The Selectionist Meaning of C. S. Peirce and B. F. Skinner

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The selectionist meaning of C. S. Peirce and B. F. Skinner, which has an empirical existence, is advanced against essentialist meaning, which does not. Against a tradition that advocates essentialist meanings, the development of selectionist meaning is traced from Darwin through Peirce and on to Skinner. The views of Peirce and Skinner on meaning are presented as sharing a compatible conceptual foundation with contrasting but complementary distinctions. Support for selectionist meaning comes from contemporary dictionary construction, pragmatist philosophers, and recent views of scientific verbal behavior. Some implications are discussed.

The purpose of this essay is to advance the Peirce–Skinner theory of selectionist meaning as the only viable account for a behavioral semantics in the world as it exists. The alternative essentialist account of meaning, despite its longstanding allure as a solution to problems of meaning, has never described meanings as they empirically exist. Only selectionist meanings exist in this world. Essentialist claims for fixed meanings independent of context are claims for a wished-for state of affairs (i.e., that some words have constant meanings, that meaning is a property of a word, or that words have strict literal meanings). In practice, meanings tend to vary in use, always depend upon context, and multiple meanings for the same word form are the rule, not the exception. In the following, the essentialist tradition of meaning is traced from the 17th century. The selectionist tradition is traced from Charles Darwin, who established natural selection and applied it to words as well as to other human behavior, to

C. S. Peirce, who established a philosophical foundation for addressing meaning in this way, and to B. F. Skinner, who added additional refinements. Further support for a selectionist view of meaning is presented from the construction of *The Oxford English Dictionary*, pragmatist philosophy, and scientific verbal behavior. Finally, some implications of selectionist meaning are discussed.

ESSENTIALIST MEANING

Claims for the desirability of essentialist meaning were prominent from the beginnings of modernism and continue to have currency. Believers in accounts of universal determinism may have found it fitting to have a language aligned to the natural divisions of that universe with a one-to-one correspondence between words and things (e.g., Leibniz, cited in Cassirer, 1936/1956, pp. 11–12; D'Alembert, 1751/1995, p. 29; Du Bois-Reymond, 1872/1874, p. 2; Huxley, 1887, pp. 200–201; Laplace, 1814/1951, p. 4). Meaning would simply be a property of a word and transparently clear:

An ideal was being built of . . . simple descriptive accounts, cleansed of ambiguity and also of emotion and persuasive stylistic devices, literal not figurative in quality, well suited to reading off information directly from Nature, and hence objectively factual not personally interpretive—"a

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transparent transmitter of natural facts.”
(Sutton, 1994, pp. 59–60)

Considerations for this wished-for state extended to proposals for an ideal or perfect language in which each word had one and only one true meaning that did not change: “The Dream of an Exact Language was . . . powerful in seventeenth-century Europe. It was shared by scientists and philosophers in many countries, not least the founders of the Royal Society of London” (Toulmin, 2001, p. 69). After Bacon’s (1620/1960) early advancements in that direction, which included a complaint about words that could not be “reduced to any constant meaning” (p. 57; also see Rossi, 2000, pp. 145–150), Descartes, Peiresc, Gassendi, Mersenne, Comenius, Newton, Boyle, Wilkins, Ward, Petty, Wallis, Ray, Wiloughby, Kircher, and Leibniz all gave serious consideration to proposals for an ideal or universal language (Knowlson, 1975, pp. 9, 22, 37; also see Eco, 1997; Slaughter, 1982). If human ideas were separated into “clear and simple thoughts” (p. 13) that could be combined into more complex ideas, Descartes (1991) considered such a language an attractive possibility in his letter to Mersenne of November 20, 1629,

If someone were to explain correctly what are the simple ideas in the human imagination out of which all human thoughts are compounded, and if his explanation were generally received, I would dare to hope for a universal language very easy to learn, to speak and to write. The greatest advantage of such a language would be the assistance it would give to men’s judgement, representing matters so clearly that it would be almost impossible to go wrong. (p. 13)

Although Descartes did not expect to see such a language in his lifetime, various endeavors were undertaken that would make some progress in that direction. Thomas Sprat (1667/1958), one of the first members of the Royal Society, sought to review all the words in English for judgment on their acceptability. Objecting to ornamental rhetoric in particular, Sprat said, “They [the Royal Society] have therefore

been most rigorous in putting in execution, the only Remedy . . . to return back to the primitive purity, and shortness, when men deliver’d so many *things*, almost in an equal number of *words*” (p. 113).

Not everyone, however, was sympathetic to the idea that words should have single or essential meanings distinguishing one object or class of objects from another. Commenting on the reification of essences related to such thinking, Locke (1689/1975) said that the concept of “*Essences*, as a certain number of Forms or Molds, wherein all natural Things . . . are cast, and do equally partake, has . . . very much perplexed the Knowledge of natural Things” (3.3.17, p. 418); and he gave some pointed objections:

The supposition of Essences, that cannot be known; and the making them nevertheless to be that, which distinguishes the Species of Things, is so wholly useless, and unserviceable to any part of our Knowledge, that that alone were sufficient, to make us lay it by. (3.3.17, p. 418)

Further,

To require that Men should use their words constantly in the same sense, and for none but determined and uniform ideas, would be to think, that all Men should have the same Notions, and should talk of nothing but what they have clear and distinct Ideas of. (3.11.2, p. 509)

Interestingly, more than two centuries later, after advancing a logically perfect language in his *Tractatus Logico-Philosophicus*, the early Wittgenstein (1922/1981) came to a similar conclusion: “Whereof one cannot speak, thereof one must be silent” (p. 189).

Jonathan Swift famously ridiculed essentialist proposals for language. In his voyage to Laputa, Gulliver found the professors at the Grand Academy (the Laputian equivalent of the Royal Society) engaged in projects for improving language. One project was to achieve brevity by shortening word forms and leaving out verbs and particles (thereby anticipating the modernist writer Wyndham Lewis, 1963, who, in writing his novel *Tarr*, wanted to

"eliminate anything less essential than a noun or a verb. Prepositions, pronouns, articles—the small fry—as far as might be, I would abolish"; pp. 552–553). Another project would abolish words altogether: "Since words are only names for *things*, it would be more convenient for all men to carry about them such *things* as were necessary to express the particular business they are to discourse on." This would be "an universal language to be understood in all civilised nations, whose goods and utensils are generally of the same kind, or nearly resembling, so that their uses might easily be comprehended" (Swift, 1726/1967, pp. 230–231).

Nevertheless, prominent men in science and philosophy affirmed the values of the essentialist tradition. John Herschel (1830/1987), perhaps the foremost philosopher scientist of his day, echoed Bacon's complaint about words without a constant meaning:

What is worst of all, some, nay most [words] have two or three meanings; sufficiently distinct from each other to make a proposition true in one sense and false in another. . . . Surely those who thus attach two senses to one word, or superadd a new meaning to an old one, act as absurdly as colonists who distribute themselves over the world, naming every place they come to by the names of those they have left, till all distinctions of geographical nomenclature are confounded, and till we are unable to decide whether an occurrence stated to have happened at Windsor took place in Europe, America, or Australia. (p. 21)

Complaints about deviations from essential unambiguous meanings continued into the 20th century, along with a recurring interest in an ideal or universal language.

Manifestations of the quest for such an ideal can be found in the views of Bertrand Russell and the logical positivists. In his approving preface to Wittgenstein's (1922/1981) *Tractatus Logico-Philosophicus*, Russell (1922/1981) emphasized the logical quality of an ideal language: "A logically perfect language has rules of syntax which prevent nonsense, and has single sym-

bols which always have a definite and unique meaning" (p. 8); and he argued that we should try to approach this ideal if we are to speak meaningfully: "The whole function of language is to have meaning, and it only fulfills this function in proportion as it approaches to the ideal language which we postulate" (p. 8). Less insistent on logical features, Otto Neurath (1931–1932/1959), one of the members of the Vienna Circle, advanced physicalistic language as a universal language: "The physicalistic language has the capacity some day to become the universal language of social intercourse" (p. 289); and this language would be developed by purifying ordinary language:

What is originally given to us is our *ordinary natural language* with a stock of imprecise, unanalyzed terms. We start by purifying this language of metaphysical elements and so reach the *physicalistic ordinary language*. In accomplishing this we may find it very useful to draw up a list of proscribed words. (p. 200)

Neurath (1931/1983, p. 50) saw his physicalistic views as allied to the views of John Watson's S-R behaviorism, and he (1931–1932/1959) saw physicalistic language as unifying all of science:

The views suggested here are best combined with a *behavioristic* orientation. One will not then speak of "thought," but of "speech-thought," i.e., of *statements as physical events*. . . . only physicalistic statements have a meaning, i.e., can become part of unified science. . . . The physicalistic language, unified language, is the Alpha and Omega of all science. (p. 292)

In this unification, the physicalistic language would apply to all the sciences in "building up a uniform scientific language with a uniform terminology" (Neurath, 1936/1983, p. 133). Rudolph Carnap (1934), another member of the Vienna Circle, also thought such a language would be well suited for science, "[Our] theory is that the physical language is the universal language and can therefore serve as the basic language of Science" (p. 95).

Essentialist interpretations can be

found elsewhere. They have been given by some who are interested in linguistics; for example, Katz (1971, p. 299), who takes an approach like that suggested by Descartes. They have also been given for "sacred" texts, in which the interpreter of the text is the source of the essential meanings. Variant interpretations that conflict with the interpreter's interpretation are denied legitimacy except as they are attributed to a more "authoritative" interpreter. Such interpreters often establish their interpretations by appealing to the "literal meaning" of a word, but an appeal to a strict literal meaning is simply an appeal to a widely accepted or an earlier meaning as the only meaning to pay attention to. It is a claim for essential meaning that does not address the meaning of a word in context. Creationists, in attacking evolution, typically rely on this approach.

SELECTIONIST MEANING

An enduring alternative to essentialist thinking can be traced to Charles Darwin in the 19th century. One of the obstacles to advancing variation and selection among organisms was the essentialist concept of natural kinds (Hull, 1989). A natural kind had essential characteristics that did not change. As long as the concept of a natural kind was held, there could be no evolution. It was an argument by definition with no empirical evidence other than the assumed existence of essential characteristics. Darwin showed convincingly that it was variations in living organisms, not natural kinds, that existed, and what mattered were the variations selected by consequences. Selectionist meaning may be considered to have begun as an extension of Darwin's natural selection. It was first developed as a thoroughgoing method of interpretation by Peirce and lay at the core of his pragmatism. Subsequently, Skinner provided additional refinements.

Darwin's Natural Selection

Although Darwin (Barlow, 1958) claimed that "everything in nature is the result of fixed laws" (p. 87), the results of Darwin's investigations and his advocacies were in conflict with the scientific tradition that appealed to fixed laws in support of essentialist beliefs. According to Ernst Mayr (1991),

Darwin's empirical researches led to results that were in conflict with most of the basic assumptions of physicalism. The physicalists were essentialists, a philosophy that Darwin totally rejected. Instead, Darwin developed . . . a mode of thinking utterly alien to the physicalists. The physicists at that time were strict determinists; prediction was not only possible but was the very test of the validity of theories. Evolutionary processes, by contrast, involved a considerable chance element: they were probabilistic, and hence they did not permit absolute prediction. (p. 48)

Darwin was advancing a different kind of thinking.

The discovery of the importance of the individual became the cornerstone of Darwin's theory of natural selection. It eventually resulted in the replacement of essentialism by population thinking, which emphasized the uniqueness of the individual and the critical role of individuality in evolution. Darwin no longer asked, as had Agazziz, Lyell, and the philosophers, "What is good for the species?" but "What is good for the individual?" (Ghiselin, 1969). And variation, which had been irrelevant and accidental for the essentialist, now became one of the crucial phenomena of living nature. (p. 42)

Mayr called this new kind of thinking *population thinking*; but *variation thinking* (to emphasize the variability of the individual) might be a more transparent term.

Agreeing with Mayr's line of argument, Gould (1996) said, "I will argue that we are still suffering from a legacy as old as Plato, a tendency to abstract a single ideal or average as the 'essence' of a system, and to devalue or ignore variation among the individuals that constitute the full population" (p. 40). The effect upon those who took Darwin's work to heart was to turn around the relation between essence

and variation: "In Plato's world, variation is accidental, while essences record a higher reality: in Darwin's reversal, we value variation as a defining (and concrete earthly) reality, while averages (our closest operational approach to essences) become mental abstractions" (p. 41). An emphasis on variation would lead not only to a different approach to the meaning of words, but to a different approach to science, notably to the methods of single-case research designs used in behavior analysis (Morgan & Morgan, 2001, p. 124).

It was not only physical forms that were involved in Darwin's new way of thinking, but the functions of behaviors as well:

It further deserves notice that reflex actions are in all probability liable to slight variations, as are all corporeal structures and instincts; and any variations which were beneficial and of sufficient importance, would tend to be preserved and inherited. Thus reflex action, when once gained for one purpose, might afterwards be modified independently of the will or habit, so as to serve for some distinct purpose. (C. Darwin, 1872/1965, p. 41)

Darwin also addressed behavior that he characterized as habits rather than reflexes. Speaking in terms of pleasure and pain as concomitants of these behaviors, Darwin (F. Darwin, 1887, Vol. 1) wrote,

An animal may be led to pursue that course of action which is the most beneficial to the species by suffering, such as pain, hunger, thirst, and fear,—or by pleasure, as in eating and drinking and in the propagation of the species, &c.; or by both means combined, as in the search for food. But pain or suffering of any kind, if long continued, causes depression and lessens the power of action. . . . Pleasurable sensations, on the other hand, may be long continued without any depressing effect . . . they stimulate the whole system to increased action. . . . Most or all sentient beings have been developed in such a manner through natural selection, that pleasurable sensations serve as their habitual guides. (p. 310)

Darwin then gave some examples of human activities guided by pleasures "which are habitual or frequently recurrent" (p. 311).

Additional selectionist thinking is found in Alexander Bain, who knew Darwin (F. Darwin, 1887, Vol. 3, pp. 172–173). Bain made an influential contribution to pragmatism in saying that the meaning of a belief is found in the consequences of acting upon that belief (Ketner & Kloesel, 1986, pp. 79–109) and to behaviorism in distinguishing two types of learning. According to Robert Boakes (1984):

Bain was very much concerned to draw a clear distinction between reflexive actions produced by the nervous system in response to some external event, the kind of activity emphasized in the physiology of that era, and what he termed spontaneous activity . . . [which] was seen as an "essential prelude to voluntary power." (p. 9)

Illustrating the role of spontaneous behavior, Bain (1868, p. 413) described how a lamb acquired feeding behavior after its birth. The infant lamb emitted spontaneous behavior that was shaped by consequences into actions that secured nourishment.

Applications of selectionist thinking extended to human behavior. Darwin, as well as others (e.g., Lyell, 1873, p. 513; Muller, 1870; Taub, 1993), had early noted a parallel between the evolution of species and the evolution of words and language in respect to their forms. Darwin (1871/1971) said, "The formation of different languages and of distinct species, and the proofs that both have been developed through a gradual process, are curiously the same. . . . The survival or preservation of certain favoured words in the struggle for existence is natural selection" (pp. 59–61). An approach to meaning in parallel with natural selection was soon to follow.

Selectionist Meaning for Peirce

Peirce was remarkably well read and active in many scholarly areas, especially those related to science. He received the first BS in chemistry offered by Harvard; was employed as a mathematician, astronomer, and physicist at the U.S. Coast Survey, where he made fundamental contributions in each area;

and was America's first experimental psychologist and a behaviorist of the selectionist variety (see Behrens, 1993; Cadwallader, 1974). In a letter of 1912, Peirce (cited in Ketner & Kloesel, 1986) said he derived the word pragmatism "from *πράγμα*, 'behavior'—in order that it should be understood that the doctrine is that the only real significance of a general term lies in the general behavior which it implies" (p. 218). Similarities between Peirce and Skinner have been noted (e.g., Moxley, 2001a, 2001b; S. M. Schneider, 1997; Skinner, 1979; Staddon, 2001, p. 96), and some of the details of these similarities are included in the following.

In a key essay, "How to Make Our Ideas Clear," Peirce (1878/1992) presented meaning in terms of the function of thought to produce habits:

The whole function of thought is to produce habits of action. . . . To develop its meaning, we have, therefore, simply to determine what habits it produces, for what a thing means is simply what habits it involves. Now the identity of a habit depends on how it might lead us to act, not merely under such circumstances as are likely to arise, but under such as might possibly occur, no matter how improbable they may be. . . . What the habit is depends on *when* and *how* it causes us to act. As for the *when*, every stimulus to action is derived from perception; as for the *how*, every purpose of action is to produce some sensible result. (p. 131)

Peirce has presented the meaning of habits as entailing the *when* and *how* of an *act*, a three-term relation of *stimulus*, *act*, and *result*. In addition, the act is *probabilistic*: "how it *might* [italics added] lead us to act." Peirce used similar formulations for habit elsewhere: *conditions*, *acting*, and *result* (1931–1958, 5.491 [volume and paragraph]; *conditions*, *action*, and *motive*; *circumstances*, *act*, and *motives* (1907/1998, p. 432); and *occasion*, *act*, and *consequence* (1985, p. 912).

The relations among these terms may be inferred from Peirce's "minute logic" of 1902. Peirce (1931–1958) generalized three-term formulations of relations across the discovery of laws

of nature, the improvement of inventions, and natural selection:

We here proceed by experimentation. . . . What if we were to vary our procedure a little? Would the result be the same? We try it. If we are on the wrong track, an emphatic negative soon gets put upon the guess, and so our conceptions gradually get nearer and nearer right. The improvements of our inventions are made in the same manner. The theory of natural selection is that nature proceeds by similar experimentation to adapt a stock of animals or plants precisely to its environment, and to keep it in adaptation to the slowly changing environment. . . . Just as a real pairedness consists in a fact being true of A which would be nonsense if B were not there, so we now meet with a Rational Threeness which consists in A and B being really paired by virtue of a third object, C. (2.86)

Applied to natural selection, the relation between (A) the environment and (B) the stock of animals adapted to it exists because of (C) the consequences that occurred for previous AB (environment–animal) relations.

A close relation exists between Peirce's terms and Darwin's (1859/1958) *conditions of life*, *variation*, and *selection*: "Natural Selection, or the Survival of the Fittest . . . implies only the preservations of such *variations* as arise and are beneficial to the being under its conditions of life" (p. 88). We can see that the same relations hold: (A) the conditions of life and (B) the variations that arise are because of (C) selection (or survival). Applied to habits, the relation between (A) the stimulus and (B) the action is because of (C) the result that was produced. This application seems permissible in that Peirce (1880/1986) saw the relation between habits and natural selection as similar: "Habit plays somewhat the same part in the history of the individual that natural selection does in that of the species; namely, it causes actions to be directed towards ends" (p. 46).

After presenting his probabilistic three-term contingency, Peirce (1878/1992) then offered a characteristic description for his pragmatism.

Thus, we come down to what is tangible and practical, as the root of every real distinction of thought, no matter how subtle [sic] it may be; and there is no distinction of meaning so fine as to consist in anything but a possible difference of practice. . . . Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (pp. 131–132)

Applied to a term such as Darwin's "pleasure," the practical effects would include "increased action," applied to Darwin's "pain," the practical effects would include an eventual lessening of action.

Of all the implications of his theory of meaning, Peirce (1931–1958) was particularly interested in meaning for listeners of difficult words or abstract concepts: "Suffice it to say once more that pragmatism is . . . merely a method of ascertaining the meanings of hard words and of abstract concepts" (5.464). This meaning could only be finalized in-the-long-run because some meanings grew with the use of words over time: for example, "How much more the word electricity means now than it did in the days of Franklin; how much more the term *planet* means now than it did in the time of Hiparchus" (Peirce, 1982, p. 496). These listeners belong to a community of listeners that extends indefinitely over time, and the final meaning for that community could only be known in-the-long-run.

Meaning-in-the-long-run is problematic. At one end of the range of meanings offered by Peirce (1931–1958), meaning-in-the-long-run was a tentative hope:

We cannot be quite sure that the community ever will settle down to an unalterable conclusion upon any given question. Even if they do so for the most part, we have no reason to think the unanimity will be quite complete, nor can we rationally presume any overwhelming *consensus* of opinion will be reached upon every question. All that we are entitled to assume is in the form of a *hope* that such conclusion may be substantially reached concerning the particular questions with which our inquiries are busied. (6.610; also cf. 5.609)

At another end, meaning-in-the-long-run was a fixed finality (6.33). Speaking of Peirce's different hypotheses about what in-the-long-run might mean, Shapiro (1973) said,

Peirce sometimes speaks as if the end is a fixed state which can actually be obtained, while in other places he treats it more as a regulative ideal; and, perhaps most appealingly, he sometimes speaks of it as a continuous activity with no terminum. (p. 38)

What-happens-in-the-long-run was an untestable speculation, and Peirce (1931–1958, 6.524) himself questioned the value of such speculations.

Although Peirce considered other kinds of meaning, he was not as interested in them. In "What Makes Reasoning Sound?" Peirce (1931–1958) asked, "What is meaning?" and gave three answers: First, he presented an immediate meaning for the use of words:

A word has meaning for us in so far as we are able to make use of it in communicating our knowledge to others and in getting at the knowledge that those others seek to communicate to us. That is the lowest grade of meaning. (8.176)

This sense of meaning is limited to the immediate import of words used by the speaker or understood by the listener. Second, Peirce considered meaning from the viewpoint of the individual speaker in a particular instance of use and the total intended consequences of that use:

The *meaning* of a word is more fully the sum total of all the conditional predictions which the person who uses it *intends* to make himself responsible for or intends to deny. That conscious or quasi conscious *intention* in using the word is the second grade of meaning. (8.176)

This level of meaning is in terms of all the consequences the speaker intends. Third, Peirce brings in his most extended sense of meaning with its most extended consequences. Meaning is considered from the listener's point of view, not only one listener but the community of listeners over time:

But besides the consequences to which the person who accepts a word knowingly

commits himself to, there is a vast ocean of unforeseen consequences which the acceptance of the word is destined to bring about, not merely consequences of knowing but perhaps revolutions of society. One cannot tell what power there may be in a word or a phrase to change the face of the world; and the sum of those consequences makes up the third grade of meaning. (8.176)

Here we have moved to a world community of listeners and a history of listeners.

This community is even larger than the sum of individual people in that Peirce's (1931–1958) evolving meanings take place within multiple selves as well as a community of selves:

Two things here are all-important. . . . The first is that a person is not absolutely an individual. His thoughts are what he is "saying to himself," that is, is saying to that other self that is just coming into life in the flow of time. When one reasons, it is that critical self that one is trying to persuade; and all thought whatsoever is a sign, and is mostly of the nature of language. The second thing to remember is that the man's circle of society (however widely or narrowly this phrase may be understood) is a sort of loosely compacted person, in some respects of higher rank than the person of an individual organism. (5.421)

Meaning develops through what one says to oneself and what a community of selves say and listen to. Peirce also addressed meaning within a fairly complex theory of semiotics that has little counterpart in Skinner's work.

Meaning for Skinner

Skinner's position on meaning changed from an essentialist to a selectionist view (Moxley, 1997). However, this change is somewhat obscured by the fact that essentialist views continued to show their influence from time to time in Skinner's writings even after his adoption of a selectionist account. Nevertheless, it is clear that Skinner rejected an essentialist account of meaning, adopted a selectionist account like that of Peirce, and made some contributions of his own to a selectionist account of meaning.

Skinner's rejection of essentialist meaning. Early influences on Skinner

(Bacon, Russell, and Watson) had advanced essentialist meanings; and Skinner's advancement of selectionist meaning proceeded against this early background of enduring influences (Moxley, 1997). Evidence of this conflict can be seen in Skinner's (1948) manuscript of the William James lectures on verbal behavior. On the one hand, Skinner praised Bacon's approach to meaning: "Bacon's treatment in the *Idols of the Market* has scarcely been surpassed" (p. 2). In that passage, Bacon (1620/1960, p. 57) advanced an essentialist advocacy of constant meanings. In contrast, Skinner advanced a functional account of meaning that embraced an extended context: "If [meaning] is defined, for example, as 'all the conditions which are responsible for an utterance,' it will cover the present formulation" (p. 14). Nevertheless, Skinner withheld approval of the term *meaning*. It was a word that did not have a constant meaning in its use and was the kind of word that Bacon objected to. Skinner said, "It is safer to drop the term altogether" (p. 14). Evidently deeming the risk worthwhile, Skinner continued to use the term *meaning* in subsequent writings.

Skinner's rejection of essentialist meaning in 1945 and after was emphatic. In "The Operational Analysis of Psychological Terms," Skinner (1945) presented himself as opposed to essentialists and those who were "adherents of the 'correspondence school' of meaning" (p. 274), saying, "It is simply not true that an organism reacts to a sign 'as it would to the object which the sign supplants' " (p. 271), and he rejected the idea of a rule for the meaning of a word: "[The psychologist] cannot, unfortunately, join the logician in defining a definition, for example, as a 'rule for the use of a term' (Feigl)" (p. 277). Extending his identification of those whose views on meaning he rejected, Skinner (1984) said, "It was not true, as Watson, Russell and others had said, that one responded to words as if they were the things the words stood for" (p. 335).

Rejecting Russell's (1926, p. 119) claim that meaning was a property of a word, Skinner (1974) said, "Meaning is not properly regarded as a property of a response or a situation but rather of the contingencies responsible for both the topography of behavior and the control exerted by stimuli" (p. 90). Skinner thereby rejected the views on meaning by a logical positivist (Feigl), an S-R behaviorist (Watson), and a logical atomist in sympathy with the logical positivists (Russell).

In his considered accounts of verbal behavior in 1945 and after, Skinner's rejection of essentialist meaning was fairly complete. Discounting the prospect of physicalistic language to become a universal language, Skinner (Blanshard & Skinner, 1966–1967) said of his 1945 paper, "The physicalism of the logical positivist has never been good behaviorism, as I pointed out twenty years ago (Skinner, 1945)" (p. 325). Skinner (1957) even rejected the possibility of an ideal language, saying, "Such a language is manifestly impossible" (p. 124).

Skinner's adoption of selectionist meaning. Skinner (1945) advanced a selectionist view of meaning for the first time in 1945 and after: "Meanings, contents, and references are to be found among the determiners, not among the properties, of response" (p. 271). These determiners were to be found in Skinner's first formulation of his probabilistic three-term contingency, which was for verbal behavior:

There are three important terms: a stimulus, a response, and a reinforcement supplied by the verbal community. . . . The significant interrelations between these terms may be expressed by saying that the community reinforces the response only when it is emitted in the presence of the stimulus. The reinforcement of the response "red," for example, is contingent upon the presence of a red object. (The contingency need not be invariable.) (p. 272)

Skinner's added characterization that "the contingency need not be invariable" contrasts with his (1938/1966) previous characterization of the "mechanical necessities of reinforcement"

(p. 178). Until 1945, Skinner presented operant behavior primarily as two paired reflexes, with the inherent assumption of necessity between stimulus and response, and he had followed this S-R account in his early work on verbal behavior in the 1930s (Moxley, 2001b).

In addition to using terms that are similar to the terms that Peirce used for his three-term contingency, the relations in Skinner's (1945) three-term contingency are similar to Peirce's AB-because-of-C relations: "The contingencies of reinforcement . . . account for the functional relation between a term, as a verbal response, and a given stimulus" (p. 277). The causal or explanatory role established by "account for" is not given to the antecedent stimulus as in S-R accounts. Instead, the causal role is given to the consequences, and the relation between stimulus and response is because of these consequences. The relation between (A) "a given stimulus" and (B) "a verbal response" is because of (C) "reinforcement." Applying Peirce's relations to Skinner's (e.g., 1973, pp. 257–258; 1988, pp. 215, 265; 1989c, p. 62; 1997, p. 156) later operant formulation, the relation between (A) the setting and (B) the behavior is because of (C) the consequences for previous AB (setting–behavior) relations. Skinner (1957) also saw a similarity between operant behavior (Peirce's habits) and natural selection: "There is a parallel between natural selection and operant conditioning" (p. 462).

In brief, Skinner's view of meaning in 1945 resembled that of Peirce. This may have been a case of independent discovery, but it may also have been a case of some direct or indirect influence. Skinner (1984, p. 41) said his growing library, apparently by the late 1920s, included *Chance, Love and Logic* by Peirce (1923/1998). The second essay in that book, "How to Make Our Ideas Clear," presented Peirce's role for belief and thought in private events, his account of meaning in terms of habit, and his seminal account

of pragmatism. In addition, Skinner (1984, pp. 92, 151, 158, 213, 281) had discussions over a period of years with his friend the pragmatist W. V. Quine, who could have presented some of Peirce's views. Quine (1981), for example, said, "Peirce scored a major point for naturalism, moreover, in envisioning a behavioristic semantics. Naturalism in psychology and semantics is behaviorism; and Peirce declared for such a semantics when he declared that beliefs consist in dispositions to actions" (p. 36).

Earlier, in the 1930s, there was little to place Skinner in the pragmatic tradition. Afterwards, Skinner (1945) advanced a pragmatic epistemology that stressed consequences: "The ultimate criterion for the goodness of a concept is . . . whether the scientist who uses the concept can operate successfully upon his material—all by himself if need be" (p. 393). This left out any final appeal to rules or to logical foundations. Probabilistic contingencies underlie rules, rules do not underlie contingencies: "Modern logic . . . can scarcely be appealed to by the psychologist" (p. 271) and if a functional analysis of behavior "invalidates our scientific structure from the point of view of logic and truth-value, then so much the worse for logic, which will also have been embraced by our analysis" (p. 277). This last quotation was cited with approval by Dewey and Bentley (1947, 306n), who regarded Skinner's views with favor.

One reason Dewey approved of Skinner's views was that they were like those of pragmatists. In response to the question, "Do you see operant conditioning as close to any existing philosophical system?" Skinner (1979) identified pragmatism and spoke favorably of Peirce:

The method of [Peirce] was to consider all the effects a concept might conceivably have on practical matters. The whole of our conception of an object or event is our conception of effects. That is very close, I think, to an operant analysis. (p. 48)

Skinner appears to be rephrasing

Peirce's (1878/1992) statement, "Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object" (p. 132). Skinner's claim that this "is very close . . . to an operant analysis" is even more understandable if Skinner had read and thought about Peirce's previous two paragraphs, which presented a three-term contingency for habits. Skinner's accurate rendering of Peirce in an interview suggests not only a close study but perhaps a recent reading or rereading (J. Morrow, personal communication, First International Association for Behavior Analysis Conference, Venice, 2001).

Some differences between Peirce and Skinner. The following will focus on differences that have counterparts between Peirce and Skinner. Such differences exist between habits and operants and the relative emphasis on the speaker and listener. Such differences in regard to selectionist meaning are more complementary than conflicting and may be considered as entailing Skinner's contribution to selectionist meaning, although he may also have been influenced in his thinking by his readings of other pragmatists. The main difference between *habits* (Peirce's term) and *operants* (Skinner's term) that Skinner (1989a) identified was size:

The main difference between an operant and a habit seemed to be one of size. Pressing a lever could have been called a habit, but so could running through a complicated maze, which was composed of many operants, each with its own stimulus, response, and consequence. (p. 125)

On this basis, Skinner has offered a consideration of smaller units or more refined discriminations for operants than Peirce did for habits.

Another difference between Peirce and Skinner was their relative emphasis on the speaker and listener. Peirce emphasized the listener and gave special attention to listeners in-the-long-

run. At first Skinner's (1957) account was primarily for the speaker:

The form of a response is shaped by the contingencies prevailing in a verbal community. A given form is brought under stimulus control through the differential reinforcement of our three-term contingency. The result is simply the probability that the speaker will emit a response of a given form in the presence of a stimulus having specified properties under certain broad conditions of deprivation or aversive stimulation. *So far as the speaker is concerned, this is the relation of reference or meaning.* (p. 115)

Skinner did not note any distinctive characteristics for the listener: "The behavior of the listener in mediating the consequences of the behavior of the speaker is not necessarily verbal in any special sense. It cannot, in fact, be distinguished from behavior in general" (p. 2). Although Skinner seemingly excluded the listener from verbal behavior, he included the listener in the verbal episode, saying, "We need separate but interlocking accounts of the behaviors of both speaker and listener if our explanation of verbal behavior is to be complete" (p. 34). The problem was in distinguishing the behavior of the listener from behavior in general.

Later, Skinner indicated how the listener's behavior might also be considered as verbal. Skinner (1980) said, "As responses [of the speaker], the circumstances controlling their appearance *are* their meaning. As stimuli [for the listener], their meaning is the behavior under their control" (p. 114). Meaning for the speaker lies in the contingencies of what the speaker says. Meaning for the listener lies in the contingencies for what the listener says or does. The listener is simply one whose response is under the control, to some extent, of what the speaker says.

In addition, Skinner distinguished the behavior of the listener engaged in rule-governed behavior from behavior acquired as contingency-shaped behavior. Skinner (1969) said, "Rule-governed behavior is in any case never exactly like the behavior shaped by contingencies" (p. 150), and "Rule-gov-

erned behavior is usually designed to satisfy contingencies, not to duplicate other features of the behavior shaped by them. Contingency-shaped behavior is therefore likely to have a greater variety or richness" (p. 170). The term *rule governed*, however, may suggest that there is no special distinction for other kinds of behavior performed in response to verbal behavior, and Skinner apparently concluded that all of the listener's behavior, as a listener, was more adequately distinguished as being verbal governed "when he suggested that rule-governed behavior might also be called verbal stimulus controlled behavior" (Hayes & Hayes, 1989, p. 159).

Actually, Skinner (1957) had already suggested how the listener's behavior can be distinguished from behavior in general when he said, "A verbal response makes it possible to 'think about' one property of nature at a time" (p. 448). Such a response appears applicable to both speakers and listeners. Listeners may also "think about" and respond to one property of nature at a time in responding to what they are hearing from the speaker in rule-governed or verbal-governed behavior.

Skinner (1989b) gave further importance to the listener when the speaker and listener are regarded as different selves within the same skin:

Many persons or selves reside within one skin. . . . When we say that we talk to ourselves, we mean that one self talks to another. Different repertoires have been shaped and maintained by different verbal environments. . . . In all this our role as listener is the important thing. We are better listeners than speakers, and we continue to listen to and read much more than we ever say or write. . . . When repertoires of speaker and listener come together in the same skin, things happen which are much less likely to happen when they are in separate skins. We converse with ourselves, arguing perhaps, but looking for agreement. The selves who converse have different histories (or silent verbal behavior would be useless), but they are not as different as the histories in a group discussion. (p. 46)

When we consider that speaker-listen-

er episodes on the same issues may occur over time between selves under the same skin, the resulting action and its meaning for a particular self may take some time to develop. Shakespeare's Hamlet, with much talking to himself, offers a singular example. Like Peirce, Skinner's verbal behavior included selves inside and outside the skin. Unlike Peirce, Skinner did not pursue meaning-in-the-long-run. Skinner's meaning was primarily for what could be found in the here-and-now.

Another difference between Peirce and Skinner was the relative emphasis each eventually gave to contexts and consequences. Peirce emphasized consequences, and when Skinner turned to a probabilistic three-term contingency account of meaning in 1945, he also emphasized consequences. But Skinner also came to emphasize contexts in some more specific ways than Peirce. Skinner (1987, p. 201; 1988, p. 471) became dissatisfied with the narrowness of the term *discriminative stimulus* as the first term in his three-term contingency, eventually replacing it with the term *setting* (e.g., Skinner, 1997, p. 156). This brought a conspicuously expanded consideration for what might be included in the contexts of meaning. The term *setting* could be more readily taken to include the genetic, cultural, and personal histories that Skinner (e.g., 1974, p. 90; 1981; 1984/1988, p. 430) also considered relevant. Such contextual considerations went beyond the typical considerations of contexts in *use* concepts of meaning, which were often if not always limited to the textual environment.

ADDITIONAL SUPPORT FOR A SELECTIONIST THEORY OF MEANING

Further support for a selectionist theory of meaning can be found in contemporary dictionary construction, philosophical positions, and views of the language of science.

The Construction of the Oxford English Dictionary

School children who use a dictionary with a definition for the word but no quotations might think that a dictionary was constructed by a sufficiently intelligent authority who wrote down the true or essential meanings of words. To know what a word meant and how to use it, all you had to do was look the word up in the dictionary and then use it as prescribed. If the word were properly applied, it would have the same essential meaning as it had in the definition. In this account, the definition has priority and then comes the use of the word.

The construction of the *Oxford English Dictionary* (OED; Simpson & Weiner, 1989), which began in the 19th century, turns this conception around. This is abundantly evident in the way that the definitions have arisen. The construction begins with a collection of quotation slips that show the written word in its written context. Then the definitions are written for the different meanings that are derived from different clusters of these slips. The use of a word in a text comes first, and then its definition follows. The quotation slips need to be continually collected over time in order to account for the senses of new word forms and new senses of existing word forms. The way the OED definitions are arrived at provides no support for essential unchanging meanings, and those who examine language closely come to a similar conclusion (cf. Berg, 1993; Crapanzano, 2000; Landau, 1989; Robinson, 1950; Schiappa, 1993; Willinsky, 1994; Winchester, 1998; Wittgenstein, 1958, 1960, especially see 1958, p. 2). The contexts provided by the quotation slips are indispensable, and a limited context is often sufficient for the case at hand. In the following, "Into the first cross-street I turned, parked the machine, and started back toward Gungen's afoot" (Hammett, 1992, p. 249), *machine* means a car. However, in this next context, "It was a cold five-thirty

a.m. when my machine got off the ground. . . . In a moment, I was in the air, climbing steadily in a long circle" (H. Quimby cited in K. Schneider, 2001, p. 67), *machine* means an airplane. The context determines the meaning, not the form of the word *machine*. A broader consideration of context also shows these uses of *machine* are suited to and evocative of the early 20th century. The relation of such a term to a mechanistic age of explanation extends the context further.

H. G. Wells, whom Skinner (1976, pp. 300–301) credited with confirming his decision to enter psychology and who may have had additional influences on Skinner (Moxley, 1999), provided a provocative illustration of how futile it would be for dictionaries to pursue essentialist definitions. Wells (1908, p. 58), who said his views on meaning appeared to be aligned with pragmatism, had studied comparative anatomy under T. H. Huxley, was familiar with the evidence for Darwin's evolutionary theory, and found that common terms showed gradations in use that were similar to the gradations in the evolution of species. Wells (1904) spoke against the idea that a definition provides an essential meaning for a word:

Take the word *chair*. When one says chair, one thinks vaguely of an average chair. But collect individual instances, think of arm-chairs and reading chairs, and dining-room chairs and kitchen chairs, chairs that pass into benches, chairs that cross the boundary and become settees, dentists' chairs, thrones, opera stalls, seats of all sorts, those miraculous fungoid growths that cumber the floor of the Arts and Crafts Exhibition, and you will perceive what a lax bundle in fact is this simple straightforward term. In co-operation with an intelligent joiner I would undertake to defeat any definition of chair or chairishness that you gave me. (p. 384)

There is no essence of a chair that is applicable to all forms of chairs. There can be no pairing of the meaning of *chair* to the essential property of objects designated as *chairs*.

Philosophy

In the area of philosophy, strong resemblances between Skinner's views and the views of pragmatists have been noted (e.g., Day, 1980; Hayes & Brownstein, 1986; Lamal, 1983; Leigland, 1999; Morris, 1988; S. M. Schneider, 1997; Zuriff, 1980). William James is noted for his strong support of Peirce's pragmatism, and he (1975) accepted Peirce's interpretation of meaning in "How to Make Our Ideas Clear."

[Pragmatism] is derived from the same Greek word *πράγμα*, meaning action, from which our words "practice" and "practical" come. It was first introduced into philosophy by Mr. Charles Peirce in 1878. In an article entitled "How to Make Our Ideas Clear" . . . [Peirce] said that, to develop a thought's meaning, we need only determine what conduct it is fitted to produce . . . of all our thought-distinctions, however subtle . . . there is no one of them so fine as to consist in anything but a possible difference of practice. To attain perfect clearness in our thoughts of an object, then, we need only consider what conceivable effects of a practical kind the object may involve—what *sensations* [italics added] we are to expect from it, and what *reactions* [italics added] we must prepare. Our conception of these *effects* [italics added], whether immediate or remote, is then for us the whole of our conception of the object. . . . This is the principle of Peirce, the principle of pragmatism. It lay entirely unnoticed by anyone for twenty years, until I, in an address before Professor Howison's philosophical union at the University of California, brought it forward again. (pp. 28–29)

James' *sensations*, *reactions*, and *effects* for conduct rephrase somewhat less clearly Peirce's *stimulus*, *act*, and *result* for habits. James (1890/1983) also found Darwin's view "quite convincing" (p. 1275), and he (1880) suggested the evolution of new conceptions in analogy with Darwin's natural selection:

The new conceptions, emotions, and active tendencies which evolve are originally *produced* in the shape of random images, fancies, accidental outbirths of spontaneous variation in the functional activity of the excessively unstable brain, which the outer environment simply confirms or refutes, adopts or rejects, preserves or destroys,—

selects, in short, just as it selects morphological and social variations due to molecular accidents of an analogous sort. (p. 456)

James saw that Darwin had introduced a new way of thinking.

Another pragmatist John Dewey (1909/1977) noted how Darwinian thinking had challenged belief in "the superiority of the fixed and final" which had treated "change and origin as signs of defect and unreality" (p. 3). Darwinian thinking was different: "[In] treating the forms that had been regarded as types of fixity and perfection as originating and passing away, the *Origin of Species* introduced a mode of thinking that in the end was bound to transform the logic of knowledge" (p. 3).

As a result of thinking in terms of variations rather than essences, Dewey (1918/1988) said, "The psychologist . . . must take for his object a certain event studied in its context of other events—its specific stimulus and specific consequences" (pp. 13–14); and one term needed to be understood in terms of the others: "We are aware of the stimuli only in terms of our response to them and of the consequences of this response" (Dewey, 1925/1988, p. 253). Similarly, Dewey (1933/1989) accounted for the meaning of anything (including words) in terms of its consequences and contexts:

To grasp the meaning of a thing, an event, or a situation is to see it in its relations to other things: to note how it operates or functions, what consequences follow from it, what causes it, what uses it can be put to. . . . In the case of the meaning of words, we are aware by watching children and by our own experience in learning French or German that happenings, like sounds, which originally were devoid of significance acquire meaning by use, and that this use always involves a *context*. (pp. 225–231; also see Dewey 1916/1966, pp. 15–16, 29–33)

The relations of a word to its contexts and its consequences constitutes a three-term contingency.

The later views of Ludwig Wittgenstein, which are conspicuously different from his earlier views, have also

been linked to pragmatism (Thayer, 1981). Wittgenstein's later views have also been linked to Skinner (Day, 1969), although Skinner (1988, p. 333) admitted to reading only Wittgenstein's early *Tractatus Logico-Philosophicus*. Wittgenstein also emphasized both the contexts and consequences for words. In terms of contexts, Wittgenstein (1960) said, "We refer by the phrase 'understanding a word' not necessarily to that which happens while we are saying or hearing it, but to the whole environment of the event of saying it" (p. 157). The "whole environment of the event of saying it" implicates an indefinitely large context. These contexts vary in different uses of the same word form and need have no commonality in the way they overlap. Wittgenstein used an extended example of the term *games* to make his point. After an extended illustration of games in which similarities appear and disappear in various overlappings without any overall commonality, Wittgenstein (1958) concludes,

I can think of no better expression to characterize these similarities than "family resemblances"; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way.—And I shall say: "games" for a family. (pp. 29–30e)

Although Wittgenstein did not draw a direct parallel between word use and organic evolution, we can see that it exists in the case of family resemblances that are the result of evolutionary processes. These family resemblances were related, but they did not need to have common or essential characteristics shared by all to be a family. In addition to contexts, Wittgenstein also emphasized consequences: "Think of words as instruments characterized by their use, and then think of the use of a hammer, the use of a chisel, the use of a square, of a glue pot, and of the glue" (Wittgenstein, 1960, p. 67); "Compare the meaning of a word with the 'function' of an official. And 'different meanings' with 'different func-

tions' ” (Wittgenstein, 1969, p. 10e). “For the question is not, ‘What am I doing when . . . but rather, What meaning does the statement have, what can be deduced from it, what consequences does it have?’ ” (Wittgenstein, 1981, p. 8e); “What are you telling me when you use the words . . . ? What can I do with this utterance? What consequences does it have?” (Wittgenstein, 1982, p. 80e).

This use-concept of meaning is a key similarity between Wittgenstein and some pragmatists. Schiller (1930) had said, “We cannot assert too emphatically or too often that meaning depends upon use, and . . . *no form of words has any actual meaning until it is used*” (p. 62). A similar view was presented by Schiller’s fellow British pragmatist Alfred Sidgwick (1892) in saying that “words are instruments” (p. 246) and “meaning consists in application” (1910, p. 312). As with his earlier concern with the term *meaning*, Skinner (1957, p. 7) was concerned that the term *use* would be misunderstood, but he went on to use the term *use* in an approving manner in discussing verbal behavior (e.g., 1974, p. 92; 1984, p. 150; 1989c, p. 33).

Philosophical approval of selectionist meaning seems to be increasing. Noting a decline in the earlier interest in advancing language as representational of the world in itself, in making meaning an issue of correspondence, the pragmatist Richard Rorty (1992) said sentences were now thought of as “used by human beings in the development and pursuit of social practices—practices which enabled people to achieve their ends, ends which do not include ‘representing reality as it is in itself’ ” (p. 373). Stephen Toulmin (2001) said, “By now, the turn-of-the-century attack on natural language by Gottlob Frege and Bertrand Russell is a historical curiosity. It is no longer clear what they saw wrong in natural language” (p. 68). Toulmin found his views to be aligned with pragmatists. “I arrived at a position close to pragmatism, and even moved from Britain to the United

States, before I had done more than glance at the works of the leading American pragmatists” (p. 175). A characterization of Toulmin as a pragmatist or as a philosopher with pragmatist affinities seems appropriate. Toulmin (1997) also said, “We are creating a pragmatist rather than a Cartesian world” (p. 191).

Scientific Verbal Behavior

Accounts of how meaning develops in science may be found in Cantor (1987), Gooding (1990), Kuhn (1996, 2000), Skinner (e.g., 1953, 1957), and Toulmin (1972). Kuhn (2000, p. 119) offered an evolutionary, branching-tree view of the sciences, which would encompass the evolving subject matter for scientific meaning and produce different meanings in different sciences. Toulmin (1972) applied the evolution of concepts with selectionist meanings to sciences in change:

In any live discipline, intellectual novelties are always entering the current pool of ideas and techniques up for discussion. . . . Some conceptual variants are picked out for incorporation, others are weeded out or ignored; yet, in suitable circumstances, this same process can account either for the continued stability of a well-defined discipline, or for its rapid transformation into something new and different. (pp. 139–140)

Neither Kuhn nor Toulmin support essentialist meanings fixed to the terms of a unified science.

Commenting on how a scientific field of investigation developed, Skinner (1957) listed the following sequence:

(1) relatively abstract responses specifying particular properties of stimuli prove useful, (2) the scientific community arranges contingencies of reinforcement which constrain speakers to respond to isolated properties, and (3) the rules and canons of scientific thinking which govern classification and abstraction are studied to explain the effectiveness of (1) and (2) and possibly to suggest improved behavior and practices. (p. 430)

In a selectionist interpretation, this development has a cyclical tendency—

where improvements are a continuing possibility and any assumed rules and canons of scientific thinking are themselves variant and susceptible to change. Such a process of scientific investigation is facilitated by a technical vocabulary that allows more precision in meaning than nontechnical terms would easily allow, but there is nothing in this process to suggest that technical terms would become fixed and unchanging or somehow essentialist in meaning. Skinner (e.g., 1938/1966, pp. 177–178; 1945, p. 272; 1969, p. 7; 1997) changed the formulation, and meaning, of the operant more than once; and Catania (1973, p. 113) found three different meanings of the term *operant* in experimental use. Would a new term for the operant in each new use advance understanding and effective action? Fixed and immutable meanings for words in scientific use are undesirable as well as nonexistent.

In sum, accounts of meaning in science favor a selectionist interpretation for a changing world and offer no support for essentialist meaning:

A more considered view, today, is that the accepted scientific account of any topic is a successful and agreed *interpretation* of what happens, established with some difficulty, rather than being simply unearthed or “dis-covered,” or read off from Nature. Generating these accepted accounts involves (i) a struggle to find suitable words, and (ii) a process of persuasion, critique and consensus in the community of investigators. (Sutton, 1994, p. 61)

Like everything else, science and its technical terms evolve in a selective process. The rates of evolution may vary, and the terms of some aspect of some science may have stabilized for the time being; but we cannot know that this will not change at a future time.

IMPLICATIONS FOR A SELECTIONIST VIEW OF MEANING

Among the various implications that might be drawn for a selectionist view of meaning, the first is that the mean-

ings of words vary in use. The meanings vary as the contingencies for the speaker and listener change, and some variation in the contingencies occur for each occasion of the word. Sometimes the details of these variations are negligible, sometimes not. As with natural selection, rates of change vary; and some variations may lead to the recognition of a new sense, some may not.

A second implication is that the meaning of words is such that no verbal account of reality can ever be regarded with absolute certainty, no matter how emphatically the statement is asserted and no matter how extensive the supporting documentation. Truth depends upon meaning and cannot be more certain than the meaning of what is held to be true. As Schiller (1927) put it, “Meaning is prior to Truth, and if it cannot be grasped all logical questions become meaningless” (p. 98). This does not mean that truth does not exist. Nor does it mean we cannot approximate, come nearer, or make improvements in some way on what is stated as true. However, as Skinner (1974) saw, an irreducible element of probability exists in the contingencies for any statement:

The truth of a statement of fact is limited by the sources of the behavior of the speaker, the control exerted by the current setting, the effects of similar settings in the past, the effects upon the listener leading to precision or to exaggeration of falsification, and so on. There is no way in which a verbal description of a setting can be absolutely true. (p. 136)

Meanings or the contingencies of behavior in its setting (current and past) and its consequences (effects) are probabilistic to some degree, and this includes the verbal behavior of scientists: “Sentences about nature range from highly probable ‘facts’ to sheer guesses” (Skinner, 1972, p. 6). Hard facts were not fixed and unchanging: “We may speak then of the evolution of facts. . . . At issue is . . . the evolution . . . of a verbal environment or culture” (Skinner, 1986, p. 121). No formulation of scientific law and no for-

mulation of logic completely escape the probabilistic origins of verbal behavior because "The contingencies always come first" (Skinner, 1989b, p. 44). For Skinner (1988), the main issue was effective action: "So far as I am concerned, science does not establish truth or falsity; it seeks the most effective way of dealing with subject matters" (p. 241). This meant planning for change, not permanency: "Regard no practice as immutable. Change and be ready to change again. Accept no eternal verity. Experiment" (Skinner, 1984, p. 346). Like Peirce (e.g., 1898/1998, p. 51), Skinner's (1974) only concession to absolute truth was in verbal formulations that disregard empirical reality: "Absolute truth can be found, if at all, only in rules derived from rules, and here it is mere tautology" (p. 136).

A third implication is a sense in which what people mean is always right. The meaning is in the contingencies. It makes no sense to talk about people wrongly responding to the contingencies for their behavior. Toulmin (1997) quoted Wittgenstein to that effect: "I remember Wittgenstein once saying in class, 'What philosophers mean is always right.' The trouble is they use language that makes it impossible for other people to understand straightaway what they're saying" (p. 195). The primary problem comes in understanding what someone else's meaning is. What are the contingencies for saying what was said? Another problem lies in determining what is useful in what was said. Will it lead to improved practice in some way? What are the consequences? What a person means then is always "correct" in the sense of being the product of operant contingencies, but what a person says may not always be "true" in the sense of being consistent with the range of meanings that a community of listeners has accepted for the words that the speaker says. If I say the speaker is "wrong" or being deceptive, I mean using words that way has problematic consequences (for others if not for the

speaker). I cannot mean the speaker is wrongly responding to the contingencies for the speaker's own behavior.

A fourth implication is that an analysis of meaning might continue indefinitely. It is typically incomplete: "When someone says he can see the meaning of a response, he means that he can infer some of the variables of which the response is usually a function" (Skinner, 1957, p. 14). A further analysis of meaning would proceed like any other account of the contingencies of behavior: "One begins wherever possible and proceeds as soon as possible to a more and more adequate account—which, of course, will never be complete" (Skinner, 1988, p. 380). Such "a description of the contingencies is never complete or exact (it is usually simplified in order to be easily taught or understood)" (Skinner, 1974, p. 125). This simplification suggests one reason for extreme statements. Although the analysis of meaning can never be absolutely complete—contingencies of meaning extend indefinitely in detail—any interpretation can be sufficient for practical action; and much practical action does not need a conscious analysis of verbal behavior.

These implications fail to offer the simplistic solution to problems of meaning that essentialists sought, but they are real. The choice for the reader is between a static dreamland of essentialist meaning and a changing, evolutionary world of selectionist meaning. One does not exist in the world we live in; the other does. One reason for the persistence of wished-for essentialist meanings may be that the alternative selectionist meaning is not well understood. Hopfully, selectionist meaning is now more understandable.

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