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Saul Kripke (1940–)

DAVID SOSA

Life

Kripke once said, "People used to talk about concepts more, and now they talk about words more. . . . Sometimes I think it's better to talk about concepts." In fact, Kripke himself has said important things, and developed and deployed significant conceptual resources, about both words and concepts.

Saul Aaron Kripke was born in Bay Shore, New York. His mother Dorothy was a teacher and father Myer a rabbi. The family soon moved to Omaha, Nebraska where Kripke spent most of his childhood. He was a child prodigy, learning Hebrew on his own at the age of 6 and reading all of Shakespeare in the fourth grade. But it was in mathematics that he exhibited the greatest precocity: he derived results in algebra – intuitively, without the benefit of algebraic notation – in fourth grade and taught himself geometry and calculus by the end of elementary school. By the time he was in high school, Kripke's work in mathematical logic was so advanced that he presented some of it at a professional mathematics conference. Around the time he published his first article, "A Completeness Theorem in Modal Logic," Kripke was on his way to Harvard, from which he graduated with a bachelor's degree in mathematics in 1962. But during his years at Harvard, Kripke's interests already began to shift to philosophy.

In 1963 Kripke was appointed to the Harvard Society of Fellows and later to positions as lecturer at Princeton University (1965, 1966) and back at Harvard (1966–8). Finally, he was appointed Associate Professor at Rockefeller University in 1968 and promoted to Professor in 1972. But the outstanding philosophy department at Rockefeller was disbanded (by the University's President, Frederick Seitz) in the mid-1970s and Kripke was appointed McCosh Professor of Philosophy at Princeton in 1977, the position from which he retired in 1999.

Modal logic

Early in his career, Kripke made essential and seminal contributions to modal logic. Modal logic is, in effect, the logic of necessity and possibility and its history can be traced to at least Aristotle. In the first half of the twentieth century, C. I. Lewis, C. H. Langford, and then Carnap revived and developed modal logic. Lewis criticized the logical system

Russell and Whitehead had proposed in *Principia Mathematica* (which could not distinguish what is simply false from what is *necessarily* false – that is, what is *impossible*). With Langford, Lewis described five different axiom systems that could represent a new concept of logical entailment: *strict* implication. Unlike the notion of implication formalized in *Principia*, *p* does not get to strictly imply *q* simply in virtue of being false: it has to be impossible for *p* to be true and *q* false. Carnap later characterized the sort of logical necessity involved in strict implication in terms of truth in all "state descriptions." But Kripke, with his "Kripke models," made this idea of necessity precise, refined it, and generalized it.

Kripke models involve a set of "possible" worlds and, for each world, an assignment of truth-values to simple ("atomic") sentences. As developed by Kripke, this system enables us to characterize the notion of logical necessity that Carnap discussed (see CARNAP): necessary truths are those that are true at *all* possible worlds in *every* model. By including in addition an "accessibility relation" (meant to select the worlds that are possible *relative* to any given possible world), Kripke was able flexibly and systematically to characterize many other modal logics that are weaker than that suggested by Carnap's discussion. Indeed, much of the later progress of modal logic has depended on the idea of Kripke models, as well as on the notion of "Kripke frames," which are just like Kripke models (specifying a set of possible worlds and an accessibility relation) but without the evaluation of atomic sentences.

Meaning

After this important work in modal logic, Kripke turned his attention to the philosophy of language, revolutionizing that field with a series of publications in the period between 1971 and 1982. In "Identity and Necessity" and the early, article version of "Naming and Necessity," Kripke begins to develop the exciting ideas and arguments that get their fullest treatment in the book version of *Naming and Necessity* in 1980. These works challenge long-held assumptions about meaning while rehabilitating others, offer a new paradigm (or "picture," to use Kripke's term) of reference and meaning, and propose, on the basis of the developing theory of meaning, provocative theses in metaphysics, epistemology, and philosophy of mind.

Fundamentally, Kripke argues that a traditional view of meaning is mistaken. In the tradition Kripke sees as beginning with Frege and Russell (see FREGE and RUSSELL), names, for example, refer to what they do in virtue of being associated with some descriptive content. The referent of the name is what *satisfies* the descriptive content associated with it. With a name such as, say, "Aristotle," one might think the descriptive content would include *taught Alexander* or *was the student of Plato*, and so on. Kripke presents, in compelling form, a battery of arguments against any such view. These arguments can profitably be seen as coming in three varieties: (1) modal, (2) semantic, and (3) epistemic.

The modal argument begins with an observation for which Kripke is now celebrated: names are *rigid designators*. A rigid designator is a word that designates the same object with respect to any possible situation. So, for example, we may say that if he had been chosen to lead the Academy, Aristotle would never have gone on to teach Alexander. When we make that statement, it's a claim about a situation (or what can also be called

a "possible world") that's different from our own; in our world, Aristotle was *not* chosen to lead the Academy after Plato. But even though we're talking about a different situation, we're talking about *Aristotle* in that situation. So the name "Aristotle" maintains its reference to Aristotle, even with respect to possible situations in which Aristotle was chosen to head up the academy, did not go on to teach Alexander, or in which his life varied in any of the ways it might have.

But notice that since names are rigid designators, we can make true claims about what *might* have happened that would appear to be ruled out by the description theory Kripke opposes. Consider any description we might think is part of the descriptive content of the name "Aristotle": say, *was born in Stagira*. Aristotle, of course, might have been born elsewhere, if his parents had moved before he was born, for example. On the other hand, no one can both be born and not be born in Stagira. So while the sentence, "Aristotle was not born in Stagira," seems to express something that's possible, any sentence like "The . . . who was born in Stagira was not born in Stagira," seems to express something impossible. But if part of what "Aristotle" *means* is *was born in Stagira*, then it's hard to see why these two sentences should differ in this way. Why is what's expressed by one sentence possible and what's expressed by the other impossible, when they have, relevantly, the same meaning? This is an example of Kripke's modal argument.

There are several other ways of putting the point of the modal argument. But they can be seen as reducing to a general pattern: names are rigid designators, descriptions are not; therefore descriptions cannot give the meaning of names (in the way proposed by the traditional view of Frege and Russell). Names have a different modal *profile* from descriptions.

Even if Kripke had given none other, many would find the modal argument sufficiently devastating to refute the traditional view of names at which it's directed. But an important part of the significance of Kripke's work on meaning is that he presents, as noted above, a battery of arguments, each of which is a further, independent point against the traditional view he challenges.

Kripke's epistemic argument has a structure similar to that of his modal argument. If *was a student of Plato's* is literally part of the meaning of the name "Aristotle," then we should expect the sentence "Aristotle was a student of Plato's" to express a trivial a priori truth that could be known without any historical or empirical investigations. But you might be a competent user of the name "Aristotle" without knowing that Aristotle was a student of Plato's. Perhaps all you know is that Aristotle was some great philosopher. The description theory predicts that certain sentences should be a priori when in reality they are not.

And Kripke's semantic arguments suggest that the referent of a name is not whatever satisfies the descriptions that might be associated with it. He is aided here by compelling examples. In one, Kripke asks us to imagine a circumstance in which Kurt Gödel did not discover the incompleteness of arithmetic (as, in fact, he did), but rather stole that result from someone named "Schmidt." Now, it's plausible that something like "discovered the incompleteness of arithmetic" is associated with the name "Gödel." But notice that in this case, that would yield Schmidt as the referent of the name "Gödel." Kripke uses this as an argument against the description theory. Surely even with respect to a situation in which Schmidt is the discoverer of the incompleteness of arithmetic,

"Gödel" refers to Gödel and not to Schmidt. But that means the name "Gödel" is not tied to its referent by means of the satisfaction of the description *discovered the incompleteness of arithmetic*. If the meaning of "Gödel" were the descriptive content associated with it, then the name would refer to the wrong person – it would have the wrong semantics. Another example: *a famous physicist* picks out Gell-Mann as much as it does Feynman. Still, even if that's the only descriptive content associated with the name "Feynman," the name refers to Feynman and not to Gell-Mann.

Acknowledging a debt to J. S. Mill, Kripke holds that names are *denotative* but *non-connotative*. The meaning of a name is exhausted by its referent. Rather than having any descriptive content as its meaning, a descriptive content that would then determine a referent, Kripke suggests that the meaning of the name just *is* the referent itself. This claim is now considered constitutive of a position known as "Millianism" in philosophy of language.

This leaves open the question of why a name has the referent it does. In place of the description theory he associates with Frege and Russell, Kripke offers an alternative "picture" of the naming relation. In the causal account he suggests (sometimes called the "historical chain" account), a name has the meaning it does – that is, it *refers* as it does – in virtue of a chain of causal relations between uses of the name and the referent. Kripke explicitly admits not having anything like a "theory": but he proposes causation as the fundamental mechanism by which reference is fixed (though these causal relations do not themselves constitute the meaning; the meaning, recall, just *is* the referent).

It's an interesting fact that although he attacks a descriptive theory of naming associated with Russell, in other work Kripke ingeniously defends Russell's theory of descriptions themselves. According to Kripke, Russell was wrong to view names on the model of descriptions; but his account of descriptions themselves was unobjectionable. Russell's theory of descriptions (in "On Denoting") concerned the meaning of expressions such as "the President" or "The even prime number," or even "Plato's most famous student." In 1966, the philosopher Keith Donnellan issued a challenge with an example in which a sentence containing a definite description seemed to have a meaning that was inconsistent with what would be predicted by Russell's theory. Drawing on a distinction between language use and language meaning, and distinguishing between *speaker reference* and *semantic reference*, Kripke answers Donnellan's challenge and defends Russell's theory of descriptions.

One serious problem for the sort of theory Kripke's arguments support (though, again, Kripke himself never explicitly adopts any particular "theory") concerns belief and belief ascription. If names are merely denotative and are non-connotative, then, since the meaning of a name is exhausted by its referent, any two names with the same referent have the same meaning. But given just a few other plausible assumptions, this entails that there should be no difference in meaning (and thus no difference in truth-value) between sentences like "Lois Lane believes Clark Kent can fly" and "Lois Lane believes Superman can fly." But (among other problems) it seems that what Lois really believes is that Clark Kent cannot fly.

In his "A Puzzle About Belief" (1979), Kripke argues that this unwelcome result is not due to any features specific to the position in question: our practices of belief ascription themselves, independent of any specific assumptions about the meaning of names,

will yield the same unwelcome results. He uses the now-infamous (in philosophy of mind and language!) example of Pierre, a normal monolingual Frenchman, who hears of that famous distant city, London (which Pierre of course calls "Londres"). On the basis of what he has heard of London, he is inclined to say, in French, "Londres est jolie." Taking him at his word, and translating, we can conclude that he believes that London is pretty. Later, Pierre leaves France and moves to an unattractive part of London. He learns English by the "direct method," without using any translation between English and French. Pierre is unimpressed with his surroundings and is inclined to assent to the English sentence "London is not pretty." Again, taking him at his word, we can conclude that he believes that London is not pretty. But now he seems to be in much the same position as Lois above.

What's important, for Kripke's purposes, is that we seem to have put Pierre into that position without explicitly appealing to a "Millian" (names are merely denotative) position. That suggests Millianism is not a distinctively problematic position. The sort of puzzle that's put forward against Millianism is really a problem for everyone, Kripke argues. Thus he defends Millianism from its main challenge.

Necessity, a priority, the mind–body problem, and essentialism

Kripke's revolution in philosophy of language would have been more than enough to secure his importance. But Kripke went on to transform his theses about meaning into interesting positions in metaphysics, epistemology, and philosophy of mind. Perhaps the most significant element of his meaning theory, for these purposes, is his distinction between what "fixes the reference" of a term (which for names, he suggests, is typically fundamentally a causal relation) and the actual meaning of that term (which, in the case of names, consists of the referent itself).

Since Immanuel Kant in the late 1700s, philosophers had traditionally seen two sorts of phenomena as intimately related. A proposition was taken to be *necessary* if it cannot possibly fail to be true, and counted as a priori if, roughly, it can be known without the benefit of empirical investigation. It was natural to think that all necessary propositions are a priori and that, with a few special exceptions, those that are not necessary can be known only a posteriori. If a proposition is necessary, then one needn't see how the world is as a matter of fact in order to know that proposition. Its truth does not depend on the state of the world; empirical investigation thus seems beside the point. And, conversely, if a proposition is contingent, then how could it be known a priori? Since it's not true in *every* possible world, we would have to investigate the world around us to see whether it's true in ours. (One exception is Descartes's *Cogito* – I think, therefore I am – whose premise, and conclusion, each seem contingent and yet, in one sense, a priori). Shockingly, Kripke rejected both directions of this alleged intimate relation.

According to Kripke, necessity and a priority are not nearly as intimately related as had been thought. There are necessary truths that can be known only a posteriori and a priori truths that are contingent. And these aren't just exceptional, unusual cases, but systematic, standard occurrences. Consider an example Kripke uses, picking up on a comment of Wittgenstein's, to support his claim that what's a priori can be contin-

gent. We introduced the word "meter" and fixed its reference with respect to a certain standard: the standard meter bar in Paris. (The reference has since been re-fixed, but set that aside.) Now take the claim that the standard meter is one meter long. How can we know this? The idea of *measuring* the standard meter is ludicrous: our knowledge that the standard meter bar is one meter long is not the sort of thing that is to be checked empirically. The standard meter is precisely what fixes the reference of the term "meter." But is it a *necessary* truth that the standard meter is one meter long? Kripke reminds us that the standard meter bar might have been longer than it in fact is. Indeed, if just before we fixed the meaning of our word "meter" with reference to that bar, it had undergone some significant temperature change (that it did not, as a matter of fact, undergo), then the bar would have been longer (or shorter) than a meter. Of course, in that circumstance, we'd use the word "meter" for that new length. But it's still true that the meter bar in that circumstance wouldn't be a meter long: we'd just be using the word "meter" for a different length. We know a priori that the standard meter's a meter long; but it *might* not have been. There are possible circumstances in which the standard meter bar has a different length.

Conversely, necessity does not entail a priority. Gold has atomic number 79 and water is H_2O. According to Kripke, these are not things we could have known a priori. The chemical composition of water and the atomic number of gold were empirical scientific discoveries. We used some superficial identifying marks to fix the references of our terms "water" and "gold." Now, those marks don't *define* the words, they don't give their meanings. They served to pick out kinds which we then investigated empirically. But it is through empirical investigation that one discovers gold's atomic weight and water's chemical composition. Nevertheless, Kripke thinks the statements "gold has atomic number 79" and "water is H_2O" are necessary. There's no possible circumstance in which *gold* has any atomic number other than 79; and *water* couldn't be anything but H_2O. There may be circumstances in which *what we call* – in those circumstances – "gold" has a different weight, or in which what we call "water" has a different chemistry, but those are just worlds in which we use the terms for other stuff. (Of course, that's not to say we'd be making a *mistake* in calling that other stuff "gold" or "water": in those other circumstances, the words wouldn't have the same meaning they actually have.) According to Kripke, it's a matter of necessity that water be H_2O and that gold have atomic number 79. Having those chemical natures is what makes water and gold what they are. Science can discover essences.

But Kripke wasn't finished yet. Before closing his work on these matters, he takes on two other shibboleths: (1) at the time he wrote *Naming and Necessity*, a popular response to the mind–body problem – the traditional philosophical problem of the nature of mind and its relation to the physical body – was a kind of "identity theory." The idea was to view the problem as solved by contemporary science in much the same way that contemporary science had discovered the nature of, for example, heat. We can suppose that heat was originally identified as what produces a certain distinctive sensation. Through empirical investigation, we find that it is the kinetic motion of molecules that produces those sensations. So, roughly, heat *is* the motion of molecules. The then-popular identity theory wanted to view the relation of mind to body as akin to that between temperature and mean molecular kinetic energy. As we investigate the brain further, and discover which states are correlated with which

mental phenomena, we learn what these mental states *are*, just as we learned what temperature *is*.

Take pain. The mental state of pain appears to be correlated with the stimulation of what are called "C-fibers." Is that just what pain *is*? Have we solved the mind–body problem? Kripke points out that if we were to take the mental state of pain to just *be* the stimulation of C-fibers, then that would constitute the empirical discovery of a *necessity*, on the model of the discovery of the chemical constitution of water (remember: "water is H_2O" is necessary) or the nature of temperature. But there's a problem. In these cases of theoretical identification, of the scientific discovery of necessity, there is an explanatory note to be paid off: what explains the *illusion* of contingency? For it certainly seems that water might have turned out not to be H_2O. As we were performing the chemical investigations, at least, it seemed to be a contingent matter, possibly turning out one way, possibly another.

There is a standard way to make good on this explanatory debt: the identifying marks by which we fixed the reference of the relevant terms are, indeed, only contingently related to the essence of the kinds. So being the colorless, odorless liquid that falls from the sky as rain, etc. – that set of properties by which we identify water – is only contingently related to being water. Water might have existed without having those identifying marks. So although water *must* be H_2O, it can seem as though it need not have been, because H_2O need not be a colorless, odorless liquid that falls from the sky as rain, etc. Similarly with heat. Heat is necessarily mean molecular kinetic energy; but it's not a necessary truth that mean molecular kinetic energy produces the *sensation* of heat. That sensation is just a mark that we used to identify the phenomenon to be investigated.

Now comes Kripke's insight: in the case of pain, there's no analogous move! The marks by which we identify pain are *essential* to it; pain could not exist without being *felt* as pain. So if the stimulation of C-fibers could occur without being felt as pain, this would refute the mind–brain identity theory. Pain appears to be only contingently related to the stimulation of C-fibers. The identity theory must, according to Kripke, deny that appearance as mistaken. But it cannot explain its plausibility as it does in the analogous cases. For the mark by which we identify pain, its painful feeling, is *essential* to pain.

That leads us to the other shibboleth Kripke attacked: anti-essentialism. (2) in the 1960s and into the 1970s, influenced by Quine among others, many philosophers were opposed to essentialism – belief in modality *de re* – while accepting modality *de dicto* (see QUINE; cf. MARCUS). In other words, it was widely accepted that statements could be necessarily or possibly true or false (modality *de dicto*) but widely denied that it made sense to speak of a particular individual's necessarily or only contingently having a given property (modality *de re*). Kripke argues that a material object's material origin (the stuff from which it was made) is essential to it: *it* could not have been made from anything else. And he argues that one has one's parents *essentially*, so that one could not have had different parents. These are *de re* necessities; properties that individuals have necessarily. It's true that the method and force of his argumentation here, as elsewhere, is largely intuitive; but Kripke holds that although "some philosophers think that something's having intuitive content is very inconclusive evidence in favor of anything" he himself doesn't "know, in a way, what more conclusive evidence one can have about anything, ultimately speaking" (1980: 42).

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Truth

In his groundbreaking "Outline of a Theory of Truth," Kripke makes a number of important advances in our theoretical understanding of truth. The paper quickly became a focus of all subsequent discussions. A main problem for our understanding of truth is presented by the so-called "liar paradox." Consider sentence (1):

(1)   Sentence (1) is false.

Is sentence (1) true or is it false? Well, exploiting the attractive idea that a sentence is true just in case what it says holds, we might suppose that sentence (1) – that is, "Sentence (1) is false" – is true just in case sentence (1) is false. But now we have a problem: for we are saying that sentence (1) is true if and only if it is false. Indeed, whether sentence (1) is true or false, it follows that it's *both* true and false!

Tarski confronted this paradox, or in effect a metalinguistic version of it, and concluded that languages for which the paradox arises are "inconsistent": they are languages in which a sentence and its negation are jointly true. He suggested that such languages were inadequate for a theory of truth and proposed replacing them with more regimented languages, whose rules prevented the paradox. Tarski proposed a hierarchy of languages, none of which contains a "truth predicate" that applies to sentences of that very language (at that same level of the hierarchy) (see TARSKI, CHURCH, GÖDEL). A truth predicate (for a language L) is any predicate T which makes the following schema true for all instances (where one obtains an instance of the schema by replacing "S" with a sentence of L):

$\ulcorner T \ulcorner S \urcorner \urcorner$ is true if and only if $\ulcorner S \urcorner$ is true.

By prohibiting the application of a truth predicate to sentences in the same language, Tarski prevents the construction of the liar paradox; but he gives up the idea that there can be a satisfactory theory of truth for English (which apparently does have a truth predicate – namely, "is true" – that applies to sentences in the same, English, language).

Kripke shows how, if we allow "truth-value gaps" (i.e. if we allow sentences that are neither true nor false) we can make progress. But we do not simply *eliminate* the paradox by alleging that (1) is neither true nor false, because we can readily see that the paradox will rearise, in strengthened form, with the sentence:

(1′)   Sentence (1′) is not true.

Perhaps (1′) is neither true nor false; but then it's not true. In which case, since what it says is that it's not true, it must be true. So the paradox rearises even if we allow truth-value gaps.

To make progress, Kripke introduces the notion of a "grounded" sentence with reference to the notion of a "fixed point" (which, very roughly, is an interpreted language whose interpretation assigns to the truth predicate all and only the true sentences of that language). This notion of groundedness is useful because, according to the constructive procedure by which it is understood, not every sentence of a language will be grounded. Some sentences, like (1) or (1′), may be ungrounded, not part of the extension of the candidate truth predicate, but also not part of the anti-extension either (where the anti-extension includes just those sentences to which, according to the

interpretation, the truth predicate does *not* apply). The point is that the interpretation may be *partial*, some sentences characterized as ones to which the candidate truth predicate applies, others characterized as sentences to which the predicate does not apply, and others simply left uncharacterized. Kripke suggests that an ungrounded sentence fails to express a proposition and this relieves some of the philosophical disease associated with the liar paradox. Sentence (1′) does not say that sentence (1′) is not true: it doesn't *say* anything. It tries, and fails, to express a proposition.

It is impossible here to expound all of the technical details of Kripke's theory. A more thorough presentation would emphasize relations between Kripke's view and Kleene's three-valued logic, would discuss Kripke's "fixed point theorem" according to which, given certain constraints, there will be a "minimal fixed point," and would detail the way in which Kripke's theory *explains* (grounds) the truth-values of those sentences that have them. Much of the significance of Kripke's work lies precisely in those details. But a couple of points should be noted: to every sentence to which it assigns a value, Kripke's construction assigns the intuitively attractive value. And its failure to assign any value to certain problematic sentences has an important philosophical payoff. Still, there are problems. For example, the sort of construction Kripke proposes fails to assign truth-values to sentences we intuitively expect to have one. Generalizations such as "every true sentence is a true sentence" are ungrounded and left without a truth-value. Attempts to extend Kripke's theory to provide intuitively attractive truth-values for such sentences threaten to undermine the basic intuition of groundedness that gives Kripke's theory much of its force. And though the idea that ungrounded sentences do not express propositions could in principle be eliminated, without that claim the theory's response to the paradox loses much of its philosophical attraction.

Substitutional quantification

In his classic, "Is There a Problem about Substitutional Quantification?" (1976), Kripke establishes a number of important results about substitutional quantification. Quantification (or "generalization"), which can be *existential* or *universal*, involves some schema's being true in at least one case (existential) or in every case (universal). But what is a "case"? This question can introduce the difference between *substitutional* and the perhaps more familiar *objectual* (or sometimes "standard" or "referential") quantification. A true objectual existential quantification requires that there be some *entity* of which the schema is true. A true substitutional existential quantification, by contrast, requires that some *expression* can be substituted for the variable in the schema to produce a true sentence. Important differences between objectual quantification and substitutional quantification arise most clearly when either (1) some names are "empty" (there is nothing in the domain of discourse of which they are the names), or (2) not every entity in the domain of discourse has a name.

Because the truth of generalizations, when they are read substitutionally, can seem not to require the existence of entities in the relevant domain of discourse, substitutional quantification promised to some philosophers an attractive "ontological neutrality." We could say for example that "every even number is divisible by two" without explicitly committing ourselves to the existence of even numbers, if we were so disinclined. But in the early 1970s, papers by J. Wallace and L. Tharp challenged some of

the alleged distinctive value of substitutional quantification. Kripke refuted any suspicion, which some drew from the arguments of Wallace and Tharp, that substitutional quantification is unintelligible or that intelligibly interpreted it reduces to objectual quantification.

Reminding us that substitutional quantification presupposes the notion of a substitution class (the class of items that can be substituted for the variable bound by the substitutional quantifier), Kripke emphasizes that the items in the class must not include the very substitutional quantifier itself. Many of the alleged "paradoxes" surrounding substitutional quantification result from ignoring this requirement. Kripke then shows that it is possible, and in some cases trivial, to give (finitely axiomatized) theories of truth (in Davidson's sense) for languages containing substitutional quantifiers. Theories of truth based on substitutional quantification can, Kripke shows, satisfy Tarski's Convention T. Moreover, Kripke shows that in some cases, a substitutional interpretation of the quantifiers will be equivalent to a referential interpretation. In these cases (which will include all first-order languages without identity), whether the quantifiers are interpreted substitutionally or objectually will make no difference to which formulae are satisfied. But this no more eliminates the difference between substitutional and referential quantification than does the logical equivalence of "P and P" and "P or P" eliminate the difference between disjunction and conjunction.

Although Kripke shows that there is no problem about substitutional quantification, he is skeptical about its role for interpreting natural language. For example, Kripke does not think the viability of substitutional quantification has any bearing on whether the ordinary expressions "there is" or "there exists" typically carry ontological commitment (indeed, he is concerned about the very intelligibility of the "issue" of ontological commitment). Moreover, ordinary existential assertions appear to make no commitment to nameability, as would be required for such quantification to be interpreted substitutionally. At the end of his paper, Kripke draws a series of valuable metaphilosophical morals.

Wittgenstein on following a rule

In his influential *Wittgenstein on Rules and Private Language* (1982), Kripke attempts an exposition of Wittgenstein's so-called private-language argument. Kripke locates that argument earlier in Wittgenstein's *Philosophical Investigations* than was common at the time, earlier, that is, than in the sections that begin with and follow §243. In §201, Wittgenstein says, "this was our paradox: no course of action could be determined by a rule, because every course of action can be made out to accord with the rule." By starting with this passage, Kripke will emphasize the centrality for the private-language argument of Wittgenstein's considerations on rule following (see WITTGENSTEIN).

Consider the word "plus" or the symbol "+." We use these to express the mathematical function of *addition*. Of course there are infinitely many possible sums: no finite being could ever perform them all. Consider now some sum that we have never performed: Kripke considers 68 + 57. Of course, that sum is 125. But we can imagine a skeptic challenging us. How do we know we're following the same rule for adding as we've used in the past? Why are we so confident that we have always used "+" with the implicit intention that 68 + 57 should turn out to stand for 125? According to Kripke,

the skeptic introduces the possibility that with all of those (finitely many) past uses we really expressed a different function, the "quus" function (or "quaddition"), which is defined to equal x + y so long as x, y < 57, and to equal 5 otherwise. So the skeptic challenges us for some reason to believe that, in order to accord with our past uses of "plus," we should now say "68 + 57 equals 125" rather than "68 + 57 equals 5." If we really did always use "plus" for *quaddition* rather than for *addition*, then in order to do to 68 and 57 what we have in the past done to, say, 3 and 5 to get 8, we should now get 5 as our result.

Kripke admits that the skeptic's hypothesis (that we have always meant *quus* by "plus") is "ridiculous," "fantastic," "bizarre," and "wild." If he proposes it sincerely, the skeptic is surely crazy. But the hypothesis is not logically impossible. If it is false, we should be able to cite some fact about our past usage which establishes that by "plus" I meant *plus* rather than *quus*. The problem is that all candidate facts can seem to fail. Our problem is philosophical: the question is not "do we mean plus by 'plus'?" but "in virtue of what do we mean plus by 'plus'?" If we have no answer to that question then we must take seriously the possibility that meaning is a myth. Of course, in *posing* the paradox we assume that language is meaningful. But we must eventually kick the ladder away: if no fact about us could suffice for our having meant *plus* rather than *quus* in the past (and the paradox is as general as it appears to be), then there can be no fact as to what we mean by anything at any time. Meaning is an illusion.

Much of Kripke's purpose in the book is to develop and sharpen the problem (though he finds material in Wittgenstein to sketch a "skeptical" solution). He deftly deflects several immediate responses. And he devotes a substantial section to discussing a "dispositional" response according to which we mean *plus* rather than *quus* in virtue of having a disposition to perform various calculations in specific ways: we are disposed to give 125, not 5, as the sum of 68 and 57. There are immediate problems such as (1) we might be disposed to perform various calculations erroneously without therefore not meaning *plus* by "plus" and (2) we might have simply *no* disposition with respect to certain additions (if the numbers are too big, for example). But the basic threat to any such response, as Kripke makes clear, is that just because I am in fact disposed to perform various calculations in specific ways does not make it the case that I *should* perform them in that way. If I am performing addition, I *should* derive 125 from 68 and 57, whatever my dispositions might actually be. In Kripke's terminology, the dispositional account of meaning *plus* by "plus" leaves out the *normativity* of meaning. Kripke's discussion has helped make Wittgenstein's rule-following considerations a central issue not only in the philosophy of mind and language, but also in the philosophy of law, where the idea of a rule's having content and normative force, with respect to previously uncontemplated circumstances, is predictably important.

Bibliography of works by Kripke

1959: "A Completeness Theorem in Modal Logic," *Journal of Symbolic Logic* 24, pp. 1–14.
1963a: "Semantical Analysis of Modal Logic I," *Zeitschrift für Mathematische Logik und Grundlagen der Mathematik* 9, pp. 67–96.
1963b: "Semantical Considerations on Modal Logic," *Acta Philosophica Fennica* 16, pp. 83–94.

1965: "Semantical Analysis of Modal Logic II," in *The New Theory of Models*, ed. J. Addison, L. Henkin, and A. Tarski, Amsterdam: North Holland, pp. 206–20.

1971: "Identity and Necessity," in *Identity and Individuation*, ed. M. Munitz, New York: New York University Press, pp. 135–64. (Also in *Naming, Necessity, and Natural Kinds*, ed. S. Schwartz, Ithaca, NY: Cornell University Press, pp. 66–101.)

1972: "Naming and Necessity," in *Semantics of Natural Language*, ed. D. Davidson and G. Harman, Dordrecht: Reidel, pp. 253–355 and 763–69.

1975: "Outline of a Theory of Truth," *Journal of Philosophy* 72, pp. 690–716. (Also in *Recent Essays on Truth and the Liar Paradox*, ed. R. L. Marin, Oxford: Oxford University Press, 1975, pp. 53–81.)

1976: "Is There a Problem About Substitutional Quantification?," in *Truth and Meaning*, ed. G. Evans and J. McDowell, Oxford: Clarendon Press, pp. 325–419.

1977: "Speaker Reference and Semantic Reference," in *Contemporary Perspectives in the Philosophy of Language*, ed. P. French, T. Uehling, and H. Wettstein, Minneapolis: University of Minnesota Press, pp. 6–27.

1979: "A Puzzle About Belief," in *Meaning and Use*, ed. A. Margalit, Dordrecht: Reidel, pp. 239–83.

1980: *Naming and Necessity*, Cambridge, MA: Harvard University Press, and Oxford: Blackwell Publishers.

1982: *Wittgenstein on Rules and Private Language*, Cambridge, MA: Harvard University Press.

1986: "A Problem in the Theory of Reference: The Linguistic Division of Labor and the Social Character of Naming," in *Philosophy and Culture: Proceedings of the XVIIth World Congress of Philosophy*, Montréal: Éditions du Beffroi, pp. 241–7.