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## **Extension, Intension, Character, and Beyond**

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This article explains some of the technical terms commonly used in semantic theory. One such term is *extension*. The notion of an extension is a generalization of the notion of reference. Proper names refer to objects, and a proper name's extension is the object to which it refers. For instance, the extension of 'Barack Obama' is Barack Obama, and the extension of 'Los Angeles' is Los Angeles. The extension of a predicate is the set of objects to which it correctly applies. For instance, the extension of the common noun 'dog' is the set of all dogs, the extension of the verb 'run' is the set of all things that run, and the extension of the adjective 'happy' is the set of all happy things. Binary predicates correctly apply to pairs of things, and so the extension of a binary predicate is a set of ordered pairs. For example, the extension of the binary predicate 'kiss' is the set of pairs of objects  $\langle x, y \rangle$  such that  $x$  kisses  $y$ . The extension of a ternary predicate (such as 'give') is a set of ordered triples. Generally, the extension of an  $n$ -place predicate (where  $n$  is greater than 1) is a set of  $n$ -tuples.

Complex expressions also have extensions. For instance, the extension of 'kisses Barack Obama' is the set of objects to which this phrase correctly applies, namely the set of objects that kiss Barack Obama. The extension of this complex expression is completely determined by the extensions of the simple expressions in it, for an individual  $z$  is a member of the extension of 'kiss Barack Obama' if and only if there is a pair of objects  $\langle x, y \rangle$  such that (i)  $\langle x, y \rangle$  is a member of the extension of 'kiss', (ii)  $y$  is identical with the extension of 'Barack Obama' (that is,  $y$  is identical with Barack Obama), and (iii)  $z$  is identical with  $x$ . Declarative sentences are

also complex expressions. If we assume that they have extensions, and we also assume that the extension of every complex expression is completely determined by the extensions of the simple expressions in it, then we are naturally led to the conclusion that the extension of a declarative sentence is its *truth-value* (either *truth*, if the sentence is true, or *falsehood*, if the sentence is false). For example, the sentence ‘Barack Obama runs’ is true if and only if Barack Obama runs. But the extension of ‘Barack Obama’ is Barack Obama and the extension of ‘runs’ is the set of things that run. So the extension of the sentence ‘Barack Obama runs’ is truth if and only if the extension of ‘Barack Obama’ is a member of the extension of ‘runs’. Therefore, the truth-value of the sentence ‘Barack Obama runs’ is completely determined by the extensions of the words in that sentence. Similar points hold for many other simple sentences.

Extensions are important to semantics, but they are not plausible candidates for the *meanings* of expressions, for expressions that have the same extension (*co-extensive* expressions) can differ in meaning. For example, the predicate ‘renate’ is co-extensive with the predicate ‘cordate’, and yet the terms differ in meaning, for ‘renate’ means *animal with a kidney* whereas cordate means *animal with a heart*. Every true sentence has the same extension (truth), and every false sentence has the same extension (falsehood), but obviously there are pairs of true sentences, and pairs of false sentences, that differ in meaning: consider, for example, the true sentences ‘Some dogs live in Pittsburgh’ and ‘All cats are mammals’ and the false sentences ‘Some cow is purple’ and ‘Every frog is a mammal’. Some pairs of co-extensive (co-referring) proper names, such as ‘George Orwell’ and ‘Eric Blair’, also seem to differ in meaning, for the sentence ‘George Orwell is George Orwell’ seems to differ in meaning from ‘George Orwell is Eric Blair’.

We can sum up the problems with identifying meanings with extensions by saying that meanings are *finer-grained* semantic entities than extensions. Generally, one sort of semantic entity  $X$  is finer-grained than another semantic entity  $Y$  if two expressions that have the same  $Y$  can have different  $X$ 's.

If meanings are not extensions, then what are they? Many traditional theories say that the meanings of expressions are individuals and attributes, and complex entities made up of these. Typically, these views say that every predicate *expresses* one or more attributes, and the meaning of a predicate is either the attribute it expresses or the set of all attributes it expresses. For instance, on some versions of this theory, 'red' expresses the property of being red, while 'human' expresses the properties of being rational and being an animal. Therefore, the meaning of 'red' is the property of being red, and the meaning of 'human' is the set consisting of the properties of being rational and being an animal. The meaning of 'renate' is the property of being an animal with a kidney and the meaning of 'cordate' is the property of being an animal with a heart. The latter two properties are distinct, and so the predicates 'renate' and 'cordate' differ in meaning. The meanings of these predicates determine their extensions. For instance, the extension of 'renate' is the set of all things that have the property of being a reneate, and so the latter property determines the extension. Similarly for other predicates: the meaning of 'kiss' is the binary relation of kissing, and this relation determines the term's extension, namely the set of all pairs  $\langle x, y \rangle$  such that  $x$  bears the relation of kissing to  $y$ .

On some versions of this traditional theory, the meaning of a proper name is the object to which it refers, and so the names 'George Orwell' and 'Eric Blair' have the same meaning. If the meaning of a proper name is its referent, then the meaning of a name on this view obviously determines its extension, for they are one and the same thing. On other versions of the traditional

theory, the meaning of a proper name is the same as that of some definite description: for instance, the meaning of ‘George Orwell’ is the same as that of ‘the author of *1984*’. The meaning of a definite description is, roughly speaking, a property that at most one object can bear. Thus the meaning of ‘George Orwell’ might be the property of being the (sole) author of *1984*, whereas the meaning of ‘Eric Blair’ might be some other property that only Orwell/Blair has. If the meaning of a proper name is a property that at most one object can satisfy, then the meaning determines the referent by determining a unique object.

Complex expressions, such as ‘kisses Barack Obama’, also have meanings. On many traditional views, the meaning of a complex expression *E* is a structured entity, whose structure reflects the grammar of *E* and whose constituents are the meanings of the words in *E*. For instance, the meaning of ‘kisses Barack Obama’ is something like a sequence of the meanings of the words in the phrase (‘kiss’ and ‘Barack Obama’), in the order in which the words appear in the phrase, or a tree-like structure whose ultimate constituents are the meanings of the words in the phrase. On such views, the meaning of a complex phrase determines its extension. For instance, the meaning of ‘kisses Barack Obama’ contains as constituents the meanings of ‘kiss’ and ‘Barack Obama’. The meaning of ‘kiss’ is the relation of kissing, and (as we saw above) this determines the extension of ‘kiss’. The meaning of ‘Barack Obama’ is either Barack Obama himself or some property that he has uniquely; either way, the meaning of ‘Barack Obama’ determines the extension of the name. Finally, as we saw before, the extensions of ‘kiss’ and ‘Barack Obama’ determine the extension of the phrase ‘kisses Barack Obama’.

The meaning of a declarative sentence is traditionally called a *proposition*. Declarative sentences are said to *express* propositions. On many traditional views, propositions are complex structured entities; if sentence *S* expresses proposition *P*, then *P* has a structure that reflects the

grammar of *S*, and the ultimate constituents of *P* are the meanings of the words in *S*. For instance, the proposition expressed by ‘Barack Obama runs’ has the meanings of ‘Barack Obama’ and ‘runs’ as constituents. Propositions that have this sort of structure are often called *structured propositions* or *Russellian propositions*, after Bertrand Russell (1903), who uses them extensively in his semantic theories. (See also Kaplan 1989 and Salmon 1986.) A proposition that has an individual as a constituent is often called a *singular proposition*. The proposition that a sentence expresses determines the sentence’s extension (its truth-value). For instance, the meaning of ‘Barack Obama runs’ has the meanings of ‘Barack Obama’ and ‘runs’ as constituents. These meanings determine the extensions of ‘Barack Obama’ and ‘runs’, and as we saw earlier, the extensions of these terms determine the truth-value of the sentence.

Many traditional theories of meaning say that people can bear various cognitive and linguistic relations to propositions. For instance, people can assert, deny, believe, or doubt the proposition that Barack Obama runs. Furthermore, propositions are the referents, and extensions, of ‘that’-clauses: for example, the extension of ‘that Barack Obama runs’ is the proposition that Barack Obama runs. Therefore, the sentence ‘Clinton believes that Barack Obama runs’ attributes to the referent of ‘Clinton’ belief in the proposition that Barack Obama runs.

Some theorists use alternative terminology for similar notions. Some use ‘denotation’ for (roughly) the extension of a term, and ‘denote’ for the relation between an expression and its denotation (Mill 1872, Book 1, Chapter 2, Section 5; Russell 1903). Others use ‘designate’ and ‘designation’ for similar extensional notions. Some use ‘connotation’ for meaning, and ‘connote’ for the relation between an expression and its connotation (Mill 1872). ‘Comprehension’ is an older term (rarely used now) for the meaning of a predicate (Arnauld 1662/1964, 51). *Intension*

is a more common term for meaning or connotation (Hamilton 1860, Volume 2,101; Carnap 1956). Semantic theories that describe only the extensions of expressions are often called *extensional semantic theories*. Semantic theories that attempt to describe the meanings of expressions are often called *intensional semantic theories*.

A more recent, twentieth-century proposal for describing the meanings of expressions relies on the idea that the extension of a term often depends crucially on the way the world is. For instance, the predicates ‘renate’ and ‘cordate’ are in fact co-extensive, but there could have been animals with kidneys but no hearts, or animals with hearts but no kidneys, and if either had been the case, then the extension of ‘renate’ would have been different from the extension of ‘cordate’. We can use this idea to try to distinguish between the meanings of ‘renate’ and ‘cordate’, in the following way. Consider all of the different ways the world might have been, and call these ways *possible worlds*. The extension of ‘renate’ *at a possible world* is the set of things that are renates *in that world*. Thus the extension of ‘renate’ varies from possible world to possible world. Now we can define a *function* from possible worlds to extensions as follows: Given any possible world as an input (or *argument*), this function yields as its output (or *value*) the set of things that are renates in that possible world. This function is the *possible-worlds intension* of ‘renate’, and according to this theory, the meaning of ‘renate’ is identical with this function. (Most theorists who accept this theory call these functions simply ‘intensions’, leaving out ‘possible-worlds’. I will say more about this terminology later.) Similarly, the extension of ‘cordate’ varies from possible world to possible world, and the possible-worlds intension of ‘cordate’ is a function whose value at any possible world is the set of things that are cordates in that world. Since it is possible that some cordates are not renates, the extensions of ‘renate’ and ‘cordate’ differ at some possible world, and so the possible-worlds intensions of these terms are

different functions. If the meanings of these terms just are their possible-worlds intensions, then they differ in meaning.

We can extend this idea to other expressions. The predicate 'kiss' has an extension at each possible world (the set of ordered pairs in which the first member kisses the second in that world), and the possible-worlds intension of 'kiss' is the function that yields the extension of 'kiss' at each possible world. Similarly for other predicates. The possible-worlds intension of a proper name is a function which, at every possible world, yields the extension of that name at that world. Suppose that the extension of a given proper name can vary from possible world to possible world. Then there may be worlds at which the extension of 'Eric Blair' is different from the extension of 'George Orwell'. If so, then the possible-worlds intensions of the names are different, and if meanings are possible-worlds intensions, then these names differ in meaning. The extension of a declarative sentence at a possible world is a truth-value, and its possible-worlds intension is a function that, at every world, yields the sentence's truth-value at that world. There are some worlds in which no dogs live in Pittsburgh, but all cats are mammals. In these worlds, the extension of 'Some dogs live in Pittsburgh' is falsehood and the extension of 'All cats are mammals' is truth. Therefore, these sentences have different possible-worlds intensions, and if their meanings are their possible-worlds intensions, then they differ in meaning.

The view that meanings are identical with possible-worlds intensions is sometimes called *possible-worlds semantics*. Many proponents of possible-worlds semantics identify the proposition expressed by a sentence  $S$  with its possible-worlds intension, but some instead identify the proposition expressed by  $S$  with the set of possible worlds in which  $S$  is true. These two ways of speaking about propositions are equivalent, on possible-worlds semantics. The possible-worlds intension of  $S$  divides up the set of possible worlds into two sets, the set of

worlds in which  $S$  is true and the set of worlds in which  $S$  is false. Therefore,  $S$ 's possible-worlds intension determines the set of worlds in which  $S$  is true. But the set of worlds in which  $S$  is true also determines  $S$ 's intension, for if  $W$  is the set of worlds at which  $S$  is true, then the intension of  $S$  is the function that yields truth for every world in  $W$  and yields falsehood for every world not in  $W$ . Therefore the two ways of speaking of propositions are equivalent, according to possible-worlds semantics.

Traditionally, the term 'intension' has been used as a virtual synonym for 'meaning'. But most contemporary philosophers and linguists use the term 'intension' specifically for functions from possible worlds to extensions; these are the functions that I called 'possible-worlds intensions' above. Some philosophers and linguists who use the term 'intension' in this modern way think that meanings really are identical with such functions (Carnap 1956, Lewis 1972, Montague 1974, Stalnaker 1984). Others who use 'intension' in this modern way accept that there are such functions, but deny that meanings are identical with them (Kaplan 1989, Salmon 1986, Soames 1987). To avoid taking a stand on this issue, I shall continue to use the term 'possible-world intension' when I speak of functions from possible worlds to extensions, and I shall continue to use plain old 'intension' (without the modifier 'possible-world') in the traditional way, as a term that is, more or less, synonymous with 'meaning'. Readers should keep in mind that I am, in this respect, departing from standard contemporary usage.

Along with 'extension' and 'intension' come other related technical terms. An *extensional context* is a part of a complex expression in which substitution of co-extensive expressions does not change the extension of the complex expression. For instance, the underlined portion of the verb phrase 'kissed Eric Blair' is an extensional context in that verb phrase, for substituting a co-extensive expression, such as 'George Orwell', for 'Eric Blair' in



this context does not change the extension of the verb phrase (namely, the set of things that kissed Blair/Orwell). Similarly, the underlined portion of ‘Eric Blair kissed Mary’ is an extensional context in this sentence, for if one substitutes a co-extensive expression for ‘Eric Blair’ (e.g., ‘George Orwell’), then the extension (the truth-value) of the entire sentence remains the same. A *non-extensional context* is a part of a complex expression in which substitution of co-referring expressions may change the extension of the complex expression. For instance, the underlined portion of ‘Necessarily, all renates have kidneys’ is a non-extensional context in the sentence, for substituting the co-extensive expression ‘cordate’ for ‘renate’ yields a false sentence. Similarly, substituting ‘cordate’ for ‘renate’ in the sentence ‘John believes that all renates have kidneys’ may result in a change in the truth-value of this sentence, and so the underlined portion is a non-extensional context in the sentence. Sentences that contain non-extensional contexts are exceptions to the general rule that the extension of a complex expression is completely determined by the extensions of its parts. An *intensional context* is a part of a complex expression in which substitution of expressions with the same possible-worlds intension does not change the extension of the complex expression. For instance, the underlined portion of ‘Necessarily, all renates have kidneys’ is an intensional context in this sentence, for we can substitute any expression with the same intension as ‘renate’, such as ‘animal with kidneys’, and the truth-value of the whole sentence will remain the same. (Different theorists use the term ‘intensional context’ differently. By my definition, the underlined portion of ‘Eric Blair kissed Mary’ is both an extensional and an intensional context. But some theorists use the term ‘intensional context’ for all and only contexts that are non-extensional; they would not count this context as intensional.) A *hyperintensional context* is a part of a complex expression in which substitution of expressions with the same possible-worlds intension may change the extension of

the complex expression. For example, the underlined portion of ‘John believes that all animals with kidneys have kidneys’ is a hyperintensional context in the sentence, for substituting ‘renate’ for ‘animals with kidneys’ may change the truth-value of the sentence.

Possible-worlds intensions resemble meanings in at least two respects. First, meanings determine extensions, and so do possible-worlds intensions. Second, two expressions with the same extension can differ in meaning, and likewise two expressions with the same extension can differ in their possible-worlds intensions. But identifying meanings with possible-worlds intensions is problematic (Soames 1987). The sentences ‘All dogs are dogs’ and ‘ $2+2=4$ ’ are both true at all possible worlds, and so have the same possible-worlds intension, but seem to differ in meaning. The sentences ‘Barack Obama exists and he is not an electron’ and ‘Barack Obama exists and  $2+2=4$ ’ are both true at all possible worlds in which Obama exists, and both false at all worlds in which Obama does not exist, and so have the same truth-value at all worlds, and therefore have the same possible-worlds intension, but they differ in meaning. The predicates ‘triangular’ and ‘trilateral’ have the same extension at any possible world, and so they have the same possible-worlds intension, but they differ in meaning. Many philosophers think that the extension of a given proper name does not vary from world to world (see Kripke 1980 for arguments for this claim). On their view, proper names are *rigid designators*, that is, expressions whose extensions, or designations, are the same at all possible worlds. If proper names are rigid designators, then two proper names that have the same extension at the actual world, such as ‘Eric Blair’ and ‘George Orwell’, have the same extension at all possible worlds, and so have the same possible-worlds intension. Yet some such pairs of names seem to differ in meaning.

To deal with some of these difficulties in identifying meanings with possible-worlds intensions, some philosophers propose to identify meanings with *structured intensions* (Lewis 1972, Creswell 1985). A structured intension is a structured entity that contains possible-worlds intensions as constituents. The structured intension of a sentence  $S$  is an entity that contains the possible-worlds intensions of the words in  $S$ , within a structure that reflects the grammatical structure of  $S$ . The structured intension of ‘All dogs are dogs’ contains the possible-worlds intension of ‘dog’, while the structured intension of ‘ $2+2=4$ ’ contains the possible-worlds intension of ‘2’ and does not contain the possible-worlds intension of ‘dog’. Therefore, these two sentences have different structured intensions, even though they have the same (unstructured, possible-worlds) intension. So if meanings are structured intensions, then these sentences differ in meaning. Similarly, ‘Barack Obama exists and is not an electron’ has a different structured intension from ‘Barack Obama exists and  $2+2=4$ ’ because (for instance) the first contains the possible-worlds intension of ‘electron’ whereas the second does not. Complex predicate phrases, such as ‘exists and is not an electron’ and ‘exists and is such that  $2+2=4$ ’ also have different structured intensions. The expressions ‘trilateral’ and ‘triangular’ also have different structured intensions, if they are complex predicate phrases made up of ‘tri’ and ‘angular’, and ‘tri’ and ‘lateral’, respectively.

Structured intensions resemble the meanings that the earlier traditional theories attribute to complex expressions. On the traditional theory, the meaning of ‘Barack Obama runs’ is a complex entity that has as its constituents the meaning of ‘Barack Obama’ (which is either the man or a certain sort of attribute) and the meaning of ‘runs’ (the property of running). The structured intension of the sentence is similar, but has the possible-worlds intensions of ‘Barack Obama’ and ‘runs’ as constituents. However, some philosophers and linguists hold that

attributes just are possible-worlds intensions. This identification is controversial, but if it is correct, then structured intensions come close to the meanings of the traditional theory. There remains one difference, however, for some traditional propositions contain individuals (such as Barack Obama) as constituents, whereas no structured intension does (though a structure intension can contain a possible-worlds intension whose value at every world is Barack Obama).

Co-referring proper names still present a serious apparent problem for both theories. Suppose that proper names are rigid designators. Then ‘George Orwell’ and ‘Eric Blair’ have the same possible-worlds intension. Therefore, the sentences ‘George Orwell is George Orwell’ and ‘George Orwell is Eric Blair’ have the same structured intension. Yet the sentences seem to differ in meaning. Traditional theories that say that the meaning of a proper name is its referent have a parallel problem, for these theories entail that the two names have the same meaning, and so entail that the two sentences have the same meaning. An advocate of structured intensions might try to evade this problem by denying that proper names are rigid designators; if ‘George Orwell’ and ‘Eric Blair’ differ in extension at some world, then they have different possible-worlds intensions, and so differ in meaning. A traditional theorist might deny that the meaning of a name is its referent, and instead hold the meaning of a name is an attribute, and claim that the meanings of these names are distinct attributes. But most theorists reject these options, for reasons given by Kripke 1980 (see also the chapter on Names in this handbook).

Gottlob Frege (1892) distinguishes between an expression’s *sense* and its *reference*. (He uses the German terms ‘Sinn’ and ‘Bedeutung’, respectively.) Frege’s notion of reference is roughly the same as that of extension; his notion of sense corresponds with the notion of meaning we have discussed so far. But Frege’s theory of sense seemingly entails that senses are finer-grained than both structured intensions and traditional meanings. Frege held that if a

rational speaker can understand two sentences  $S$  and  $S'$ , and think that  $S$  is true and  $S'$  is false, then  $S$  and  $S'$  differ in sense. A rational speaker can understand 'George Orwell is George Orwell' and 'George Orwell is Eric Blair', and yet think that the first is true and the second is false. So Frege's theory entails that these sentences differ in sense. Therefore the Fregean senses of proper names are finer-grained than possible-worlds intensions, and the Fregean senses of proper names are also finer-grained than the meanings that certain traditional views attribute to names, namely those views that identify the meaning of a proper name with its referent. Parallel considerations seemingly show that the Fregean senses of predicates are finer-grained than possible-worlds intensions and attributes. Consider the sentences 'All pails are pails' and 'All pails are buckets'. The property of being a pail is the same as the property of being a bucket, and the possible-worlds intension of 'pail' is the same as that of 'bucket'. Yet it seems that a rational person could understand both of these sentences and think that the first is true and the second is false. If this is right, then Fregean senses cannot be identified with possible-worlds intensions or the attributes of traditional theories of meaning. Philosophers are divided on the plausibility and viability of a theory of fine-grained Fregean senses. See Kripke (1980) and Salmon (1986) for discussion.

We need yet further distinctions, further sorts of semantic entities, and further semantic vocabulary, to describe a common phenomenon that we have ignored so far, namely that a single sentence can "say" different things in different contexts. Imagine that John and Mary both utter the sentence 'I run'. This sentence is not ambiguous (or at least it is not ambiguous in the way that 'bank' and 'John is standing next to a bank' are). Nevertheless, John and Mary assert different propositions, for John says that he runs while Mary says that she runs (and John does not say that Mary runs and Mary does not say that John runs). What they say may even differ in

truth-value, for it may be true that John runs, while false that Mary does. In view of this, it is natural to think that the sentence 'I run' has a single meaning, but that it expresses different propositions on different occasions, depending on who utters it. Something similar happens with sentences containing 'here', 'today', 'yesterday', 'now' 'he', 'she', 'this', and 'that'. Two people who utter a single sentence containing one of these words may very well end up asserting different propositions.

We can systematize these observations in the following way (as Kaplan 1989 does). Let us suppose that words and sentences have two kinds of meaning, *character* and *content*. The sentence 'I run' has a single character. The character of this sentence is the meaning that all utterances of it have in common. But this sentence has different *contents* in different *contexts*. The content of the sentence in a context is the proposition that it expresses in that context. The content of 'I run' in John's context is the proposition that John runs. The content of that same sentence in Mary's context is the proposition that Mary runs. The character of the sentence determines what its content will be in a context. Similar points can be made about single words. The word 'I' has a single character, but varies in content from context to context, depending on who the agent of the context is. When an expression varies in its content from context to context, we call it 'context-sensitive'. Some expressions, such as 'runs', have the same content in all contexts, and so are context-*insensitive*.

The meanings that we discussed earlier in this article should be identified with the *contents* of this new view that distinguishes between character and content. The claim that there are two kinds of meaning, character and content, is compatible with various views about the nature of contents. If contents are like the meanings of some traditional theories, then the content of 'I run' in John's context is a structured proposition that contains John himself and the

property of running as constituents. If contents are possible-worlds intensions, then the content of 'I run' in John's context is a function from possible worlds to truth-values whose value at any world is truth iff John runs at that world. Similarly, the content of 'I' in John's context is John himself, if contents are like the meanings of certain traditional theories; if contents are possible-worlds intensions, then the content of 'I' in John's context is a function whose value at every world is John. From here on, I will (for the sake of simplicity) assume a traditional theory of meaning on which contents are individuals, attributes, propositions, and complexes of such entities.

The character of an expression is usually identified with a function from contexts to contents, whose value at any context is the content of that expression in that context. For instance, the character of 'I' is a function on contexts whose value at any context is the content of 'I' in that context, namely the agent of the context. Given John's context, this character yields John himself, and given Mary's context, it yields Mary herself. The character of 'runs' is a constant function whose value, at every context, is the property of running. The character of 'I run' is a function whose value at every context is the singular proposition that *A* runs, where *A* is the agent of the context.

Typical theories of character (such as that of Kaplan 1989) assume that every context has its own agent, time, location, and possible world, and also assume that the agent of a context exists in the world of that context, and is located at the time and place of that context in that world. A sentence is true at a context *C* iff its content in *C* is true in the world of *C*. For instance, the sentence 'I exist' is true in a context *C* iff the content of that sentence in *C* is true in the world of *C*. Therefore 'I exist' is true in every context, for the agent of a context always exists in the world of the context. Similarly, 'I am here now' is true in every context. However,

the content of 'I exist' at a context can be false at worlds other than the world of the context. For example, the content of 'I exist' in a context  $C$  in which Mary is the agent is the proposition that Mary exists; this proposition is true in the world of  $C$ , but is false in some other worlds.

Therefore, 'Necessarily, I exist' is false in context  $C$ , even though 'I exist' is true in all contexts. Similarly, 'I am here now' is true at every context, but 'Necessarily, I am here now' is false at all contexts whose agent is a thing that could have been at a different location at the time of the context.

Some theorists argue that the above theory of character is not sufficiently fine-grained. Suppose that the content, in a context, of any expression of the form "that  $F$ " is the demonstrated object of the context, if that object is  $F$ . For instance, the content, in a context, of 'that dog' is the demonstrated object of that context, if it is a dog. (This assumption is controversial; see Braun 1994 and King 2001 for discussion.) Now consider the expressions 'that dog' and 'that dog which is black if it is black'. Anything that is a dog is also a dog which is black if it is black. So on the preceding theory, 'that dog' has the same content in every context as 'that dog which is black if it is black'. Therefore, 'that dog' and 'that dog which is black if it is black' have the same character, on the above theory. Yet they seem to differ in meaning in some respect. Some theorists (Braun 1994) propose to use *structured characters* to deal with this apparent problem. The structured character of a complex expression is a structured entity that contains the (functional) characters of the words in the expression as constituents. For instance, the structured character of 'I run' is a structured entity whose constituents include the character of 'I' and the character of 'run'. 'That dog' and 'that dog which is black if it is black' differ in structured character, for the structured character of the latter has the character of 'black' as a constituent, whereas the structured character of the former does not.



## References

- Arnauld, Antoine. 1662/1964. *The Art of Thinking: Port-Royal Logic*. Translated by James Dickoff and Patricia James. New York: Bobbs-Merrill.
- Braun, David. 1994. "Structured Characters and Complex Demonstratives." *Philosophical Studies* 74, 193-219.
- Carnap, Rudolf. 1956. *Meaning and Necessity*, second edition. Chicago: University of Chicago Press.
- Cresswell, Max. 1985. *Structured Meanings*. Cambridge, MA: MIT Press.
- Frege, Gottlob. 1892. "Über Sinn und Bedeutung," *Zeitschrift für Philosophie and philosophische Kritik*, 100, 25-50. Translated as "On Sense and Reference." In Peter Geach and Max Black (eds.), *Translations from the Philosophical Writings of Gottlob Frege*. 1952. London: Blackwell.
- Hamilton, William. 1860. *Lectures on Logic*. Boston: Gould and Lincoln.
- King, Jeffrey. 2001. *Complex Demonstratives: A Quantificational Account*. Cambridge, MA: MIT Press.
- Kaplan, David. 1989. "Demonstratives." In Joseph Almog, John Perry, and Howard Wettstein (eds.), *Themes from Kaplan*, 481-563. New York: Oxford University Press.
- Kripke, Saul. 1980. *Naming and Necessity*. Cambridge, MA: Harvard University Press.
- Lewis, David. 1972. "General Semantics." In Donald Davidson and Gilbert Harman (eds), *Semantics of Natural Language*, 169-218. Dordrecht: Reidel. Reprinted in David Lewis, 1983, *Philosophical Papers Volume 1*, pp. 189-232, New York: Oxford University Press.
- Mill, John Stuart. 1872. *System of Logic*. London: Longman, Green, Reader, and Dyer.
- Montague, Richard. 1974. "Pragmatics." In Richmond Thomason (ed.), *Formal Philosophy: Selected Papers of Richard Montague*, 95-118. New Haven, CN: Yale University Press.
- Russell, Bertrand. 1996. *Principles of Mathematics*. New York: Norton. Originally published in 1903, London: Allen and Unwin.
- Salmon, Nathan. 1986. *Frege's Puzzle*. Cambridge, MA: MIT Press.

Soames, Scott. 1987. "Direct Reference, Propositional Attitudes, and Semantic Content." *Philosophical Topics* 15, 47-87. Reprinted in Nathan Salmon and Scott Soames (eds.), *Propositions and Attitudes*, 197-239, Oxford: Oxford University Press.

Stalnaker, Robert. 1984. *Inquiry*. Cambridge, MA: MIT Press.