

THE SKINNER-CHOMSKY DEBATE: THE CENTRALITY OF THE DILEMMA ARGUMENT

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Abstract: The Skinner-Chomsky debate has been with us for a long time but has never been fully resolved. Outside behaviorism, Chomsky's review is generally highly praised. Behaviorists have, however, countered by demonstrating many inaccuracies, misquotes, and basic errors couched in Chomsky's emotional language. The purpose of this paper is to show that both parties are right. Although much of Chomsky's criticisms miss the mark, one very basic point that Chomsky himself endlessly repeats is yet unresolved.

This part of Chomsky's is called the dilemma argument and is shown to be a valid constructive critique that behaviorists would do well to address.

Therefore, it is necessary to go in some detail into this criticism. It is about time to flesh out its basic structure in order to add clarity to its examination. It is however, not the purpose of this paper to answer this criticism but only to highlight it. This will be a determined attempt at clarity, never giving up even when wading through Chomsky's general emotional attitude – to say the least.

Key words: Skinner; Chomsky; MacCorquodale; behaviorism; verbal behavior; dilemma argument

The purpose of this paper is to examine the current status of the Skinner/Chomsky debate. This debate has been with us for some time now – so long in fact that both sides seem a little battle-weary. Chomskeans still regard Chomsky's original review (Chomsky, 1959) of Skinner's *Verbal Behavior* (Skinner, 1957) a classic, whereas Skinnerians regard MacCorquodale's answer to Chomsky (MacCorquodale, 1970; MacCorquodale, 1969) as adequate. Skinner himself never responded to Chomsky but did favorably refer to MacCorquodale's answer.

There is in fact only one place where Skinner even mentions Chomsky and that is in a quite entertaining lecture that he gave in New York in 1971.

Let me tell you about Chomsky ... In 1958, I received a ... review by someone I had never heard of ... I read half a dozen pages, saw that it missed the point of the book, and went no further ... I found its tone distasteful. (1971b, p. 345)

Skinner (1971) adds:

Ironically, Chomsky was later invited to give the John Locke Lectures at Oxford. I was at Cambridge University at the time, and the BBC thought it would be interesting if we were to discuss our differences on television. I don't know what excuse Chomsky gave, but I agreed to participate only if the moderator could guarantee equal time. I suggested that we use chess clocks ... The BBC thought that my suggestion would not make for a very interesting program. (p. 347)

In an unpublished letter from Skinner to Stephen Murray from 1977, reported elsewhere, Skinner says much of the same thing as before, this time after the appearance of both Skinner's *Beyond Freedom and Dignity* (1971) and Chomsky's review (1972) of that later book. Skinner writes:

I have never been able to understand why Chomsky becomes almost pathologically angry when writing about me but I do not see why I should submit myself to such a verbal treatment ... Chomsky simply does not understand what I am talking about and I see no reason to listen to him. (Andresen, 1991, p. 57; footnote)

Skinner simply says that Chomsky "misses the point of" *Verbal Behavior* and that it was rather a review of "what Chomsky took, erroneously, to be my position" (Skinner, 1971b, p. 345). He adds though, that, "No doubt I was shirking a responsibility in not replying to Chomsky, and I am glad an answer has now been supplied by Kenneth MacCorquodale (p. 346).

I claim that MacCorquodale has not provided an answer to Chomsky's main argument and that he disregards the main force of Chomsky's argument. The point is that Chomsky has some very specific arguments against the extension of Skinner's basic theory to human behavior.

I claim that MacCorquodale and others overlook this basic argument. A curious thing though, is that Skinner essentially agrees with Chomsky on where that crucial point lies (more on that later). This is not to say that Skinner and Chomsky agree on the outcome – indeed they could not disagree more.

This paper will begin with a detailed analysis of Chomsky's original review, where an attempt will be made to show that he is all along setting up his one main argument – the dilemma argument. This will take us to MacCorquodale's answer, where he tries to respond to Chomsky's criticisms. As I argue that MacCorquodale does not succeed in answering Chomsky, the question has to be faced whether and how a Skinnerian answer could be provided. Finally, I will examine Chomsky's argument

from a Skinnerian point of view, to determine the current status of the debate.

Chomsky's Review of Skinner's *Verbal Behavior*

Earlier reviews of Skinner's *Verbal Behavior* were mixed (i.e. Broadbent, 1959; Dulaney, 1959; Gray, 1958; Mahl, 1958, Morris, 1958; Osgood, 1959; Tikhomirov, 1959; see Knapp, 1992 for a summary of these reviews). Chomsky (1959) begins his review by pointing this out:

The only way to evaluate the success of [Skinner's] program and the correctness of his basic assumptions about verbal behavior is to review these examples in detail and to determine the precise character of the concepts in terms of which the functional analysis is presented. (p. 28)

Chomsky subsequently divides his review into 11 sections, each of which deals with at least one of Skinner's basic technical terms deriving from his first book: *The Behavior of Organisms* (Skinner, 1938) namely: stimulus, response, response strength, reinforcement, and operant. In the remaining sections Chomsky deals with the terms specially introduced by Skinner to account for verbal behavior.

Before I go on, it must be pointed out that I discuss only the first five sections of Chomsky's review (p. 26-44) in this paper. This means that I only deal with Chomsky's examination of the older terms, i.e., the basic technical terms deriving from Skinner's first book. The reason for this becomes clearer later on for Chomsky's basic criticism is only directed against Skinner's technical terms, as they are applied (i.e. "extrapolated") to human (i.e., verbal) behavior.

Chomsky is essentially only interested in the extrapolation of the experimentally derived terms in *The Behavior of Organisms* (Skinner, 1938) to human behavior. So, in a very important sense (this point will be developed more fully later), Chomsky has nothing (negative) to say against Skinner's terms as applied to "lower organisms" in limited experimental situations. It is the extrapolation of the same terms applied to human (verbal) behavior to which Chomsky is opposed. Chomsky in fact supports such an interpretation, when he says at the beginning of section 6, after his treatment of the experimentally derived terms,

We now turn to the system that Skinner develops specifically for the description of verbal behavior. Since this system is ... based on the notions "stimulus," "response," and "reinforcement," we can conclude from the preceding sections that it will be vague and arbitrary. (1959, p. 44; emphasis added)

In later attacks on Skinner, Chomsky makes exactly the same point. Both in his review of Skinner's (1971a) *Beyond Freedom and Dignity* (Chomsky, 1971) and a year later in the paper "Psychology and Ideology" (Chomsky, 1972) he merely reiterates my above point.

Skinner does not comprehend the basic criticism: when his formulations are interpreted literally, they are trivially true, unsupported by evidence, or clearly false; and when ... interpreted in his characteristic vague and metaphorical way, they are merely a poor substitute for ordinary usage. (1972, p. 19)

The basic concepts of stimulus and response

Before Chomsky begins discussing Skinner's concepts, he points out that the concepts of "stimulus," "response," and "reinforcement" are "relatively well defined" with respect to restricted experimental situations. But before we can extend them to "real-life" behavior, Chomsky (1959) goes on, certain difficulties must be faced:

"We must decide, first of all, whether any physical event to which the organism is capable of reacting is to be called a stimulus on a given occasion, or only one to which the organism in fact reacts; and correspondingly, we must decide whether any part of behavior is to be called a response, or only one connected with stimuli in lawful ways. Questions of this sort pose something of a dilemma for the experimental psychologist." (p. 30)

The dilemma argument

This is Chomsky's most basic argument. I call it the dilemma argument. The first horn of the dilemma is this: Skinner can define his terms narrowly, "in which case behavior is lawful by definition" (Chomsky, 1959, p. 30) since it consists of responses. If the only criterion of what is to count as a stimulus is that it elicits a reaction, then Chomsky's point is that an organism is behaving, if and only if, it is responding. The other horn is that Skinner can define his terms broadly, by characterizing any physical event impinging on the organism as a stimulus, and any part of the organism's behavior as a response. But in that case, Chomsky observes, "he must conclude that behavior has not been demonstrated to be lawful." Chomsky concluded that, "Hence the psychologist either must admit that behavior is not lawful (or that he cannot at present show that it is ...) or he must restrict his attention to those highly limited areas in which it is lawful" (p. 30). Skinner does not consistently adopt either course, Chomsky further claims,

pointing out that Skinner utilizes the experimental results “as evidence for the scientific character of his system of behavior, and analogic guesses ... as evidence for its scope” (*ibid.*).

Narrow or wide definitions?

Chomsky’s argument seems quite sloppy at this point. Skinner would, of course, adopt the wider definitions, but what are the consequences? What must follow from the fact that behavior has not been demonstrated to be lawful? Surely not that the psychologist must admit that behavior is not lawful, or that he must restrict his attention to those highly limited areas in which it is lawful. What Chomsky is trying to say is that the psychologist cannot claim that all behavior is lawful, and that he must consequently restrict his attention to areas in which it has been shown to be lawful. This is just plainly wrong. Surely, there is a middle ground here. Strangely enough, Chomsky gives that possibility in parenthesis, incorrectly implying that this has not been considered.

Skinner, as any other psychologist and indeed any experimental scientist would, assumes that the subject matter under investigation (behavior in this case) follows some laws. Lawfulness is then just a working hypothesis without which no experimental work would make any sense. Skinner therefore does not have to restrict his attention to areas in which behavior has been shown to be lawful, nor must he admit that behavior is not lawful in general.

But Chomsky seems to realize all this, when he says (in parenthesis) that Skinner cannot at present show that behavior is lawful, for he adds to the quote already given that: “... not at all a damaging admission for a developing science” (p. 30). Chomsky’s argument or the idea behind it, therefore deserves something better than a crude dismissal.

The probable reason for Chomsky’s incorrect implication here is complicated. We understand Chomsky better when we consider his own view of psychology – scientific psychology in particular. It is beyond the scope of this paper to go into detail here but suffice it to say that his view is quite simply that there is no such thing! For Chomsky there cannot be a science of behavior. This he clearly states in an interesting interview:

Behavior is evidence. It’s not what you are studying; what you are studying is competence, capacity ... the study of behavior is like calling physics “meter-reading science” because meter readings are the data. But in a serious field, you wouldn’t identify the subject with the study of the data. Behavioral science was so superficial that history, sociology, psychology were all called the sciences of behavior, which means the study of data. Of course, this was never going to get anywhere. (Virués-Ortega, 2006, p. 245)

Elsewhere Chomsky has commented on psychology in general and after making a distinction between a puzzle (temporary) and a mystery (permanent), he virtually delegates the whole of psychology to the latter, leaving only room for what he calls “armchair psychology,” meaning that we can never predict human behavior, only speculate about the free inner workings that make behavior possible (1975, p. 25). Put differently, Chomsky insists that we can never relate stimulus conditions to behavior (a mystery – due to free will?), but only from stimulus conditions to a cognitive state. This negative rationalist view of Chomsky towards scientific psychology in general is widely overlooked.

Setting up the dilemma

At this point most readers either reject Chomsky or hail his work as a classic. Let’s do neither. Rather, let’s look individually at Chomsky’s analysis of Skinner’s technical terms. This makes it necessary to review how Chomsky criticizes the terms “stimulus,” “response,” “response strength,” and “reinforcement,” to see how he is building up to his main criticism – the dilemma argument.

Chomsky begins by pointing out that in his first experimental book, *The Behavior of Organisms*, Skinner defines his terms narrowly. There, a part of the environment and a part of behavior are called stimulus and response, respectively, only if they are lawfully related. Skinner himself explicitly emphasizes this with its full title: *An Experimental Analysis*. But let the reader be quite clear that Skinner never intended to define his terms narrowly. This is just his method of building up a theory – a bottom-up strategy – beginning with small well-defined units not derived from common sense psychology, as the basic building block on which the whole system is erected. In stark contrast to this is the method of the mentalist – a top-down strategy – where the aim is to start with the broad and loosely defined terms of common sense psychology, the intentional vocabulary of mentalism (see D. C. Dennett, 1971, for a further elaboration on the contrast between the two strategies).

But in the book under review, where Skinner extrapolates his system to human (verbal) behavior, Chomsky maintains that something else is going on. Taking Skinner’s example of stimulus control, (for example, saying *Dutch* as a response, when looking at a painting), Chomsky (1959) says “Suppose instead of saying *Dutch* we had said *Clashes with the wallpaper*, ... *Beautiful*, *Hideous*, ... or whatever else might come into our minds when looking at a picture” (p. 31).

To this, Skinner could only say that each of these responses is under the control of some other stimulus property of the physical object. The response “red,” says Chomsky, is under the control of “redness,” and similarly for any other response. This device is “as simple as it is empty,” he says, since properties are free for the asking. We identify the stimulus when we hear the

response. Chomsky (1959) concludes from all this that “Stimuli are no longer part of the outside world; they are driven back into the organism ... the talk of “stimulus control” simply disguises a complete retreat to mentalistic psychology” (p. 32).

Skinner the mentalist!

Chomsky’s conclusion at this point, is no less radical than it is startling. He accuses Skinner, the behaviorist, of a complete retreat to mentalism. No wonder Skinner found Chomsky’s review “distasteful,” and to think that if there is any one thing characteristic of Skinner’s whole position (even to the extent of distinguishing him from other behaviorists), then it must be his rejection of mentalism.

Chomsky’s seemingly rash claim at this point, that this constitutes a complete retreat to mentalist psychology, is probably the reason Skinner never responded to the review (me a mentalist?). At least it explains Skinner’s statement that Chomsky’s review missed the point of the book. One can only imagine what would have happened if they ever met on British television and argued with a chess-clock guaranteeing equal time!

At this point, one can well ponder and perhaps realize that it is probably right here that behaviorists and cognitivists (not mentalists, for the latter but not the former, are necessarily disagreeable to behaviorists of any kind) regrettably start talking cross purposes. Chomsky’s rashness is obvious, but so is Skinner’s dismissal.

The specifics of Chomsky’s dilemma argument

Where does Chomsky get the dilemma argument from? I suggest that he must have read Michael Scriven’s “A Critique of Radical Behaviorism” (Scriven, 1956). Scriven makes his point on the first page:

The general point I hope to make is this: Skinner’s position on almost every issue admits of two interpretations – one of them exciting, controversial, and practically indefensible; the other moderately interesting, rather widely accepted, and very plausible – and Skinner’s views quite often appear to be stated in the first form but defended in the second. (p. 88)

The difference between Chomsky’s and Scriven’s treatments is that the former uses it in attempt to stop the extrapolation of Skinner’s basic theory to human verbal behavior, but Scriven is actually very impressed by Skinner’s theories, stating, “I regard his work so highly and his arguments as so persuasive,” (p. 88) and in the above paper is only interested in Skinner’s restricted views on theories and especially psychoanalytic

theories.

The verbal operant

That Chomsky is attacking the definition of stimulus as applied to human behavior is clear enough, but what could it mean when saying that stimuli are driven back into the organism? To get at that, we have to consider Chomsky's criticism of the other basic terms. Skinner recognizes the problem of characterizing the unit of verbal behavior, Chomsky observes, but is satisfied with an answer "so vague and arbitrary" (p. 30) that it does not really contribute to its solution. The unit of verbal behavior, for Skinner, the verbal operant, is defined as a class of responses of identifiable form functionally related to one or more independent variables. But it is hard to specify, Chomsky thinks, how much similarity in form is required for two physical events to be considered instances of the same operant. The general problem is that "No method is suggested for determining in a particular instance what are the controlling variables, how many such units have occurred, or where their boundaries are in the total response." (Chomsky, 1959, p. 33)

Again, we see that Chomsky attacks the definitions as applied to human behavior. And again, he confidently concludes that when extrapolated to human behavior the concept (of operant in this case) is "completely meaningless" (p. 33). Similarly, Chomsky attacks Skinner's basic dependent variable of response strength in terms of probability. Earlier, as Chomsky points out, Skinner defined probability by emission during extinction. Chomsky's claim that in the move from *The Behavior of Organisms* to *Verbal Behavior* the term is extended to probability of emission. Very significantly, Chomsky (1959) concludes from Skinner's use of response strength that the extrapolation of the concept of probability can best be interpreted as "In effect, nothing more than a decision to use the word "probability," with its favorable connotations of objectivity, as a cover term to paraphrase such low-status words as "interest," "intention," "belief" and the like" (p. 35; emphasis added).

Finally, a clearer picture is beginning to emerge. Chomsky clearly uses the widening of definitions from *The Behavior of Organisms* in 1938 to *Verbal Behavior* in 1957 to set up his claim that these technical terms not only become vague and arbitrary after the extrapolation but also, and more significantly, cover terms, paraphrasing low-status terms of common-sense mentalist psychology. I emphasize here not only Chomsky's claim that Skinner paraphrased common-sense mentalist terms, but also his claim that this is a hidden feature of Skinner's system. The interesting question at this point is whether Chomsky's criticism of the term reinforcement will further support this interpretation.

Reinforcement

The third basic concept Skinner extrapolates from his experimental work is reinforcement. Chomsky immediately points out that this term suffers from similar problems as the previous ones. And just like before, Chomsky examines Skinner's earlier definition of the term, and contrasts it with its use in *Verbal Behavior*. Earlier reinforcement was defined as the presentation of a certain kind of stimulus in a temporal relation with either a stimulus or a response. A reinforcing stimulus, says Skinner, is defined "By its power to produce the resulting change. There is no circularity about this: some stimuli are found to produce the change, others not, and they are classified as reinforcing and non-reinforcing accordingly" (1938, p. 62).

First, Chomsky points out that given this definition of a reinforcing stimulus and Skinner's Law of Conditioning Type R, we get a tautology. Thus, "if the occurrence of an operant is followed by presentation of a reinforcing stimulus (defined by its power to produce change in strength), the strength is increased."

Second, Chomsky makes what should now be a familiar point, namely that this definition is "perfectly appropriate" in the basic experimental work, but "perfectly useless" in the discussion of human behavior, "useless we can somehow characterize the stimuli which are reinforcing (and the situations under which they are reinforcing)" (p. 36).

Chomsky furthers his point by many examples of Skinner's use of reinforcement. In fact, Skinner does not, says Chomsky, take the requirement seriously that the reinforcer be an identifiable stimulus. Thus, "the artist ... is reinforced by the effects his works have upon ... others," and the writer is reinforced by the fact that his "verbal behavior may reach over centuries or to thousands of listeners or readers at the same time" (Skinner, 1957, p. 224). Chomsky concludes "From this sample, it can be seen that the notion of reinforcement has totally lost whatever objective meaning it may ever have had" (1959, p. 37).

Chomsky is clearly arguing in just the way he did before, playing on the narrow and wide interpretations of the definitions, arguing that each of Skinner's basic technical terms now lacks any objective meaning. And just as he claimed that the attempt of finding stimulus properties after the fact of the response was an empty device; to say now that a person reads, says, thinks, etc., what he likes, because he finds it reinforcing is just as empty. The extrapolated term reinforcement is, says Chomsky, reduced to a purely ritual function:

The phrase "X is reinforced by Y (stimulus, state of affairs, event, etc.)" is being used as a cover term for "X wants Y", "X likes Y", "X wishes that Y were the case," etc. Invoking the term "reinforcement" has no explanatory force, and any idea that this paraphrase introduces any new clarity or objectivity onto the description of wishing, liking, etc., is a serious

delusion. (Chomsky, 1959, p. 38)

This is exactly what Chomsky means when he charges Skinner with mentalism.

From something of a dilemma to a serious delusion

This concludes Chomsky's critique of the terms "stimulus," "response," ("response strength"), and "reinforcement." Notice how Chomsky slides from "something of a dilemma" to "a complete retreat" – "completely meaningless" – "cover term" – "tautology," and finally, "totally lost" and "a serious delusion."

I have already given the reason for limiting my discussion to this part of the critique. It should be quite clear by now what Chomsky's point is, for he does not so much criticize the concepts themselves, but much rather as extrapolated from basic experimental work to human behavior. Chomsky is then, all along, setting up a dilemma. As he says in the last section:

My purpose in discussing the concepts one by one was to show that in each case, if we take [Skinner's] terms in their literal meaning, the description covers almost no aspect of verbal behavior, and if we take them metaphorically, the description offers no improvement over various traditional formulations. The terms borrowed from experimental psychology simply lose their objective meaning with this extension, and take over the full vagueness of ordinary language. (Chomsky, 1959, p. 54)

Let me end this discussion of Chomsky's original review of Skinner's *Verbal Behavior* by summarizing Chomsky's main argument – the dilemma argument:

1. Skinner has built up a simple system of behavioral terms operationally defined to explain animal behavior in restricted experimental situations. Chomsky sees nothing wrong with that, and even expresses his admiration.
2. By extending a system of animal (i.e., simple or experimental) behavior to human (i.e., complex or real-life) behavior, the basic operationally defined terms become wider, thus:
3. It is only possible to identify the stimulus after the response has occurred (i.e., the empty device).
4. The boundaries of the behavioral unit (the operant) and the dependent variable (response strength) lack independent criteria of identification after the extrapolation to human behavior.
5. Reinforcement plus the definition of conditioning is a tautology.
6. There are no independent criteria of what is to count as a

reinforcer in the extended system.

7. In conclusion, each of Skinner's basic technical terms, stimulus, response, and reinforcement, loses its objectivity after the extrapolation. Together these terms, by functioning as cover terms and paraphrases of common sense, disguise a complete retreat to mentalist psychology.

MacCorquodale's answer

MacCorquodale's paper, "On Chomsky's Review of Skinner's *Verbal Behavior*" (1970) is the only response I know that attempts to answer Chomsky's critique directly – although some recent papers come very close (e.g. Palmer, 2000a; 2000b; and 2006; see also Czubaroff, 1988; Place, 1981; Stemmer, 2004). Various others have discussed the debate (see Wiest, 1967; Katahn & Koplín, 1968; Segal, 1975; McLeish & Martin, 1975; Richelle, 1976; Waller, 1977; and Lacey 1974 & 1980). Most attempt to answer only a particular point of Chomsky's critique without going to the heart of the matter. None even mention Chomsky's dilemma argument. MacCorquodale is not impressed by Chomsky's arguments. He says "I believe that the review is, in fact, quite answerable. In spite of its length it is highly redundant; nearly all of Chomsky's seeming cornucopia of criticisms of Skinner's basic behaviorism reduce in fact to only three." (MacCorquodale, 1970, p. 84)

These are:

1. "*Verbal Behavior* is an untested hypothesis which has, therefore, no claim upon our credibility" (p. 84).
2. "Skinner's technical terms are mere paraphrases for more traditional treatments of verbal behavior" (p. 88), and finally that:
3. "Speech is complex behavior whose understanding and explanation require a complex, meditational, neurological-genetic theory" (p. 90).

In (1) it seems that MacCorquodale wants to make the point that *Verbal Behavior* is a hypothesis, though neither Skinner nor Chomsky use that term. The hypothesis of *Verbal Behavior*, according to MacCorquodale, is simply that "the facts of verbal behavior are in the domain of the facts from which the system has been constructed" (*ibid.*). But this is just to say that Skinner extrapolates his basic system of animal behavior onto human behavior. Why then, does MacCorquodale insist that this is a hypothesis? The reason seems to be that this enables him to claim that Chomsky has not refuted Skinner. Consider this:

The fact is simply that we do not know if verbal behavior is within the domain of Skinner's system and whether the technical terms stimulus, response, reinforcement are literally

applicable to verbal behavior and correctly parse it into its functional parts of speech. (MacCorquodale, 1970, p. 86)

Granted that Chomsky has not shown the hypothesis to be false, there surely are some grounds for claiming that he has shown it to be unsupported. What does it take to refute a hypothesis? Notice that it is in the nature of the case that no empirical data can be the deciding factor here, for neither is Skinner's book empirical in that sense, but rather "an exercise in interpretation" (Skinner, 1975, p. 11), nor does Chomsky provide any data. Indeed, MacCorquodale says it all, when he admits that "Chomsky raises special considerations for doubting that each particular term of the basic theory applies to the verbal case" (p. 86).

It is clear this is the only way Chomsky can proceed, given that Skinner's book is an exercise in interpretation, rather than an accumulation of empirical data. As we will see later, Chomsky has indeed touched upon the crucial question, as even Skinner himself admits – namely the justification of the extrapolation.

It has to be concluded, therefore, that in no way does MacCorquodale answer Chomsky on this point. Though he points out – in terms of his "hypothesis" that we do not know whether Skinner's system applies, it is still Skinner's working assumption that it does. Concerning the criticism that we identify the stimulus when we hear the response, MacCorquodale says that stimuli are "free for the asking" in a hypothesis and that not until an empirical test has been conducted "is anyone entitled to conclude that these are not stimuli for those responses" (p. 86).

Though quite true, this does not answer Chomsky's point in any way. The argument is that Skinner's terms become too wide or vague after the extrapolation to human behavior. MacCorquodale (1970) merely reiterates that this is not true. He says "Skinner did not hypothesize a (hypothetical) stimulus. The stimulus is as real as ever. He hypothesized that there is a controlling relation between the real stimulus and the real response" (p. 86). It should be obvious, given my interpretation of Chomsky's dilemma argument, that this merely begs the question at issue.

I should add at this point that I skip much of MacCorquodale's comments, as they are not directed at Chomsky's main argument. Much of MacCorquodale's answer concerns the technical terms specially introduced by Skinner to account for verbal behavior. Here MacCorquodale does a much better job, forcefully answering Chomsky's many elementary mistakes concerning these terms. See for instance Chomsky's inaccurate treatment of "mand" (Chomsky, 1959, section 7) and MacCorquodale's answer (MacCorquodale, 1970, p. 96).

The reason for Chomsky's misunderstandings here are probably those that he is too interested in stopping the extrapolation to verbal behavior altogether. Maybe, also the revealing fact (in a later admission) that he

wrote the review before Skinner published the book! (Virués-Ortega, 2006, p. 246). Maybe Chomsky can be forgiven since he probably had access to the notes (Hefferline, 1947) from Skinner's summer course at Columbia in the summer of 1947. The notes were widely distributed at that time.

MacCorquodale's answer concerning the term reinforcement is even less to the point. His aim seems to be to defend Skinner by holding on to the claim that Skinner "does not say or imply that the reinforcement for verbal behavior must be applied with 'meticulous care'" (p. 87). MacCorquodale adds that Skinner does not even claim that any reinforcement is necessary for verbal behavior. If true, this trivializes the entire Skinnerian program. MacCorquodale does correctly point out that Chomsky is complaining because reinforcers can only be postdicted from the fact of reinforcement:

The fault, if any, is in nature, not in our theories. Reinforcers seem in fact to have only one universal property: they reinforce, and no amount of dissatisfaction will either [sic] add a correlated property nor disprove the fact that they reinforce. (p. 87)

The fact is that Chomsky finds Skinner's functional or operational definition unsatisfactory. But the quote above in no way answers that worry. It merely reiterates: A reinforcer is simply that which reinforces.

In all fairness, it must be mentioned that MacCorquodale discusses data showing that all reinforcers are at least partially trans-situational, and that reinforcers can be classified into species-specific (i.e., the unconditioned ones) and species-independent. Together, these considerations provide information for predicting which stimuli will reinforce a given response, and provide constraints upon *ad hoc* reinforcer explanations.

Paul Meehl has provided an even stronger answer along these lines (Meehl, 1950). Meehl's basic point is that circularity has two meanings. First is the circularity in definition "in which an unfamiliar term is defined by using other terms which are (directly or ultimately) defined by the term in question" (p. 54). Skinner's definitions are not circular in this way, for the words *stimulus*, *strength*, *increase*, and *response* are all definable without reference to the fact or theory of reinforcement. Meehl's second point is:

The other meaning of the word circularity refers ... to the establishment of propositions. We speak of *proofs* as being circular if it can be shown that in the process of establishing (proving) a proposition we have made use of the probandum. I am not aware that any responsible theorist has attempted to "prove" the Law of Effect in this way. (Meehl, 1950, p. 55; emphasis in original)

In Skinner's first book he defines operant conditioning this way: "If the

occurrence of an operant is followed by presentation of a reinforcing stimulus, the strength is increased (1938, p. 21). This effectively says that an operant is reinforced by a reinforcer, or that a reinforcer is that which is reinforcing. Many scientific definitions are tautological in this sense – think “survival of the fittest” in evolutionary biology.

The definitions of reinforcement and conditioning are not circular, for each is not defined in terms of the other. What does follow is that no empirical content has been supplied by these definitions. In other words, we do not know whether there is any such thing as a reinforcer, or how to go about finding one, but only that if we find any, then they apparently will have the property of strengthening operants. But Chomsky does not develop this point beyond the mere fact of mentioning a tautology. This illustrates well his main point, being the dilemma argument itself, not some intricacies in the definitions themselves.

MacCorquodale’s neglect of the dilemma argument

So far, we have discussed MacCorquodale’s treatment of the first of the criticisms he finds in Chomsky’s review. The second one is that Skinner’s technical terms are mere paraphrases from the more traditional treatment of verbal behavior. MacCorquodale does come close to the essence of Chomsky’s critique here, pointing out that: “this point is at very high strength in Chomsky’s review” (p. 88). He discusses one such alleged paraphrase in some detail. The example is of “stimulus control” as a paraphrase of the traditional term “reference.” He thinks Chomsky is badly mistaken here, and that it stems from his neglect of Skinner’s discussion of multiple causation and the erroneous belief that by naming one stimulus for a verbal response we name its only stimulus.

MacCorquodale is right on both of these points, Chomsky does neglect Skinner’s frequent discussions of multiple causation (see Part III, Ch. 9: “Multiple Causation”, pp. 227-309 in *Verbal Behavior*) and consequently thinks that it makes sense to speak of the stimulus for everything. MacCorquodale is clearly on the right track here. The following rather lengthy quote, however shows that he still does not grasp Chomsky’s argument:

“No one technical term in Skinner’s causal verbal analysis covers all instances of reference (nor was any intended to), and the one term “stimulus control” covers much that is not reference in the traditional sense. The same argument can be made for the nonequivalence of the other terms, deprivation, reinforcement, and probability, to other more traditional terms; if these are simply paraphrases, they do not map unequivocally and isomorphically, term to term, into each other. Curiously Chomsky seems to sense this too, and so criticizes the

behavioristic paraphrase for blurring the traditional concepts!
Given all this, it seems quite obvious that the term “paraphrase”
is simply inappropriate in this context.” (1970, p. 89)

As discussed earlier, Chomsky claims that we face a dilemma in interpreting Skinner’s technical terms as extrapolated to human behavior. We could, he thinks, understand Skinner’s technical terms literally or metaphorically. In the first case the description covers almost no aspect of verbal behavior, Chomsky claims, and in the second case the description offers no improvement over various traditional formulations. Chomsky, therefore, does not claim that Skinner is trying to translate traditional mentalist terms one by one, but is making that interpretation of Skinner as a horn of a dilemma. The reason that that interpretation would not work well for Skinner, says Chomsky (and MacCorquodale) is that none of Skinner’s terms fits a particular mentalist term. Chomsky does not, by saying this, contradict his earlier interpretation (as MacCorquodale thinks) but merely points out that if interpreted that way, Skinner’s paraphrase offers no improvement over the traditional formulations.

I must conclude then, that though MacCorquodale realizes that the paraphrased argument is important for Chomsky, he does not get its purpose. MacCorquodale endeavors to show that when Skinner puts forward a hypothesis, he is not translating mentalist terms. However, this has no bearing on Chomsky’s argument, for does not deny that the hypothesis is a hypothesis, but merely questions the support for it.

E. Erwin, in a book on the foundations of behavior therapy, came to a similar conclusion. He says:

“The fact remains that MacCorquodale merely attempts to show, in each case he discusses, that Chomsky does not refute Skinner’s causal claims; he provides no evidence that any of these claims is true. Hence, if Chomsky’s key contention is [that in *Verbal Behavior* Skinner fails to provide adequate evidence for his hypothesis], then MacCorquodale, not matter what else he does, fails to meet the key criticism.” (1978, p. 93)

Chomsky’s third and final criticism, according to MacCorquodale, is that “speech is complex whose understanding and explanation require a complex, meditational, neurological theory.”

Though questions of this sort are relevant and important to both Skinner and Chomsky, they cannot concern us at this point. They do indeed take up much space both in Chomsky’s review and MacCorquodale’s answer, but only after Chomsky has advanced the dilemma argument. They serve as alternatives, once the dilemma argument has been seen to have its effect. Therefore, this part of the debate does not concern us here.

There is only one place where Chomsky does answer MacCorquodale directly. This he does in an article that is an extension of his review (of

Beyond Freedom and Dignity). First Chomsky points out that Skinner never responded to him, and that:

“Skinner does not comprehend the basic criticism: when his formulations are interpreted literally, they are trivially true, unsupported by evidence, or clearly false; and when these assertions are interpreted in his characteristic vague and metaphorical way, they are merely a poor substitute for ordinary usage.” (1972, p. 19)

This of course, is the dilemma argument. Later, in the same article, Chomsky points out that, to his credit, Skinner recognized quite early that only through a successful analysis of language could he extend his theory to complex human behavior. But by comparing Skinner’s actual results with his claims, Chomsky now thinks that:

“we gain a good insight into the nature of Skinner’s science of behavior. My impression is, in fact, that the claims are becoming more extreme and more strident as the inability to support them and the reasons for this failure become increasingly obvious.” (1972, p. 24)

This fits in very nicely with my emphasis on the extrapolation. The quote also shows that Chomsky is now even more pessimistic about “the science of behavior,” presumably because of the behaviorist’s inability to answer or even comprehend the basic dilemma argument. Finally, in his short answer to MacCorquodale, Chomsky makes no attempt to answer any of MacCorquodale’s arguments (many of which are quite valid), for once again he solely relies on the dilemma argument.

“The main confusion ... is this. MacCorquodale assumes that I was attempting to disprove Skinner’s thesis, and he points out that I present no data to disprove them. But my point, rather, was to demonstrate that when Skinner’s assertions are taken literally, they are false on the face of it ... or else quite vacuous.” (1972, p. 24; footnote)

The current state of the debate

My point in discussing Chomsky’s critique in such detail has not been to show that Chomsky is right (or wrong), but simply to point out that the aim and force of his criticism is generally ignored. This is equally true, as has been shown, not only of Skinner’s defenders, but also of most followers of Chomsky, who have written on the debate. So, while I claim that Skinnerians cannot (or rather, should not) rest confident with

MacCorquodale's answer, I also want to claim that Chomskeans should look more carefully at the debate.

As a quick look at various evaluations of the debate will show, quite unwarranted conclusions concerning its outcome are predominant. Thus, commentators variously refer to Chomsky's review as: "devastating" (Campbell & Wales, 1970, p. 248), "entirely well founded," "right" (Fodor, 1975, p. 101 and 102), "brilliant" (Malcolm, 1964 p. 154), "undoubtedly valid" (Lyons, 1970a, p. 85), and even that it is "the most devastating review ever written" and that it "sounded the death-knell for behaviorism" (Smith, 1999, p. 97) to name but a few.

It should also be mentioned that many (mentioned above) have attempted to answer Chomsky and one (Adelman, 1975) scolds Chomsky for his ignorance of psychology in general, and behaviorism and radical behaviorism in particular. Adelman even (and correctly) lists 6 gross errors (p. 30-32) Chomsky makes, ranging from misquotes to basic errors.

Skinner never answered Chomsky directly and Chomsky has never seen any reason to amend or correct his views on the original review, although many have found numerous errors. Chomsky had a good opportunity to do this in the Chomsky-Place correspondence from 1993-94 (Chomsky, Place & Schoneberger, 2000) and well as in a series of interviews (Rondal, 1994). Further, Chomsky was once directly asked the direct question that Skinner was right when he said that Chomsky missed the point. In particular, the complicated question pointed out that some of the concepts were not Skinner's (Hineline & Wanchisen, 1989; Luzoro, 1992, MacCorquodale, 1970, Wiest, 1967). How would Chomsky consider these claims?

Chomsky's reply was:

I already responded 30 years ago, in a footnote to a review of Skinner's *Beyond Freedom and Dignity*. Most is just inaccurate ... As for the rest, the authors missed the point of the review: There is an interpretation of Skinner in which he is taken literally, and it is false; there is an interpretation in which he is taken metaphorically, and it is a bad translation of ordinary mentalistic terminology into terminology borrowed from the lab and deprived of meaning. Their critiques are limited to pointing out that the latter interpretation is possible. (Virués-Ortega, 2006, p. 247; emphasis added)

Once again, we only get the dilemma argument. Chomsky is not interested in correcting minor faults or inaccuracies; it is all based on the basic argument. However, he does change his dilemma slightly. He does say as before, if taken metaphorically, then "bad translation" and "deprived of meaning" (i.e. return to mentalism) but taken literally, "and it is false" (ibid.). Before that, he did not go so far. In fact, he has said the opposite all along. That Skinner's experimental work is of a high standard (Chomsky, 1959, p. 28; Virués-Ortega, 2006, p. 249). Chomsky has said that he

specifically criticized Skinner because he was the culmination (high praise indeed!) of the longstanding empiricist tradition of Locke, Berkeley, and Hume. “My reason for discussing Skinner’s book [*Verbal Behavior*] in such detail was that it was the most careful and thoroughgoing presentation of such speculations” (1967, p. 143).

Finally, it is interesting to see how Chomsky replies to the direct question that his review is written in an “angry” tone (mentioning Chomsky’s term from the review: “Perfectly useless,” “tautology,” “vacuous,” “quite empty,” etc. Chomsky’s answer is revealing: “I checked to find the context: Here it is: This is a perfectly appropriate definition for the study of schedules of reinforcement. It is perfectly useless, however, in the discussion of real-life behavior” (Virués-Ortega, 2006, p. 249; emphasis added).

And once again, we see the dilemma argument. Chomsky’s point is that no one has responded to his criticism that when extended the narrow technical terms become “perfectly useless,” in the descriptive non-angry sense, he says, of being a mere statement of fact.

The extrapolation

It was established earlier that Skinner can adopt the wider definitions of his technical terms and accept the consequences of not having (conclusively) shown all behavior to be lawful. This does not force him to restrict his attention to areas where behavior has been shown to be lawful, but it does force him – once the extrapolation has been made – to justify his claim and to give (some) criteria for the determination (or identification) of his technical terms in each case.

But is this really such an important criticism? Is Skinner’s move from *The Behavior of Organisms* in 1938, to *Science and Human Behavior* in 1953, and especially, to *Verbal Behavior*, which Skinner didn’t publish until 1957, so important? Is not the core of Skinner’s theory, or so the objection might continue, contained in his first book? We have seen that MacCorquodale does not think much of Chomsky’s criticism on this point, for Skinner’s extrapolated system is just a “hypothesis” in MacCorquodale’s terms.

I have argued that this is not much of an answer (except maybe to show that Chomsky has not refuted Skinner) and should add here that it does not do full justice to Skinner’s theory either. Surely, Skinner thinks more of his later (and extended) theory than as a mere hypothesis. Skinner says this quite clearly at the end of his first book. He says about *The Behavior of Organisms*:

The importance of a science of behavior derives largely from the possibility of an eventual extension to human affairs ... The book represents nothing more than an experimental analysis of a

representative sample of behavior. Let him extrapolate who will (1938, p. 441-442; emphasis added)

We see that Skinner uses the term “extrapolation” and does think the extrapolation is of major importance. He adds,

We can neither assert nor deny discontinuity between the human and subhuman fields ... If, nevertheless, the author of a book of this sort is expected to hazard a guess publicly, I may say that the only differences I expect to see revealed between the behavior of rat and man (aside from enormous differences of complexity) lie in the field of verbal behavior. (Skinner, 1938, p. 442; emphasis added)

Skinner’s Harvard friend, the philosopher William Van Orman Quine (whom Chomsky later also attacks; see Chomsky, 1977, chapter 4: Empiricism and Rationalism), comments especially on this in a letter to Skinner:

Many thanks for *The Behavior of Organisms*. It’s a tremendous thing ... a masterly job of cold, clear writing and thinking. And the utter freedom from hedges is a great relief. (Quine, May 17, 1939, Harvard University Archives. HUGFP 60.10 Chronological correspondence, 1928-1979. Earliest Correspondence. Box 1 1928-1950.)

Quine then writes up the Skinner quote above, and adds exclamations:

“If, nevertheless, the author ... is expected to hazard a guess publicly ... (aside from enormous differences of complexity) lies [perfect build-up for a hedge] in the field of verbal behavior [thud!].” (*ibid.*)

Conclusion

The main purpose of this paper is not to resolve the Skinner/Chomsky debate one way or the other, but rather to show that the debate is still of interest and that if Chomsky’s original review of *Verbal Behavior* is interpreted as a constructive criticism, certain highly interesting consequences follow. There is one basic argument being developed all through Chomsky’s review that is generally overlooked. This is the dilemma argument.

Chomsky shows quite clearly that this is his main criticism, for in his later writings he only says that MacCorquodale and Skinner do not comprehend this basic criticism. Regarding all those who have attempted to

defend Skinner – and some did a pretty good job – Chomsky doesn't bother to reply to any specifics, but only relies on this one type of criticism.

The dilemma argument is just a question mark regarding narrow versus wider definitions – or put differently, the extrapolation of Skinner's basic experimental terms to human verbal behavior. This extension is of prime importance, for the evaluation of Skinner's later theory – as both Skinner and Chomsky would agree.

Finally, the surviving part of Chomsky's criticism can be construed as constructive as it focuses the issue on definitions of key terms in the behaviorist vocabulary, as well as on the importance of independent criteria of identification for them. We should therefore regard Chomsky's review of *Verbal Behavior* as a challenge – a challenge for the (operant) behaviorist to provide independent criteria for the determination of each technical term that plays an explanatory role in the theory.

Two main areas need fleshing out. One is the actual possibility of a pure science of behavior – of behavior as the subject matter – and not as an indicator of something else, whether it be the mind, capacities, or the soul. A thorough analysis is needed of Skinner's theory from the beginnings in 1938 with *The Behavior of Organisms*, through its extrapolation to society in general in *Science and Human Behavior* (1953) and finally to *Verbal Behavior* (1957). The question is what kind of extrapolation this is and how it differs from a top-down strategy of the mentalist and some cognitivists. A further question is the fleshing out of Chomsky's own quite negative view of the possibility of any science of psychology. Then there is the possibility that it is altogether wrong to view the development of Skinner's theories as moving slowly from simple bottom-up experiments with lower animals to a later extrapolation to more complex human behavior.

This is the answer that I personally want to give to Chomsky's dilemma argument – in effect by turning it on its head, by pointing out that Skinner did not in fact first develop his simple experimental theory, only later wanting to extrapolate it. Although Skinner himself does sometimes seem to say as much, it is my belief that Skinner all along had two interconnected research programs going on at the same time, simple rat experiments and detailed work on human verbal behavior – at least as early as 1934, and further that is in the latter – human – experiments that Skinner first develops his most basic term: the operant – but to prove that is beyond the scope of the present paper.

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