The Behaviorisms of Skinner and Quine: Genesis, Development, and Mutual Influence

Sander Verhaegh

Abstract: B. F. Skinner and W. V. Quine, arguably the two most influential proponents of behaviorism in mid-twentieth century psychology and philosophy, are often considered brothers in arms. They were close friends, they had remarkably parallel careers, and they both identified as behaviorists. Yet, surprisingly little is known about the relation between the two. How did Skinner and Quine develop their varieties of behaviorism? In what ways did they affect each other? And how similar are their behaviorisms to begin with? In this paper, I shed new light on the relation between Skinner and Quine by infusing the debate with a wide range of new and previously unexamined evidence from the personal and academic archives of Skinner and Quine.

Keywords: Skinner, Quine, behaviorism, Chomsky, *Verbal Behavior*, *Word and Object,* phenomenalism, operationism, meaning

1. Introduction

In April 1933, two bright young Ph.D.'s were elected to the Harvard Society of Fellows: the psychologist B. F. Skinner (1904–1990) and the philosopher/logician W. V. Quine (1908– 2000). Both men would become among the most influential scholars of their time; Skinner leads the "Top 100 Most Eminent Psychologists of the 20th Century," whereas philosophers have selected Quine as the most important Anglophone philosopher after the Second World

War.[1] At the height of their fame, Skinner and Quine became "Edgar Pierce twins"; the latter obtaining the endowed chair at Harvard's department of philosophy, the former taking up the position at Harvard's psychology department.[2]

Besides these biographical parallels, there also appear to be striking similarities in theory and approach. Both Skinner and Quine were interested in the analysis of language, both dismissed some core commitments of their positivistic predecessors, and both identified as behaviorists. Last but not least, both Skinner and Quine published their *opera magna* about language in the late 1950s—books that spawned heated debates in psychology, philosophy, and linguistics.[3]

Despite these far-reaching similarities, however, surprisingly little is known about the relation between the two, apart from the fact that they were close friends. Although their theories have been extensively studied from a systematic point of view, little is known about whether the two influenced each other. In fact, scholarly work on the historical relation between Skinner and Quine is virtually non-existent. The question as to how the two influenced each other often comes up, but is standardly dealt with by rehearsing the few remarks on the issue in Skinner's and Quine's autobiographies. Indeed, in their introduction to the *Handbook on Behaviorism*, O'Donohue and Kitchener argue that "Quine and Skinner show a remarkable agreement" on some issues, but that "it is not clear how much either influenced the other."[4] The only paper that exclusively focuses on the connection between Skinner's and Quine's theories merely speculates about the actual historical relation between the two. John Malone argues that Quine "*must* have influenced Skinner, particularly concerning the nature of language and the heavy reliance on context to define meaning," but that it is "open to question" whether Quine was influenced by Skinner.[5] Even Laurence D. Smith, who has written a comprehensive study about the relation between psychological and philosophical behaviorists,[6] can only speculate about the relation between the two, arguing that the nature of the relation between Skinner and Quine "will doubtless exercise future intellectual historians."[7]

In this paper, I shed new light on the relation between Skinner and Quine by infusing the debate with a wide range of new and previously unexamined evidence. How did Skinner

and Quine develop their psychological and philosophical varieties of behaviorism? In what ways did they affect each other? And how similar are their behaviorisms to begin with? I address these questions by examining a large set of documents—correspondence, notes, datebooks, drafts, lectures, and teaching material—from the personal and academic archives of Skinner and Quine, thereby reconstructing the relation between two of the most prominent scholars of the mid-twentieth century.[8]

This paper is structured as follows. After examining Skinner's and Quine's first meeting in September 1933 (section 2), I reconstruct the genesis of their behaviorisms by examining their notes and student papers from the late 1920s and early 1930s (section 3–4). Next, I compare their early behaviorisms (section 5) and analyze Skinner's and Quine's development in the years before and after the Second World War (sections 6–7). Finally, I examine a wide range of archival evidence that shows that Skinner and Quine did not influence each other when they started writing *Verbal Behavior* and *Word and Object* (sections 7–8), and compare their responses to Chomsky's attack on behaviorism in 1959 (section 9).

2. Society of Fellows

Skinner and Quine first met on September 25, 1933, at the commencement dinner of the Harvard Society of Fellows.[9] The Society of Fellows was a newly created research institution for "rare and independent geniuses," comprising six junior and seven senior fellows.[10] Abbott Lawrence Lowell, the president of Harvard University between 1909 and 1933, was one of the institution's main initiators. In 1926, Lowell had ordered a committee of Harvard professors to study the practices of Trinity College at Cambridge, the most prestigious academic society in Europe, and to advise him on the design of a similar institution at Harvard. In their report, the committee proposed a society in which exceptional talents can devote their time to productive scholarship without having to worry about teaching and the formal requirements of regular academic degree programs.[11] Although a serious lack of

funding caused considerable delay to the plan's execution—in the end, Lowell himself had to contribute one million dollars as an 'anonymous donor' to provide the Society with a principal fund—the creation of the Society of Fellows was approved in 1932.[12]

Junior fellowships were primarily created to offer exceptional talents an alternative to the mandatory dissertation and formal course work of a regular Ph.D. program. Skinner and Quine, however, had already obtained their Ph.D.s when they were awarded the fellowship.[13] Skinner's selection even violated the Society's charter because it explicitly claimed that "First appointments shall not be made after the age of twenty-five."[14] Still, Skinner was selected, partly due to the strong recommendation letters of the physiologists Hallowell Davis and W. J. Crozier. The Senior Fellows had decided to circumvent the eligibility issue by exploiting a loophole in their own charter. Because the charter did not mention a maximum age for *second* terms, Skinner's fellowship was officially booked as a second-term appointment.[15] On April 11, 1933, three weeks after his twenty-ninth birthday, Skinner received a selection letter from Lowell.[16]

Quine, who was nominated for a junior fellowship by Alfred North Whitehead when he was touring Europe as a Sheldon Travelling Fellow in the 1932–1933 academic year, learned about his selection in Prague. In the very weeks in which he first met Rudolf Carnap, the German philosopher he would later describe as "the greatest of my teachers,"[17] he received a telegram from Whitehead:

<ext>

YOU HAVE BEEN SELECTED FOR APPOINTMENT TO THE NEW SOCIETY OF FELLOWS AT

HA[R]VARD STOP THE TENURE IS FOR THREE YEARS COMMENCING NEXT SEPTEMBER STOP . . .

DEVOTION OF WHOLE TIME TO PRODUCTIVE SCHOLARSHIP STOP.[18]

</ext>

Quine was ecstatic, as he had extensively worried about his job opportunities in an academic market that was plagued by the effects of the Great Depression. In a letter to his parents,

Quine writes, "Three years without any job-finding problems, three years for full-time research without having to spend time teaching!"[19]

After he had returned to Cambridge, Quine settled in on his new life as a member of the Society of Fellows. And it was a luscious life; the junior fellows met twice a week; on Mondays they dined with the senior fellows and on Thursdays they had lunch amongst each other. Both Skinner and Quine were humbled by the grandeur of these dinners. After the Society's commencement dinner, Skinner writes,

<ext>
It was possibly the greatest evening of my life. We have a Common Room like a very rich club room, and a dining room for our exclusive use. . . . We had probably the best dinner I have ever eaten—sherry and bitters before, imported Dutch beer and cognac and other liqueurs afterward. Green turtle soup and steak three inches thick. Afterward we all signed the record of the Society. I signed first of the junior fellows. The record is a beautifully bound book that will eventually contain God knows how many great names.[20]
</ext>

Although Skinner and Quine do not seem to have talked at great length during the first dinner,[21] they soon became close friends. Six weeks after their first meeting, Quine writes that his "most interesting acquaintance among the Junior Fellows" is "one Fred Skinner," an "experimental psychologist who is doing some very important work."[22] Indeed, within a few weeks, Skinner and Quine start to meet on a regular basis outside the official dinners and lunches. Quine's datebooks show that he and Skinner regularly met for parties, dinners, and outdoor activities.[23] In letters to his parents, Quine frequently describes his adventures with Skinner. He mentions that he "has been over often," that "he has a car," and that they "occasionally . . . go out to Middlesex Fells" for hikes.[24]

3. The Inception of Quine's Behaviorism

Despite their close friendship from 1933 onwards, it would be a mistake to believe that Skinner, who had been a committed behaviorist for years, played a role in the genesis of Quine's behaviorism. Quine had already adopted a behaviorist perspective in the 1929–30 academic year, when he read John B. Watson's *Psychology from the Standpoint of a Behaviorist* for a psychology course at Oberlin College.[25] The course was taught by Raymond Stetson, a behaviorist who had worked under William James when he was a graduate student at Harvard. Although Stetson was critical of Watson's atomism, he was one of the first psychologists to appreciate his contributions in the early 1910s. L. D. Hartson recalls that Stetson, referring to the idea that mind is a substantive entity, was known for quipping that he would not "want to be caught dead with a mind."[26]

Stetson's course primarily aimed to compare the theories of James and Watson. It is clear, however, that Stetson favored the latter's perspective. Even though he shared some of James's views, Quine's lecture notes show that he believed that Watson had significantly improved the latter's hypotheses and explanations. Although James paved the road for the study of behavior, Stetson taught, it was Watson who "institute[d] non-stop transportation."[27]

In retrospect, Quine has claimed that Watson's book did not shock his preconceptions.[28] Still, Quine's early writings show that Stetson's course made a considerable impression. Not only does he clearly side with Watson in his mid-term paper,[29] also outside Stetson's classroom, Quine's writings suddenly become riddled with references to behaviorism. In his notebook "Random Thoughts," for example, Quine reported that his views on logic could be characterized in terms of "the relation of psychological response to stimulus" and that his view on free will "harmonizes with the terminology of behaviorism."[30]

The strongest evidence for Quine's early commitment to behaviorism, however, can be found in a paper he read before the Oberlin Mathematics Club on January 10, 1930—the day before he submitted his essay for Stetson's class. The paper, "Mathematics as a Mode of Thought," discussed the nature of mathematics and examined the role that mathematical methods play in advancing the sciences. Quine argued that "the one underlying element common to every phrase of mathematics is the presence of complete implication between each

step and the next" and he concluded that a science becomes more exact the more the implications of its facts and hypotheses "are capable of being asserted with complete definiteness."[31] In arguing for this thesis, Quine also discussed the use of mathematical methods in psychology:

<ext>

Psychology has in the past been almost wholly conjectural, and its laws were not only conjectural but most inexact. . . . Behaviorism has come to the rescue, of recent years, and given psychology a completely new method, far more mathematical than the old. Laboratory methods are making psychological data as sound as those of physiology. The laws of psychology are as yet far less exact than those of physiology, but improvements are constantly made.[32]

</ext>

Where Watson argued that psychology ought to be "a purely objective experimental branch of *natural science*,"[33] in other words, Quine primarily stressed that psychology should become an *exact science*. This subtle difference notwithstanding, it is clear that Quine had firmly adopted a behaviorist perspective in the early 1930s.

Still, one should not conclude that psychology was Quine's *primary* interest in college. As can be gathered from his notebook and "Mathematics as a Mode of Thought," Quine was primarily fascinated by what Bertrand Russell called "mathematical philosophy," the application of modern logic to the study of philosophical questions. In fact, Quine's notes for Stetson's class show that even behaviorism was interpreted through a Russellian lens. When Stetson claimed that mind "is not an independent spatial entity" but only a "(physical) function of the body," Quine (without explicitly mentioning Russell) concluded that mind should be thought of as an "incomplete symbol"[34]—a technical notion Russell had introduced to describe words that do not have "any meaning in isolation" but can only be "defined in certain contexts."[35]

Although Quine got "more pleasure from Stetson's course in psychology" than from his mathematics courses,[36] Russell's work showed him that mathematical logic can also be used to clarify philosophical questions and he decided to major in mathematics with honors reading in mathematical philosophy. As a result, most of his energy went into mastering the classics in modern logic,[37] and references to behaviorism gradually started to disappear from Quine's notebooks after he entered graduate school at Harvard, where Whitehead was teaching. Even John Beebe-Center's 'Advanced Psychology' course does not seem to have reignited his affinity for psychology.[38] Quine finished Beebe-Center's course with a well-informed but sober review of the literature on depth perception[39]—a paper in which he (strategically?) does not pick sides between the behaviorists, the associationists, and the Gestalt psychologists—but he did not return to the psychological literature for a number of years. He finished both his MA *and* his Ph.D. in an astounding two years,[40] and he left for Europe to learn from the scholars that were rapidly advancing the field he wanted to master: mathematical philosophy.

4. Skinner's Early Development

Quine's behaviorism antedates his first meeting with Skinner. Conversely, Skinner had already developed a penchant for philosophy before he walked into Eliot House on September 25, 1933. In fact, Skinner's interests in behaviorism and philosophy can be traced back to the very same source. In his autobiography, Skinner writes:

<ext>

I had been converted to the behavioristic position by Bertrand Russell. . . . Russell had reviewed *The Meaning of Meaning* by C. K. Ogden and I. A. Richards. He had referred to Watson and his theories, and at the end he had said, "It will be seen that the above remarks are strongly influenced by Dr. Watson, whose latest book, *Behaviorism*, I consider massively impressive." After reading the review, I bought *Behaviorism* and, a year or so later, Russell's

Philosophy.[41]

</ext>

Although Skinner and Quine chased different specializations, Russell played a significant role in both their decisions to enroll in the graduate program of what was then still Harvard's Department of Philosophy *and* Psychology.[42]

Skinner started his graduate program in 1928, two years before Quine.[43] Influenced by the physiologists Crozier and Hoagland, Skinner soon started to specialize in what he himself called "the behavior of intact organisms."[44] And he was almost immediately successful. Despite his very limited background in psychology,[45] Skinner published a highly influential article within 18 months after he first arrived in Cambridge. In short, Skinner had studied what he called "eating reflexes" in rats and shown that the rate at which deprived rats eat their daily rations of food over the course of two hours is lawful and can be mathematically described by the power function

<ext>

$N = Kt^n$

</ext>

where N is the amount of food eaten at time t and K and n are constants. Even more surprisingly, Skinner showed that n is an approximately constant magnitude (between 0,67 and 0,71), even when the conditions (food size, rat, and exposure to food on the day before the experiment) are varied.[46] In a letter to his parents, Skinner cheerfully reports:

<ext>

I got . . . some remarkable results from the data of my experiment. Crozier is quite worked up about it. . . . In a word, I have demonstrated that the rate in which a rat eats food, over a period of two hours, is a square function of the time. In other words, what heretofore was supposed

to be 'free' behavior on the part of the rat is now shown to be just as much subject to natural laws as, for example, the rate of his pulse.[47]

</ext>

Skinner's successes in the laboratory did not reduce his interest in philosophy, however. In fact, Skinner was clearly aware of the philosophical problems underlying his experimental studies. Although his paper was titled "On the Conditions of Elicitation of Certain Eating *Reflexes*" (my emphasis), he was well aware that the notion of 'reflex' was problematic and lacked a clear definition: "In spite of the fact that the measurement of reflex strength is common practice, the dimensions of a reflex have never been critically examined."[48]

Inspired by Ernst Mach's *The Science of Mechanics*, which had been discussed in one of his courses on the history of science, Skinner decided to study the history of the *concept* of 'reflex.' Starting with Descartes account in *Traité de l'homme*, Skinner reconstructed the history of the notion in both psychology and physiology and published it as "The Concept of the Reflex in the Description of Behavior." This time, however, the reviews were somewhat less laudatory. Paul Huston, a former fellow graduate student, reported that people at Northampton were discussing the paper but "were a little puzzled" about its implications because it did not mention any experiment.[49] Similarly, Don Purdy, a student of Troland, noted that he was "not so clear as to just what" the paper had "to say regarding the causal theory of behavior."[50]

Clearly, the psychological world was not used to this type of conceptual analysis. Still, Skinner's reconstruction served an important purpose. It contributed to his conviction that key psychological concepts like 'reflex' require *operational* definitions.[51] Where Quine, in a quiz exam for his course on Watson, had still defined the *reflex* as an "incomplete symbol"—as "a fiction from the empirical viewpoint"[52]—Skinner showed how the concept can also be defined as a strictly functional relation:

<ext>

A reflex is defined as an observed *correlation* of two events, a stimulus and a response. A survey of the history discloses no other characteristic upon which a definition can legitimately be based.[53]
</ext>

Skinner's definition satisfied the operationalist strictures. For unlike definitions that appeal to the supposedly involuntary, unlearned, or unconscious character of the reflex, correlations between stimuli and responses *can* be directly observed.

Again it was Russell who had influenced Skinner. In *Cumulative Record*, the collection of papers that includes his article on the reflex, Skinner writes:

<ext>
I believe the clue to the definition of *reflex* came from Bertrand Russell. . . . Russell pointed out that the concept of the reflex in physiology had the same status as the concept of force in physics. Add that to Bridgman's treatment of force in *The Logic of Modern Physics* and you have the present point. I supported the argument with a Machian analysis of the history of the reflex.[54]
</ext>

Despite the tepid reception of his paper, constructing operational definitions became an important methodological tool in Skinner's early work. In a note from November 17, 1932, Skinner writes that, next to the "experimental description of behavior," it is one of his main aims to "support behavioristic methodology" by constructing "Operational definitions of all psychological concepts."[55]

5. Two Types of Behaviorism

Skinner's work on the conceptual foundations of behaviorism greatly contributed to his philosophical development. The clearest evidence of Skinner's early concern with philosophy, however, is his 1930s notebook *Sketch for an Epistemology*, which contains his notes for a monograph he started writing when he was still a graduate student. One of the reasons for writing the book, Skinner's notes show, was his dissatisfaction with the widespread influence of *phenomenalism*—the radically empiricist view that physical objects are nothing but constructions out of primary sense experiences ('phenomena'). In the early 1930s, phenomenalism was a popular view about the nature of our knowledge about the physical world, defended both by epistemologists and by world-renowned physicists like Arthur Eddington and James Jeans.[56] In one his notes, Skinner describes the situation as follows:

<ext>
Recent trends are toward a solution of the dilemmas of physics in terms of a theory of knowledge. It would be a pity if physicists in turning to epistemology should take up an out-moded scheme of mind, which presents as many difficulties in its own systematization as the physicist is trying to rid himself of in physics. Jeans and Eddington are already out of the frying pan into the fire. This movement cannot be traced to one source. On the one hand lies positivism, on the other Ernst Mach.[57]
</ext>

Skinner's reference to Mach seems surprising considering the fact that his historical work was modeled on the latter's *The Science of Mechanics*. Still, Skinner's early notes show that he strongly disagreed with Mach's *The Analysis of Sensations*, a book he read as a staunch defense of phenomenalism. According to Skinner, Mach had it exactly backwards: we do not need a phenomenalistic analysis of science; we need a scientific analysis of 'phenomena':

<ext>
Mach reduces the concepts of science to a subjective basis . . . we can return to an objective expression by asking him for a definition of sensation. This can only be supplied . . . in terms

</ext>

of Mach's *behavior* (as a scientist). Thus while Mach makes science personal (and therefore private), the definition of sensation makes it again public, i.e. a matter of human behavior.[58]
</ext>

Where epistemologists aimed to secure our scientific knowledge by reconstructing our fallible concepts and theories out of 'indubitable' sense experiences, Skinner aimed to revert the picture: we should not aim to ground science in sensation, we should ground sensation in behavioral science.[59]

Skinner's notebook sheds new light on his philosophical perspective in the early 1930s. It also reveals that Skinner and Quine defended diametrically opposed versions of behaviorism. For Quine, unlike Skinner, *did* combine behaviorism with a broadly phenomenalist perspective in the early 1930s. In "Mathematics as a Mode of Thought," for example, Quine defines science as a conceptual structure that aims to organize experience:

<ext>
It is time to turn to the general case. Our raw material is always experience. It is upon this that reasoning operates in correlating, classifying, formulating laws, and applying them. Knowledge of a given entity, rather than mere acquaintance with it, exists only when we have explored in part its consequences, surely or conjecturally. Such exploration can be performed only with the aid of implication.[60]
</ext>

Although Quine's paper celebrated the use of mathematical methods in advancing the sciences (see section 3), science itself was interpreted phenomenalistically.[61]

Quine's views did not change when he entered graduate school. Rather, they were reinforced by C. I. Lewis's courses on Kant and Epistemology. Although Quine, like Lewis criticized certain phenomenalistic ideas about the nature of perception (the naïve sense data theory),[62] he was still swayed by the argument that every theory, including the theories of the

behaviorist, ultimately requires an epistemological basis instead of the other way around. In a paper for a course by Whitehead, Quine writes:

<ext>

It may well suit the purposes of the neurologist or psychologist to take the presentational aspect of an experience as anterior, and to trace the remainder of the process through neural connections to arrive at conditioned reflexes and general habit responses; but it must be remembered that such treatment . . . depends upon the prior adoption of a whole system of concepts and hypotheses. Philosophy, if it would inquire into the nature of all such conceptual systems and hypotheses, must certainly endeavor to remain aloof from the initial adoption of any one such system . . . let the psychologically prime be what the psychologist finds most efficacious; for philosophy, no one item is initially certified as of more fundamental or ultimate character than any other.[63]

</ext>

6. Junior Fellows

Between 1933 and 1936, Skinner and Quine were enjoying the freedoms of their Harvard fellowships. Quine was making his way to becoming a world-renowned logician and published work on a variety of logical systems: his own logic of sequences,[64] Schönfinkel's combinatorial logic,[65] and class theory.[66] His greatest contribution was an axiomatic set theory (NF), first set out in "New Foundations for Mathematical Logic,"[67] and today still considered a milestone in the history of logic.[68] In consequence, Quine spent little time thinking about epistemology and psychology. Outside a short series of lectures about Carnap's *The Logical Syntax of Language*[69]—a series that aimed to convince the department that Carnap should be offered a Harvard professorship[70]—Quine's work was only touching the "border regions of philosophy."[71]

As a result, Quine's perspective on the relation between psychology and philosophy did not change much during his years as a junior fellow. Indeed, there is quite some evidence that Quine had not changed his mind about phenomenalism as late as 1941, when he was regularly meeting with, among others, Carnap, Nelson Goodman, and Alfred Tarski in what has become known as the "Harvard Logic Group." Even though Carnap, "the greatest of his teachers," had changed his perspective on sense-data languages in the early 1930s, Quine kept defending a phenomenalist perspective. In a vote on the issue, notes of the Logic Group meetings show, Carnap and Tarski chose a physicalistic language, whereas Quine and Goodman favored a phenomenalistic one:

<ext>

We have not agreed among ourselves whether it is better to begin with thing-predictates or sense-data-predicates. For the first: I and Tarski; Hempel follows Popper. For the second: Goodman and Quine.[72]

</ext>

Skinner, meanwhile, had (temporarily) dropped his epistemology project and was frantically working on *The Behavior of Organisms*, the book that was to provide the first comprehensive statement of his theory of behavior. In the process, Skinner took major steps towards abandoning his early stimulus-response psychology and developing the functional analysis for which he was to become famous. From 1935 onwards, Skinner's publications and correspondence show, he gradually started to argue that are two types of conditioned reflexes: the behavior of his rats was not only *elicited* by stimuli; the rats were also *emitting* behavior that can be controlled by a separate process—a procedure he dubbed 'operant conditioning.'[73]

There is quite some evidence that Skinner and Quine talked about the latter's theoretical revisions. This evidence, however, also suggests that Quine's knowledge of Skinner's work was relatively superficial. After Skinner published *The Behavior of Organisms*, for example, Quine was asked to write a book report for the Society of Fellows.

In the report, Quine claimed that he only had a working knowledge of Skinner's theoretical advancements:

<ext>
Though clearly unqualified to judge the experimental side . . . I gather that the . . . experimental details are intended to accomplish three main purposes: exemplification of method, presentation of some specific correlations, and indication of the fruitfulness of some new basic concepts (notably that of the 'operant') with which Skinner would supplant or supplement present concepts of behavioristic psychology. From conversation I know the importance which he attaches to the latter revisions, and the pleasure which he has taken in the extensions and the unifications which they bring to the Pavlovian psychology; but independently I know nothing of these matters.[74]
</ext>

Although Quine, considering his background, should have had the conceptual resources to develop a substantive analysis of the merits and disadvantages of Skinner's framework, he claimed that he only had limited knowledge about the latter's theoretical innovations. So either Quine was too involved in his work on logic to keep track of Skinner's development, or he was not convinced by the latter's approach and chose not to criticize his friend in a report to the Society of Fellows. In both scenarios, however, Quine's influence on Skinner will have been limited.

7. Bridging the Distance

In 1936, R. M. Elliott, the Chairman of the psychology department at the University of Minnesota, offered Skinner an instructorship.[75] Skinner, who had experienced great difficulties in finding a job because he, in the words of Gary Boring, was already "so great" that departments were afraid to make him a minor offer,[76] thankfully accepted the position and

moved to Minneapolis. And although Skinner tried to arrange a job for Quine at Minnesota in both 1937 and 1939,[77] the two would be living miles apart until 1948, when both Skinner (March 1, 1948) and Quine (July 1, 1948) became full professors at Harvard.[78]

Perhaps surprisingly, it is precisely in this period that Skinner's and Quine's perspectives *do* start to converge. For it is in 1941 that Quine—after his experiences with the Harvard Logic Group and the publication of his third (text)book in logic—decides to write a more distinctively *philosophical* book. He obtained a small grant for a project about "the philosophical presuppositions of science,"[79] wrote a paper about the nature of philosophy,[80] and started to work on a book that he tentatively titled *Sign and Object*.[81]

One of the most important reasons behind Quine's decision to start developing his own philosophical system was his dissatisfaction with Carnap's *Introduction to Semantics*, a draft of which the Harvard Logic Group had discussed earlier that year. The core of Quine's frustration was Carnap's view about analyticity, a notion the latter used, Quine believed, to explain why logical laws and mathematical theorems are meaningful, even if they are without empirical content.[82] Quine had always been mildly skeptical about Carnap's appeal to analyticity in justifying logical and mathematical knowledge, but the discussions in the Harvard Logic Group made clear that Carnap was now pushing for an intensional (non-extensional) explication of the analytic-synthetic distinction, which was a major revision of the syntactic interpretation Carnap had offered in *The Logical Syntax of Language*, the book Quine had earlier called "the most important document" he "ever encountered."[83] And although Quine was not yet able to exactly specify his problems with Carnap's explication of analyticity during the Logic Group meetings,[84] he soon figured out *why* he was so strongly opposed to Carnap's solution. In a letter to Carnap, written approximately eighteen months after the Harvard discussions, Quine writes that the points where he dissents "are peculiarly crucial to semantics" and that he "has become somewhat clearer on them in the year and a half since we talked" (5 January 1943).[85] The problem with notions like analyticity and synonymy, Quine now started to argue, is that they cannot be given a *behavioristic* interpretation:

<ext>

It is only by having some general, pragmatically grounded, essentially behavioristic explanation of what it means in general to say that a given sound- or script-pattern is analytic for a given individual, that we can understand what is intended when you tell us (via semantical rules, say) "the following are to be analytic in my new language." Otherwise your specification of what is analytic for a given language dangles in midair.[86]
</ext>

When Carnap responded that he did not share Quine's call for a behavioristic explication,[87] it became clear to Quine that they fundamentally disagreed about nature of semantics, and hence of philosophy. In a letter to Alonzo Church, Quine explains his newfound analysis of his disagreement with Carnap as follows:

<ext>

my attitude toward 'formal' languages is very different from Carnap's. Serious artificial notations, e.g. in mathematics or in your logic or mine, I consider supplementary but integral parts of natural language. . . . Thus it is that I would consider an empirical criterion . . . a solution of the problem of synonymy in general. And thus it is also that . . . I am unmoved by constructions by Carnap in terms of so-called 'semantical rules of a language.'[88]
</ext>

Quine, in sum, actively started to push for an empirically grounded theory of meaning. He judged that Carnap's notions of analyticity and synonymy were too mentalistic and started looking for a behavioristically acceptable alternative. In a 1943 note titled "Foundations of a Linguistic Theory of Meaning," Quine writes, "Vagueness of semantics. Mentalism still flourishes. . . . Effort to shortcut the appeal to the mental in semantics would mean looking for a criterion, in terms of linguistic behavior, of a relation of synonymy directly between one expression and another."[89]

Skinner, meanwhile, was dealing with very similar issues. He had obtained a Guggenheim fellowship and was applying his theory of behavior to a field he dubbed 'verbal

behavior,' attempting to write a book on the subject.[90] In the process, Skinner also read Carnap's *Introduction to Semantics* and drew a conclusion very similar to Quine's: "Carnap has wandered off by himself into system-building which is so remote that few if any of his discoveries have parallels in 'real' languages." When Skinner reported this in a letter to Quine,[91] the latter replied:

<ext>

You will find that I share your misgivings about Carnap, and have further serious ones of my own. . . . I've been wanting to write a book of philosophical and semantic character, but I don't seem to make any headway now. . . . The great Tarski, unfortunately, likewise suffers from this hypertonicity of the philosophical sphincter; and he is one whom, unlike Carnap . . . I consider genuinely sound and undeluded in his semantics and his philosophical orientation toward logic.[92]

</ext>

Quine's insight regarding the nature of his disagreement with Carnap was not his only theoretical advancement, however. For Quine's notes on *Sign and Object* show that he was also becoming more skeptical about *phenomenalism*. Where Quine had still defended a broadly phenomenalistic perspective in the Harvard Logic Group, he started to develop a wide range of arguments against the view in the mid-1940s. In a note from 1943, for example, Quine sets up the dialectical situation as follows:

<ext>

Here is a straightforward view, likely to be held by a physicist unspoiled by philosophy . . . atoms are more *real* than the tables, chairs etc. . . . Some physicists—tainted with philosophy—make them less so. Thus, Eddington's two desks. Again Bridgman, operationism. . . . But the macroscopic objects are rather arbitrary as a basic reality, for certainly these are inferred from a yet more immediate zone in much the way that atoms are inferred from the macroscopic objects. . . . Things are made up now not of atoms but of

perceptions. Seemingly two rival theories of things, the atomic theory and the sensory theory.[93]

</ext>

Where Quine in the 1930s would have chosen the sensory theory (at least in discussions about epistemology, see n. 61), he now gradually starts to push the former, a transition that would finally lead him to conclude that epistemology is "an empirical science" and that we should replace talk about primary sense experience with talk about "the barrage of physical stimuli to which [a man's] end organs are exposed":[94]

<ext>

realism says 'There *are* . . . tables, chairs, etc, + their constituent parts, because this is how we use the word "there are" par excellence. And their ultimate constituent parts are probably atoms etc. . . . *The pcpns. are themselves states of physical objects*; hardly want to construct the objects from them.[95]

</ext>

<ext>

Reason there seemed to be a rival claim for reality in an absolute sense is that an argument can be made for reducing the one to the other, and a counter-argument can be made for the opposite reduction. . . . Needless, though, to use the word 'reality' here. . . . So I *am* being a realist.[96]

</ext>

In the early 1940s, in other words, Quine's and Skinner's perspectives suddenly start to converge: they were both writing a book about language, they had both adopted a broadly anti-phenomenalistic perspective, and they were both trying to rid semantics of mentalism by developing a behavioristic approach to language.

Skinner's and Quine's development in the early 1940s might lead one to suspect that the two must have influenced each other in the years that Skinner was based in Minneapolis (1936–1945) and Bloomington (1945–1947), especially since the two so unequivocally shared their problems with Carnap's approach in the above-discussed exchange of letters. Surprisingly, however, archival evidence shows that this suspicion is unwarranted. For besides the above-quoted exchange of letters in 1945, Skinner and Quine pretty much lost contact between 1941 and 1947, the crucial years in which Quine started to work on *Sign and Object* and Skinner completed his first draft of *Verbal Behavior*. Indeed, Skinner's letter from 1945 seems to have been his first letter to Quine in years, as it updated Quine about his book on language, the end of his project for the National Defense Research Committee, and his having a second child.[97] Skinner and Quine *did* correspond on a relatively frequent basis between November 1937 and June 1941—the Skinner and Quine archives contain approximately 20 letters and postcards written in this period—but they never discussed theoretical developments, in these letters, let alone that they were keeping each other up to date by exchanging offprints, drafts, notes, or lectures.[98]

Skinner's and Quine's lack of (academic) communication strongly suggests that the two did not directly affect each other's development between 1936 and 1947. More important evidence, however, is the fact that there are no signs that the two were engaging with each other's work at all. Skinner does not mention Quine in his first (1947) draft of what was to become *Verbal Behavior*,[99] and Quine does not mention Skinner in his notes for *Sign and Object*.[100] Even in the early 1950s, when Skinner was back in Cambridge and Quine had attended the former's William James Lectures on Verbal Behavior, Skinner's influence remained remarkably minimal. Quine's 454-page manuscript on philosophy of language (a transcript of his 1952 Philosophy of Language course that served as his first draft of what would later become *Word and Object*), only makes two fleeting references to Skinner's work: in one lecture he makes a passing remark about Skinner's and G. A. Miller's work on unconscious rhyming and in another lecture he claims that Skinner's rat experiments show that induction and habit-formation "are basically the same thing."[101]

8. Two Types of Behaviorism, Part 2

Prima facie, Skinner and Quine appear to have had the same goal in developing a behavioristically satisfactory theory of language. They were both convinced that traditional talk about 'meanings,' 'propositions,' and 'ideas' is deeply flawed and they both wanted to get rid of mentalistic explanations:

<ext>

Pending a satisfactory explanation of the notion of meaning, linguists in semantic fields are in the situation of not knowing what they are talking about. . . . Meanings . . . purport to be entities of a special sort: the meaning of an expression is the idea expressed. . . . The evil of the idea idea is that its use, like the appeal in Molière to a *virtus dormitiva*, engenders an illusion of having explained something.[102]

</ext>

<ext>

It has generally been assumed that to explain behavior, or any aspect of it, one must attribute it to events taking place inside the organism. In the field of verbal behavior this practice was once represented by the doctrine of the expression of ideas. An utterance was felt to be explained by setting forth the ideas which it expressed. . . . There is, of course, no real explanation. When we say that a remark is confusing because the idea is unclear, we seem to be talking about two levels of observation though there is, in fact, only one. It is the *remark* which is unclear.[103]

</ext>

Skinner and Quine shared a negative program: they wanted to expunge mentalism because its concepts and explanations are fundamentally defective. Just like positing a *virtus dormitiva* does not contribute to explaining the sleep-inducing quality of opium, positing an 'idea' does

not explain why we utter a certain sentence, and positing a 'meaning' does not explain why we understand this sentence.[104]

When one examines Skinner's and Quine's work from the 1940s and 1950s, however, it becomes clear that their *alternatives* to mentalism were quite distinct. Quine's positive project was primarily conceptual. He wanted to show that abandoning mentalistic talk does not entail that our utterances are *meaningless*. We can explain why our utterances are 'significant,' Quine argued, without having to appeal to philosophically problematic concepts like 'meaning,' 'synonymy,' and 'analyticity':

<ext>

It is argued that if we can speak of a sentence as meaningful, or as having meaning, then there must be *a meaning* that it has, and this meaning will be identical or distinct from the meaning that another sentence has. This is urged without any evident attempt to define synonymy in terms of meaningfulness. . . . Whistling in the dark is not the method of true philosophy. Let us review the situations that prompted the positing of propositions, and consider what can be done without that expedient.[105]

</ext>

Quine, in other words, was interested in the question of how we can explain our *use* of language without appealing to philosophically problematic concepts. This project need not conflict with a behavioristic approach to psychology—indeed Quine once remarked that he *thinks* that behaviorists are right "in holding that talk of ideas is bad business *even for psychology*"[106]—but his project also does not *entail* that we ought to be behaviorists in psychology.[107]

Skinner's project, however, was a more classically scientific one: he wanted to provide a *causal* analysis of language. He did not want to explain why our utterances are meaningful, he wanted to explain why we utter the sentences we utter—he wanted to *predict and control* our verbal behavior:

The extent to which we understand verbal behavior in a 'causal' analysis is to be assessed from the extent to which we can predict the occurrence of specific instances and, eventually, from the extent to which we can produce or control such behavior by altering the conditions under which it occurs.[108]

</ext>

Where Quine was interested in the philosophical question of how we are able to understand each other, in other words, Skinner's question was much more concrete: can we predict, explain, and control verbal behavior?[109] And although there is at least one area in which these two projects overlap—both Skinner and Quine were interested in language learning[110]—there is no guarantee that their divergent aims should yield compatible theories. Indeed, in a response to a letter from Crozier, Skinner notes that it is almost impossible to achieve 'unity of science' in the field of verbal behavior: "With the logicians on one side and the linguists on the other it is difficult to steer a straight course toward a causal analysis."[111]

Yet, Skinner and Quine did not only have different *aims*. If one examines Quine's views about causal explanation in psychology, their behavioristic theories turn out to be *in fact* incompatible. To see this, reconsider the first sentence of the above-quoted passage from *Verbal Behavior* ("It has generally been assumed that to explain behavior, or any aspect of it, one must attribute it to events taking place inside the organism"). From the very beginning of his academic career, Skinner was skeptical about what might be called 'inner causes,' whether they be mentalistic or physiological explanations.[112] Indeed, even Skinner's 1931 publication about the concept of reflex, discussed in section 4, was already remarkably clear about this point. Reflexes are *correlations* between stimuli and responses and no study of intervening physiological features will contribute to our understanding of the reflex:

<ext>

Reflex physiology undertakes to describe the events which intervene between a stimulus and a response. The physiological usage does not question the definition of a reflex as a

correlation. . . . The essence of the description of behavior is . . . the determination of functional laws describing the relationship between the forces acting upon, and the movement of, a given system.[113]

</ext>

Even if the physiological variables between stimulus and response were to be completely specified, Skinner maintained, the *laws* are to be found on a behavioral level; physiologists and neuroscientists can at best fill the temporal and spatial gap between a stimulus and a response.[114]

Quine, however, defended the opposite view. He believed that behavior ultimately requires a physiological (or better, a neurological) explanation instead of a functional one:

<ext>

The importance of behaviorism is its insistence on shoring up mentalistic terms, where possible, by forging substantial links with observation. For a deep *causal* explanation of mental states and events, on the other hand, we must look not just to behavior but to *neurology*.[115]

</ext>

<ext>

Behavior calls for explanation. And the explanation is going to be in the nervous system. It's going to be physiological.[116]

</ext>

Quine certainly did not deny that a functional analysis can yield interesting correlations. Indeed, he has never denied that there explanations at the behavioral level:

<ext>

an explanation, not the deepest one, but one of a shallower kind, is possible at the purest behavioral level. One can hope to find, and I think one does find, behavioral regularities.[117]
</ext>

Ultimately, however, Quine believed that explanation is to be sought at a different level: "Mental states and events are neural states and events . . . and behavioral description is just a means of specifying and spotting them."[118]

9. Epilogue: Chomksy's Reviews

In this paper, I have argued that a much-speculated-upon question in the historiography of twentieth-century psychology and philosophy—did Skinner and Quine influence each other in developing their behaviorisms?—should be answered negatively. Although Skinner and Quine were close friends and had remarkably parallel careers, they do not seem to have significantly affected each other's development. I have supported my conclusion using a wide range of previously unexamined archive material and shown that these documents suggest (1) that Skinner and Quine had already developed quite mature views about epistemology and psychology before they first met each other in 1933, (2) that they defended incompatible versions of behaviorism during their years as junior fellows, (3) that Quine did not keep close track of Skinner's theoretical development in the late 1930s, (4) that Skinner and Quine did not discuss their theoretical advancements when their approaches started to converge in the early 1940s, (5) that key documents related to the development of *Verbal Behavior* and *Word and Object* show no sign of Skinner's influence on Quine (or vice versa), and (6) that Skinner's and Quine's mature behaviorisms are much more in conflict than the surface similarities suggest.

Since most of this evidence was not available in the 1950s and 1960s, it is not surprising that Skinner and Quine were often viewed as brothers in arms. After all, they were close friends, they were both interested in language, and they both dubbed their views

'behavioristic.' Indeed, there is no evidence that Quine objected to being viewed as part of a larger behavioristic movement.

This situation changed, however, when Noam Chomsky started to attack Skinner's and Quine's behaviorisms.[119] Where Skinner largely remained silent in the years immediately following Chomsky's first review,[120] Quine responded vigorously: within seven months after he first received Chomsky paper on November 16, 1967,[121] Quine wrote and presented three papers in which he responds to these arguments: "Philosophical Progress in Language Theory" (first delivered in February 1968), "Linguistics and Philosophy" (presented on April 13, 1968), and "Reply to Chomsky" (completed on June 12, 1968).[122] And although Quine was convinced that Chomsky's arguments were flawed, he became much more careful in his use of the label 'behaviorism' in the years after the review. From the early 1970s onwards, Quine started to speak about "moderate behaviorism,"[123] about "linguistic behaviorism,"[124] about "behaviorism, in the form in which I find it acceptable"[125] and about a "very moderate, and I would say . . . very reasonable behaviorism."[126] Similarly, in private correspondence, Quine also started to emphasize that his behaviorism is "pretty moderate,"[127] that his behaviorism is a "behaviorism . . . for semantics,"[128] and that he "perhaps . . . never qualified as a behaviorist" in the first place.[129]

Still, Quine would never go so far as to betray his friend. For although he started to reframe his commitment to 'behaviorism' both in public and private correspondence, he almost always added that "Skinner . . . is not and was not as extreme as his critics make him out,"[130] that Skinner's "behaviorism . . . is commonly exaggerated,"[131] and that he kept hoping that future inquiry "will bring behavioral psychology and neurology effectively together,"[132] creating a unified science of brains and behavior.[133]
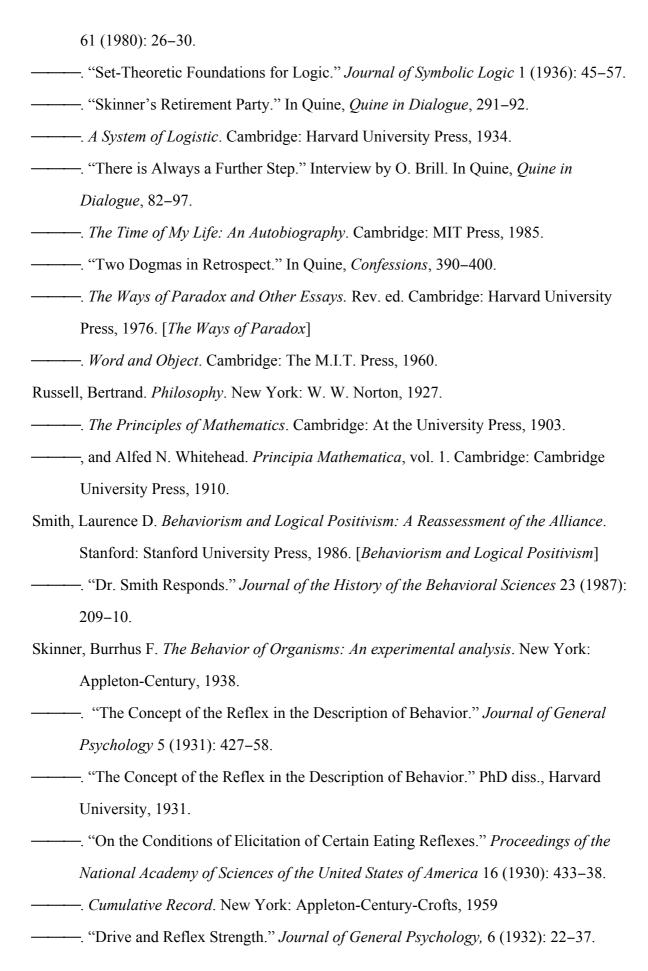
Bibliography and Abbreviations

Archival Sources

Quine, Willard Van Orman Papers. MS Am 2587. Houghton Library, Harvard University. [WVQ Papers, HLHU]

⸺. Unprocessed Papers. Private Collection, Douglas B. Quine. [DBQ Collection]

Skinner, Burrhus F. Papers. Accession 14327. Harvard University Archives, Harvard University. [Acs. 14327, BFS Papers, HUA]

⸺. Papers. Accession 14328. Harvard University Archives, Harvard University. [Acs. 14328, BFS Papers, HUA]

⸺. Papers. HUGFP 60.xx. Harvard University Archives, Harvard University. [BFS Papers, HUA]

Other Sources

Bridgman, Percy W. *The Logic of Modern Physics*. New York: Macmillan, 1927.

Brinton, Crane. *The Society of Fellows*. Cambridge: Harvard University Press, 1959.

Carnap, Rudolf. *Introduction to Semantics*. Cambridge: Harvard University Press, 1942.

⸺. *The Logical Syntax of Language*. Translated by Amethe Smeaton. London: Routledge & Kegan Paul, Trench, Trubner & Co, 1937.

⸺, and Willard Van Orman Quine. "Correspondence 1932–1970." In Creath, *Dear Carnap, Dear Van*, 105–425.

Chomsky, Noam. "Quine's Empirical Assumptions." *Synthese* 19 (1968): 53–68.

⸺. "Review: *Verbal Behavior* by B. F. Skinner." *Language* 35 (1959): 26–58.

Creath, Richard, ed. *Dear Carnap, Dear Van*. Berkeley: University of California Press, 1990.

Eddington, Arthur. *The Nature of the Physical World*. New York: Macmillan, 1928.

Frost-Arnold, Gregory. *Carnap, Tarski, and Quine at Harvard: Conversations on Logic, Mathematics, and Science*. Chicago: Open Court, 2013. [*Carnap, Tarski, and Quine at Harvard*]

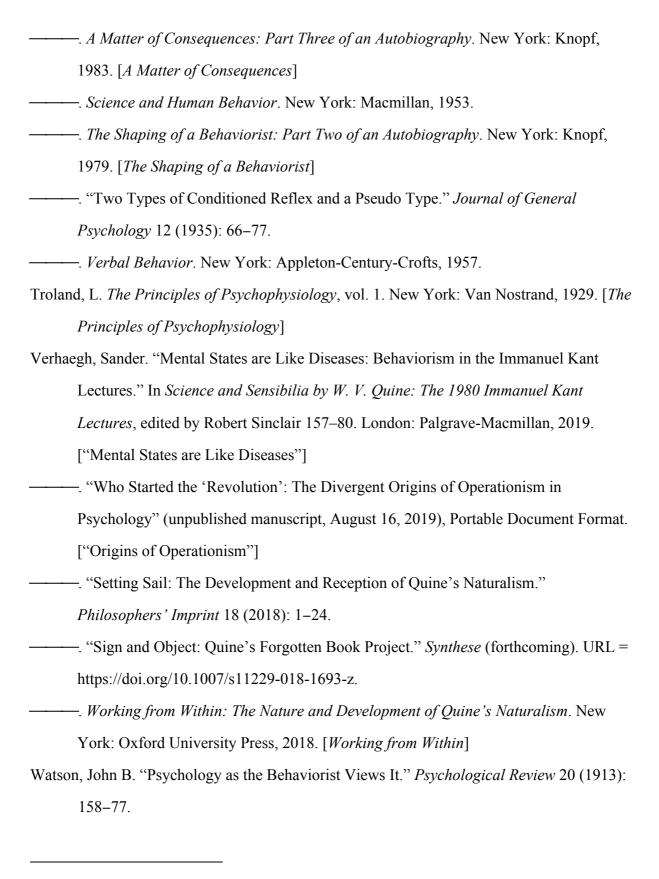Haggbloom, Steven J. et al. "The 100 Most Eminent Psychologists of the 20th Century." *Review of General Psychology* 6 (2002): 139–52. ["100 Most Emiment

Psychologists"]

Hahn, Lewis E., and Paul A. Schilpp, eds. *The Philosophy of W. V. Quine*, vol. XVIII. The
     Library of Living Philosophers. La Salle: Open Court, 1986.

Hartson, L. D. "Raymond Stetson: 1872–1950." *American Journal of Psychology* 64 (1951):
     287–88. ["Raymond Stetson"]

Henderson, Lawrence J. et al. "The Report of the Committee of Four," 1926. In Homans and
     Bailey, *The Society of Fellows*, 32–48.

Homans, George, and Orville Bailey. *The Society of Fellows*. Cambridge: Harvard
     University, 1948.

Howard, Don. "Reference from a Behaviorist Point of View." In *Perception, Realism, and
     the Problem of Reference*, edited by Athanassios Raftopoulos and Peter Machamer,
     183–211. Cambridge: Cambridge University Press, 2012.

Hylton, Peter. *Quine*. New York: Routledge, 2007.

Jeans, James. *The Mysterious Universe*. New York: Macmillan, 1927.

King, David. "Quine and Skinner: A Philosophical Friendship." URL = https://kingdablog.
     wordpress.com/2017/12/23/quine-and-skinner-a-philosophical-friendship, 2017.
     ["Quine and Skinner"]

Leiter, Brian. "Most Important Anglophone Philosophers, 1945–2000: The Top 20." URL =
     http://leiterreports.typepad.com/blog/2015/01/most-importantanglophonephilosophers
     -1945-2000-the-top-20.html, 2015. ["Most Important Anglophone Philosophers"]

Malone, John C. "Ontology Recapitulates Philology: Willard Quine, Pragmatism, and
     Radical Behaviorism." *Behavior and Philosophy* 29 (2001): 63–74. ["Ontology
     Recapitulates Philosophy"]

O'Donohue, William T., and Richard F. Kitchener. "Introduction: The Behaviorisms." In
     Handbook of Behaviorism, edited by William T. O'Donohue and Richard F.
     Kitchener, 1–13. London: Academic Press, 1999.

Peak, Helen. "An Evaluation of the Concepts of Reflex and Voluntary Action."
     Psychological Review 40 (1933): 71–89.

Quine, Willard Van Orman. "Autobiography of W. V. Quine." In Hahn and Schilpp, *The

Philosophy of W. V. Quine, 1–46.

———. *Confessions of a Confirmed Extensionalist and Other Essays.* Edited by Dagfinn Føllesdal and Douglas Quine. Cambridge: Harvard University Press, 2008.

———. "Interview with Willard Van Orman Quine." Interview by Lars Bergström and Dagfinn Føllesdal. In Quine, *Quine in Dialogue*, 69–81.

———. "Lectures on Carnap." In Creath, *Dear Carnap, Dear Van*, 45–103.

———. "Letter to Morton White and Nelson Goodman, June 3, 1947." In *A Philosopher's Story*, edited by Morton White, 338–340. University Park: Pennsylvania State University Press, 1999.

———. "Linguistics and Philosophy." In Quine, *The Ways of Paradox*, 56–58.

——— *The Logic of Sequences: A Generalization of 'Principia Mathematica,'* PhD diss., Harvard Unversity, 1932. New York: Garland, 1990. [*The Logic of Sequences*]

———. "On Mental Entities." In Quine, *The Ways of Paradox*, 221–27.

———. "Mind, Brain, and Behavior." In Quine, *Confessions*, 347–51.

———. "New Foundations for Mathematical Logic." *The American Monthly*, 44 (1937): 70–80.

———. "Philosophical Progress in Language Theory." *Metaphilosophy* 1 (1970): 2–19.

———. "The Problem of Meaning in Linguistics." In *From a Logical Point of View*, edited by Willard Van Orman Quine, 47–64. Rev. ed. Cambridge: Harvard University Press, 1961.

———. *Pursuit of Truth.* Rev. ed. Cambridge: Harvard University Press, 1992.

———. *Quine in Dialogue.* Edited by Dagfinn Føllesdal and Douglas Quine. Cambridge: Harvard University Press, 2008.

———. "A Reinterpretation of Schönfinkel's Logical Operators." *Bulletin of the American Mathematical Society* 42 (1936): 87–89.

———. "Reply to Chomsky." *Synthese* 19 (1968): 274–83.

———. "Response to Segal." In *Knowledge, Language and Logic*, edited by Alex Orenstein and Petr Kotatko, 417–18. Dordrecht: Kluwer Academic Publishers, 1999.

———. "Sellars on Behaviorism, Language, and Meaning." *Pacific Philosophical Quarterly*

61 (1980): 26–30.

———. "Set-Theoretic Foundations for Logic." *Journal of Symbolic Logic* 1 (1936): 45–57.

———. "Skinner's Retirement Party." In Quine, *Quine in Dialogue*, 291–92.

———. *A System of Logistic*. Cambridge: Harvard University Press, 1934.

———. "There is Always a Further Step." Interview by O. Brill. In Quine, *Quine in Dialogue*, 82–97.

———. *The Time of My Life: An Autobiography*. Cambridge: MIT Press, 1985.

———. "Two Dogmas in Retrospect." In Quine, *Confessions*, 390–400.

———. *The Ways of Paradox and Other Essays*. Rev. ed. Cambridge: Harvard University Press, 1976. [*The Ways of Paradox*]

———. *Word and Object*. Cambridge: The M.I.T. Press, 1960.

Russell, Bertrand. *Philosophy*. New York: W. W. Norton, 1927.

———. *The Principles of Mathematics*. Cambridge: At the University Press, 1903.

———, and Alfed N. Whitehead. *Principia Mathematica*, vol. 1. Cambridge: Cambridge University Press, 1910.

Smith, Laurence D. *Behaviorism and Logical Positivism: A Reassessment of the Alliance*. Stanford: Stanford University Press, 1986. [*Behaviorism and Logical Positivism*]

———. "Dr. Smith Responds." *Journal of the History of the Behavioral Sciences* 23 (1987): 209–10.

Skinner, Burrhus F. *The Behavior of Organisms: An experimental analysis*. New York: Appleton-Century, 1938.

———. "The Concept of the Reflex in the Description of Behavior." *Journal of General Psychology* 5 (1931): 427–58.

———. "The Concept of the Reflex in the Description of Behavior." PhD diss., Harvard University, 1931.

———. "On the Conditions of Elicitation of Certain Eating Reflexes." *Proceedings of the National Academy of Sciences of the United States of America* 16 (1930): 433–38.

———. *Cumulative Record*. New York: Appleton-Century-Crofts, 1959

———. "Drive and Reflex Strength." *Journal of General Psychology,* 6 (1932): 22–37.

―――. *A Matter of Consequences: Part Three of an Autobiography*. New York: Knopf, 1983. [*A Matter of Consequences*]

―――. *Science and Human Behavior*. New York: Macmillan, 1953.

―――. *The Shaping of a Behaviorist: Part Two of an Autobiography*. New York: Knopf, 1979. [*The Shaping of a Behaviorist*]

―――. "Two Types of Conditioned Reflex and a Pseudo Type." *Journal of General Psychology* 12 (1935): 66–77.

―――. *Verbal Behavior*. New York: Appleton-Century-Crofts, 1957.

Troland, L. *The Principles of Psychophysiology*, vol. 1. New York: Van Nostrand, 1929. [*The Principles of Psychophysiology*]

Verhaegh, Sander. "Mental States are Like Diseases: Behaviorism in the Immanuel Kant Lectures." In *Science and Sensibilia by W. V. Quine: The 1980 Immanuel Kant Lectures*, edited by Robert Sinclair 157–80. London: Palgrave-Macmillan, 2019. ["Mental States are Like Diseases"]

―――. "Who Started the 'Revolution': The Divergent Origins of Operationism in Psychology" (unpublished manuscript, August 16, 2019), Portable Document Format. ["Origins of Operationism"]

―――. "Setting Sail: The Development and Reception of Quine's Naturalism." *Philosophers' Imprint* 18 (2018): 1–24.

―――. "Sign and Object: Quine's Forgotten Book Project." *Synthese* (forthcoming). URL = https://doi.org/10.1007/s11229-018-1693-z.

―――. *Working from Within: The Nature and Development of Quine's Naturalism*. New York: Oxford University Press, 2018. [*Working from Within*]

Watson, John B. "Psychology as the Behaviorist Views It." *Psychological Review* 20 (1913): 158–77.

---

[1] See Steven Hagbloom et al. "100 most Eminent Psychologists"; and Brian Leiter, "Most Important Anglophone Philosophers."

[2] Quine, "Skinner's Retirement Party," 291.

[3] Skinner, *Verbal Behavior*; and Quine, *Word and Object*.

[4] "Introduction: The Behaviorisms," 12.

[5] "Ontology Recapitulates Philosophy," 63, 67. He supports this claim, inter alia, by quoting Skinner's colleague W. S. Verplanck, who remembers that "Quine was a relatively frequent topic of [Skinner's] conversation."

[6] Smith, *Behaviorism and Logical Positivism*.

[7] Smith, "Dr. Smith Responds," 210. See also David King, "Quine and Skinner," which complains about the "limited data" that is available "as neither theorist spoke about the influence they had on each other in any detail."

[8] The B. F. Skinner Papers are stored at the Harvard University Archives (collections HUGFP 60.xx; Accessions 14327-14328), the W. V. Quine Papers can be accessed at Houghton Library, Harvard University (collection MS Am 2587). Some of the documents discussed in this paper are not yet available at the Harvard Archives. Quine's son and literary executor, Douglas B. Quine, has made them available. In the main text and in the footnotes, I will refer to documents from this private collection of 57 boxes as the DBQ collection. Documents from the B. F. Skinner Papers will be referred to by dates (if known), collection codes, and box and folder numbers; documents from the W. V. Quine Papers will be referred to by providing dates and item numbers. In transcribing Skinner's and Quine's autograph notes, drafts, and letters, I have aimed to minimize editorial interference and chosen not to correct ungrammatical shorthand.

[9] Quine, "Datebook 1933," Box 45, DBQ Collection.

[10] George Homans and Orville Bailey, *The Society of Fellows*, 5. Besides Skinner and Quine, the junior fellows were Garrett Birkhoff, Thomas Chambers, John C. Miller, and Frederick M. Watkins.

[11] Lawrence Henderson et al. "The Report of the Committee of Four."

[12] Homans and Bailey, *The Society of Fellows*, 18.

[13] Skinner, *The Concept of the Reflex in the Description of Behavior*; Quine, *The Logic of Sequences*.

[14] Homans and Bailey, *The Society of Fellows*, 48–50.

[15] Later the rules of the Society were changed to close this loophole. See Crane Brinton, *The Society of Fellows*, 70–71.

[16] Lowell to Skinner, 11 April 1933, HUGFP 60.10, B. F. Skinner Papers, Harvard University Archives (hereafter cited as BFS Papers, HUA).

[17] Richard Creath, *Dear Carnap, Dear Van*, 463.

[18] Quine, "Scrapbook" [27 March 1933], Box 11, DBQ Collection.

[19] Quine to his parents, 27 March 1933, Box 21, DBQ Collection.

[20] "Scrapbooks" [25 September 1933], Box 1, Item 3, Acs. 14327, BFS Papers, HUA. In his autobiography, Skinner cites a slightly different letter, which I have not been able to locate. See *The Shaping of a Behaviorist*, 128–29. The above paragraph is quoted from a letter in a scrapbook about Skinner kept by his mother.

[21] After the commencement dinner, Skinner writes, "The other junior fellows are fine, although I have not got to know them well yet" ("Scrapbooks" [25 September 1933], Box 1, Item 3, Acs. 14327, BFS Papers, HUA).

[22] Quine to his parents, 5 November 1933, Box 21, DBQ Collection.

[23] The datebook's first explicit mention of Skinner is October 24, when Quine visited Skinner at his room at Winthrop House. Quine (and his wife Naomi) returned the favor a week later (November 1) when they invited Skinner to dine at their house. See "Datebook 1933," Box 11, DBQ Collection.

[24] Quine to his parents, 3 October 1933 and 5 November 1933, Box 21, DBQ Collection.

[25] In his autobiography, Quine even claims that his "exposure to John B. Watson slightly antedated [Skinner's]" but this is most likely based on a calculation error (*The Time of my Life*, 110). Watson's book played a significant role in Skinner's decision to apply for graduate school in psychology and he was admitted to Harvard well before Quine took the psychology course at Oberlin.

[26] "Raymond Stetson," 287.

[27] Quine, "WVQ College Class Notes" [ca. March 1930], Box 26, DBQ Collection, my transcription.

[28] "Two Dogmas in Retrospect," 390.

[29] Quine's paper ("The Behavioristic Treatment of James' Notion of Perception") aimed to "examine, from the point of view adopted by John B. Watson . . . William James' treatment of *perception* as set forth . . . in Chapter XX of his *Psychology*" ("Miscellaneous Papers" [11 January 1933], Item 3225, W. V. Quine Papers, Houghton Library, Harvard University [hereafter cited as WVQ Papers, HLHU]).

[30] "Random Thoughts" [11 April 1930 and 13 May 1930], Item 3224, WVQ Papers, HLHU, my transcription. In section 7, I discuss Quine's (behavioristic) views on logic in more detail.

[31] "Miscellaneous Papers" [10 January 1930], Item 3225, WVQ Papers, HLHU.

[32] "Miscellaneous Papers" [10 January 1930], Item 3225, WVQ Papers, HLHU.

[33] "Psychology as the Behaviorist Views It," 158, emphasis added.

[34] "WVQ College Class Notes" [September 1929], Box 26, DBQ Collection, my transcription.

[35] Bertrand Russell and Alfred N. Whitehead, *Principia Mathematica*, 66. Also, Quine's definition of mathematical method in "Mathematics as a Mode of Thought" is clearly based on Russell's work. See Russell, *Principles of Mathematics*, 3: "Pure mathematics is the class of all propositions of the form 'p implies q,' where p and q are propositions containing one or more variables, the same in the two propositions, and neither p nor q contains constants except logical constants."

[36] "Intellectual Autobiography," 7.

[37] Quine mentions that he read Couturat, Peano, Keyser, and Venn for his honors reading ("Intellectual Autobiography," 8). His portfolio shows that he also read Cantor, Mill, Reichenbach, Royce, and True. See Quine, "Psychology 5 and Psychology 21," item 3237.

[38] Perhaps Quine's lack of enthusiasm about psychology at Harvard can be explained by the fact that Beebe-Center's class was centered around Leonard Troland's *The Principles of*

Psychophysiology, a book that was not very sympathetic to Watson's approach: "I stoutly maintain that the behaviorist's view of the science is a fearful error" (Troland, *The Principles of Psychophysiology*, ix).

[39] "On the Vision of Depth" [1 May 1931], Item 3225, WVQ Papers, HLHU.

[40] One reason for Quine's decision to obtain a Ph.D. in two years (besides the job insecurity in academia during the Depression) is that he was disappointed by what Harvard had to offer in logic. In his autobiography, Quine writes, "American philosophers associated Harvard with logic because of Whitehead, Sheffer, Lewis, and the shades of Peirce and Royce. Really the action was in Europe. . . . America's logical awakening was still to come" (*The Time of my Life*, 83).

[41] *The Shaping of a Behaviorist*, 10.

[42] Psychology would become an independent department in 1936. Still, the tension was already noticeable in the late 1920s. In his first month at Harvard, Skinner writes, "psychology is still considered a subdivision of Philosophy out here, but the disciples of Kant are sweating heavily to include a course in the histology of the nervous system in a scheme which postulates the mind *inetendue*" (Skinner to Percy Saunders, 26 September 1928, HUGFP 60.10, BFS Papers, HUA).

[43] When Quine enrolled as a graduate student in 1930, the animal psychology laboratories had just been moved from Emerson Hall to Boylston Hall. As a result, it is unlikely that Skinner and Quine met before 1933.

[44] "The Concept of Reflex in the Description of Behavior," 427.

[45] As an undergraduate at Hamilton College, Skinner had not taken any courses in psychology.

[46] "On the Conditions of Elicitation of certain Eating Reflexes," 437.

[47] *The Shaping of a Behaviorist*, 59.

[48] "On the Conditions of Elicitation of certain Eating Reflexes," 434.

[49] Huston to Skinner, 5 November 1931, HUGFP 60.10, BFS Papers, HUA.

[50] Purdy to Skinner, 5 November 1931, HUGFP 60.10, BFS Papers HUA. See also Helen Peak, "An Evaluation of the Concepts of Reflex and Voluntary Action," 74: "By thus taking to philosophical grounds [Skinner] neglect[s] possible differentiae of a purely observational nature." When Skinner wrote a similar paper about the concept of 'drive' a few months later, Crozier warned him: "The general idea I approve" but "The theoretical treatment of these questions will be very much stronger and much more effective when backed up by hard analysis of new experimental results." Crozier to Skinner, 3 June, 1931, HUGFP 60.10, BFS Papers, HUA; and Skinner, "Drive and Reflex Strength."

[51] Operational definitions explicate concepts in terms of the way they are measured. Operationalism is a philosophy of science first proposed by the American physicist P. W. Bridgman in *The Logic of Modern Physics*. Although Bridgman mainly wrote about physics, operationalism would become one of the central methodological issues in mid-twentieth-century psychology. See Sander Verhaegh, "Origins of Operationism." For our present purposes, it is important to note that operationalism is closely related to logical positivism, the school of philosophy Quine was studying in Europe. I will return to Skinner's and Quine's (evolving) views about operationalism and positivism in section 7.

[52] "WVQ College Class Notes" [5 October 1929], Box 26, DBQ Collection.

[53] "The Concept of Reflex in the Description of Behavior," 445, emphasis added.

[54] *Cumulative Record*, 427.

[55] "Transcriptions of Notes," Box 3, Folder 6, HUGFP 60.50, BFS Papers, HUA.

[56] When Skinner started working on his *Sketch*, both Arthur Eddington and James Jeans had just published books that relied on strongly phenomenalist conceptions of science. See, e.g. Eddington, *The Nature of the Physical World*, 281: "The stuff of the world is mind-stuff. . . . It is difficult for the matter-of-fact physicist to accept the view that the substratum of everything is of mental character. But no one can deny that mind is the first and most direct thing in our experience, and all else is remote inference"; and Jeans, *The Mysterious Universe*, 137: "Today there is a wide measure of agreement, which on the physical side of science approaches almost to unanimity, that the stream of knowledge is heading towards a non-

mechanical reality; the universe begins to look more like a great thought than like a great machine. Mind no longer appears as an accidental intruder into the realm of matter; we are beginning to suspect that we ought rather to hail it as a creator and governor of the realm of matter."

[57] "Sketch for an Epistemology," Box 3, Folder 5, HUGFP 60.50, BFS Papers, HUA, my transcription.

[58] "Sketch for an Epistemology," Box 3, Folder 5, HUGFP 60.50, BFS Papers, HUA, my transcription and emphasis. I have not been able to precisely date this note, but it is clear that Skinner was already working on *Sketch for an Epistemology* before he became a Junior Fellow. In a 1933 letter to his parents, Skinner writes, "Richards came in to Cambridge with his wife. They spent yesterday morning in the lab and we had an interesting and profitable discussion. He is much interested in my book on Epistemology and Behaviorism which by the way is coming along very well" (*The Shaping of a Behaviorist*, 130).

[59] In his autobiography, Skinner shares an anecdote that supports this interpretation: "Alfred North Whitehead . . . told me that a young psychologist should keep an eye on philosophy . . . I told *him* that it is was quite the other way around—we needed a psychological epistemology."

[60] "Miscellaneous Papers" [10 January 1930], Item 3225, WVQ Papers, HLHU.

[61] It should be noted that Quine was not a phenomenalist in Eddington's sense. That is, Quine did not believe that 'the stuff of the world is mind-stuff.' He was a phenomenalist in *epistemology*, however. We always begin with sense experience if we want to *find out* what the world is like.

[62] See Quine, "Miscellaneous Papers" [10 March 1930], Item 3225, WVQ Papers, HLHU: "No analysis of a given experience can yield any other experience which is, in any full sense, the 'bare datum' of the form of experience; any such analysis is, rather, merely a further interpretation."

[63] "Miscellaneous Papers" [10 March 1930], Item 3225, WVQ Papers, HLHU.

[64] Quine, *A System of Logistic*.

[65] Quine, "A Reinterpretation of Schönfinkel's Logical Operators."

[66] Quine, "Set-Theoretic Foundations for Logic."

[67] Quine, "New Foundations for Mathematical Logic."

[68] In one of his last interviews, Quine listed "New Foundations" as one of his two most important contributions to philosophy (next to *Word and Object*). Quine to Emranno Bencivenga, 21 June 1998, Item 68, WVQ Papers, HLHU.

[69] Quine, "Lectures on Carnap."

[70] Quine to his parents, 29 September 1934, Box 21, DBQ Collection, my transcription. Skinner, who would later describe Carnap as "the only European I have ever met who grasps the significance of modern behavioristic psychology," also favored Carnap as a professor in the early 1930s. Skinner had been an early subscriber to *Erkenntnis*, the journal of the Berlin Group and the Vienna Circle, and was corresponding about Carnap's views on metaphysics even before he learned about Quine's adventures in Prague. Purdy to Skinner, 3 February 1933, Box 1, HUGFP 60.10, BFS Papers, HUA; Skinner to J. B. Carroll, 2 April 1937, Box 1, HUGFP 60.10, BFS Papers, HUA.

[71] Quine to his parents, 9 October 1934, Box 21, DBQ Collection, my transcription.

[72] Carnap, 8 June 1941 as quoted in Frost-Arnold, *Carnap, Tarski, and Quine at Harvard*, 189–90. See also Goodman's 1941 letter to Quine: "That was a good defense yesterday of the epistemological approach. . . . It will be interesting to see what happens Monday. Carnap's resistance may have softened a little as a result of being shown that his argument that phenomenal sentences are incomplete presupposes the physicalistic basis he uses it to defend. I hope you are as successful at the department meeting . . . as you were in getting phenomenalism another hearing in the group" (Goodman to Quine, 22 May 1941, Item 420, WVQ Papers, HLHU).

[73] See Skinner's letter to Fred Keller: "I've made some rather sweeping changes in my system. . . . Have two kinds of behavior *operant* and *respondent*. No *elicitory* stimulus for the first. . . . An operant is a castrated reflex with no stimulus. . . . The thing is quite different

from a *respondent* (e.g. flexion reflex or Pavlovian conditioned reflex)" (Skinner to Keller, 12 April 1936, Box 1, Folder 4, Acs. 14328, BFS Papers, HUA).

[74] Quine to Society of Fellows, 6 March 1937, Item 1001, WVQ Papers, HLHU.

[75] Elliott to Skinner, 18 June 1936, Box 1, Folder 4, HUGFP 60.10, BFS Papers, HUA.

[76] Boring to Skinner, 8 April 1936, Box 1, Folder 2, HUGFP 60.7, BFS Papers, HUA.

[77] Even though Quine acquired a job as an 'Instructor in Philosophy' at Harvard, he was tremendously unhappy with his position in the late 1930s:

<ext>

Day after day I yearn for *offers* . . . a good job outside would be extremely welcome. Things contribute to this feeling: heavy teaching load, poverty, lack of interest in my field on the part of the rest of the department, and lack of good friends. (Quine to Skinner, 18 November 1937, Item 1001, WVQ Papers, HLHU, my transcription)

</ext>

Skinner started an intensive lobby to get Quine a position at Minnesota and eventually arranged that the Dean (John Tate) would visit Quine in Cambridge (13 November 1937 and 16 February 1938). Although Quine was not offered a position, Skinner tried again in the spring of 1939, when he learned that the Harvard administration had denied Quine a promotion (17 March 1939). Quine sent a full application dossier to Skinner (24 May 1939), but he eventually held off when he learned that the administration had reconsidered its decision and had promoted him to associate professor with tenure. See the correspondence between Quine and Skinner, Item 1001, WVQ Papers, HLHU; and Quine, "Scrapbook" [19 February 1940], Box 11, DBQ Collection.

[78] Quine, "Scrapbook," Box 11, DBQ Collection.

[79] Quine to William F. Milton Fund, 9 January 1941, Item 475, WVQ Papers, HLHU.

[80] "Scope of Semantics" [5 November 1941], Item 3058, WVQ Papers, HLHU.

[81] Although Quine never publicly mentioned the project, there is much archival evidence for his book plans. He mentions the project in letters to, among others, Alonzo Church (Item 570, 15 February 1942,), D. C. Williams (Item 1221, 7 April 1942), Morton Wurtele (Item 1244, 10 October 1944), Nelson Goodman (Item 420, 19 December 1944). Paul Buck (Item 473, 30 November 1945), and as we shall see, Skinner. The Quine archives also contain a large series of notes related to Quine's book project. For a reconstruction of the project, see Verhaegh, "*Sign and Object*: Quine's Forgotten Book Project."

[82] See Quine, "Two Dogmas in Retrospect," 394: "I think Carnap's tenacity to analyticity was due largely to his philosophy of mathematics. One problem for him was the lack of empirical content: how could an empiricist accept mathematics as meaningful? Another problem was the necessity of mathematical truth. Analyticity was his answer to both." See Verhaegh, *Working from Within*, ch. 6.

[83] Quine, "General Report of my Work as a Sheldon Traveling Fellow" [8 January 1934], Item 3254, WVQ Papers, HLHU.

[84] According to Gregory Frost-Arnold, Quine "does not articulate complete arguments against Carnapian analyticity" in 1940–41 but rather "simply voices disagreement with . . . Carnap's characterization of analyticity in modal terms" (Frost-Arnold, *Carnap, Tarski, and Quine at Harvard*, 89).

[85] Creath, *Dear Carnap, Dear Van*, 294.

[86] See also Quine's letter from 5 January 1943: "The definition of this relation of synonymity [and of analyticity, which can be defined in terms of synonymity], within pragmatics, would make reference to criteria of behavioristic psychology and empirical linguistics. I have never succeeded in setting up a satisfactory one, but consider that it would be very useful to do so, both for philosophy and for empirical linguistics itself." See Creath, *Dear Carnap, Dear Van*, 299, 337–38.

[87] "Here is an important methodological point. I believe that we cannot construct an exact and workable theory of concepts like 'true,' 'analytic,' 'meaning,' 'synonymous,' 'compatible' etc. if we refer merely to the actually used language of science. It seems to me that we can

use those concepts only if we replace the given language by a system of rules" (Creath, *Dear Carnap, Dear Van*, 309).

[88] Quine to Church, 14 August 1943, Item 224, WVQ Papers, HLHU.

[89] "Early Jottings on Philosophy of Language" [ca. August 1943], Item 3169, WVQ Papers, HLHU.

[90] Skinner had already started working on verbal behavior in 1934, but postponed the project because he wanted to complete *The Behavior of Organisms*. See Skinner's Guggenheim application: "human behavior has always been my primary concern. The stumbling block in that direction is verbal behavior. I began the application to that field in 1934. In the summer of that year I spent 500 hours on a basic formulation. Seeing little chance of completing the work immediately, I put it aside until I could round out the experimental studies in progress at the sub-human level" (Skinner, "Materials Used in Writing *The Shaping of a Behaviorist*" [ca. October 1941], Box 2, Folder 1, HUGFP 60.50, BFS Papers, HUA).

[91] Skinner to Quine, 13 January 1945, Item 1001, WVQ Papers, HLHU.

[92] Quine to Skinner, 23 February 1945, Item 1001, WVQ Papers, HLHU.

[93] "Early Jottings on Philosophy of Language" [30 January 1943], Item 3169, WVQ Papers, HLHU, my transcription.

[94] "The Place of a Theory of Evidence" [7 October 1952], Item 3011, WVQ Papers, HLHU.

[95] "Early Jottings on Philosophy of Language" [30 January 1943], Item 3169, WVQ Papers, HLHU, my transcription and emphasis.

[96] "Ontology, Metaphysics, etc. . . ." [4 October 1944], Item 3181, WVQ Papers, HLHU, my transcription.

[97] Skinner to Quine, 13 January 1945, Item 1001, WVQ Papers, HLHU. Also note that Quine, in the above-quoted letter about Tarski and Carnap, informs Skinner about his "wanting to write a book of philosophical and semantic character" (23 February 1945), a project he had already started in 1941.

[98] The two did send copies of their books. See Quine (17 May 1939): "Many thanks for *The Behavior of Organisms*. It's a tremendous thing. I haven't read through its thick and solid

middle yet, but my enthusiasm over the first and last parts make me hope for time to do so"; and Skinner (28 October 1940): "The book [*Mathematical Logic*] looks swell and I promise you that I will read at least the first third." See the correspondence between Skinner and Quine, Item 1001, WVQ Papers, HLHU. It should be noted, however, that Skinner and Quine were not avid readers. See Skinner, *The Shaping of a Behaviorist*, 34: "I never learned how to read the "literature" in psychology, and the literature remained largely unread by me"; and Quine, "Intellectual Autobiography," 43: "Both in logic and philosophy I have tended to write first and search the literature only afterward for anticipations of knowledge. . . . This indocile habit of mind has obvious drawbacks. Surely it has led to inefficiency and duplication of effort."

[99] "A Psychological Analysis of Verbal Behavior" [Summer 1947], Box 3, Folder 7, HUGFP 60.50, BFS Papers, HUA.

[100] Skinner *did* mention Carnap, Freud, Jespersen, Mach, Ogden and Richards, Russell, Watson, and Zipf. Quine mentioned Bloomfield, Bloch and Trager, Carnap, Gardiner, Goodman, Korzybski, Moore, Nagel, Neurath, Peirce, Russell, and Wittgenstein.

[101] "Philosophy 148" [ca. 1952], Item 3158, WVQ Papers, HLHU.

[102] Quine, "The Problem of Meaning in Linguistics," 47–48.

[103] Skinner, *Verbal Behavior*, 6.

[104] See Verhaegh, "Mental States are like Diseases." Interestingly, Quine already learned about the *virtus dormitiva* example in graduate school. In his summary of E. B. Holt's *Animal Drive and the Learning Process*, Quine writes, "functional psychology is verbal magic; Molière's soporific" (Quine, "Psychology 5 and Philosophy" [ca. 1931], Item 3237, WVQ Papers, HLHU). See also Quine, "Letter to Morton White and Nelson Goodman": "Frege, Carnap, Lewis, and the rest seem to derive from those shadowy entities [attributes, propositions, and meanings] the same smug illusion of clarity that Toletus did from his substantial forms, and Moli[è]re's physician from the *virtus dormitiva*."

[105] *Word and Object*, 206–7, emphasis added.

[106] "The Problem of Meaning in Linguistics," 48, emphasis added.

107 See Quine, *Pursuit of Truth*, 37–38: "In psychology one may or may not be a behaviorist, but in linguistics one has no choice." Peter Hylton argues that it is a mistake in general to believe that "Quine's approach to language . . . depends on a behaviourist approach to psychology" (Hylton, *Quine*, 102).

108 See also: "We seek 'causes' of behavior which have an acceptable scientific status. . . . Our first responsibility is simple *description*: what is the topography of this subdivision of human behavior? Once that question has been answered in at least a preliminary fashion we may advance to the stage called *explanation*: what conditions are relevant to the occurrence of the behavior—what are the variables of which it is a function?" (Skinner, *Verbal Behavior*, 3, 10).

109 This also explains why Quine "nowhere makes use of any of the theoretical apparatus developed in Skinner's . . . *Verbal Behavior*" (Don Howard, "Reference from a Behaviorist Point of View," 193).

110 Not surprisingly, the section on the earliest stages of language development is the only section in which Quine, in *Word and Object*, refers to *Verbal Behavior* (*Word and Object*, 80–82).

111 Skinner to Crozier, February 20, 1950, Box 1, HUGFP 60.15, BFS Papers, HUA.

112 Skinner, *Science and Human Behavior*, 27.

113 "The Concept of the Reflex in the Description of Behavior," 455.

114 See Skinner, *Science and Human Behavior*, 54: "Pavlov, as a physiologist, was interested in how the stimulus was converted into neural processes and in how other processes carried the effect through the nervous system to the muscles and glands. . . . We may suppose, however, that comparable processes will eventually be described in terms appropriate to neural events. Such a description will fill in the temporal and spatial gaps between an earlier history of conditioning and its current result. The additional account will be important in the integration of scientific knowledge but will not make the relation between stimulus and response any more lawful or any more useful in prediction and control."

115 "Sellars on Behaviorism, Language, and Meaning," 26, emphasis added.

[116] "There is Always a Further Step," 94. See Verhaegh, "Mental States are Like Diseases." Admittedly, both quoted passages are from papers that were written many years after *Word and Object*. Still, I believe that they are also exemplary of Quine's position in the 1950s. In "On Mental Entities," a paper Quine presented at a symposium on Skinner's *Science and Human Behavior*, for example, Quine already seems to replace mentalistic explanations with physiological explanations:

<ext>

To repudiate mental entities is not to deny that we sense or even that we are conscious; it is merely to report and try to describe these facts without assuming entities of a mental kind. What is spoken of in terms of the residual posited objects of science and common sense as my cut finger is keyed into our nervous responses in various ways; nerves from my eye and other eyes are involved, and nerves from my finger. ("On Mental Entities," 213)

</ext>

In fact, even in the above-quoted 1943 note for *Sign and Object*, Quine does not argue that perceptions should be analyzed functionally; he concludes they are "states of physical objects" (Quine, "On Mental Entities," 213; and "Early Jottings on Philosophy of Language" [30 January 1943], Item 3169, WVQ Papers, HLHU, my transcription).

[117] "Interview with Willard Van Orman Quine," 94.

[118] "Mind, Brain, and Behavior," 348.

[119] Chomsky, "Review: *Verbal Behavior* by B. F. Skinner"; and Chomsky, Quine's Empirical Assumptions."

[120] In a letter to Sidney Hook, Skinner writes, "An adequate reply to Chomsky would take more time than I have at present available" (Skinner to Hook, 19 June 1959, Box 1, Folder 5, HUGFP 60.50, BFS Papers, HUA). See also Skinner, *A Matter of Consequences*, 153: "I . . . received a . . . fifty-five-page manuscript by a linguist whom I had never heard of named Noam Chomsky. The first pages were not reassuring. . . . I could not see how a review

beginning that way could be of any value, and I stopped reading. A year later I received a thirty-two-page version reprinted from the journal *Language*. When I saw that it was the same review, I put it aside again."

[121] Jaakko Hintikka to Quine, 16 November 1967, Item 1490, WVQ Papers, HLHU.

[122] See Verhaegh, "Setting Sail: The Development and Reception of Quine's Naturalism." Burton Dreben, Quine's closest philosophical companion, had already warned Quine not to rely too much on Skinner's account in the late 1950s. In a note titled "Revidenda (Burt, July 16, 1958)," Quine writes, "'Conditioning'; go easy; controversial; Chomsky vs. Skinner. Neutralize the assumption of a specific mechanism as much as possible. Talk of learning, habit formation, etc." (Quine, "Erledigte Notizen" [16 July 1958], Item 3170, WVQ Papers, HLHU).

[123] "Sellars on Behaviorism, Language, and Meaning," 26.

[124] "Response to Segal," 417.

[125] "The Mentalistic Heritage" [ca. January 1983], Item 2851, WVQ Papers, HLHU, my transcription.

[126] "There is Always a Further Step," 94.

[127] Quine to Laurence Smith, 8 December 1980, Item 1004, WVQ Papers, HLHU.

[128] Quine to Dirk Koppelberg, 10 July 1983, Item 601, WVQ Papers, HLHU, my transcription.

[129] Quine to H. G. Callaway, 28 September 1983, Item 177, WVQ Papers, HLHU, my transcription.

[130] Quine to H. G. Callaway, 28 September 1983, Item 177, WVQ Papers, HLHU, my transcription.

[131] Quine to Steven James, 1 February 1994, Item 558, WVQ Papers, HLHU, my transcription.

[132] "Mind, Brain, and Behavior," 349.

[133] I would like to thank Douglas Quine, Julie Vargas, Dagfinn Føllesdal, Warren Goldfarb, two anonymous referees for the *Journal of the History of Philosophy*, and the staff at