Skinner and Chomsky 30 Years Later
Or: The Return of the Repressed*

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If we have learned nothing else in the last thirty years, we have learned to understand the importance of such variables as context and audience. In this particular context and with this particular audience, I thought it unlikely that anyone would come expecting me to resurrect Skinner's work from its very deep grave only to bury it again. Nevertheless, I felt that my rather bland title "Skinner and Chomsky 30 Years Later" called for a subtitle to properly frame my historiographic account of the fate of Skinner's famous 1957 book *Verbal Behavior* and Chomsky's more-famous 1959 review of it that appeared in *Language*.

In searching for an appropriate subtitle, I extended the idea of graves and exhumations and hit on "The Ghost of Christmas Past." The image of behaviorism as ghost will resonate for those of you for whom the stimulus of the word "behaviorism" elicits a very strong negative response by calling to mind the spectres of other words such as "manipulation" and "control" and by suggesting the frightening reductions of human activity to that of "rats pressing bars." If for some of you behaviorism is a spectral dragon, your hero will certainly be Chomsky who was, almost unilaterally, acknowledged to have slain that monster with the well-aimed lance of his 1959 review.

However, since my sympathies are firmly with Skinner—and I make haste to foreground this bias—I wished to stimulate sweeter responses from the audience and, thus, hit on a second candidate, namely: "Snow White Awakens." This subtitle plays on behaviorism as our heroine and casts Chomsky into the role either of the huntsman sent to slay Snow White and bring back her heart as proof of the deed or of the wicked stepmother who forced down our heroine's throat the poisoned apple of essentialism and question-begging nativism. Of course, Snow White does not die; she merely falls into a deep sleep. Recently, she has been awakened by the kiss of Prince Charming, a handsome connectionist model known as Parallel Distributed Processing. Connectionism, it might be said—allowing a mix of metaphors and fairy stories—is "behaviorism in computer's clothing."[1]

Again, however, since my romantic impulses are generally under the control of different intraverbal operants, I rejected the Snow White allusion in favor of presenting my account as a psychodrama with the subtitle: "The Return of the Repressed." It's a classic story of repression that began when strict behaviorism transgressed the bounds of decency by entering the realm of human endeavor and the sacred circle of verbal behavior. It found itself instantly driven back by the might and deeply culturally-inscribed forces of rationalism, formalism, innatism, and universalism. Its return is like all returns in that nothing ever returns unchanged: strict, old-fashioned behaviorism has been updated by biological thinking about the brain, most notably Gerald Edelman's work on what he calls neural darwinism.

For the period from the late 1950's to

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[1] See Seymour Papert (1988, p. 9). Papert also uses the Snow White conceit in his paper to tell the story of the return of behaviorism/connectionism.

the early 1980's, I have identified 4 reasons for the behaviorism's repression and/or the success of generative grammar: i) cognitive taste; ii) the legacy of the 1960's; iii) the power of essentializing humanism; and iv) the discipline of linguistics as it conceived of itself through its textual tradition. Changes in these same 4 categories have provided a more positive climate for behaviorism in the late 1980's.

i) Cognitive Taste

There was a distinct aesthetic appeal in the transformational approach. Elsewhere, I have referred to the Bauhaus "feel" of generative grammar with its taste for a powerfully abstracted Cartesian geometric (Andresen, 1988). It was cool and modern, stripped of ornamentation, and it operated in the hushed world of the idealized speaker-listener in a streamlined, dust-free speech community. Transformational derivations looked crisp and scientific on a page, and transformational analyses were valued for their elegance and economy. Within the framework of transformational grammar, the study of the finished monologic utterance was an art.[2]

By comparison (if anyone had bothered to read Skinner to compare it) Verbal Behavior, with its rush of details, its humor and its eccentricities, must have seemed cluttered and inelegant. There is little having to do with language in the widest possible sense that does not receive Skinner's attention: "reading, writing, word associations, translation, belief, wit, verbal 'slips' and distortions, Empsonian 'ambiguities,' verbal games and puzzles, hypnosis . . . metaphor, abstraction, grammar and syntax, logic (the nature of assertion, negation and predication), scientific method, and a final chapter on no less than thinking" (Smith, 1957, p. 4).

Now, of all the criticisms levelled against Skinner, no one at the time accused him of "bad style." However, Verbal Behavior is a frankly noisy book, resounding with exclamations of Fire! and Water! and illustrated with a welter of lively examples designed, in a functional analysis, not to describe something's features but to show how something operates. My point here is that Skinner's book reads well in the late 1980's set against the postmodern aesthetic with its new geometry. I refer, of course, to the fractal geometry of Benoit Mandelbrot who, opposing himself to the rigors of Bauhaus design, offers instead the model of the architecture of the Beaux-Arts, with its sculptures and gargoyles, its cornices and scrollwork. "Art that satisfies," Mandelbrot claims, "lacks scale, in the sense that it contains important elements at all sizes . . . . A Beaux-Arts paragon like the Paris Opera has no scale because it has every scale" (Gleick, 1987, p. 117). Verbal Behavior satisfies similarly in that it, too, has every scale: from a major rethinking of the conception of "language" itself down to the most "trivial" observations, e.g., Skinner's comment on the "delight" of a "good palindrome—for example, A man, a plan, a canal—Panama" (1957, p. 292).

And speaking of Mandelbrot, the new science of chaos has alerted us to the fact that the scientist can no longer ignore "very small influences." One thinks here of the supposedly "irrelevant" influences as "memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic)" of the Aspects model (Chomsky, 1965, p. 3). To put it bluntly, classical, rule-governed perfection is out, and the Butterfly Effect is in, with all its local unpredictability, statistical variation and just plain static.[3]

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[2] The phrase "finished monologic utterance" is from Vološinov who explains that: "guided by philological need, linguistics has always taken as its point of departure the finished monologic utterance—the ancient written monument, considering it the ultimate realium. All its methods and categories were elaborated in its work on this kind of defunct, monologic utterance or, rather, on a series of such utterances constituting a corpus for linguistics by virtue of common language alone" (1973 [1929], p. 72, emphasis mine).

[3] The Butterfly Effect is the name, half-jokingly, given to the phenomenon of "sensitive dependence on initial conditions." In meteorology, for example, the "sensitive dependence on initial conditions" plays on the idea that "a butterfly stirring the air today in Peking can transform storm systems next month in New York" (Gleick, 1987, p. 8).

*ii) The 1960's: Post-Sputnik
Shock and the War in Vietnam*

Here the topic is money, and the intersection is with algorithms. If I had never before been aware just how closely were linked the funding successes of TGG in the 1960's to the Artificial Intelligence industry at M.I.T., I became fully conscious of it in a recent article by Seymour Papert (1988). In this article, Papert acknowledges that he and Marvin Minsky were responsible for having killed in the dawn of cybernetics the early attempts to build neural networks with features inherited from the study of the brain—what would return two decades later as connectionism. Instead, Papert and Minsky were devoted to building models of intelligence out of computer programs, with their formalizable domains, computational complexity and algorithmic power. Papert states candidly that he was driven to argue vigorously against the early neural nets "from the fact that funding and research energy were being dissipated on what still appear to me ... to be misleading attempts to use connectionist methods in practical applications" (1988, pp. 4–5). The fact remains that, in the funding game, Papert and Minsky's computer programming approach to intelligence triumphed over those machine models with no "innards," that is with no innate disposition to acquire particular behaviors.

The successes of AI parallel the successes of TGG to capture NSF and NDA grant monies, and none of the funding can be divorced from the war in Vietnam. Frederick Newmeyer has noted that "the earliest money from the armed services filtered into the M.I.T. Research Laboratory of Electronics and various mechanical translation projects." Transformational research was deemed by some in the Air Force to hold promise of programming 'command and control' computer systems of use in planning and executing military operations in the mid-60's (Newmeyer and Emonds, 1971, p. 288).

On a grander scale than even that, artificial intelligence and the transformational approach benefitted from the weight of the tradition of symbolic information processing, which is the way of all Western philosophy, and not just Descartes and his descendants. What Papert and Minsky and Chomsky took for granted was what they had inherited from the tradition extending from Socrates to Kant, namely the idea that:

... understanding a domain consists in having a *theory* of that domain. A theory formulates the relationship among objective, *context-free* elements (simples, primitives, features, attributes, factors, data points, cues, etc.) in terms of abstract principles (covering laws, rules, programs, etc.). (Dreyfus and Dreyfus, 1988, p. 25).

In one of Chomsky's recent books, *Knowledge of Language* (1986), he is still committed to making such statement as: "children unerringly use *computationally complex* structure-dependent rules rather than computationally simple rules ..."; and "... the language faculty appears to be, at its core, a *computational system* that is rich and narrowly constrained in structure and rigid in its essential operations, nothing at all like a complex of dispositions or a system of habits and analogies" (1986, pp. 7, 43, emphasis mine). Like I said, transformational formalisms looked good—even *familiar*—on a page.[4]

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[4] In his critique of information processing models of human intelligence, Edelman writes: "According to information processing models, neural signals from the periphery are *encoded* in a variety of ways and are subsequently transformed by various nuclei and way stations; finally, they are retransformed in a variety of ways by increasingly sophisticated relay systems culminating in cortical processing and output. Perforce, this view puts a very strong emphasis on strict rules for the generation of precise wiring during the development of the brain. Such models strongly rely on neural coding (Bullock, 1967) and on the transfer of *information* from one particular neuron to another. This view also makes an assumption about the nature of memory which it considers to occur by representation of events through recording or replication of their informational details. The notion of information processing tends to put a strong emphasis on the ability of the central nervous system to *calculate* the relevant invariances of a physical world. This view culminates in discussions of algorithms and computations, on the assumption that the brain computes in an algorithmic manner (Marr, 1982). Categories of natural objects in the physical world are implicitly assumed to fall into defined classes or typologies that are

For the last thirty years at least, behaviorism and innatism have shared interlocking and inverse fates. The new and remarkable features of the more recent neural nets is that no one programs them. They are "trained" to do their tasks by a rigorous behaviorist process of external association of stimuli with reinforcements. However, since neural nets are usually simulations run on digital computers, it is sometimes doubted whether or not neural nets offer something revolutionarily new in artificial intelligence. Yet, no one doubts that the excitement generated by "the return of the repressed" neural nets is genuine; and while neural nets are not intended to be models of living organisms, they are inspired by

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accessible to a program. Pushing the notion even further, proponents of certain versions of this model are disposed to consider that the rules and representations (Chomsky, 1980) that appear to emerge in the realization of syntactical structures and higher semantic functions of language arise from corresponding structures at the neural level. If statistical variation enters at all into such a view of the brain, it is considered in terms of noise in a signal, which in information processing models is taken to be the main manifestations of variation" (1987, p. 38).

Table 2.1

Some Unresolved Structural and Functional Issues in Neuroscience

Facts	Proffered Explanations
Precise, prespecified, point-to-point wiring is excluded.	"Noise"
Uniquely specific connections cannot exist.	"Derived at higher levels"
Divergent overlapping arbors imply the existence of vast numbers of unidentifiable inputs to a cell.	"Codes"
The majority of anatomic connections are not functionally expressed.	"Silent synapses"
Major temporal fluctuations in maps; unique maps in each individual; variability of maps in adults dependent upon available input.	"Alternative systems"
Extensive generalization in object recognition without the need for language.	"Hidden cues"
Unitary appearance to the perceiver of perceptual processes that are in fact based upon complex parallel subprocesses.	"Algorithms, computations, invariants"

the neurobiological modeling of Edelman who has exposed the inadequacies of the information processing model of the brain (1987, p. 38).[5]

iii) The Power of Essentializing Humanism

If we want to find a reason why Skinner's approach to verbal behavior did not "take," we need look no farther than the "common-sense" theory of language and communicative reasons for language use in our culture. The ability to talk is part of our humanity, and a central axiom in the conception of that humanness is particularly hard to abandon: namely, that the human being is an actor, rather than a locality (see Vargas, 1986, p. 129).

Chomsky's 1959 review of Skinner played up and played on the worst fears engendered by behaviorist approaches to human activity. Chomsky's review is 31 pages long. On 13 of those pages, Chomsky refers to rats or Skinner's bar-pressing experiments, often more than once per page—although nowhere in *Verbal Behavior* is there mention of rats and, in my first and recent reading of *Verbal Behavior,* I found Skinner's book to be always fresh, often amusing and sometimes idiosyncratic—in short, very human. Nevertheless, Chomsky framed his entire

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[5] In the *New York Times Book Review* of Sunday, December 24, 1989, George Johnson has written a review of Jeremy Campbell's new book *The Improbable Machine. What the Upheavals in Artificial Intelligence Research Reveal About How the Mind Really Works.* Johnson is critical of Campbell's position that neural nets are truly new. Johnson defends Minsky et al. by writing that "no one in artificial intelligence ever believed that the brain processed information in the same way as the I.B.M. tabulating your telephone bill . . . . For those trying to understand intelligence, the computer was not a blueprint but an inspiration and a tool, the perfect device for modeling complex systems." Johnson does concede that: "True, a few people in artificial intelligence have been preoccupied with using symbolic logic to simulate the mind."

Chomsky might be identified as having been preoccupied with symbolic logic, and he might also be mentioned as one who *did* believe that the brain processed information like a computer.

Johnson does not mention Edelman's neurobiological work in his review.

review of *Verbal Behavior* with a five-page discussion of Skinner's *Behavior of Organisms* (1938) and recurrently associated Skinner's innovative terminology for human language-use with rats pressing bars.[6] The most egregious example was his dismissal of the term "verbal behavior." Some 19 pages into the review, Chomsky writes:

Consider first the term 'verbal behavior' itself. This is defined as 'behavior reinforced through the mediation of other persons.' The definition is clearly too broad. It would include as 'verbal behavior, for example, *a rat pressing the bar in a Skinner box,* a child brushing his teeth, a boxer retreating before an opponent, and a mechanic repairing an automobile. (1959, pp. 44–45, emphasis mine)

Chomsky's rhetorical move, that is, interlarding his review of Skinner with repeated references to "rats pressing bars," was extremely effective, but the scare tactic came at a price. With this excoriating review, Chomsky might be said to have programmatically exiled pragmatics from language theory.

Now, however, 30 years later, Skin-

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ner's original formulations and particularly the idea of "verbal behavior" do not seem so misguided or so threatening:

In defining verbal behavior as behavior reinforced through the mediation of other persons we do not, and cannot, specify any one form, mode or medium. Any movement capable of affecting another organism may be verbal. We are likely to single out vocal behavior, not only because it is commonest, but because it has little effect upon the physical environment and hence is almost necessarily verbal. But there are extensive written languages, sign languages, and languages in which the "speaker" stimulates the skin of the "listener." Audible behavior which is not vocal (for example, clapping the hands for a servant, or blowing a bugle) and gestures are verbal, although they may not compose an organized language. The skilled telegraphist behaves verbally by moving his wrist. Some of these forms normally arise only after vocal behavior has been established, but this is not necessarily so. Writing and typing may be either primordially verbal or transcriptions of a prior vocal form. Pointing to words is verbal—as, indeed, is all pointing, since it is effective only when it alters the behavior of someone. (1957, p. 14)

This passage will not strike as odd the reader used to the arguments of Jacques Derrida, who has contributed to deconstructing and blurring the facile dichotomies that have troubled Western philosophy for centuries, including that of written *versus* spoken. Nor would this passage strike as odd the reader familiar with the work of J. L. Austin, who constantly integrates his analysis of performative utterances with illustrative performative actions of the type: "suppose I bow deeply before you; it might not be clear whether I am doing obeisance to you or, say, stooping to observe the flora or to ease my indigestion." Austin explains the case as one of "actions which are non-linguistic but similar to performative utterances in that they are the performance of a conventional action (here ritual or ceremonial)" (1975 [1962], p. 69). The difference between Skinner and Austin on this score is only that for Skinner the first act (of ceremonial bowing) would count as verbal, but non-vocal.

What *does* strike the contemporary reader in Skinner's description of "verbal behavior" is the radical *non-automony* of that description. Not only does Skinner fail (or refuse) to separate the written from the spoken—a major disciplinary

heresy 30 years ago—and the vocal from the gestural, he also fails (or refuses) to separate out an "autonomous speaking agent." Nor does he separate the speaker from the listener in any given speech episode (see p. 84ff), including those instances when the speaker behaves as his own listener as in "thinking."

And, to be sure, Skinner does not separate human behaviors from the behaviors of other creatures. The memorable first paragraph of *Verbal Behavior* proposes a double continuity of verbal behavior with all other human behaviors, and of verbal behavior with the behaviors of other creatures:

Men act upon the world, and change it, and are changed in turn by the consequences of their action. Certain processes, which the human organism shares with other species, alter behavior so that it achieves a safer and more useful interchange with a particular environment. When appropriate behavior has been established, its consequences work through similar processes to keep it in force. If by chance the environment changes, old forms of behavior disappear, while new consequences build new forms. (1957, p. 1)

Here is one of Skinner's enduring insights, then, that of "selection by consequences," where behaviors, both for the species and for the individual, are selected and maintained by effects in a Darwinian framework (see also Skinner, 1981). Skinner has insisted "that no reputable student of animal behavior has ever taken the position that the animal comes to the laboratory as a virtual *tabula rasa,* that species' differences are insignificant, and that all responses are about equally conditionable to all stimuli" (1966, p. 1205). And this in spite of the routine charge that behaviorist models assume that a *general* theory of learning could hold across species. Current research certainly emphasizes the fact that particular evolutionary features conditioned by niche influence the learning and behavior of individual species (Edelman, 1987, p. 293). In *Neural Darwinism,* for example, Edelman acknowledges his relationship to a (Skinnerian) type of operant conditioning.[7] He is, however, crit-

ical of the (Skinnerian) type of radical behaviorism only insofar as it is environment-driven and allied to a covert notion of an empty animal driven by categories from the outside. Edelman insists that brain structures "*themselves* are *populations* upon which selection acts . . . [and] that such selection is the basis of perceptual categorization" (1987, p. 12).

It is important here to emphasize that, for Edelman, the world is initially an unlabelled place, that it does not have any particular information in it to instruct the

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ditioning. At the end, he identifies his own position as not representing an extraordinary divergence from a synthesis of the two types of behaviorisms:

"Learning is a specific change in the animal related to a positive or negative outcome, using an event or its absence as a signal for something else. Classical conditioning involves reliable presentation of a neutral conditioned stimulus (CS) prior to a hedonic stimulus (the unconditional stimulus, or US); the CS is a predictor or signal for the US, and the animal reacts to the CS as if it is in anticipation of the US. In contrast to this classical, or Pavlovian, conditioning, operant conditioning involves two phases. The first is behavior that leads sooner or later to reward or punishment, a kind of control by consequences (Skinner, 1981). The second phase consists of recurrence of adaptive behavior when the animal is again presented with the original situation.

"These two forms of conditioning are closely related: the selection of the behavior in a Pavlovian response depends upon the animal's ability to predict on the basis of the relation between the particular CS and the US; in the operant situation, the discriminative stimulus consists of all those environmental features (leading to categorization) that can control behavior. In both cases of conditioning, a change in expectancy, signaling a change in internal state based on categorization, is required.

"A way of summarizing the difference in the two modes is to say (Staddon, 1983) that classical conditioning is open-loop (or a procedure for assigning value to a *neutral* stimulus); in contrast, operant conditioning is closed-loop and leads to a change in the priority of action. While in this latter case action *is part of the animal's categorical representation,* classical procedures relating contingencies are nonetheless required to reinforce operant behavior. It is the Pavlovian mode that allows an animal to define a situation according to values depending upon prior innate and previously formed associations. In the operant mode, the animal must not only select candidate stimuli related to value but also select stimuli to allocate behavior. Given our view of global mappings and of gestures as part of categories, this does not represent an extraordinary shift in interpretive point of view" (1987, pp. 297–298).

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[7] In the following passages, Edelman summarizes the relation between classical and operating con-

brain like a computer tape, nor then does the brain act as a computer to interpret that information. Thus, the question is not *whether* human verbal behavior is biological but rather *at what level of specificity*. For Edelman, it is deeply biological that the brain is a general-purpose perceiving and thinking organ *not* inherently marked for a prescribed function or meaning. It is, for Edelman, deeply biological that the brain has no built-in program, that individual groups of neurons do not have any *a priori* fixed purpose, and that particular neurons in the brain's centers are not inherently marked for a prescribed function or meaning. It is adaptive that *no* program exists in the nervous system as a hardwired entity and that neural maps are selected by the brain in the course of development.[8]

Chomsky's point in his 1959 review that no "independent neuro-physiological evidence" is available (27) might have sounded convincing 30 years ago. However, in *Knowledge of Language,* he continues to assert that "so little is now known about the relevant aspects of the brain" (1986, p. 39). At some moment, the point must simply be conceded that neurophysiological advances have been made and that these have shown that the brain does not work in an algorithmic mode (Edelman, 1987, p. 44). The power of essentializing humanism is running out of steam, and the search for those genetically-encoded, hardwired, essential absolutes of humanness must eventually be abandonned.

And what is to fear in that? Chomsky reminds us most recently in *Language and Problems of Knowledge*:

Quite typically, intellectuals have been ideological and social managers, serving power or seeking to assume power themselves by taking control of popular movements of which they declare themselves to be the leaders. For people committed to control and manipulation it is quite useful to believe that human beings have no intrinsic moral and intellectual nature, that they are simply objects to be shaped by state and private managers and ideologues—who, of course, perceive what is good and right. Concern for intrinsic human nature poses moral barriers in the way of manipulation and control . . . . In accordance with these conceptions, human rights are rooted in human nature, and we violate fundamental human rights when people are forced to be slaves, wage slaves, servants of external power, subjected to systems of authority and domination, manipulated and controlled "for their own

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[8] Reeke and Edelman caution against assuming too much similarity between their biological work on neural networks and the connectionist models. They state that connectionist models "'look sideways to biology' because they take their inspiration and much of their terminology from the neural networks in living organisms, but they are not model neural networks (nor are they intended to be). Physicists, in their search for simplicity, are not prepared to deal with systems whose fundamental aspect lies in variability rather than regularity. In the attempt to find regularity in biological systems, many features have been introduced into their simulation in connectionist systems that are quite unbiological. These include the notion of memory as a replica or transformation of "information" given in the world (human memories are highly context- and affect-sensitive and to some extent nonveridical); the conception of memory retrieval as the relaxation of a network to a stable state (a brain is continually exposed to changing input patterns and has no opportunity to freeze them while waiting for the approach to equilibrium); the idea of energy minimization through simulated annealing (a brain decides actions more quickly than known annealing procedures could attain in model networks operating at the speeds of real neurons); the notion of bidirectional and symmetric single connections (synaptic connections in the brain are monodirectional); and the idea that learning can proceed by clamping the output of the system to a desired value while synaptic weights are adjusted according to some rule (the motor output of a brain can in general not be imposed externally). Yet each of these elements is present in one or another of the connectionist models" (Reeke and Edelman 1988, pp. 152-153).

The connectionist work Reeke and Edelman are evidently referring to here is by David Rumelhart

and James McClelland and the PDP Research Group where, in contrast to older work on AI, computer simulations of certain language learning tasks do not rely on the prior existence of rules and paradigms. As opposed to the old approach, where generalizations are conceived of in terms of rule use, the new approach conceives of generalizations in terms of cue acquisition.

Pinker and Prince (1988) critiqued the Rumelhart and McClelland simulation of the acquisition of the past tense in English. See, however, MacWhinney and Leinbach (1989) for analysis of the acquisition of German gender in a Rumelhart and McClelland framework.

Also see Rosenfield (1988) for a nice introduction into Edelman's work as well as a thorough critique of the idea of memory as "stored" images of replication of experience.

good." (1988, pp. 165–166; see also Chomsky, 1971)[9]

I thoroughly appreciate the moral high road Chomsky takes here. I, too, am against slavery, but it is notable that arguments against behaviorist and other non-essentialist accounts of human behavior(s) have been obliged to shift from an epistemological grounding to a moral one. Non-essentialist accounts—e.g., the account of verbal behavior offered by Skinner—seem to force "a retreat from an epistemological position to a moral one, transforming strictures from what *can* not be known [e.g., neurophysiological brain structure] to what *should* not be known [e.g., that verbal, and other human, interactions are at some level and perhaps fundamentally manipulative]" (Smith, 1957, p. 2). It seems that, in the most simplistic terms, an anti-behaviorist stance has the moral mandate to ward off the possibility that if a behaviorist account should happen to correspond to some aspect of reality, then knowledge of it *in the wrong hands* would be disastrous. Time and space limitations prevent me from fully commenting on this dimension of the Skinner/Chomsky juxtaposition. I will only point out that *nothing changes* as a result of differing accounts of human language, and that we have had vicious slavery, evil bloodshed and political tyrannies of various malevolent sorts without any theory of language (or human nature) whatsoever.

*iv) The Discipline of Linguistics
as It Conceived of Itself
Through Its Textual Tradition*

I return to Chomsky's review of Skinner. One of the more salient features of *Verbal Behavior* is Skinner's innovative terminology, and one of the more salient features of Chomsky's review was his constant effort to wrench that terminology back into the traditional definitions.

At various instances, Chomsky comments on Skinner's use of terms: "It appears that the word 'control' here is merely a misleading paraphrase for the traditional 'denote' or 'refer' (1959, p. 33); "We are no doubt to interpret the terms 'strength' and 'probability' in this context as paraphrases of more familiar locutions such as 'justified belief' or 'warranted assertability,' or something of the sort" (1959, p. 35); "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." (1959, p. 38). Chomsky's dislike of Skinner's terminology is thorough-going. He does not like *mand* or *tact* or *echoic operant,* and he certainly does not like anything resembling 'textual behavior' or 'intraverbal operant'.[10] Writes Chomsky:

A verbal response to a written stimulus (reading) is called 'textual behavior'. Other verbal responses to verbal stimuli are called 'intraverbal operants'. Paradigm instances are the response *four* to the stimulus *two plus two* or the response *Paris* to the stimulus *capital of France.* Simple conditioning may be sufficient to account for the response *four* to *two plus two,* but the notion of intraverbal response loses all meaning when we find it extended to cover most of the facts of history and many of the facts of science; all word association and 'flight of ideas'; all translations and paraphrase; reports of things seen, heard, or remembered; and, in general, large segments of scientific, mathematical, and literary discourse. (1959, pp. 51–52)

"Discourse" is the very interesting word in his passage, and the contemporary reader familiar with Foucault will be struck by just how similar are Skinner's notion of the "intraverbal" and Foucault's understanding of "discourses,"

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[9] I wish to thank Kary Smout for having pointed out the relevance of this passage in Chomsky (1988).

Chomsky (1971) might also be invoked for a discussion of the "dangers" and/or "vacuity" of behaviorism.

[10] "Intraverbal behavior" is that portion of "verbal behavior" that Skinner claims is under the control of "verbal stimuli." "Intraverbal behavior" is, thus, distinguishable from, say, a *tact* which would be an operant "exemplified when, in the presence of a doll, a child frequently achieves some sort of generalized reinforcement by saying *doll*" (Skinner, 1957, p. 81). The idea associated with "tact" is making contact with the physical world. The idea associated with "intraverbal" is operating within an already verbally-defined territory of thoughts/ideas/feelings.

See Vargas (1986) for an explanation and a reorganization of "intraverbal behavior."

these grand realms of words and texts and traditions we are disposed to calling "scientific" and "mathematical" and "literary." It is not, as Chomsky would have it, that the notion of intraverbal response "loses all meaning" when extended to cover these discourses; it is rather that these discourses can no longer make *certain kinds of truth claims* under Skinner's description. With such a thorough discrediting of Skinner's terminology by Chomsky, it is no wonder that Skinner wrote some years later that Chomsky's review was "not really a review of my book but of what Chomsky took, erroneously, to be my position" (1972, p. 346).[11]

The effect of Chomsky's review was to bar the possibility of Skinner participating in the intraverbal behavior called "linguistics." Chomsky opened his review with terms like *language* and *language behavior* and closed it with repeated instances of the phrases *present-day linguistics, grammar, theory of language, construction of a grammar,* and *mastery of language,* thus anchoring his review in its own textual tradition. And just in case anyone missed the intraverbal operants controlling Chomsky's discourse, he identified them unequivocally a few years later in *Aspects of the Theory of Syntax.* In the opening pages, after describing how linguistic theory is concerned primarily with an ideal speaker-listener, Chomsky buttressed his position by stating that it was consonant with that of the "founders of modern general lin-

guistics [the Neogrammarians?]," and declared firmly that "no cogent reason for modifying it has been offered" (1965, pp. 3–4).[12] Later in the chapter, and after a passing tip of the hat to Saussure's *langue/parole* dichotomy, he harkened back not only to Humboldt but also to the *grammaires générales* and accepted as given the problems of "linguistic theory" as traditionally posed. The advance Chomsky offered in *Aspects* was supposedly the ability to solve those problems (1965, p. 8).[13]

Again, Chomsky's pursuit of a path forged by "traditional linguistic theory" no doubt sounded less problematic in 1965 than it does today. The last twenty years of scholarship have seen the advent and the expansion of linguistic historiography, and that practice has made it impossible to point uncritically to some unitary, even monolithic, tradition that qualifies as "linguistics" or to accept uncritically the problems posed by that tradition. The last twenty years of linguistic historiography has permitted the reassessment and reintegration of numerous "lost" or "forgotten" or otherwise undervalued and disparaged ideas, approaches, and/or insights to the study of language that, for one reason or another, were either stricken from the historical record or disbarred from it from the beginning. I am not saying that I wish linguistics to suddenly rally around Skinner and adopt him *in toto* or *uncritically.* I *am* saying that his approach is interesting, even salutary, and that writing Skinner *into* record changes the history of what

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[11] I wish to thank Stephen Murray for having kindly sent me a copy of an exchange of letters he had with Skinner in 1977. Skinner's comments on Chomsky's review of *Beyond Freedom and Dignity* bear repeating. Skinner wrote in October 1977: "I have never actually read his long review of *Beyond Freedom and Dignity* though I have read three answers to it none of which the *New York Review* would publish. 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 verbal treatment. If I thought I could learn something which might lead to useful revisions of my position I would of course be willing to take the punishment, but Chomsky simply does not understand what I am talking about and I see no reason to listen to him."

[12] See Andresen (1990, p. 184) for a reinterpretation of the "scientific advances" achieved by the Neogrammarians.

[13] See Vološinov (1973 [1929]) for a brilliant critique of "Two Trends of Thought in Philosophy of Language," the two trends being "abstract objectivism" whose most striking expression is Saussure, and "individualistic subjectivism" whose foundations were laid by Wilhelm von Humboldt. For Vološinov, "abstract objectivism" is "listener-oriented" while "individualistic subjectivism" is "speaker-oriented." However, Vološinov's solution to the problems raised in the two opposing accounts was *not* to simply put the listener and speaker in the same skin, as Chomsky did, but to put them in dialogue.

we think our discipline to be and thereby reconfigures the disciplinary boundaries—which is, after all, the purpose of historiography.

The Skinner/Chomsky episode has a fascinating, curious and perhaps even unique place in the historical record of linguistic activity. The principals are still alive, although Skinner is reportedly very ill, and those of us who do not remember the splash of Chomsky's 1959 review have at least heard of it as part of the oral history of our discipline. Strangely, no reviews of *Verbal Behavior* appeared in psychology journals or other social science journals, and while all of Skinner's other books were widely reviewed, the psychologists were evidently just not interested in Skinner's work on language. As far as I can tell, the only two reviews ever published of *Verbal Behavior* were the one by Chomsky in *Language* and the one by O. K. Tikhomirov, also in 1959, in the journal *Word*. Since Tikhomirov's review was also generally negative, Skinner's oblivion in language studies seemed secured.

Given that Tikhomirov was a Soviet behaviorist in the Department of Psychology at the University of Moscow, his criticism of Skinner was, not surprisingly, entirely different from Chomsky's. Tikhomirov followed Pavlov who distinguished two systems of signals, the first being the signal system of reality which man shares with animals, while the second is attuned to Marxist/social understanding:

The very process of formation of speech activity in man does not manifest the regularities of behavior formation of animals. Man as a social being *acquires* socially determined patterns of behavior, including speech behavior. This process of acquisition signifies a new type of development in human behavior and is due precisely to the social existence of man. Furthermore, the acquisition of language becomes the subject of special training (in schools, for example) and consequently cannot be reduced to individual activity. (1959, p. 366)

We see here, then, a fifth—and final— reason why Skinner's approach did not "take" in the late 1950's. While, on the one hand, Skinner failed to "properly" acknowledge autonomous human agency and an autonomous human language

ability demanded by Chomsky, he also failed to "properly" foreground the Marxist/social dimension of human behavior demanded by Tikhomirov.

Nevertheless, many of Skinner's formulations do not seem radically at odds with the important study, *Marxism and the Philosophy of Language,* written by another Soviet, V. N. Vološinov, who formulated a "behavioral ideology" (1973 [1929], p. 91ff). Indulging in the kind of post hoc speculation that is the peculiar specialty of the historiographer, I will hazard to say that Skinner would have found many points of satisfaction in Vološinov's account of language. If we put Skinner and Vološinov in dialogue, it appears that:

a) Skinner probably would have "agreed" with Vološinov's formulation that: "individual consciousness is not the architect of the ideological superstructure, but only a tenant lodging in the social edifice of ideological signs" (1973 [1929], p. 13). It is certainly in accord with Skinner's notion of the individual as "locality" rather than "prime actor."

b) Skinner would have been sympathetic to Vološinov's discussion of that troublesome concept "meaning." Let us compare Vološinov's statement:

. . . there is no reason for saying that meaning belongs to a word as such. In essence, meaning belongs to a word in its position between speakers; that is, meaning is realized only in the process of active, responsive understanding. Meaning does not reside in the word or in the soul of the speaker or in the soul of the listener. Meaning is the *effect of interaction between speaker and listener produced via the material of a particular sound complex.* It is like an electric spark that occurs only when two different terminals are hooked together. (1973 [1929], pp. 102–103)

to Skinner's:

It is usually asserted that we can *see* meaning or purpose in behavior and should not omit it from our account. But meaning is not a property of behavior as such but of the conditions under which behavior occurs. Technically, meanings are to be found among the independent variables in a functional account, rather than as properties of a dependent variable. When someones says that he can see the meaning of a response, he means that he can infer some of the variables of which the response is usually a function. The issue is particularly important in the field of verbal behavior where

the concept of meaning enjoys unusual prestige. (1957, pp. 13–14)

That is, for neither Skinner nor Vološinov could "meanings" be properties of "things." "Meanings" could only be "by-products" of "speech episodes" or "dialogic events," which brings me to the point that:

c) Vološinov valorized the notion of the "dialogic" over and against the "monologic." *The actual reality of language-speech is not the abstract system of linguistic forms,"* writes Vološinov, *"and not the isolated monologic utterance, and not the psychophysiological act of its implementation, but the social event of verbal interaction implemented in an utterance or utterances"* (1973 [1929], p. 94). Verbal interaction, for Vološinov, is the basic reality of language, which includes dialogue in the narrow sense of the word, but also dialogue as verbal communication of any type whatsoever. A book, for instance, is for Vološinov a *"verbal performance in print"* (1973 [1929], p. 95).

Vološinov's idea that language is a "continuous process of becoming" and his related idea that individuals "do not receive a ready-made language at all, rather, they enter upon the stream of verbal communication" (1973 [1929], p. 81) would both certainly have received approval from Skinner. They have also found a recent voice in Paul Hopper and his work on "emergent grammar" (1988).

And, finally, d) in denying that language is handed down as a ready-made product, Vološinov avoids the reification of the system of language and attacks the hypostasizing tendencies of certain types of language studies (1973 [1929], p. 81). Skinner could only shake his head in dismay over the failure—called "hypostasis"—to recognize that the conditions responsible for an expression such as *It is four o'clock* (called a "response") may not share anything in common with the conditions responsible for the response on the part of the describing scientist (1957, p. 18). Perhaps Skinner is most useful to current linguists in having understood that the concept of "language" itself needs quotation marks.

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