking the identity sign both designate one and the same thing, the number seven, though the thing signified is presented, or picked out differently by the two expressions. According to Frege, those favoring the equality interpretation of the identity sign confuse the "sign and thing signified." (Gottlob Frege, "Function and Concept," in *Translations from the Philosophical Writings of Gottlob Frege*, eds. Peter Geach and Max Black (Oxford: Basil Blackwell, 1966), 22) It is as if "one wanted to regard the sweet-smelling violet as different from *Viola odorata* because the names sound different. Difference of sign cannot by itself be a sufficient ground for difference of the thing signified." (Frege, "Function and Concept," 22). Thus Frege makes a distinction between the number being picked out – in this example the number seven – and the way that that thing is determined by an expression like " $2 + 5$." The former Frege calls the *reference* (*Bedeutung*). The latter, the "mode of presentation," he calls the *sense* (*Sinn*). For more on the history of this particular topic, see Kevin C. Klement, *Frege and the Logic of Sense and Reference* (New York: Routledge, 2002).

example, does the sense/reference distinction hold for larger expressions, say, for entire declarative sentences? In response, Frege says that a whole sentence may be regarded as a name and that each sentence contains what Frege calls “a thought [*Gedanke*].”¹⁷ Tabling the question of what exactly Fregean thoughts are for a moment, one might then pose the question of whether a thought is the sense or the reference of a sentence. Here, it is worth quoting Frege in full:

Let us assume for the time being that the sentence has reference. If we now replace one word of the sentence by another having the same reference, but a different sense, this can have no bearing upon the reference of the sentence. Yet we can see that in such a case the thought changes; since, e.g., the thought in the sentence ‘The morning star is a body illuminated by the Sun’ differs from that in the sentence ‘The evening star is a body illuminated by the Sun.’ Anybody who did not know that the evening star is the morning star might hold the one thought to be true, the other false. The thought, accordingly, cannot be the reference of the sentence, but must rather be considered as the sense.¹⁸

This passage is important for several reasons: first, we’re given a couple of crucial assumptions for Frege’s argument about the referents of sentences. Second and more importantly, these two assumptions are also invoked in Church’s slingshot appearing in 1943.¹⁹ Third, using these assumptions, Frege argues for the conclusion that the thought of a sentence cannot be its referent, but must be the sense. Let’s name the two assumptions just mentioned as follows:

SR: Sentences are referring expressions

SUB_{DES}: The referent of a compound referring expression – not containing devices like quotation marks or “believes that” – is preserved when a component referring expression is replaced by another with the same referent.

The first assumption reflects Frege’s tentative proposal to accept that sentences have references, while the second assumption reflects important rules of substitution for singular terms. *SUB_{DES}* is therefore a generalized principle of substitution for compound expressions, an analogue to similar principles regarding the substitution of coreferring singular terms. The qualification in *SUB_{DES}* is important both from a logical perspective and an historical one, for even Frege is careful to remark on the importance of the principle’s restricted application for nonextensional contexts: “Exceptions are to be expected when the whole sentence or its part is direct or indirect quotation; for in such cases, as we have seen, the

¹⁷ Gottlob Frege, “On Sense and Reference,” in *Translations from the Philosophical Writings of Gottlob Frege*, 62.

¹⁸ Frege, “On Sense and Reference,” 62.

¹⁹ Church, “Review of Introduction to Semantics.”

words do not have their customary reference.”²⁰ One other notable remark about Frege’s motivations (and so too with Church) is that Frege sought a *theoretical analogue* to singular term reference for the class of expressions larger than proper names. Calling this an analogue is appropriate, since Frege recognized the counterintuitive nature of positing sentence referents when he asks us to “assume for the time being that the sentence has a reference.”²¹

Now let us examine Frege’s reasoning for thinking that the referent of the sentence must be either the *True* or the *False*. Informally, it seems that Frege’s argument goes something like this.²²

(a) *SR*: Sentences are referring devices. Sentences *qua* singular terms may be regarded as proper names, and like proper names have both a sense and a reference.

(b) *Compositionality*: the referent of a complex referring expression is a function of the referents of its parts, whereas the sense of a complex referring expression is a function of the senses of its parts.²³

(c) *SUBDES*: Given (b), the referent of a compound referring expression – free from devices like quotation or “believes that” – is preserved when a component referring expression is replaced by another with the same referent.

(d) The referent of a sentence cannot be the thought (or proposition) it expresses since the thought (proposition) expressed by ‘The morning star is a body illuminated by the Sun’ differs from the thought expressed by ‘The evening star

²⁰ Frege, “On Sense and Reference,” 65.

²¹ Frege, “On Sense and Reference,” 62.

²² The following argument is a reconstruction developed from Anthony C. Genova, “How Wittgenstein Avoids the Slingshot,” *Journal of Philosophical Research* (2001): 1–22 and through personal correspondence with him.

²³ Following common parlance I use the term ‘compositionality’ in discussion of the Fregean notion. Care should be taken to avoid confusion with other, broader characterizations of compositionality in the philosophy of language and mind. For example, what’s often called “The Principle of Compositionality” gets articulated in the following way: the meaning of a complex expression is a function of its meaningful constituents [morphemes] and its syntactic structure.” The similarity between this broad notion of compositionality and the idea of Frege’s is evident, but the former discusses the relationship between expressions and meanings more generally, while the latter specifically concerns itself with the determination of the two semantic values of *sense* and *reference* and their relationship between respective bits of language. See Zoltán Gendler Szabó, *Problems of Compositionality* (New York: Garland Publishing, 2000) and Jerry Fodor, *The Compositionality Papers* (Oxford: Oxford University Press, 2002) for discussions of the Principle of Compositionality in the philosophy of language and the philosophy of mind respectively.

is a body illuminated by the Sun'. This is so given (c) and because 'The morning star' and 'The evening star' are coreferential.

(f) Whatever the referent of a sentence is, it must remain the same across coreferential substitutions – this includes subsentential expressions as well as full sentences themselves. Sentences with the same truth-value will be substitutable across all extensional contexts.

(g) *IBETv.* consequently, since the only semantically relevant thing about sentences that remains unchanged across substitution of coreferring expressions (in extensional contexts) is the truth-value, what else but the truth-value could be the referents of sentences?

The remaining discussion in “On Sense and Reference” focuses on various examples testing Frege’s thesis about the referents of sentences: the rather controversial initial assumption that sentences are similar enough to names to warrant applying the sense/reference distinction; an assumption about substitution to preserve reference given a reasonable principle of compositionality; and importantly even the makings of something similar to an abductive premise, which I label ‘*IBETv.*’ We can see that most of the assumptions required for a slingshot-style argument to proceed may plausibly be found within Frege’s reasoning. It is important to bear these Fregean considerations in mind when examining Church’s argument.

2.2. Church’s Slingshot²⁴

Let’s turn to Church’s argument appearing in his 1943 review of Carnap’s *Introduction to Semantics* (appearing in the same year). This slingshot was a response to Carnap’s break with the Fregean view that sentences designate truth-values, opting instead for the alternative thesis that sentences designate propositions. Much of the argument, as should now be apparent, is inspired by Fregean considerations, in particular the recognition that Frege sought a theoretical analogue to singular term reference when constructing his own argument. Church’s argument requires four relatively simple assumptions.

²⁴ My reconstruction of the Church argument is a version of what Tyler Burge calls a “standardized form,” though Burge notes that the argument “has a number of interesting variants, and ... even more uses” (Tyler Burge, “Frege on Truth,” in *Frege Synthesized*, eds. Leila Haaparanta and Jaakko Hintikka (Boston: D. Reidel Publishing Company, 1986), 108). However, later Burge notes that it is unlikely that Frege was giving an “elliptical” version of the Church-Gödel argument, since (by Burge’s interpretation) Frege “invokes the normative foundations of logic and the normative roots of the primacy of sentences in logical theory in arguing for this conclusion ... The Church-Gödel argument makes no such appeal ...” (Burge, “Frege on Truth,” 109).

SUBDES: The referent of a compound referring expression – free from nonextensional devices like quotation marks or “believes that” – is preserved when a component referring expression is replaced by another with the same referent.

SR: Sentences are referring expressions

ST: A definite description \lceil the ϕ \rceil refers to the only individual that satisfies the formula ϕ , if there is exactly one such individual and refers to nothing otherwise.

LED: Referring expressions that are logically equivalent to one another refer to the same thing.

I'll quickly remark on the two new assumptions. One may regard *ST* as an analogue of the Fregean assumption that sentences are complex names, but in the current case the expressions with which we are concerned are definite descriptions. Note first that this assumption is in keeping with Frege's treatment of descriptions as referring devices, but second that the assumption is contrary to a Russellian descriptional theory – one that treats descriptions as quantificational rather than referential devices. Now consider the assumption I label '*LED*.' Let us say that two singular terms α and β are logically equivalent if and only if $\lceil\alpha = \beta\rceil$ is logically true.²⁵ By this principle, logically equivalent referring expressions, whether names or definite descriptions, corefer.

Now consider the proof.

1. Assume *SR* and consider any two arbitrarily chosen sentences with the same truth-value, *S* and *S'* (e.g. *S* can be “Washington D.C. is the capital of the United States,” while *S'* may be “Aristotle founded the Lyceum.”) (Note: the symbol ' \emptyset ' stands for the null set).

(a) S

(b) $\{x: x = x \ \& \ \text{not-}S\} = \emptyset$

(c) $\{x: x = x \ \& \ \text{not-}S'\} = \emptyset$

(d) S'

2. (a) and (b) refer to the same thing (by *LED*)

3. (c) and (d) refer to the same thing (by *LED*)

²⁵ For example, consider ‘The president's dog’ and ‘The president's self identical dog,’ both of which are logically equivalent; by *LED* these are also coreferential. David Kaplan remarks that this is a “seemingly gratuitous assumption” (David Kaplan, *Foundations of Intensional Logic*, Ph.D. thesis (University of California, Los Angeles, 1964), 13), though some have disagreed. While rejecting *LED* is one way to avoid the slingshot's conclusion, I wish to focus on other ways the slingshot can misfire, though my inclination is that the burden is on challengers of *LED*.

4. (b) and (c) corefer (by *SUBDES* and *ST*)
5. So (a) and (d) refer to the same thing (1, 2, and 4)
6. So all true sentences refer to the same thing (1 – 5 and Universal generalization)

We could next run a similar argument, but this time instead of true sentences for *S* and *S'* we would use the falsities “New York is the capital of the United States” and “Plato founded the Lyceum” respectively. The result would be that all false sentences corefer. Thus, two quick, relatively simple slingshots get us the following *semantic* thesis: all true sentences refer to the same thing, while all false sentences refer to the same thing.

Notice that in order to draw a metaphysical conclusion about what the referents of sentences *are* – say the Fregean position that sentences refer to truth-values – one will need a further premise, one perhaps similar to the one briefly mentioned above, along the following lines:

IBETV: The best explanation to account for the result of the slingshot is that all true sentences refer to a single unique entity *the true*, while all false sentences refer to a single unique entity, *the false*.

Without *IBETV* the slingshot is restricted to a more modest semantic thesis, namely that coextensional expressions are also codesignative, while remaining silent on the ontological question of what the referents of true and false sentences are. And though this premise itself seems pretty reasonable, as far as the slingshot itself is concerned, one might take the argument to give equal support to the claim that all true sentences refer to say the number one, while all false sentences refer to the number zero or the null set.²⁶

2.3. Gödel’s Slingshot

Gödel’s slingshot,²⁷ like Church’s, explicitly makes use of three assumptions similar to the one’s invoked by both Church and Frege. Those assumptions are as follows:

Referential Compositionality – “the signification of a composite expression, containing constituents which have themselves a signification, depends only on the signification of these constituents (not on the manner in which this signification is expressed)”

²⁶ To this end one might construct a similar abductive alternative: *IBENOT*: The best explanation to account for the result of the slingshot is that all true sentences refer to a single unique entity *the number one*, while all false sentences refer to a single unique entity, *the null set*.

²⁷ Gödel, “Russell’s Mathematical Logic.”

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LED^* – $\lceil \phi\alpha \rceil$ and $\lceil \alpha$ is the object which has the property ϕ and is identical with $\alpha \rceil$
(in Gödel's words) "means the same thing." [sic]²⁸

SR^* : "Every Proposition 'speaks about something', i.e., can be brought to the form $\phi(\alpha)$. Furthermore one would have to use the fact that for any two objects a, b , there exists a true proposition of the form $\phi(a, b)$ as, e.g., $a \neq b$ or $a = a.b = b$ ".²⁹

Though Gödel's wording deviates from Church's language, many of his assumptions do the same theoretical work. First, the assumption above labeled "Referential Compositionality" presumably does the work of Church's substitution assumption. Second, Gödel's assumption LED^* , though seemingly worrisome, is likely best interpreted along the lines of LED , that logically equivalent referring expressions refer to the same thing.³⁰ Third, I take SR^* as a syntactic articulation doing the work of SR above. Fourth, just as Church requires an assumption about the uniqueness of referents for definite descriptions, so too with Gödel. Finally, just as Church's slingshot needs a further premise to get to an ontological conclusion about truth-values, so does Gödel, though Gödel's language is careful to conclude only that "all true sentences have the same signification (as well as all the false ones)."³¹ Gödel leaves readers to piece through the argument for themselves (as the hints of the argument are made only in a footnote), though the reasoning runs the same as the Church deployment. Let us now turn to more contemporary slingshot deployments. As we will see, these slingshots draw far more robust metaphysical conclusions.

²⁸ Gödel, "Russell's Mathematical Logic," 122. Neale remarks that "[LED^*] is less worrying than Gödel's wording might suggest" (Neale, *Facing Facts*, 130), though he does not go on to say why he thinks this. Later, Neale writes, "An examination of the main text ... might suggest that [Gödel] intends 'signify the same thing.' Whatever Gödel's intention, for the purposes of this argument I shall attribute to him, it is both sufficient and necessary that if descriptions are singular terms that simply stand for things, then $\lceil \phi\alpha \rceil$ and $\lceil \alpha$ is the object which has the property ϕ and is identical with $\alpha \rceil$ stand for the same fact" (130). I disagree with Neale's latter characterization, mainly because of the use of the phrase "stand for the same fact," for Gödel never uses the term "fact." I find it far more plausible to interpret the phrase "means the same thing," along the lines of Neale's earlier proposal as "signify the same thing," since this is Carnap's characterization of synonymy (see Carnap, *Introduction to Semantics*, 55) and it's reasonable to think that Gödel, having published his article originally two years later in 1944, was familiar with this fact.

²⁹ Gödel, "Russell's Mathematical Logic," 122.

³⁰ Cf. footnote 28 above.

³¹ Gödel, "Russell's Mathematical Logic," 122.

3. Quine, Davidson, and Common-Noun Slingshots³²

There are important distinctions between the slingshots presented by both Church and Gödel and those I am about to discuss. One key difference is one of presentation, as both Quine and Davidson present their arguments in the form of a *reductio*. Quine's targets are purportedly "opaque contexts," i.e. intensional contexts involving words like "necessarily" and "possibly," and hyperintensional contexts involving propositional attitude terms like "believes," "wishes," "wants," etc.³³ Davidson's various slingshot deployments serve several different purposes, the most widely discussed being his famous argument against traditional correspondence theories of truth that make use of facts as truth-makers for sentences. Let's begin with the assumptions Church uses in his version of the argument – *SUBDES*, *SR*, *ST*, and *LED* – and turn first to discussion of Quine.³⁴

3.1. Quine's Slingshots

Quine has several slingshots, one in "Reference and Modality" in the first edition of *From a Logical Point of View*, and in his "Three Grades of Modal Involvement," while another occurs in 1960 in *Word and Object*. All versions of the argument may be interpreted to the same end: to cast doubt on the intelligibility of ostensibly nonextensional contexts. I shall focus on the one from 1953 in "Reference and Modality."

³² One other slingshot receiving little to no discussion in the literature may be found in footnote 71 of David Kaplan's essay on demonstratives from 1977 (David Kaplan, "Demonstratives: An Essay on the Semantics, Logic, Metaphysics, and Epistemology of Demonstratives and Other Indexicals," in *On Sense and Direct Reference*, ed. Matthew Davidson (Columbus: McGraw-Hill, 2007). This slingshot deployment like those of Quine and Davidson takes the form of a *reductio* with the aim of showing that certain substitution moves are not legitimate for *pseudo de re* contexts.

³³ Quine appears to use the term "intensional" to describe both modal and hyperintensional contexts alike, though overall it appears he is concerned with contexts that appear to result in some failure of substitution. I will simply use the expression "nonextensional" when referring to such contexts.

³⁴ Krüger, like Barwise and Perry ("Semantic Innocence and Uncompromising Situations"), agrees that Davidson's argument does not succeed in refuting the correspondence theory of truth. However, Krüger denies that slingshot deployments represent "... a unified tradition launched by Frege ... whose representatives have supposedly all lost their 'semantic innocence' ..." (Lorenz Krüger, "Has the Correspondence Theory of Truth Been Refuted? From Gottlob Frege to Donald Davidson," in *Why Does History Matter to Philosophy and the Sciences? Selected Essays*, eds. Thomas Sturm, Wolfgang Carl, and Lorraine Daston (Berlin: Walter de Gruyter, 2005), 202). (Originally published in 1995).

More generally, Quine claims that his slingshot allows him to make a more “sweeping observation,” that “*any* mode of statement composition other than the truth functions, is referentially opaque.”³⁵ However, in order for this conclusion to be plausible, Quine needs two variants on the principles of Frege and Church:

SUB_{TV}: The truth-value of an expression is preserved when a component expression is replaced by another with the same truth-value.

LES: Logically equivalent expressions may be substituted in all contexts *salva veritate*.

The other assumption needed is *ST*, which for Quine’s purposes does not depart significantly from the one stated above. Quine’s aim is to show that *SUB_{TV}* does not extend to expressions containing non-truth-functional operators that still allow *LES*. Restated in Quine’s own words, his aim is to show that non-truth-functional expressions are “referentially opaque.” It is important to notice that *SUB_{TV}* omits the extensional restriction, as this will be a bone of contention I discuss later in this essay.³⁶ So let Φ be a purportedly non-truth-functional expression such as ‘necessarily’ or ‘possibly,’ and assume for *reductio* that *SUB_{TV}* applies to sentences containing Φ , for then it will follow that Φ is truth-functional, a presumably unacceptable result. So let S and S' be any two arbitrarily chosen sentences alike in truth-value, say ‘Hesperus is Hesperus’ and ‘Quine was born in Akron.’ Suppose further that Φ is ‘necessarily.’ Then if $\Phi(S)$, then $\Phi(S')$, or if ‘Necessarily, Hesperus is Hesperus,’ then ‘Necessarily, Quine was born in Akron.’

- | | |
|---|---|
| 1. $\Phi(S)$ | Assumption |
| 2. $\Phi(\{x: x = x \ \& \ S\} = \emptyset)$ | 1., <i>LES</i> |
| 3. $\Phi(\{x: x = x \ \& \ S'\} = \emptyset)$ | 2., <i>SUB_{TV}</i> , <i>ST</i> |
| 4. $\Phi(S')$ | 3., <i>LES</i> |

Presumably this conclusion is an unacceptable result unless, as Quine states, “the context represented by ‘ Φ ’ is referentially opaque.”³⁷ Referential opacity, according to Quine, is problematic since problems arise when one attempts to quantify into nonextensional contexts.³⁸ Thus, Quine’s reasoning appears to be

³⁵ Quine, “Reference and Modality,” 159. Emphasis is Quine’s.

³⁶ See Section 5.

³⁷ Quine, “Reference and Modality,” 159.

³⁸ The argument for why quantifying into nonextensional contexts is unintelligible is hinted at in Quine, “Reference and Modality,” but is spelled out in more explicit detail in W.V. Quine, “Quantifiers and Propositional Attitudes,” *Journal of Philosophy* 53 (1956): 177–187.

that if we treat purportedly nonextensional expressions as truth-functional, then a slingshot delivers unacceptable results, while if we accept nonextensional expressions as indeed nonextensional, we risk the incoherence of quantifying into them.³⁹

As we saw above, in order for this variant of the slingshot to work, Quine must modify the assumptions used by Church and Frege. Although Quine's principles are quite close to the versions employed by Frege and Church, these are concerned with truth-preservation rather than preservation of reference. Thus, Quine's slingshot, with its two variants of the principles discussed earlier, *SUB_{TV}* and *LES*, its *reductio* form, and the conclusion it draws, represents a significant departure from the original reasoning employed in Frege, Church, and Gödel. We will return to these differences later. For now, let us turn to discussion of Davidson.

3.2. Davidson

To my knowledge there are at least three separate slingshots in the work of Davidson, all of which share an affinity with Quine's formulations in taking the characteristic *reductio* form. The first two appear in 1967. One appears in "Truth and Meaning"⁴⁰ where Davidson uses the slingshot as a way to show that expressions cannot refer to their meanings since the slingshot would show that all expressions with the same semantic extension end up having the same meaning, a clearly and unacceptable result. The other in "The Logical Form of Action Sentences"⁴¹ raises an objection to Reichenbach's⁴² analysis of the logical form of action sentences. According to Davidson, if one adopts Reichenbach's proposal, a quick slingshot shows that there is but one event, and so by *reductio* Reichenbach's view must be false. Finally, perhaps the most famous of the three is the slingshot in "True to the Facts" where Davidson uses the slingshot to object to Correspondence theories of truth that make use of facts as the truth-makers of sentences. If sentences designate facts, Davidson maintains, then all true sentences designate the same fact. Since this Eleatic conclusion is unacceptable, the initial

³⁹ The Kronecker δ version from Quine (*Word and Object*, 148–149) is employed much to the same effect as the earlier 1953 version, but this time using propositional attitude contexts instead. So, where Φ is a propositional attitude operator such as 'believes that,' the result would be that the subject of the sentence ends up believing everything. Unless of course 'believes that' is referentially opaque.

⁴⁰ Davidson, "Truth and Meaning," 19.

⁴¹ Davidson, "The Logical Form of Action Sentences," 117–118.

⁴² Hans Reichenbach, *Elements of Symbolic Logic* (New York: The Macmillan Company, 1947).

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presupposition about sentences designating facts must be false, *reductio ad absurdum*.⁴³

Davidson begins by asking when statements with the following form hold:

(3) the statement that p corresponds to the fact that q

His response is as follows:

Certainly when “ p ” and “ q ” are replaced by the same sentence: after that the difficulties set in. The statement that Naples is farther north than Red Bluff corresponds to the fact that Naples is farther north than Red Bluff, but also it would seem, to the fact that Red Bluff is farther south than Naples (perhaps these are the same fact). Also to the fact that Red Bluff is farther south than the largest Italian city within thirty miles of Ischia. When we reflect that Naples is the city that satisfies the following description: it is the largest city within thirty miles of Ischia, and such that London is in England, then we begin to suspect that if a statement corresponds to one fact, it corresponds to all.⁴⁴

Next Davidson turns to spelling out in more formal fashion the reasoning employed in the above excerpt. The two assumptions provided are as follows:

(4) the sentences that replace ‘ p ’ and ‘ q ’ are logically equivalent

(5) ‘ p ’ differs from ‘ q ’ only in that a singular term has been replaced by a coextensive singular term

Although these suppositions as stated are not themselves principles, it’s easy enough to turn them into principles similar enough to the ones already discussed. Thus (4) appears to do the work of the assumption above *LED*, namely that logically equivalent referring expressions corefer, while it’s likely that (5) does the work of *SUBDES*. Though not mentioned, presumably Davidson also needs something like *ST*, and the assumption that descriptions of the form ‘the fact that ϕ ’ are designators. Now consider any two arbitrarily chosen sentences that have the same truth-value, S and S , and consider the following slingshot:

1. the fact that S
2. the fact that $(\iota x)(x = \text{Diogenes} \ \& \ S) = (\iota x)(x = \text{Diogenes})$
3. the fact that $(\iota x)(x = \text{Diogenes} \ \& \ S) = (\iota x)(x = \text{Diogenes})$

⁴³ While the first slingshot in “Truth and Meaning” is interesting within the context of that essay, since the conclusion reached is far more plausible than Davidson’s other uses of the argument, namely that there must be more to meanings than extension, discussion on this version can for the most part be ignored. What’s more, this version is put forth as a formalized version of Frege and Church’s arguments. For my purposes, however, it’s the questionable cases that are of interest.

⁴⁴ Davidson, Donald “True to the Facts,” 41–42.

4. the fact that *S*

Davdison's reasoning then proceeds in typical slingshot fashion: 1 and 2 are codesignative by *LED*; 3 is codesignative with 2 by *SUBDES* and *ST*; 3 and 4 are codesignative by *LED*. Thus, 1 and 4 are codesignative. If we universally generalize with the result, we get the desired Eleatic conclusion: all descriptions with the form [the fact that ϕ] designate the same fact.

This concludes the discussion on what we might call the "Classic" slingshot deployments. However, before I turn to the final section, there is one more suspect slingshot to discuss, one proposed by Nathan Salmon⁴⁵ concerning the referents of common noun phrases.

3.3. A Slingshot for Common Nouns⁴⁶

Along these lines, one might construct a slingshot argument in the vein of Church and Gödel to argue for the claim that any two arbitrarily chosen common nouns that happen to have the same extension refer to the very same thing. If sound, the argument would strongly suggest that any two common nouns that happen to have the same semantic extension, e.g. "Tyrannosaurus rex" and "dodo," refer to the same thing.

The argument requires the same assumptions from the original Church version above, though with two minor changes, *v-SUBS* and *CNR*. The former is simply our good old original *SUBDES* reformulated to accommodate common nouns. The latter just states that common noun phrases are referring expressions. Salmon also employs a device that turns an open sentence into a common noun phrase using the phrase "thing which is such that."⁴⁷

⁴⁵ Salmon, *Reference and Essence*.

⁴⁶ This sub-section considers argument one might propose to support the view that Platonic natural kinds are individuated by their metaphysical extensions, a project I discuss in future work. The argument for this view, one I'm calling the *extensional view* of kind individuation, takes the conclusion from a common noun slingshot: that for any arbitrarily selected pair of common nouns with the same semantic extension, those two nouns corefer. Generalizing to other common noun pairs yields the conclusion that common nouns with the same semantic extension corefer, which may then be used to formulate an argument for the individuation of kinds. The specifics of such an argument needn't be articulated in much detail here since my intent is to nip any such argument in the bud by showing how a slingshot of this form fails.

⁴⁷ Salmon, *Reference and Essence*, 50–51.

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Assumptions⁴⁸

v-SUBS: The referent of a compound referring common noun phrase – free of devices like quotation or “believes that” – is preserved when a component referring expression is replaced by another with the same referent.

CNR: Common noun phrases are referring expressions

ST: A definite description \lceil the ϕ \rceil refers to the only individual that satisfies the formula ϕ , if there is exactly one such individual and refers to nothing otherwise.

LED: Referring expressions that are trivially logically equivalent to one another refer to the same thing.

Preliminaries

Let v and v' be any two (arbitrarily chosen) common nouns that have the same extension (e.g. ‘*T-rex*’ and ‘dodo’ or ‘molecule of water’ and ‘molecule of H₂O’).

The Argument

1. Assume *CNR* and consider:
 - (a) v
 - (b) thing x such that $(\iota n)[\text{if } x \text{ is a } v, \text{ then } n = 1) \ \& \ (\text{if } x \text{ is not a } v, \text{ then } n = 0)] = 1$
 - (c) thing x such that $(\iota n)[\text{if } x \text{ is a } v', \text{ then } n = 1) \ \& \ (\text{if } x \text{ is not a } v', \text{ then } n = 0)] = 1$
 - (d) v'
2. (a) and (b) refer to the same thing by *LED*.
3. (c) and (d) refer to the same thing also by *LED*.
4. $\lceil(\iota n)[\text{if } x \text{ is a } v, \text{ then } n = 1) \ \& \ (\text{if } x \text{ is not a } v, \text{ then } n = 0)]\rceil$ and $\lceil(\iota n)[\text{if } x \text{ is a } v', \text{ then } n = 1) \ \& \ (\text{if } x \text{ is not a } v', \text{ then } n = 0)]\rceil$ are coreferential by *ST* since both are set equal to 1.
5. So (b) and (c) have the same referent [4., *SUBDES*].
6. So (a) and (d) have the same referent [2, 3, 5].
7. So any common noun phrases that apply to the very same things (that have the same extension) have the same referent [1 – 6 and Universal Generalization]

Like other slingshots, this conclusion only delivers a semantic conclusion, one telling us only that for any two arbitrarily chosen common noun phrases that happen to have the same extension, those noun phrases have the same referent;

⁴⁸ This argument is adapted from Nathan Salmon, *Frege's Puzzle* (Atascadero: Ridgeview Publishing Company, 1991), and Salmon, *Reference and Essence*, 48–52.

the argument itself tells us nothing about what the referents of those expressions are.

It should be noted that Salmon thinks the argument is unsound since line 5 makes an illegitimate appeal to ν -SUBS. If the argument were sound, so Salmon reasons, the phrases “neighbor of Shakespeare” and “neighbor of England’s greatest playwright” would refer to one and the same thing.⁴⁹ However, this seems wrong since “it is easy to imagine circumstances in which there are individuals who are of one kind but not the other.”⁵⁰ Unfortunately, this is the only explanation given in *Reference and Essence* for rejection of ν -SUBS. Though we are told rejecting ν -SUBS is the reason for the trouble, I suspect that flat out rejection of the principle is a little too hasty. In fact, I think the reasoning employed in rejecting the sort of substitution move involved in the common noun slingshot has to do with the context created by the phrase “thing x such that.” Salmon acknowledges this fact in later essays⁵¹ and it’s likely the idea he had in mind (albeit implicitly in his earlier work) in rejecting ν -SUBS.

There is one final topic to address before moving on to criticisms, namely substitution rules. All slingshots require some form of substitution, whether the substitution is intended *salva designate*, to preserve the referent of the larger containing expression, or *salva veritate*. Such a key move needs a brief discussion since the legitimacy of certain slingshot deployments hinges on which substitution moves are acceptable.

4. Substitution Rules⁵²

Here I will discuss various substitution principles commonly found in extensional logic. This will be helpful in reminding readers of Frege’s and Church’s motivations for developing their substitution analogues, provided one is careful to remember that the Frege-Church-Gödel versions were concerned with substitution *salva designate* rather than truth-preservation. As such, certain

⁴⁹ What I’m calling “ ν -SUBS” Salmon calls the “*Interchange Principle for Common Nouns*” (Salmon, *Reference and Essence*, 52).

⁵⁰ Salmon, *Reference and Essence*, 52.

⁵¹ See for instance Nathan Salmon, “The Very Possibility of Language,” in his *Metaphysics, Mathematics, and Meaning: Philosophical Papers, Volume I* (Oxford: Oxford University Press, 2001), which I discuss below in Section 4.

⁵² This section borrows significantly from Neale, *Facing Facts*, Chapter 7 and I adopt Neale’s symbolization in stating the proceeding rules. There is however one addition, *Nu-Substitution*, which is a formal representation of Salmon’s *Interchange Principle for Common Nouns*. One other significant departure from Neale is that I prefer not to discuss these as *inference* rules, but rather rules concerning legitimate substitution, *salva designate*.

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principles concerned with referent preservation ought therefore to be regarded as a class of principles separate from typical principles of inference. Inference principles, as any student of introductory symbolic logic will attest, *are* truth-preserving rather than referent preserving. In articulating many of the principles found below, however, I shall speak loosely of inference, though it is important to remember that slingshot substitution principles are but *analogues* to principles of inference.

PSME: Principle of Substitutivity for Material Equivalents

$$(\phi \equiv \psi)$$
$$\Sigma(\phi)$$

$$\Sigma(\psi)$$

We can read this as saying that for any two sentences ϕ and ψ sharing the same truth-value, where $\Sigma(\phi)$ is a true sentence containing at least one occurrence of ϕ (in an extensional context), we can legitimately infer $\Sigma(\psi)$, where $\Sigma(\psi)$ is the result of replacing at least one occurrence of ϕ in $\Sigma(\phi)$ by ψ and vice versa. As is familiar, a linguistic context is extensional just in case it permits the substitution of coextensional expressions such that the truth of the larger containing expression is preserved. Consider:

a) Quine was born in Ohio and Davidson was born in Massachusetts

The binary connective ‘and’ (along with the other usual truth-functional connectives) is extensional in the sense that it operates on the extensions of sentences, namely their truth-values. Thus, the truth of (a) is preserved if we substitute for either of the sentences flanking ‘and’ with another true sentence, e.g. “Kripke was born in Nebraska.”

PSST: Principle of Substitutivity for Singular Terms

$$\alpha = \beta \quad \text{or} \quad \Sigma(\alpha)$$
$$\Sigma(\alpha) \quad \sim \Sigma(\beta)$$

$$\Sigma(\beta)$$
$$\alpha \neq \beta$$

We can read this principle as saying that if one has two coextensional singular terms α and β , where $\Sigma(\alpha)$ is a sentence containing at least one

occurrence of α (in an extensional context), then one may infer $\Sigma(\beta)$, where $\Sigma(\beta)$ results from replacing α in $\Sigma(\alpha)$ by β , and vice versa. So consider:

(b) Venus revolves around the sun

In (b) we may substitute for the proper name 'Venus' the coreferring proper name 'Hesperus' to obtain

(c) Hesperus revolves around the sun

One bit of contention surrounding this principle is the question of what sorts of expressions are included among the class of singular terms. Some, such as Frege, include definite descriptions in this class, while others like Russell did not. Thus, Frege would allow the move from

(d) Hesperus is Phosphorus

to

(d') The evening star is Phosphorus

provided of course that (d) and (d') are not themselves embedded in nonextensional contexts. Russell on the other would not treat (d') as a singular term, asserting instead that it should be given a quantificational analysis (see footnote 1 above).

PSLE: Principle of Substitutivity for Logical Equivalents

$\phi \Leftrightarrow \psi$

$\Sigma(\phi)$

—————

$\Sigma(\psi)$

Let us say that two expressions ϕ and ψ are logically equivalent if and only if the sentence $\lceil \phi \Leftrightarrow \psi \rceil$ is logically true, where ' \Leftrightarrow ' is to be understood as symbolizing dual entailment. So this principle can be read as saying that if two expressions ϕ and ψ are logically equivalent and $\Sigma(\phi)$ is a true sentence containing ϕ as a constituent (in an extensional context), then $\Sigma(\psi)$ will also be true, where $\Sigma(\psi)$ results from replacing ϕ in $\Sigma(\phi)$ with ψ and vice versa. By this principle we can move from

(e) The President's dog is black

to

(e') The President's self-identical dog is black

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This principle is particularly important for slingshot-style arguments, as many have contested the principle's legitimacy in criticizing slingshot deployments.

ι-SUBS: Iota-Substitution (Principle of Substitutivity for Definite Descriptions)

| | | |
|-----------------------------|------------------------|------------------------|
| $\iota x\phi = \iota x\psi$ | $\iota x\phi = \alpha$ | $\iota x\phi = \alpha$ |
| $\Sigma(\iota x\phi)$ | $\Sigma(\iota x\phi)$ | $\Sigma(\alpha)$ |
| $\Sigma(\iota x\psi)$ | $\Sigma(\alpha)$ | $\Sigma(\iota x\phi)$ |

For those who accept definite descriptions as singular terms, these substitution rules will be superfluous since PSST already directly licenses these moves. However, for those who adopt a Russellian treatment of descriptions, PSST will not work. Consider

- (f) i. Kripke = the greatest philosopher from Omaha
 - ii. Kripke authored *Naming and Necessity*
-
- iii. The greatest philosopher from Omaha authored *Naming and Necessity*

It's clear that (f) is a valid argument, but if we were to formalize it we cannot use our principle about singular terms, PSST, to make the move (assuming of course a Russellian theory of descriptions):

- | | |
|---------------------------|-------------|
| (f') i. $k = (\iota x)Ox$ | premise |
| ii. Nk | premise |
| iii. $N(\iota x)Ox$ | i, ii, PSST |

Iota-Substitution, however, resolves this problem; rather than using PSST as the justification at iii, one can appeal to ι-SUBS. This triplet of rules says that first, if the unique individual satisfying the constitutive formula ϕ is the same as the unique individual satisfying the constitutive formula ψ , one can substitute $\lceil \iota x\phi \rceil$ for $\lceil \iota x\psi \rceil$ and vice versa. Second and third, if the unique individual satisfying the constitutive formula ϕ is the same individual denoted by the singular term α , then one may substitute (in extensional contexts) $\Sigma(\alpha)$ for $\Sigma(\iota x\phi)$, where $\Sigma(\alpha)$ is the result of replacing α for $\iota x\phi$ in $\Sigma(\iota x\phi)$ and vice versa.

v-SUBS: Nu-Substitution (Principle of Substitutivity for Common Nouns)

| | | |
|------------------|----|---------------------|
| $\alpha = \beta$ | or | $\tau(\alpha)$ |
| $\tau(\alpha)$ | | $\sim\tau(\beta)$ |
| | | |
| $\tau(\beta)$ | | $\alpha \neq \beta$ |

In keeping with the Fregean spirit of maintaining the analogy with singular term reference, one might construct a principle for the interchange of common noun phrases. We can read this principle as saying that if two coextensional singular terms α and β (i.e. $\lceil \alpha = \beta \rceil$ is true), where $\tau(\alpha)$ is a common noun phrase containing at least one occurrence of α (in an extensional context), then one may infer $\tau(\beta)$, where $\tau(\beta)$ results from replacing α in $\tau(\alpha)$ by β , and vice versa.

Earlier I mentioned that Salmon⁵³ suggests a rejection of *v-SUBS*. However, a flat out rejection of the principle is too quick. The trouble in the common noun slingshot seems to be caused not by the principle of substitution, but by the phrase “thing x which is such that,” in particular the “that” operator, which Salmon in later essays maintains is arguably nonextensional.⁵⁴ If indeed the “that” operator is nonextensional, then slingshots that make the substitution moves for expressions within the scope of these operators have ignored the caveat that substitution is licensed only for extensional contexts. This move is perhaps the most frequently occurring dubious strategy in slingshot deployments.

5. Slingshot Malfunctions

I now turn to discussion of some surprisingly common slingshot malfunctions.

⁵³ Salmon, *Reference and Essence*.

⁵⁴ See for example Salmon, *Frege's Puzzle*, 6 and Salmon, “The Very Possibility of Language,” 349). One potential hiccup for Salmon’s hypothesis is that contexts typically regarded as opaque, e.g. propositional attitude contexts like “believes that” or modal contexts like “It is necessary that,” are opaque because of operators like “believes” or “It is necessary” rather than the “that” operator. The reply is that this seems wrong if we consider expressions like “Russell affirmed Logicism,” which omits the occurrence of “that” but remains perfectly grammatical. Further, from the truth of this statement one can infer the following: Russell affirmed that mathematics is reducible to logic. That the “that” operator is nonextensional seems to me a plausible hypothesis. But what about expressions like “it’s not the case that”? If anything is an extensional operator, surely this is. Salmon’s reply (in e-mail correspondence) is that the expression “the case” is synonymous with “true,” and that “It is the case that snow is white” is a stylistic variant of “That snow is white is the case.” Similarly, “It is not the case that snow is white” is an variant of “That snow is white is not the case,” which express the proposition *that snow is white is not true*.

5.1. The Extensional Malfunction

Arguments without the extensional restrictions on substitution go awry in that there is an illegitimate appeal to a substitution principle *very similar* to a legitimate one, although the principle itself in its unqualified form is strictly speaking false.⁵⁵ Consider the original formulation of our substitution principle:

SUBDES. The referent of a compound referring expression – *free of devices like quotation or “believes that”* – is preserved when a component referring expression is replaced by another with the same referent.

Preservation of reference for a larger containing expression when substituting coreferring constituent expressions is preserved only when those constituent expressions are not within the scope of ostensibly nonextensional, or *ungerade*, contexts. As I discussed earlier, even Frege himself was careful to include a clause about the principle’s inapplicability for cases involving direct or indirect quotation.⁵⁶

But now consider Quine’s slingshots in light of this restriction, both of which involve substitution of coreferring expressions under the scope of what Quine claims are purportedly nonextensional operators such as “it is necessary that” or “believes that.” Given the extensional restriction on substitution principles, Quine’s slingshots might strike one as odd, but recall that *SUBTV* as I formulated it did away with this restriction. Also remember that Quine’s aim is to show that accepting *SUBTV* along with the other assumptions listed earlier delivers the result that supposed nonextensional operators in fact turn out to be extensional, which is evidently unacceptable. Quine’s further result, that supposed nonextensional bits of language are simply incoherent, is obviously not delivered by this slingshot, and must be argued for elsewhere.⁵⁷

But the trouble for the Quinean deployments, as well as other slingshots utilizing the *reductio* model, is that the strength of a *reductio* relies on the assumption that all other premises in the argument are true. So imagine that the

⁵⁵ Philosophers who propose the argument either without or who fail to adhere to the extensional restriction include Barwise and Perry (“Semantic Innocence and Uncompromising Situations”), Davidson (“The Logical Form of Action Sentences,” “True to the Facts,” “Truth and Meaning”), McGinn (Colin McGinn, “A Note on the Frege Argument,” *Mind* 85, 339 (1976): 422–423), Perry (John Perry, “Evading the Slingshot,” in *Philosophy and Cognitive Science: Categories, Consciousness, and Reasoning*, eds. Andy Clark, Jesús Ezquerro, and Jesús M. Larrazabal (Dordrecht: Kluwer, 1996), Quine (*Word and Object, From a Logical Point of View*).

⁵⁶ Admittedly, neither Church nor Gödel explicitly include a clause restricting the principle to extensional contexts, although neither attempts to use a slingshot with such devices either.

⁵⁷ E.g. In Quine (“Quantifiers and Propositional Attitudes”).

Quinean supporter replies that the question of which substitution moves are legitimate principles for slingshot-style argumentation is precisely what is at issue, and that deciding which contexts are applicable to various substitutions in advance stacks the deck unfairly against the Quinean argument. However, if one can reject a premise other than the *reductio* premise, and in our current case it is at least *plausible* that the principle that's false is not the *reductio* premise, but the unqualified restriction principle, the whole argument is significantly weakened.

Let's now turn to the Davidson slingshot about facts. Recall that Davidson's goal was to cast doubt on correspondence theories that made use of facts, and that the slingshot supposedly shows that all facts collapse into one great Eleatic fact. However, Davidson's slingshot also contains a questionable context, viz. "the fact that ...," arguably nonextensional due to the occurrence of the "that" operator.⁵⁸ Since Davidson's slingshot about facts also employs the characteristic *reductio* form, his argument, like the Quinean deployment, is significantly weakened. For the proponent of facts may just as easily reject Davidson's substitution principle while maintaining that sentences still correspond to facts.

Thus, in order to derive the intended disquieting conclusions from these two slingshots, the arguments must include a premise that is at least arguably contestable. This strategy should strike the reader as highly methodologically suspect.

Suppose, however, an advocate of the *reductio*-style slingshot of Davidson's simply grants that the "that" operator is nonextensional. There is another way to read Davidson's slingshot that need not appeal to a contestable, purportedly nonextensional context like "the fact that." Consider the original Church slingshot and its four assumptions. As a reminder:

SUBDES. The referent of a compound referring expression – free of devices like quotation or "believes that" – is preserved when a component referring expression is replaced by another with the same referent.

SR: Sentences are referring expressions

ST: A definite description \lceil the ϕ \rceil refers to the only individual that satisfies the constitutive "predicate" (or formula) ϕ , if there is exactly one such individual (and refers to nothing otherwise).

LED. Referring expressions that are trivially logically equivalent to one another refer to the same thing.

⁵⁸ Cf. Krüger, who says that the trouble is caused not by the occurrence of the 'that' operator per se, but the assumption that facts are extensions (Krüger, "Has the Correspondence Theory of Truth Been Refuted," 208).

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However, suppose one were to replace *SR* with a variant that we assume for *reductio*

SF: Sentences correspond to facts

If we now run the slingshot as Church did, the Eleatic conclusion appears to follow, and the critic of facts may now claim that *SF* is the premise causing the trouble, for we now no longer have substitutions that take place within a context like “the fact that.”

But what this reconstruction of Davidson’s slingshot does is suspicious for two reasons. First, it makes the contentious assumption that the correspondence relation is the same as reference.⁵⁹ Second, and more importantly for our purposes, it builds into an ostensibly semantic argument a fairly substantive and highly suspicious metaphysical assumption about facts. This strategy represents a significant deviation from the original Frege-Church-Gödel slingshots.

5.2. Dubious Metaphysical Premises

This malfunction involves building dubious metaphysical assumptions into the argument in order to draw what are often shocking metaphysical conclusions. The original slingshot deployments, those by Frege, Church, and Gödel, by themselves established only the semantic thesis that sentences with the same truth-values have the same designation. A more general conclusion may be drawn with the slingshot and expressions other than sentences, namely that the closest thing to singular term reference for *any* expression will be the expression’s extension. Any further metaphysical conclusions can be reached only by adding one or more substantive metaphysical assumptions, for example by way of adding an abductive premise, as with Frege and Church. That assumption may look similar to what I earlier called *IBETV*.

⁵⁹ I flag this as contestable move, though for the purpose of this essay, the point is not all that crucial. I would however like to say a little about why collapsing reference to correspondence is at least arguably illegitimate. Historically, both Frege and Mill are notable for distinguishing between the *referent* of an expression on the one hand, and the *content* on the other. Contemporary advocates of Millianism also make a similar distinction, though for certain sorts of expressions – e.g. demonstratives, indexical expressions, and proper names – content and reference are the same. Slingshots, as we’ve noted, are arguments concerned with the referent, or designata of expressions, rather than their content. What’s more, consider the fact that a theory of content, and so too with the notion of correspondence, seeks to preserve certain structural features between an expression, and what that expression is supposed to represent. This mirroring, isomorphism or paralleling, is not something typically associated with reference.

IBETV: The best explanation to account for the result of the slingshot is that all true sentences refer to a single unique entity *the true*, while all false sentences refer to a single unique entity, *the false*.

As briefly mentioned earlier, the conclusion of the slingshot (if sound) seems equally compatible with a variant of *IBETV* where the referents of sentences are say the number one and zero or the empty set. However, recognizing that the slingshot is an argument concerning the relationship between bits of language and their relations to various semantic values, there is reason to favor *IBETV* over a principle invoking numbers since it's difficult to see the initial semantic relevance of numerical entities to whole sentences.⁶⁰

Similarly, the second reconstruction of Davidson's slingshot builds into the assumptions of the argument a rather substantive answer to what the referents of sentences are, namely facts. But this should strike one as a dubious methodological strategy. I can use the slingshot in this way to prove there's only one fact, one truth, one proposition, but only if I build entities into the argument precisely those assumptions needed for the argument to work.

Presumably the rationale behind Davidson's questionable assumption rests on the idea that a correspondence theorist must say that sentences correspond to facts, and that the relation of correspondence is the same as reference. This ignores the possibility of linguistic expressions relating to objects in other ways. For even Frege notes that while the sense of an expression cannot be the reference, we still might say that a sentence *expresses* its sense and *refers* to its referent. This same Fregean strategy – in effect, the loss of one's so-called 'semantic innocence' – is open to one who would like to avoid the Davidson slingshot as well.

6. A Lesson From Misfired Slingshots

I began with an examination of the historical roots of slingshots with the hope that an understanding of the original motivations of the argument's authors would give us insight into later versions of it. I then examined a variety of slingshot deployments with a special focus on those whose conclusions were of significance for metaphysics. Those metaphysically oriented slingshots I argued made use of several methodologically suspect strategies. These dubious strategies came in two main varieties: first, extensional malfunctions as we saw in Quine, Davidson, and one discussed (but not endorsed) by Salmon; and second those deployments whose metaphysical assumptions were to blame for generating the shocking conclusions.

⁶⁰ Obviously numbers will be relevant if we're inquiring after the referents of numerals.

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These suspicious strategies, I argued, make certain slingshot deployments far less metaphysically significant than they might at first appear. What's more, these misfired slingshots malfunctioned precisely because of the confusion of metaphysics and language.

Still, insofar as slingshots are more than merely linguistic, we cannot conclude from this that there are *no* genuinely metaphysical conclusions to be had from primarily linguistic considerations. I have also not argued that the slingshot is of no historical or philosophical significance. To the contrary, the argument is particularly enlightening in that it (i) gives us very strong (though not decisive) evidence for the claim that the designatum of any expression is its semantic extension and that (ii) certain sorts of linguistic contexts require substitution restrictions on pain of generating absurd results. These, however, are interesting *semantic* results; they tell us very little (if anything) about metaphysics.