On the Similarity Between Skinner and Chomsky
Per Linell

B. F. Skinner and Noam Chomsky are two well-known scholars generally thought to be their respective extreme opposites in their views on language and linguistic behavior. At least this has been the prevailing opinion since Chomsky's review (Chomsky 1959) of Skinner's Verbal Behavior (Skinner 1957). The purpose of this tiny paper is to bring some confusion into this picture. I would like to suggest the following:

(A) In his Verbal Behavior Skinner in fact leaves radical behaviorism in his attempt to account for some aspects of linguistic behavior, thereby incorporating traditional linguistic insights such as the need for analysis at several levels of abstraction.

(B) Chomsky's theory, or at least one possible interpretation of it, shares important features with behaviorism, such as causal determinism, mechanism and associationism.

It must be admitted, of course, that Skinner's and Chomsky's theories cannot be directly compared, since they are concerned with rather different things. Skinner studies what variables in each specific situation make people say something specific, i.e., what are the 'controlling' and 'reinforcing' 'stimulus dimensions.' This is not a speech act theory, dealing with the items of a speaker's behavior repertoire, but rather a theory of the speaker's momentary verbal responses to different stimuli. Chomsky, on the other hand, is not concerned with linguistic behavior and the use of language at all; he makes assertions about speakers' grammatical competence which is a very abstract knowledge not always directly reflected in linguistic performance. However, Skinner would surely not accept a Chomskyan 'competence' as an important variable controlling verbal behavior, while Chomsky, first, vehemently denies that Skinner's theory of verbal behavior has any significance at all (Chomsky 1959), and secondly, he definitely argues that the speaker possesses a ‘Chomskyan competence’ (i.e., a generative transformational grammar) which does interact in linguistic performance (in some way never made clear by Chomsky; Chomsky's characterizations of the relationship between competence and performance are vague and equivocal, see disc. in Derwing 1973, Steinberg 1975). Thus, the fact that Skinner and Chomsky do make the above-mentioned assertions (implicitly or explicitly) means that a discussion of whether they are really mutually incompatible in all respects is not meaningless.

Skinner bases his theory of verbal responding on the concept of operant conditioning. Verbal operants are classified as follows, depending on the nature of the controlling or reinforcing stimulus (-i) in the specific situation:

Operant type: Evoked (or reinforced) by stimulus type:

TACT
MAND

Essential operants (Skinner, op. cit.: 349)

TACT
MAND

ECHOC

TEXTUAL

INTRAVERBAL

AUTOCLITIC

An utterance (or even a certain specific aspect of it) may be a function of several different operants at the same time (multiple causality).

Though I cannot go into detail here, two properties of the stimulus-response (S−R) paradigm of behaviorism must be mentioned here, i.e. externalism and associationism. That is, the controlling (or reinforcing) variables of verbal behavior must be observable (or at least: observable in principle) physical entities. Internal mediating variables may exist but need not be referred to (according to Skinner) in the prediction (and explanation) of verbal behavior. (Factors like the individual's genetic endowment, motivational status and history of reinforcements may be treated as constants in the specific situation). The causally efficient mechanisms are explained in terms of (some kind of simple) associations between observable stimuli and responses. In an S−R chain, a behavioral unit which is a response to some stimulus (−i) may itself function as a stimulus thus triggering other responses. A stimulus is causally related to the response and must of course precede (or at least not follow) the response in time.
When a sentence is uttered, the specific words may be controlled by utterance-external stimuli (the cases of 'essential operants') or by interverbal associations (e.g., the word(s) emitted so far may elicit the following word by association). This of course is the view of the language which can be formalized in a finite-state grammar. It is well-known (at least since Chomsky, 1957) that this cannot account for even the most common types of utterances, since there are countless cases of properties of words being determined by words which follow (e.g., the choice of the definite article depending on the number and gender of the following noun in German noun phrases; der alte Mann vs. die alte Frau vs. das alte Haus) and cases of various nested dependencies (e.g., examples 5—7 below).

Now, as a matter of fact, Skinner has means to deal with these things, and this is what I would like to discuss. Thus, Skinner introduces the class of *autoclicits*. The term "autoclicits" is intended to suggest behavior which is based upon or depends upon other verbal behavior (Skinner, op. cit.: 315). This definition of Skinner's is not quite appropriate, since it does not appear to separate 'autoclicits' from 'intra-verbal'. It seems that autoclicits are always verbal responses to other aspects of the same utterance in which they occur. They comprise descriptive autoclicits (I see, I say, I imagine, I guess etc.), qualifying autoclicits (negation, assertion), quantifying autoclicits (all, every, some, relational autoclicits (predication, inflections, modal verbs, syntactic frames etc) and manipulative autoclicits (and, but, if, . . . then etc). It is immediately clear that autoclicits is a very powerful category; among other things it covers all of the morphology and syntax of utterances. What is important, however, is that Skinner leaves externalism- with-associationism when he brings in autoclicits. For an autocitic very often precedes, or is interspersed among, the verbal stimuli to which it is a response. This means that the autocitic cannot respond to the actual vocalizations in the speech signal but rather to counterparts of these in the speaker's utterance plan. They are not responses to overt behavior, but to 'covert or incipient or potential verbal behavior' (Chomsky 1959: 53). Consider, e.g., (1):

1. **Skinner is a genius.**

At most occasions, when (1) is uttered by someone, *Skinner and genius* would be 'essential operants.' *Skinner* may, for example, be a tact under the control of an object, namely the person BFS himself, and *genius* may be another tact under the control of a property of BFS, or it may be an intraverbal evoked by associations to the word *Skinner*. Now, as

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2. Other possibilities also exist; the whole utterance may, for example, be a textual operant (under the control of a written text).

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3. Note, however, that *genius* could hardly be a tact under the control of a property of Skinner in this case.

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Skinner observes (cf. op. cit.: 334 ff), the mere pronouncing of *Skinner genius* does not reflect common English practice. 'The responses evoked by a situation are essentially nongrammatical until they have been dealt with autocically' (op. cit.: 346). In our case, a 'relational autocitic of ordering and grouping' plus an 'autocitic of assertion' are evoked by the two constituent operants, thus together yielding a predication of the form (1). The autocitic is appears before at least one of the stimuli by which it is controlled. In (2) the negation would be an autocitic under the control of the whole of (1) (or rather some behavioral structure underlying it):

2. **Skinner is not a genius.**

In (3), it is true that is an autocitic operating on (2) (or the structure underlying it):

3. **It is true that Skinner is not a genius.**

It turns out that Skinner's 'autocitic under the control of X' very often corresponds to a (token of a) funcon of a function applied to X in a function-argument grammar, and sometimes it corresponds to a quantifier binding a variable in X as, e.g., *all* in (4):

4. **All swans are white.**

Skinner suggests that *all* is an autocitic modifying (the structure underlying) *Swans are white* (cf. disc. in Chomsky, 1959: 53). Skinner does not consider any complicated linguistic examples in his book *Verbal Behavior*, but it seems clear that he would need very complex nested stimulus-autocitic structures in many cases, e.g., (5) and (6):

5. **Skinner is not easy to refute.**

6. **It is obvious that either Skinner is crazy or our common sense is all wrong.**

Furthermore, he would need at least two different underlying S—R structures to derive physically identical pieces of overt verbal behavior in countless cases of grammatically ambiguous utterances, e.g., (7):

7. **Skinner is ready to eat.**

The utterance of (7) may be either under the control of a situation in which BFS is going to have dinner, or under the control of a rather different situation in which (7) is intended as an attempt to trigger the eating of BFS by some cannibals.
It is commonplace in grammar theory that sentences have to be syntactically analyzed at an abstract level distinct from the actual overt surface level. Skinner in fact recognizes this; his autocitic structures may provide at least some features of the underlying formal structures of sentences. For example, Skinner’s discussion of the sentence *He rented a leaky boat* (op. cit.: 347—8) is slightly reminiscent of a standard generative-transformational derivation.

Thus, Skinner asserts: ‘The speaker not only emits verbal responses appropriate to a situation or to his own conditions, he classifies, arranges, and manipulates this behavior. His activity is autocitic because it depends upon a supply of verbal responses already available.’ (op. cit.: 344). This arranging and manipulation must take place before the vocal behavior is executed, i.e., it belongs to the speaker’s planning of the utterances. Thus, I conclude that Skinner is actually operating with a theory which differentiates (a) a recursive S—R-structure (using plenty of autocitic functions) which is the speaker’s plan for the production of the utterance, and (b) the execution of this behavior plan. His theory is not one based on associations of actual external stimuli and responses, though he does not make this important point clear (nor does Chomsky in his review).

One may ask whether autocitics are the only category which has non-overt controllers. For example, are all ‘essential operands’ under the control of observable stimuli? Skinner seems to think so. But it is hard to believe him. Take for example the definite article in, e.g., (8), which is both an autocitic and a tact indicating ‘the specificity of the situation’.

(8) *(I met a man and his son.)* *The boy cried.*

Presumably, Skinner takes ‘the specificity of a situation’ to be a property of that physical situation. But anyone familiar with the use of articles knows that there are extreme difficulties in correlating their occurrences with properties of extralinguistic situations (cf. the notion of ‘tact’). There are many other types of examples of how Skinner’s stimuli are ‘driven into the organism’ to use a wording of Chomsky’s (1959: 32). Chomsky’s criticism is no doubt justified. Skinner’s way of explicating verbal behavior is unilluminative and is mostly just a disguise for mentalistic (I would prefer to say ‘phenomenological’) terms. A straightforward phenomenological language would serve the purposes much better.

It cannot be true that ‘the right way (or even a useful way)’ of taxonomizing the utterance forms in a language is by grouping together the ones whose production is contingent upon the same (or similar) eliciting stimuli’ (Fodor 1976: 100). Utterances are produced as results of complex interactions between the speaker’s mental states and processes and the external physical and social environment. This of course is not to deny that people often do talk about things in the external ‘stimulus situation’ when they talk, that there are some interesting relations between situations and what people tend to say in these situations, that there are other approaches to the mind-body problem that are much more unsound etc.

It is important to realize that (what I have called) Skinner’s ‘underlying structures’ are behavioral S—R-structures, i.e., entities of the same kind as overt stimuli and responses. These S—R-processes occur ‘mechanically,’ no recourse to a human agent is necessary. The things involved are ‘a train of events no less physical or inevitable than direct mechanical action, but clearly more difficult to describe’ (Skinner, op. cit.: 2). But even here, in this respect, Skinner and Chomsky perhaps go together. Chomsky has suggested that theoretical constructs in ‘competence’ are (psychologically) *real*, and much speculation has been generated as to what kind of reality things like syntactic deep structures and underlying (morpho)phonological forms may actually have. Chomsky is notoriously equivocal on these issues (cf. Derwing 1973, Linell 1974, Steinberg 1975), but at least some interpreters of Chomsky have brought him rather close to Skinnerian mechanism. Chomsky’s close colleague J. J. Katz is probably the one who has been most explicit (in his 1964 paper ‘Mentalism in Linguistics’). He in fact views ‘mentalism’ as paramechanism (though he of course does not say this quite explicitly).5

According to Katz, ‘every aspect of the mentalistic theory (e.g., a generative transformational grammar /PL) involves psychological reality’ (op. cit.: 133), and a generative grammar ‘and all its features have the same ontological status as the utterance itself’ (ibid.: 136). The linguist ‘invents a theory about the structure of this mechanism (i.e., mechanism underlying linguistic communication) and the causal chain connecting the mechanism to observable events, to explain how these internal causes produce linguistic communication as their effect’ (ibid.: 129). ‘The events to which the mentalist’s constructions refer can stand as links in the causal chain that contains vocalizations and sound waves as other links’ (ibid.: 129—130). Clearly this gives us a picture of the mind as a structure of mental entities which are related to each other and causally impinge on each other much like the components of a complicated closed physical system (say, a computer). Speakers are viewed as more or less mechanical input-output systems. This metaphys-

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4 I here leave out of consideration many obvious difficulties in a one-sided behaviorist approach to meaningful behavior, e.g., exclusively extensional semantics, inability or difficulty to cope with intentions, zero expressions, oblique speech acts etc.

5 Cf. however Katz (op. cit.: 125): ‘Such a version of mentalism (i.e., that Katz advocates /PL) is wholly compatible with the doctrine Bloomfield called ‘mechanism’.'
ics does not leave much room for the active creativity and conscious monitoring of a human agent. Instead, we are faced with a paramechanistic explanatory paradigm (Ryle 1949) not too different from a multistage S-R psychology. The function of the mental grammatical machinery is to a large extent independent of the speaker's control or conscious monitoring. For example, the creative process in speech production seems to consist solely in the setting up of a semantic-syntactic deep structure and the plugging in of certain lexical items (in morpheme-invariant abstract forms). This input structure to the derivation is some kind of a 'mental thing' (or rather a complex association of such things), the neurological correlate of which must be located somewhere in the brain (since the grammatical model must be 'isomorphic' to a neuro-physiological model [Katz, op. cit.: 129]). For the rest, the derivation will be an automatic process (at least if only 'obligatory' rules apply); the deep structure enters the deterministic rule system of the grammar, where each representation or rule elicits a new rule in a long chain reaction, until the final pronounceable phonetic representation is produced and the articulatory organs can start to work.

Such a model seems very difficult to reconcile with our everyday experience of how meaningful verbal behavior is produced. We would think of verbal behavior as intentional and meaningful. The speaker is normally conscious of his intentions to communicate a certain message in a certain way so as to affect the listener's beliefs, feelings and actions in a specific desired way. In formulating his message he tries to calculate the way in which the listener will presumably react to his message, and these considerations influence his way of communicating the message. The speaker's intentions will influence all aspects (semantic, grammatical and phonological) of his utterance.

Of course, the mechanistic model works no better for listeners. The process of understanding an utterance can hardly be accurately explained as a mechanical process of transforming a phonetic representation into a syntactic surface representation (or whatever you have) into a semantic representation. Rather, the listener actively uses the utterance (and his knowledge of the rules for its use) to make sense of it, i.e., he tries to construct an interpretation which could possibly correspond to what the speaker intended.

Of course, Katz' interpretation of Chomskyan mentalism is by no means universally accepted by generativists. A majority would probably dispute it, particularly since most of Chomsky's characterizations imply a more indirect relationship between 'competence' and 'perform-

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6 Plus, possibly, some feed-back mechanism which compares the semantic interpretation of the structure thus set up to the message intended. See e.g., Fodor et al. (1974: 391).

7 Optional rules may perhaps be assigned some probability measures.

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8 Cf. work in 'neurolinguistics' by scholars like Schnitzer and Witaker. For some discussion, see Linell (1974: 144--6).

9 For a more detailed argumentation of these points, see Allwood (1976: 13-16, 25-27).
and his competence may be in error (Chomsky 1965: 8). 'The greatest defect of classical philosophy of mind ... seems to me to be its unquestioned assumption that the properties and content of the mind are accessible to introspection' (Chomsky 1968: 22).

It may certainly be true that the distinction between conscious and unconscious processes is not very important in a psychological model of the actual physiological processes going on in the nervous system of an individual during thinking, speaking, listening, trying to understand etc. But it is important, I would maintain, in a theory of communicative competence. Yet, generativists are, at least sometimes, inclined to give a mechanistic account also of linguistic competence. And obviously, the more inclined one is to argue that consciousness is not a possible distinction, the more one has in common with behaviorism. Mental processes are described not as intentional and consciously monitored but rather as something which happens to people. Thus, there are indeed important similarities between Chomskyan generative linguistics and earlier American structuralism (many proponents of which were behaviorists).

Neither Chomsky nor Skinner presents a satisfactory theory of linguistic behavior or its underlying competence. Obviously, they are often wrong in different ways, but they do share some properties. Both give mechanistic or paramechanistic paradigms, which are rather bad adaptations of natural-science type theories to social phenomena. What one would want is a behavioral (but not behavioristic) theory of language which also provides a proper place for the insight that linguistic behavior is intentional, meaningful and rule-conforming, and that, in all probability, communicative linguistic competence concerns what the individual can perform in terms of such linguistic behavior.

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10 Jens Allwood (pers. comm.) has called my attention to this point.

11 Other aspects of this kinship are argued for in Iskonen (1974). See also Steinberg's (1975) excerpts from the works of Chomsky which clearly show his dependence on American structuralism. Consider also Chomsky's explanation of language acquisition which involves the postulation of an innate Language Acquisition Device which, by virtue of an evaluation measure, necessarily selects a unique and most highly valued (i.e., simple and general) grammar given certain linguistic input data. This, Derwing (1973: 53-63) argues, amounts to postulating an innate discovery procedure for grammars. This is remarkable in view of the fact that Chomsky has often argued against discovery procedures in his critique of American structuralist grammar (esp. phonology).

12 That Chomsky's theory is loaded with many kinds of other difficulties is shown in, e.g., Derwing (1973) and Linell (1974).

References


Kokemäki: Societas Philosophica et Phaenomenologica Finlandiae.


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