

Referring in Logic

To prove some argument in ordinary language by introducing symbolic logic, it is necessary to find a clear and unambiguous **logical form** buried in what might be a rather woolly sentence. Classical logic reasons about a domain of objects, so the main task is to see what objects are being referred to in the sentence. If I do something 'for the sake of my sanity', I don't mean that there is an object called a 'sake', so not every noun refers to an object. A term which successfully picks out a unique object is called a '**name**', and has the role of a 'constant' in a proof. The simplest names are 'proper names' such as 'Napoleon', but anything which successfully denotes (such as 'him!', or 'the man on the throne') can function as a name. Typically, **proper names** have no structure, can't be negated, always apply to one object, and are fully understood once the object is known. Other types of names, such as unique descriptions, are more complex, and their status is controversial. It would be helpful to know what a name actually means.

The '**Millian**' view of proper names is that they simply mean the object they refer to, so that the meaning of 'Napoleon' is Napoleon (the physical man). For 'Napoleon is busy' this might be plausible, but for 'Napoleon never existed' or for fictional names like 'Hornblower' the theory works less well. These examples point to the problem of **empty names**, if some names can be understood when they don't do the obvious job of labelling an object. It is then unclear what the sentence is referring to, and how we could understand it, and how it could ever be true.

When someone has two names (such as Sam Clemens/Mark Twain), someone could know 'Mark is a writer' but not know 'Sam is a writer', which suggest there is more to those names than the physical object. One suggestion is to split a name, or a naming phrase, into its '**reference**' (the item picked out) and a '**sense**' (or meaning) containing any extra social or descriptive information. This can lead to a theory about language, that the meaning is what achieves the reference. Some names, however, seem to contain no sense (if I called someone 'Q', for example), and the sense 'is a writer' doesn't seem part of the meaning of 'Mark Twain', given that he might not have been a writer. If names contain a sense, that might explain how we understand them, but not what they refer to, or where truth comes in.

At this point the thought arises that the logical form of a name might not be so simple. If a name were in fact a compressed and **disguised description**, we might reduce the name to a set of properties and a claim that the thing exists, in which case we could say that 'Hornblower' claims falsely that Hornblower exists, and that 'Mark Twain' does actually embody a set of properties, such as being a writer, and the problem of empty names would be solved. We would have reached a solution, however, by the bold expedient of saying that (in logical form, at least) there aren't any names, and this doesn't seem right. Constants in logic name things, 'Q' is clearly not a disguised description, and we saw that names have fixed features which do not apply to descriptions.

We can approach the problem of referring from the other end, by asking when and how phrases which are obviously complex **descriptions** succeed (or fail) in the task. Some singular descriptions clearly work as proper names, such as 'the first Tudor monarch of England' (Henry VII), while others don't, such as 'the person living in London in 1510'. A distinction can be made between '**referential**' uses of descriptions (aimed at naming), and '**attributive**' uses (aimed at giving information), but the borderline is blurred, because all referential descriptions do some attributing, and attributive descriptions can end up naming something (at least temporarily). A few names are taken as referring, even though they only seem to exist as attributive descriptions, such as 'Jack the Ripper' (only known as the perpetrator of murders). However, where a proper name such as 'Napoleon' and a description such as 'victor of Austerlitz' apply to the same thing, they cannot always be substituted for one another (the victor of Austerlitz might have been someone else, but Napoleon couldn't be someone else). The descriptions of Jack the Ripper define that name, but 'victor of Austerlitz' doesn't define Napoleon. Hence it is proposed that successful proper names (or descriptions which do that job) are '**rigid designators**', which *must* always name that one thing, and nothing else (in all possible worlds, which is a key idea in modal logic). A referential description might succeed in naming something, but without the full strength implied by the word 'rigid'. Thus 'The Prime Minister' picks someone out, but it is a transient designation, unlike the actual name of the office-holder.

An object might have more than one name, and more than one description, and these possibilities have pointed to some puzzling cases where the underlying logic is unclear. The Clemens/Twain case involves an entity with two names but one description, suggesting that names might have a 'sense'. It is also possible to know the name of something ('Walter Scott'), but not know the description ('author of *Waverley*'); those two refer to the same person, but then identifying them sounds like you are saying 'Walter Scott is Walter Scott'. Hence they co-refer, but they also differ. A case of having one name which is known under two descriptions is given by 'Paderewski', who was known as a pianist in one sphere of life (1), and a leading statesman in another (2). If 'Paderewski' just labels that man, how can I refer to Paderewski 1, and yet not refer to Paderewski 2?

Another gulf that opens up between proper names and referential descriptions is that the latter can succeed in referring even when they are false, as when I successfully refer to 'the man holding the martini', even though his glass actually contains water. One response to this problem is to say that it is *people*, rather than words or phrases, who refer to things. If I want you to grasp who I am talking about, any method of referring is fine if it works. That view may fit ordinary experience well, but it is bad news for logic, where we are trying to pin down the way *language* refers to objects in the domain.

In first-order logic we only quantify over objects, and so names refer to those objects. If you start to quantify over properties (second-order), then those must be named, and things get more complicated. An interesting way of referring to a property in first-order logic is the procedure of '**lambda (λ) abstraction**', which permits us to construct a formula which gives a referring description of 'the property this thing has if it satisfies this predicate'. It is an addition to normal logic, but illustrates the ways in which it is sometimes necessary to contrive reference to something.