Definite Descriptions

Nils Kürbis

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Abstract

Definite descriptions are expressions of the form 'the *F*'. The present entry begins by explaining Russell's theory of definite descriptions, according to which 'The *F* is *G*' means 'There is exactly one *F* and it is *G*'. It then discusses the alternative theories of Frege and Carnap, two influential criticisms by Strawson and Donnellan, and some formalisations of theories of definite descriptions building on Hintikka's and Lambert's work in free logic.

Keywords: definite article, definite descriptions, formal logic, free logic, Gottlob Frege, quantificational phrases, reference failure, referential and attributive uses of singular terms, Bertrand Russell, scope, singular terms, speaker's meaning and sentence meaning, the theory of definite descriptions

Key Points

- Definite are descriptions explained.
- Russell's theory of definite descriptions is outlined, in which definite descriptions are not singular terms, but analysed as quantificational phrases.
- Alternatives are surveyed in which definite descriptions are treated as singular terms: Frege, Carnap, Strawson.
- Referential and Attributive uses of definite descriptions are distinguished.
- Some formal theories of definite descriptions are discussed.

1 Introduction

Definite descriptions are expressions of the form 'the so-and-so': the first man on the moon, the author of *Principia Mathematica*, the present King of France. Grammatically they are singular terms that purport to refer to a unique object that answers to the description. If such an object exists, the definite description is *proper*, otherwise it is *improper*. Thus 'the first man on the moon' is proper, because one and only one man, Neil Armstrong, was first on the moon; 'the author of *Principia Mathematica*' is improper, because this is a joint work by Whitehead and Russell; 'the present King of France' is improper, because France is presently a republic.

When a definite description 'the F' is proper, it is generally agreed that 'The F is G' is true if and only if the unique object that is F is G. For instance, 'The first man on the moon was born in Wapakoneta' is true, because Neil Armstrong was born there, while 'The first man on the moon was born somewhere other than Wapakoneta' is false, because Neil Armstrong was not born somewhere other than Wapakoneta. There is, however, disagreement over whether the logical form of such sentences is the same as the subject-predicate form they have grammatically. There is further disagreement over what to do when 'the F' is improper. Is, for instance, 'The author of *Principia Mathematica* smokes a pipe' false, neither true nor false, or might it even be true, e.g. when someone says it while indicating Russell as he's smoking a pipe?

The present entry addresses these questions from the perspectives of the most important theories and views concerning definite descriptions, those of Russell, Frege, Carnap, Strawson and others, and explains the most common criticisms levelled against them. The final section discusses formalisations of theories of definite descriptions that differ from Russell's.

In formal languages it is customary to represent the definite article by $\imath$. This goes back to Peano (Peano, 1901, §7). Russell adapted Peano's notation so that $\imath$ is a term-forming operator that takes a variable x and a formula Fx and forms a complex singular term or name $\imath xFx$ from them, where x is bound. Where proper definite descriptions are concerned, this notation suffices in extensional contexts, such as mathematics. Matters are not so straightforward where improper definite descriptions are concerned and in intensional or modal contexts.

2 Russell's Theory of Definite Descriptions

The most celebrated theory of definite descriptions is Russell's – indeed, it is often simply referred to by the definite description 'the Theory of Definite Descriptions'. See (Russell, 1905), (Whitehead and Russell, 1910, Introduction, Ch. 3, and Part I, Sec. B, $*14$), (Russell, 1919, Ch. XVI). Russell's theory of definite descriptions is closely related to his metaphysics and epistemology, and it had a profound influence on the development of analytic philosophy. It played a central role in Wittgenstein's *Tractatus* (Anscombe, 1971, Ch. 2). For Ramsey it was a paradigm of philosophy (Ramsey, 1990, 1, footnote 1). This section is restricted to logic and semantics.

Russell observes that the meaning of 'The present King of France is bald' cannot consist in expressing that the referent of 'the present King of France' has the property expressed by 'is bald'. There is presently no King of France. The same must therefore hold for 'The present King of the United Kingdom of Great Britain and Northern Ireland is bald', even though there is presently such a person. According to Russell, 'The present King of France is bald' means that there is presently a King of France, there is a unique such person, and he is bald; that is, (1) means the same as (1′):

(1) The present King of France is bald.

(1′) There is exactly one present King of France and he is bald.

(1′) no longer contains the definite description 'the present King of France'.

It disappears upon analysis. Although 'the present King of France' is the grammatical subject of (1), it is not its logical subject. Analysis reveals that (1) has no logical subject at all, as (1′) does not have subject-predicate form.

It is tempting to think that (1) is neither true nor false, because 'the present King of France' is improper and has no referent: as there is no present King of France, (1) cannot say of anyone that he is bald, so neither can it do so truly or falsely. Russell's analysis, however, reveals that (1) is false. (1) means the same as (1′). (1′) is true only if there is a present King of France. As there is no such person, (1′) is false, and so, therefore, is (1).

According to Russell's theory, definite descriptions only appear to be singular terms. Logically they are akin to quantificational phrases, or denoting phrases, as Russell calls them: Russell classifies 'the present King of France' together with the phrases 'a man', 'some man', 'any man', 'every man', 'all men' (Russell, 1905, 479). We must not look for the meaning of a definite description in isolation, but only in the context of a complete sentence. A definite description has no meaning on its own, but every sentence in which one occurs is given a meaning by Russell's analysis.

Russell's analysis leads to a clearer distinction between two negations of (1):

(2) The present King of France is not bald.

(3) It is not the case that the present King of France is bald.

(2) is the internal negation of (1), (3) its external negation. They differ in truth conditions: (2) is false, for the same reason that (1) is false, while (3) is true.

Russell introduces scope markers to represent this distinction in the formal development of his theory in *Principia Mathematica*. The use of the $\imath$ operator is defined by a contextual definition, in modernised notation:

(∗14.01) $[\imath xFx]G(\imath xFx) =_{df.} \exists x(\forall y(Fy \leftrightarrow x = y) \wedge Gx)$

Then (2) has the form $[\imath xFx]\neg G(\imath xFx)$ and (3) the form $\neg[\imath xFx]G(\imath xFx)$.

That a definite description is proper is expressed by $\exists y\forall x(Fx \leftrightarrow x = y)$, 'The F exists', which Russell abbreviates by $\mathrm{E}!\imath xFx$. Where proper definite descriptions are concerned, scope markers do not matter (Whitehead and Russell, 1910, 193ff, ∗14.3). For instance, the internal and the external negations of $[\imath xFx]G(\imath xFx)$ are equivalent, when $\imath xFx$ is proper:

(∗14.32) $\mathrm{E}!\imath xFx \rightarrow ([\imath xFx]\neg G(\imath xFx) \leftrightarrow \neg[\imath xFx]G(\imath xFx))$

For a thorough exposition of Russell's theory of definite descriptions and its defence against various objections, see (Neale, 1990). Neale applies the Russellian approach of analysing noun phrases in terms of quantification to a variety of other linguistic phenomena. Russell also considers plural definite descriptions, such as 'the inhabitants of London' (Russell, 1919, Ch. XVII), which he takes to refer to classes, or sets, of objects. For an alternative theory of plural definite descriptions, see (Oliver and Smiley, 2016).

3 Definite Descriptions as Singular Terms

Although Russell's theory of definite descriptions is the most celebrated one, Frege must be credited with having developed the first views on this topic in

modern philosophy of language and logic. At least three theories of definite descriptions can be extracted from Frege's writings. Pelletier and Linsky find a fourth, which, however, they do not claim to have been held by Frege; cf. (Pelletier and Linsky, 2005) for further discussion of anything relating to Frege discussed here. Two theories are presented in this section, the other two in section 4. All four theories have in common that definite descriptions are taken to be what they are grammatically: complex proper names or singular terms.

Two of Frege's theories are in 'On Sense and Reference' (Frege, 1892). Reference is the relation between an expression and that for which it stands or to which it refers, its referent. Frege characterises the sense of an expression as a way of being given its referent or as a mode of presentation of it. To illustrate with Frege's famous example, the senses of 'Morning Star' and 'Evening Star' differ, but their referent is the same, the planet Venus. See (Dummett, 1981, Ch. 5) for an in depth study.

Frege observes that ordinary language contains names that do not refer, such as 'Odysseus'. Nonetheless, these names have sense, and so do sentences containing them, such as 'Odysseus was set ashore at Ithaca while sound asleep' (tr. Black (Frege, 1952, 62)). They express thoughts (Frege, 1892, 33f). As Frege does not see any essential semantic difference between simple and complex singular terms – their purpose is to refer to objects – this view can safely be applied to improper definite descriptions, too. Frege takes the referents of sentences to be the truth values True and False. Sentences containing singular terms that do not refer are neither true nor false. According to Frege, it is a presupposition of our use of singular terms that they refer. So while a thought may be expressed with a sentence containing a singular term that lacks a referent, it is a defect of language that it contains such terms ((Frege, 1892, 41), (Frege, 1971, 32)). This is Frege's first theory. For exposition and serious difficulties arising in conjunction with Frege's views about truth and falsehood, see (Milne, 2010). Evans questions whether sense can be made of sense without reference (Evans, 1982, Ch. 1). Bell answers (Bell, 1990).

In a scientific language, or *Begriffsschrift*, it is possible to remedy the defect by stipulating that singular terms that would otherwise lack a referent refer to the number 0 (Frege, 1892, 41) or some other more or less arbitrarily chosen object, i.e. if there is no unique A, then ιxAx refers to 0 or some arbitrary object. This Frege's second theory.

The two theories need not contradict each other. Frege called sentences that express thoughts that are neither true nor false *Dichtung* (fiction, poetry) in unpublished notes written shortly after 'On Sense and Reference' (Frege, 1971, 25, 32). Fiction is concerned only with sense, not with reference. Lack of referent is a defect whenever truth and falsity are concerned, where logic and reason are applied. It is a defect only in science and ordinary discourse, but not in *Dichtung*. The two theories apply to different domains. In his Logik of 1897 (Frege, 1971, 40ff) Frege called the thoughts expressed in fiction *Scheingedanken*. Following Bell, translating *Scheingedanke* as 'mock thought' or 'pseudo thought', suggesting a defect in what is expressed, is problematic (Bell, 1990, 273): a *Scheingedanke* is not an apparent, as opposed to a real, thought, but a thought about appearance, as opposed to a thought about reality. Lack of referent does not result in a defect in sense, but evidently it is a defect when we are concerned with reference, that is, with reality rather than appearance.

A similar thought as in Frege's second theory underlies Carnap's 'chosen

object theory' (Carnap, 1947, §7, §8). It is from one perspective unsatisfactory: whether 'The present King of France is bald' is true or false would depend on whether the arbitrary object it refers to is bald or not. If we adopt Frege's suggestion and choose the number 0, he would not be bald. He would, however, turn out to have rather surprising properties, such as having 1 as his successor. From another perspective, this does not really matter, as we are only interested in proper definite descriptions, and these the theory gets right. When doing arithmetic, for instance, we are not going to refer to the number 0 with 'the present King of France'. We could also choose a very special object that is not in the extension of any atomic predicate. Then all atomic sentences with improper definite descriptions are false. The question remains, however, which object this is supposed to be, and how to apply the distinction between atomic and complex predicates to ordinary language, where it seems arbitrary which is which. For instance, every material object is either transparent or opaque; something is opaque iff it is not transparent and not opaque iff transparent; so which of 'transparent' and 'opaque' is atomic? Maybe both are, and then the chosen object is not material. But rejecting materialism because of the problem of improper definite descriptions seems a little drastic.

Strawson delivered what is perhaps the most influential criticism of Russell's theory of definite descriptions (Strawson, 1950). Strawson distinguishes the meaning of a sentence, its use by a speaker, and assertions or statements made by its use. (Strawson uses both these last terms.) Its meaning consists in general directions for how to use it to make assertions (p.327). The sentence 'The present King of France is bald' has a certain meaning, the same sentence can be used at different times, say during the reign of Charles the Bald and during the reign of Louis XIV, and on these occasions speakers make different assertions by so using them, as they refer to different persons (p.325). (Allowing ourselves some historic license.) Contrary to what one might expect, in the former case the assertion was apparently false, while in the latter it was true. When the sentence is used during times when France is a republic, however, the question whether the statement made is true or false does not arise, because there is no King of France to be referred to (p.330). According to Strawson, it is a presupposition of our use of definite descriptions that they are proper. The use of improper ones is defective, and this carries over to the use of sentences containing them, which bars them from being useable to make statements that can be assessed for truth or falsehood.

This is reminiscent of Frege's views on *Dichtung* in as far as something is permitted to be neither true nor false. Strawson, however, at least sometimes applies truth and falsehood to assertions, that is, acts performed by speakers, while Frege only applies it to thoughts, which may or may not be asserted.

The distinction between an assertion, the speech act performed by a speaker, and its content, the thought expressed by the assertion, also indicates that Strawson does not so much deliver a refutation of Russell as an alternative account or an account of something other than what Russell aims to account for. According to Strawson the truth or falsity of assertions of sentences containing definite descriptions depends on the definite description being proper. Russell denies that the truth or falsity of such sentences, whether asserted or not, depends on this. Russell aims to give the truth conditions of (1). Frege says that the thought expressed by a sentence is that its truth conditions are fulfilled (Frege, 1893, §32). Strawson agrees with Russell that (1') describes circumstances

that are necessary conditions for the truth of an assertion using (1) (Strawson, 1950, 324). For Russell, the truth of (1′) gives the necessary and sufficient conditions for the truth of (1). The question is what the sufficient conditions are according to Strawson. And it seems clear that if an assertion using (1) has been made in circumstances described by (1′), then the assertion is true, hence the circumstances that (1′) describes are also sufficient. So it seems as if Russell is right about the truth conditions of (1) and hence the content, or the thought expressed, by an assertion using (1). It may well be that an assertion of (1) is defective in some sense, because usually speakers intend to refer, and their hearers expect them to intend to refer, to a unique object that answers to a definite description. But this does not mean that the content of their assertion is equally defective.

This line of argument forms part of Neale's defence of Russell against Strawson, for which see (Neale, 1990, 24ff).

Another phenomenon connected to speech acts involving definite descriptions is the following. Definite descriptions 'the *F*' purport to refer to the unique *F*, but sometimes they are used successfully to refer to something that is not *F*. Sentences 'The *F* is *G*' can be used to convey true information even when there is no unique *F*. Donnellan distinguishes an attributive from a referential use of definite descriptions (Donnellan, 1966). A speaker may succeed in referring to the animal in the corner and say something true of it with 'The pig in the corner is new to the zoo' when it is not a pig but an aardvark. Yet according to Russell's analysis, if the animal in the corner is not a pig but an aardvark, then 'The pig in the corner is new to the zoo' is false. This is the referential use. In the attributive use, a speaker refers to whatever satisfies the description. In 'The next winner of "Animal of the Month" will be an aardvark' a speaker refers to whichever unique animal wins the prize and predicts that it will be an aardvark. Donnellan thinks that Russell is right about the attributive uses of definite descriptions, but not the referential ones.

While presumably no one disputes that cases such as those described by Donnellan occur, it may be contested that they present a problem for Russell. Kripke argues that Russell can accommodate them by drawing a distinction between speaker's reference and semantic reference, or more generally between speaker's meaning and semantic meaning (Kripke, 1977). This builds on work by Grice (1989, Chs 6 & 17), who suggested a similar line of defence, which is also followed by Neale (1990, Ch. 3). It has an independent motivation. It is a wider phenomenon that speakers can use sentences to convey other information or express different propositions than what their sentences literally mean – indeed, false sentences can be used to convey true information. Whether this happens, and what has been said, is dependent on speakers' intentions. The sentence 'The pig in the corner is new to the zoo' means that there is one and only one pig in the corner and it is new to the zoo. Its meaning is not dependent on there being any pigs in the corner and it requires no pigs to be referred to. On this occasion, however, the intention of the speaker determines that what is meant is that the animal in the corner is new to the zoo, and this is the animal referred to, and the proposition expressed is about that animal.

It is probably the majority view that definite descriptions are genuine singular terms. A third option besides it and Russell's is that they are complex predicates. Graff argues that their paradigmatic use is as predicates 'is the *F*', as in, e.g., 'Napoleon is the greatest French soldier' (Graff, 2001). This view may be

compared with Quine's that proper names are may be understood as predicates (Quine, 1961).

4 Formalisations of Theories of Definite Descriptions

Definite descriptions played an important role in the development of mathematical logic by Frege and Russell. Frege's third theory of definite descriptions is the first axiomatisation of such expressions. However, Frege's treatment of the function that is a 'substitute for the definite article' in his formal language is not at all what one might expect. Frege's operator \ applies to proper names (or singular terms), not to (simple or complex) predicates (or names of functions, as Frege would say). Typically, these proper names refer to the extensions of concepts, represented in Frege's formal language by expressions of the form $\acute{\epsilon}\varphi(\epsilon)$, but this is not necessary. $\backslash\xi$ is the unique object that falls under a concept, if ξ is a name of the extension of a concept under which a unique object falls, and $\backslash\xi$ is its argument in all other cases (Frege, 1893, §11). What Frege calls 'extensions of concepts' roughly corresponds to what is now called 'sets'. So, if b is a singleton set $\{a\}$, then $\backslash b = a$, and if it is not (i.e. either it is the empty set, a set with more than one element, or an object other than a set), then $\backslash b = b$ and \ is vacuous. The sole axiom for \ is: $a = \backslash\acute{\epsilon}(a = \epsilon)$: a is identical to the unique thing that falls under the concept 'being identical to a'. In modernised notation, $a = \backslash\{x \mid a = x\}$.

An oddity of this theory is that it only specifies how to use \ in deductions when applied to singletons referred to by names of the form $\acute{\epsilon}(a = \epsilon)$. The axiom does not cater for any other cases. If a set is known to be a singleton, we can introduce a name for its element and produce a name of the required form to use the axiom. According to Dummett, no specification of any other cases is required, because Frege only attaches \ to names of sets that have been proved to be singletons (Dummett, 1991, 158). He thus follows the common practice of mathematicians who only speak of 'the F' after the existence of a unique F has been established. Building on (Frege, 1884, footnote 1, §74), the latter is a fourth theory Pelletier and Linsky find in Frege's work, but one they do not claim him to have held. Certainly an oddity remains: on Frege's view of logic, logic should cover *all* cases, not just those that happen to be needed, and his explanation of the meaning of \ does exactly that. Although Frege does not give a formal semantics for his theory of definite descriptions, this points to an incompleteness: Frege's axiom for \ fails to cover all cases considered in the explanation of the meaning of \.

The fourth theory is explicitly endorsed by Hilbert and Bernays. They admit only proper definite descriptions, that is, before it is permitted to use a term $\imath xFx$, it must be established that there is a unique F (Hilbert and Bernays, 1934, 384). They underline that this is how mathematicians use such expressions. Consequently it is not in general decidable whether an expression $\imath xFx$ belongs to the language or not, because the predicate calculus is undecidable. Definite descriptions are mere convenience and convention, introduced as we go along. A disadvantage might be that then mathematicians shouldn't say things such as 'The largest prime number does not exist'. But it is not clear what is lost by that

prohibition, as they could equally say 'There is no largest prime number'.

A motivation for the development of free logic was the formalisation of alternative theories of definite descriptions. In (universally) free logic, non-referring terms and the empty domain of quantification are permitted. See (Bencivenga, 1986) for an introductory survey. Hintikka and Lambert proposed this axiom to govern $\imath$ ((Hintikka, 1959), (Lambert, 1962)):

(4) $\forall y(\imath x Fx = y \leftrightarrow \forall x(Fx \leftrightarrow x = y))$

Anything is the F iff it is the unique F. As in free logic At can be inferred from $\forall x Ax$ only if t refers, this axiom only specifies how to use proper definite descriptions. If $\imath x Fx$ is improper, nothing about it can be inferred. The omission of not caring for the improper definite descriptions is turned into a principle by free logicians. Everyone agrees on how to treat proper definite descriptions, and logic should remain largely silent on the improper ones. This also explains the absence of scope distinctions from (4).

Lambert adds a second axiom (Lambert, 1964):

(5) $t = \imath x(x = t)$

t is the thing that is t. This is reminiscent of Frege's axiom for \, and it is $*14.2$ of *Principia*.

While it may be debatable whether scope distinctions are necessary in the non-modal case, presumably everyone agrees that they are required in modal contexts. The distinction between modalities *de re* and *de dicto* is a matter of scope:

(6) The animal in the corner is necessarily an aardvark.

(7) It is necessary that the animal in the corner is an aardvark.

(6) is true, if being a member of its species is a necessary property of an animal. (7) is false, because if the zoo moves the animals around, there could also be a hippopotamus or no animal in the corner.

An early influential paper in this area is (Smullyan, 1948). For the developments of two different theories of definite descriptions in modal logic, see (Garson, 2013, Chs 18, 19) and (Fitting and Mendelsohn, 2023, Ch. 20).

It must be admitted that Russell's way of marking scope is not the most convenient. A more elegant way of incorporating the Russellian view that definite descriptions are quantificational phrases while expressing scope distinctions immediately in the notation goes back to Arthur Prior (Prior, 1963, 198). Prior proposes to formalise 'The F-er is G-er' by a binary quantifier that takes two formulas and binds a variable to form a formula: $\imath x(Fx, Gx)$. Its external negation is $\neg\imath x(Fx, Gx)$, its internal negation $\imath x(Fx, \neg Gx)$, that G is necessary *de re* of the F is $\imath x(Fx, \Box Gx)$, necessity *de dicto* is $\Box\imath x(Fx, Gx)$.

Some authors formalise 'The F is G' by $(\imath x Fx)(Gx)$ to mimic the prefix form of quantifiers. This and $\imath x(Fx, Gx)$ are notational variants: in classical and negative free logic, either expresses that there is exactly one F and it is G.

Recent investigations concern the proof theory of definite descriptions in sequent calculus and natural deduction, formalised as singular terms ((Indrzejczak, 2018), (Indrzejczak, 2023)) and with the binary quantifier (Kürbis, 2021). Initial work in this area was done by Tennant (Tennant, 1978).

5 Conclusion

Russell's theory of definite descriptions had an immense influence on analytic philosophy. Although often considered to be a paradigm of philosophy, not everyone agrees with Russell's analysis of sentences of the form 'The *F* is *G*', where 'the *F*', despite appearance, is not treated as a singular term, but the whole sentence is rendered using quantificational phrases instead. Indeed, before Russell, in the first theories of definite descriptions, Frege took them to be what they appear to be, singular terms. Objections raised against Russell's theory are not conclusive, however, and it continues to be defended.

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