

## Bateson's Hierarchical Theory of Learning and Communication

By Eric Bredo

There are some major gaps in the view of behavioral change offered by much of contemporary learning theory. In particular: (1) Learning is divorced from development. Learning theories tend to focus on short-run changes without examining how they contribute to long-run development, while developmental theories focus on long-run changes without the benefit of any short-run mechanisms by which they might occur. (2) Individual task learning is separated from social learning. Learning theorists tend to focus on individual task learning independent of social context,<sup>1</sup> while socialization theorists focus on the effects of social context independent of the task. In short, knowledge of behavioral change seems to be divided along fault lines corresponding to short-term, task-relevant change versus long-term and socially relevant change.

These divisions have evidently arisen as researchers have simplified the problem of behavioral change by dividing it into different temporal or social strata. However, for whole persons in their complete environments these different aspects of change are linked. Learning surely cannot occur without some long-term developmental implications, just as development cannot occur without learning. Similarly, task and social aspects of learning evidently co-occur and have implications for one another. Such crosscutting linkages provided a rationale for theories which attempt to integrate the separated aspects of change, viewing relations across different levels of change in behavior.

In this essay I would like to consider an integrative, multilevel approach to learning proposed by Gregory Bateson. Bateson's approach differs from much contemporary learning theory in that it is based on a theory of communication rather than the problem-solving model which underlies cognitive learning theory, thus immediately altering the individualistic focus adopted in learning theory.<sup>2</sup> It bears considerable similarity to the work of some of the pragmatists, being similarly processual and interactional in approach. However, Bateson grounded his approach in information theory, cybernetics, and Russell's theory of logical types, giving it a more modern flavor. He also places greater or more explicit emphasis on the hierarchical aspects of systems. While this communication theory has been rather influential, giving rise to ethnographic approaches to face-to-face interaction and to the family systems approach to psychotherapy, the same cannot be said of his learning theory. The present essay seeks to reintroduce his learning theory while also elaborating some of its less developed aspects. In order to do this I will first describe Bateson's approach to communication and then his learning theory. I will conclude with some of the implications of the theory for a more integrated approach to behavioral change. My emphasis will be on the multilevel aspects

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1. Jerome Bruner notes: "Too often, human learning has been depicted in the paradigm of the lone organism pitted against nature — whether in the model of the behaviorist's organism shaping up responses to fit the geometries and probabilities of the world of stimuli, or in the Piagetian model where a lone child struggles single-handed to strike some equilibrium between assimilating the world to himself or himself to the world." Jerome Bruner, "Vygotsky: A Historical and Conceptual Perspective," in *Culture, Communication, and Cognition*, ed. James V. Wertsch (Cambridge, England: Cambridge University Press, 1985), 25.

2. For an elaboration of this problem-solving model, see Herbert A. Simon, *Models of Thought* (New Haven, Conn.: Yale University Press, 1979).

of his theory which make it complementary with single-level theories. In addition, I will also elaborate some aspects of his approach to learning, such as generalization within a given level of learning, in an attempt to flesh it out somewhat more fully.

#### COMMUNICATION

Bateson attempted to develop a theory of communication which is based on informational and behavioral linkages across different levels of systems. His approach to communication may be thought of as based on three assertions: (1) The meaning of a message depends upon its context. (2) Messages function at different logical levels, some serving to specify the contexts in which to interpret other messages. (3) Communicative subtleties, such as occur in play, art, and ritual, involve an interplay between messages at different logical levels. Each of these assertions may be seen as part of his overall approach to communication.

#### *Contexts*

"Context" is a key concept in Bateson's theory of communication as well as in other discussions of communication. It is of central importance because it helps specify the way in which information flows from a larger system to the parts of which it is composed.

Bateson used a variety of synonyms for context, such as "form," "pattern," and "relationship."<sup>3</sup> He defined contexts more formally, in terms drawn from information theory, as patterns of redundancy in sequences of events. Redundancy is significant because it allows one to predict parts of a sequence given knowledge of the whole and of particular other parts.<sup>4</sup> For instance, if you know the sorts of structures of which sentences are composed, you can use this knowledge, along with knowledge of a given part, to help anticipate other parts of the sentence. A context, then, is simply a pattern taken by a series of events, knowledge of which can help inform one of future events. It is a pattern considered in terms of its informational value.

The meaning of an event "in" a context, at least in the most elementary sense of "meaning," may be thought of as the set of other events that it allows one to predict. "I would argue . . . that the concept of 'redundancy' is at least a partial synonym of 'meaning.' As I see it, if the receiver can guess at missing parts of the message, then those parts which are received must, in fact, carry a meaning which refers to the missing parts and is information about those parts."<sup>5</sup> The same event would of course then have different meaning if it were part of a different context since it would lead to different predictions. This approach to meaning makes clear that it is not a psychological thing, or something added to an event, but is inherent in the potential predictability of the events making up a context.

Bateson's approach to contexts was not a dualistic one, at least not in his later works. He did not think of objects or events as "in" a context, at least in his later work, as though the context were in a container of some sort which held the object or event. Rather, objects or events are considered to be parts of the contexts which they help to compose. For example, this paragraph is a context for every sentence "in" it, since every sentence is also a part of the whole paragraph, helping to create the patterns implicit in it. Similarly, every number in the number series "2 4 6 8 . . ." is not only "in" the context of the other numbers in the series, but also contributes to making up the series. Thus for Bateson a context is the particular whole which a given

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3. "What has been said above will serve as sufficient definition of what is here meant by 'form and pattern.' The focus of discussion was upon form rather than content, upon context rather than upon what occurs 'in' a given context, upon relationship rather than upon the related persons or phenomena." Gregory Bateson, *Steps to an Ecology of Mind*, (New York: Ballantine Books, 1972), 154.

4. Gregory Bateson, "The Message of Reinforcement" (Unpublished manuscript), 1.

5. Bateson, "Redundancy and Coding", in *Steps to an Ecology of Mind*, 415.

part helps compose, not something separate from or abstracted from that part. This way of thinking of contents and contexts in part/whole terms, rather than in terms of inside and outside, makes the concept useful for linking multiple levels of analysis rather than for isolating analysis at each level. It avoids both extreme reductionism, in which wholes are seen as providing no new information, and extreme holism, in which parts are seen as providing no new information.

Bateson also considered higher-order contexts. Just as contexts consist of sequences of events, so may metacontexts consist of sequences of contexts, and so on. Thus contexts may have elaborate, hierarchical structures with each higher level providing information which helps narrow predictions about events at lower levels.

### *Social Contexts*

Bateson extended these basic ideas about context to include social contexts. Knowledge of social contexts may be used to predict and explain interactional events like knowledge of other contexts. However, in the case of social contexts, interactional sequences do not just follow a rule, but result from the use of rules in interpreting and constructing the sequence. One might say that predictability arises from the very fact that the interactants seek predictability in certain (conventional) ways.

A social context was for Bateson the particular type of social situation, or communicative relationship, operative among two or more individuals. Such a relationship exists when there is mutual awareness that the actions of others are responses to one's own actions.<sup>6</sup> Identifying the particular context is analogous to the interactants' figuring out the "game" currently being played and its current state.<sup>7</sup> Consider, for example, the elements making up a game. These include a set of states of affairs (e.g., positions on a chess board), the legal moves and objectives for each "side" vis-à-vis the other, and the procedures for taking turns in making moves. For interaction to consist of playing "chess" as opposed to doing something else, the interactants must be actively using these rules and responding to each other as though the other person were also using them. Their mutual establishment of the "name of the game" (e.g., chess), the roles being taken (e.g., white or black), and the present situation (e.g., the state of the board) specify the present context of their actions.<sup>8</sup>

Bateson's view of social contexts is a dynamic one, making different contexts operative at different points in time as the interactants implicitly propose, negotiate, agree or disagree, and hold each other accountable for agreements as to the interpretation of their actions. As he puts it, "The definition of a relationship depends not merely upon the skeleton of events which make up the interaction but also upon the way the individuals concerned see and interpret those events."<sup>9</sup> Clearly the operative perspectives may change over time.

Furthermore, the interactants are viewed as acting under uncertainty. Since their actions constitute only part of the larger social activity in which they are involved, their interaction is a construction, or assemblage, of which they each try to make sense while providing each other new clues as they build it. Each interactant's conscious knowledge and goals are also only part of their whole way of behaving so that they do not even fully know themselves in the context (compare with Mead's conscious "me" versus spontaneous "I"). Thus they must try to make sense of their own and

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6. Jurgen Ruesch and Gregory Bateson, *Communication: The Social Matrix of Psychiatry* (New York: W. W. Norton, 1968), 23.

7. While Bateson used a game metaphor, other common metaphors for social interaction are as "text" or as "drama." For a comparison of these different metaphors, see Clifford Geertz, "Blurred Genres: The Refiguration of Social Thought," in *Local Knowledge* (New York: Basic Books, 1983).

8. Bateson similarly noted that the name of the situation "specifies not only the status assignments (roles) of the participants and the rules pertaining to the gathering, but also the task or purpose to which a social situation is devoted." Bateson, *Steps to an Ecology of Mind*, 28.

9. Ruesch and Bateson, *Communication: The Social Matrix of Psychiatry*, 200.

each other's actions in the face of inevitable uncertainties arising from their own partiality.

### *Communication and Metacommunication*

Viewed communicatively, the role persons adopt in a situation is equivalent to the code in which they send and receive messages.<sup>10</sup> Communicators thus face a hermeneutic problem, having to use information about a message's content to help determine the code in which it is communicated and using guesses about its code to help interpret its content. Bateson considered every act of communication as having two aspects corresponding to these two sides of the interpretive problem. Every message has a "content" aspect, consisting of what it "says" or denotes, and a "relationship aspect," consisting of the social relationship that its being sent (at that moment) exemplifies.<sup>11</sup> Since social relationships furnish the code for interpreting messages, every expression of relationship may be considered metacommunicative.

In considering these different levels of language Bateson drew upon an analogy with different levels of formal logic. In first-order logic one can use various relationships to describe objects or events, but one cannot "talk" about these relationships themselves. In order to talk about relationships one needs a higher-order language such as second-order logic. But then in order to talk about its relationships one needs a meta-metalanguage, and so on. This hierarchy of such different orders of logic is like the different orders of context, in which one moves up the hierarchy by shifting focus from individuals to relationships to relationships-among-relationships, and so forth.

Problems arise in logic when different logical levels are not kept separated. For instance, paradoxical statements such as "this sentence is false" create obvious logical problems because the same word, "sentence" functions at two different levels. Where Russell and Whitehead's approach to this problem, in their theory of logical types, was to ban all such sentences by cleanly separating statements at different logical levels, Bateson pointed out that good logic may be bad natural science. Some of the most interesting aspects of communication may depend upon the use of contradictory messages at different logical levels, just as some interesting aspects of behavior may involve "pathological" nonterminating, recursive loops which are the behavioral equivalents of self-referential paradoxes.

### *Contradictory Communication*

Once communication is viewed as involving intertwined language and metalanguage, a greater range of expression is possible than when only a single level is involved. Many expressive aspects of communication, such as those involved in play, art, and ritual, involve interplay and contradiction between messages at different logical levels.<sup>12</sup> Bateson's analysis of such multilevel communication helps bring out some of the broader implications of his communications theory.

Play involves the metaphorical interpretation of actions, e.g., a war game is like a war, but it is not a literal war. But how does one send the message "This is war but do not take it as such"? Bateson studied the message of "play" by observing the way it is signaled among river otters, as when one bites another (thereby signaling the beginning of a "fight") but by not following through on the pattern of aggression signals

10. Bateson, *Steps to an Ecology of Mind*, 27.

11. Nelson Goodman also sees symbols as referring in two ways, "downwards" by denotation, indicating the things that comply with a label, and "upwards" by exemplification, indicating the labels which apply to the "individuals" in question. See *Languages of Art* (Indianapolis: Hackett, 1976).

12. Grice's "conversational implicatures" also involve the exploitation of expectations which are violated in order to make an implicit point. H. P. Grice, "Logic and Conversation," in vol. 3, ed. Peter Cole and Jerry L. Morgan (New York: Academic Press, 1975), 49.

that it is *not* a fight.<sup>13</sup> The combination of the two contradictory messages at different levels communicates a desire to "play" or engage in fictive aggression.<sup>14</sup>

In art, as Bateson analyzed it, the artist is often communicating a way of seeing as much as depicting something. In effect, the message of the work is the code in which it is "written." Artists attempt to show "where they are coming from," but this showing is itself "coming from" somewhere, creating an infinite regress. By considering art as primarily about relationship rather than content, Bateson saw it as a corrective to consciously rational, objectivizing thought and facilitative of psychic integration.

Bateson saw religious ritual — "the metaphor that is meant" — as an attempt to return to communicative simplicity by denying or blurring the difference between a code and what is codified. When something is taken as "sacred," expressive statements which would normally be treated as metaphorical are presented as literal truths, such as the wine being taken as real blood. Or, in another example (of nationalism as religion), when one is prepared to "die for the flag," the flag is taken as synonymous with the country that it symbolizes.

Bateson's double-bind theory of pathological communication also involves contradictory messages at different levels. When the content aspects of a message are contradicted by its relational aspects, as when a mother says "I love you" in a cold, distant way, then the child is placed in an untenable position in which accepting either aspect of the message will result in rejection.<sup>15</sup> When much is at stake in the interpretation, such as a mother's continued love, then a pattern of contradictory communication may result in pathological adaptations, such as becoming simplistically literal minded, or deeply distrustful of "surface" content, or withdrawing from communication entirely.

These sketches suggest some of the range of Bateson's approach to communication which moves from information theory to these grander themes while maintaining a considerable degree of rigor on the way. They also show some of the interesting implications of a hierarchical view of communication which helps include phenomena like humor and ritual that are all too easily excluded with more linear, single-level analyses.

#### LEARNING

Bateson's approach to learning is related to his communication theory in that he viewed learning as involving changes in habits or beliefs regarding different levels of context. For instance, one may alter one's beliefs about how events are related "in" a given context, such as learning which chess moves are good responses in which situations. One may also alter one's understanding of the context of these moves itself, such as getting a better understanding of the pattern of activity constituting "chess." Finally, one might alter one's habits or beliefs about the context of that context, such as reconsidering chess by relating it to other institutions in a new way. Bateson emphasized the first two levels of change, and sometimes the third, viewing individual human beings as incapable of more than two or three levels of change.

He defined these orders of learning more explicitly as follows:

Learning I is change in specificity of response by correction of errors of choice within a set of alternatives.

Learning II is change in the process of Learning I, e.g., a corrective change

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13. One of Bateson's points in analyzing interaction among animals concerned what creatures who possess only analog symbolization have to do in order to signal something equivalent to "not."

14. Nelson Goodman's analysis of metaphor is also useful in extending Bateson's approach here. See Goodman, *Languages of Art*, 81-85.

15. Mothers took the blame initially, but later work focused on the whole family's communication patterns, eventually giving rise to the "family systems" approach to psychotherapy.

in the set of alternatives from which choice is made, or it is a change in how the sequence of experience is punctuated.

Learning III is change in the process of Learning II, e.g., a corrective change in the system of sets of alternatives from which choice is made.<sup>16</sup>

Thus one has a hierarchy of learning going from elementary changes, to change in the way such changes are made, to changes in the way such changes of changes are made, and so on.<sup>17</sup>

It is important to note that this multilevel approach to change is not a stage theory moving sequentially from lower to higher levels of learning. Rather, the different levels of learning go on in parallel.<sup>18</sup> There is an interplay between learning to make better moves in chess and learning better what chess is about. Neither sort of knowledge is a fixed point; each is used to construct and constrain the other.<sup>19</sup>

### *Learning I*

First-order learning may be thought of as the sort typically studied in psychological research, whether behavioristic or cognitive. In Bateson's terms, it involves "revision of choice within an unchanged set of alternatives."<sup>20</sup> Selecting a different answer to a given question when asked it a second time would be an example. Herbert Simon's definition of learning as "any process that modifies a system so as to improve, more or less irreversibly, its subsequent performance on the same task or of tasks drawn from the same population" is similar.<sup>21</sup> Simon's suggestion that the task remains the same is analogous to Bateson's suggestion that the set of alternatives remains constant. However, there is an important difference in emphasis between their two analyses since the context is the foreground of Bateson's analysis while it is the background of Simon's.

Given a fixed context, learning may proceed in two directions. There may be generalization from sets of examples, so that one learns rules for classes of events, or there may be sequential elaboration such that one learns rules for compound problems.

While Bateson barely considers generalization within a level of learning, doing so helps avoid confusing his levels of learning with the hierarchy of generalization usually found in individualistic approaches to learning. Consider, for example, the following set of teacher-posed problems, student solutions, and teacher evaluations, about which students may learn in different ways.

<i>Problem</i>	<i>Solution</i>	<i>Evaluation</i>
1 + 1 ?	2	Correct
1 + 2 ?	3	Correct
1 + 3 ?	5	Incorrect
2 + 2 ?	4	Correct
2 + 3 ?	6	Incorrect
2 + 3 ?	5	Correct

16. Bateson, *Steps to an Ecology of Mind*, 293.

17. This hierarchy can also be seen as analogous to that in physics in which Newtonian mechanics adopts fixed viewpoints, special relativity theory moving viewpoints, and general relativity theory accelerating viewpoints.

18. Actually Bateson left open the sequential relationship between these different levels of learning. However, many of his examples suggest parallelism.

19. This point seems important given the prevalence of stage theories in education. For criticisms of these theories, such as Piaget's and Kohlberg's, see Steven Toulmin, *Human Understanding* (Princeton, N. J.: Princeton University Press, 1972), and D. C. Phillips, *Philosophy, Science and Social Inquiry* (Oxford, England: Pergamon Press, 1987).

20. Bateson, *Steps to an Ecology of Mind*, 287.

21. P. Langley and H. A. Simon, "The Central Role of Learning in Cognition," in *Cognitive Skills and Their Acquisition*, ed. J. R. Anderson (Hillsdale, N.J.: Lawrence Erlbaum, 1981), 367.

Some might use a rote strategy, memorizing features of each particular problem and solution and relating the two sets of features in memory. Others might use a rule-induction strategy, examining subsets of problem-solution pairs so as to find a rule accounting for all of the correct pairs in a subset. For instance, they might learn a rule for adding one to another number. Still others might use a discovery strategy for inducing a rule or set of rules for organizing all of the events without being explicitly told whether they are right or wrong. Thus a hierarchy of levels of generality could apply to learning from these examples.

The more general levels of learning are not, however, the same as learning about the learning context itself. As Jerome Bruner puts it, "I do not think that my interest in theater and literature has made me more abstract. Instead, it has joined me to the possible worlds that provide the landscape for thinking about the human condition as it exists in the culture in which I live."<sup>22</sup> Second-order learning, which will be discussed shortly, seems to involve changes in "joining with possible worlds" rather than generalization within a given one.

Problems and solutions may also be compound rather than simple. Stimuli may be complex affairs, with patterns within patterns, just as responses may involve complex chains of response (i.e., plans composed of subplans and subsubplans, etc.).

For instance, solving the equation  $X - ((2 + 3) \times (3 \div 4))^2$  involves decomposing it into a set of nested subproblems which must then be solved in the proper order. Learning to solve such compound problems essentially involves learning a set of rules for parsing problems into simpler subproblems, in this case the associative, commutative, and distributive laws of arithmetic.

Despite the complications to first-order learning added by generalization and elaboration, the set of "things" about which learning occurs is the same (e.g., the problem-solution pairs shown above or a compound problem and solution), as is the goal of the activity. Thus these complexities may be seen as variants of first-order learning, involving no change in context.

### *Learning II*

As conceived by Bateson, second-order learning changes the *process* of first-order learning, altering its manner or rate. An example of such learning familiar to those in education derives from the "hidden curriculum" conveyed by the manner of teaching rather than the content being taught.<sup>23</sup> By learning how to "play the game" in the classroom students enhance their ability to learn what the teacher intends and to show what they know. Considered quantitatively, this should show up as a change in their *rate* of learning. Such "learning to learn" appears to have been a greater concern to teachers and therapists, or sociologists and anthropologists, than to most learning theorists, although recent interest in metacognitive learning is changing this.

Bateson considered second-order learning as consisting of "changes in the manner in which the stream of action and experience is segmented or punctuated into contexts together with changes in the use of context markers."<sup>24</sup> This definition may be compared to Ralph Turner's similar characterization of the outcomes of role socialization as "a way of conceiving of situations. . . . the framework that supplies the interpretations for the gestures of self and other and assessments of the probable effectiveness of various interpersonal techniques."<sup>25</sup>

Consider the arithmetic exercises presented earlier in this light. When teachers ask "What is one plus one?" they are engaging in a certain type of social activity with

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22. Jerome Bruner, *Actual Minds, Possible Worlds* (Cambridge, Mass.: Harvard University Press, 1986), 128.

23. Of course, style and content are not so neatly separated since any content has a style which it displays. Style and content are not different "things" but different aspects of the same set of events.

24. Bateson, *Steps to an Ecology of Mind*, 293.

25. Ralph H. Turner, *Family Interaction* (New York: Wiley and Sons, 1970), 210.

a student. This "game," which might be called "arithmetic quiz," is one in which a "teacher" asks questions of a "student," whose answers are then evaluated by the "teacher." It is a very simple game with an instrumental pattern: get the right answer and you get a good evaluation.

To spell out this obvious structure, it helps show how the particular problems, solutions, and evaluations considered in first-order learning are embedded in a larger activity structure. If a student or teacher did not know what activity they were engaged in, or their roles in that activity, they might interpret each other's actions quite differently. For instance, an action that was meant to be a literal question, like "Do you know . . . ?" might be taken as a mere rhetorical comment. Thus the way in which such a sequence is parsed or segmented changes the functional status of its elements. What is a "stimulus" (or question) on one interpretation could be a "response" (or answer) on another.

There also appear to be two directions in which such social learning may proceed, by generalization from a set of instances and by elaboration of simple sequences into compound sequential structures. Bateson did not say much about either of these, so some elaboration may be helpful.

Learning a social role is partly a matter of generalization, as Mead emphasized in his concept of the "generalized other." One has to move from the patterns of interaction characterizing relations with particular individuals to the more generally or publicly utilized patterns that apply to classes of individuals. Children must learn not just how to interact with their mother when performing a certain activity, but what the role of "mother" involves for that type of activity. Similarly, a student learns not just how to get on with Miss Brown when doing a particular problem, but how to be a "student" to another's "teacher" when doing "arithmetic." In short, a more general pattern of roles is learned which may be enacted by arbitrary individuals.

As Mead puts it, in discussing the generalized other:

At the first of these stages, the individual's self is constituted simply by an organization of the particular attitudes of other individuals toward himself and toward one another in the specific social acts in which he participates with them. But at the second stage . . . that self is constituted not only by an organization of these particular individual attitudes, but also by an organization of the social attitudes of the generalized other or the social group as a whole to which he belongs. . . . [T]he individual arrives at them, or succeeds in taking them, by means of further organizing, and then generalizing, the attitudes of particular other individuals in terms of their organized social bearings and implications.<sup>26</sup>

The interactional patterns that are the focus of second order learning may also have compound structures of their own, like the compound arithmetic problems considered in first order learning. Learning a game or other activity as a whole involves learning all the different roles making it up and the ways in which they must be coordinated in sequential interaction.<sup>27</sup> Thus one learns the pattern of interaction involved among the whole network of players in a game, learning what is involved in the activity of "baseball" as opposed to, say, "football."

Hugh Mehan's work provides a fine example of the way in which classroom "lessons" have a sequential structure.<sup>28</sup> He looks at a lesson as having a structure like a hierarchical plan. It consists of large (i.e., long-duration) activities such as a related series of discussions, each of which continues on a certain topic, such as addition of ones. Each topical discussion is in turn made up of a series of related interactional sequences, such as a series of initiatives on the part of the teacher, responses to these initiatives on the part of the student, and evaluations of these

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26. Anselm Strauss, ed., *George Herbert Mead: On Social Psychology* (Chicago: University of Chicago Press, 1964), 222.

27. *Ibid.*, 215-16.

28. Hugh Mehan, *Learning Lessons* (Cambridge, Mass.: Harvard University Press, 1979).

responses by the teacher. Finally, each of these initiatives or responses may be of different sorts, such as questions and answers, statements and acknowledgments, or commands and responses. Thus a lesson has a complex sequential structure very much like the phrase structure of a sentence. It may be seen cross-sectionally as focusing on topics and subtopics or longitudinally as a complex plan of sequential activity which teachers and students must know in order to be able to insert themselves behaviorally into the ongoing flow.

Considering such structures is important because an adequate interpretation of a "lesson" or other social activity must take these structures into account. Just as a learner must take account of parenthetical nesting in arithmetic problems or end up solving them in the wrong order or in the wrong context, so too must interactants take the structure of an activity into account or act wildly out of turn. They literally would not know which action is a response to which other action. The same is true of the observer who must also be able place events in their appropriate contexts. To do otherwise is to destroy the structure of the activity and would be as senseless as solving arithmetic problems irrespective of parentheses organizing them.

### *Learning III*

Bateson considered third-order learning to be both difficult to accomplish and to describe. Unfortunately, this belief was borne out by his own descriptions. We may nonetheless try to fill in his sketch, bearing in mind that the results are likely to remain less definite than with the other two levels of learning.

Third-order learning is a change in the process of second-order learning or a "change" in the system of sets of alternatives from which choice is made.<sup>29</sup> Its results modulate second-order learning, either enhancing or interfering with it, in the same way that the results of second-order learning modulate first-order learning. For example, "Learning III . . . may lead either to an increase in Learning II or to a limitation and perhaps a reduction in that phenomenon. Certainly it must lead to a greater flexibility in the premises acquired by the process of Learning II."<sup>30</sup>

By implication, if third-order learning increases the rate of second-order learning and second-order learning increases the rate of first-order learning, then first-order learning will be *accelerated* by a favorable combination of second- and third-order learning. Thus quantitative examination of third-order learning should look for acceleration or deceleration of learning rates.

The "problem" to which third-order learning is a "solution" consists of systematic contradictions in experience.<sup>31</sup> For instance, if one is first socialized according to one pattern and then later according to a different inconsistent pattern, how can one learn from these experiences so as to anticipate future inconsistencies? If one can learn about the broader pattern of patterns relating one context to another, then one could allocate one's effort and attention better within a given context. Bateson suggests that the "solutions" to such "problems" are deep changes in philosophical, aesthetic, and ethical assumptions.

There appear to be two aspects of third-order learning, implicit in Bateson's descriptions of it as "a corrective change in the system of sets of alternatives" and as a "change in the process of second order learning." As an example of the first, a variety of institutions in this country can be seen as organized around a similar market metaphor involving individual exchange and bargaining and additive aggregation of individual preferences.<sup>32</sup> In a different society, such as Japan's, such individualism

29. Bateson, *Steps to an Ecology of Mind*, 293.

30. *Ibid.*, 304.

31. "If, as I have suggested above, the creature is driven to level III by 'contraries' generated at level II, then we may expect that it is the resolving of these contraries that will constitute positive reinforcement at level III." *Ibid.*, 305.

32. See Charles Taylor, "Interpretation and the Sciences of Man," in *Knowledge and Values in Social and Educational Research*, ed. Eric Bredo and Walter Feinberg (Philadelphia: Temple University Press, 1982).

would seem strange, and different principles, such as those of cooperation and consensus, would inform a variety of institutions. Thus a whole collection of sets of concepts differs in the two cases. Given such differences, third-order learning would consist of adaptively adopting one or the other collection as a set of ways in which experience can be interpreted.

As an example of third-order learning from the second viewpoint, individuals might learn about the sequential connections between outcomes in different institutions. For instance, there is a sequence of life experiences moving from the family to school to work. School is often a family's way of getting their children a good job. But how important is it that a child adapt to the pattern of teaching and learning used in school? If schooling is an isolated activity that neither builds upon the patterns learned at home nor leads to patterns used at work, then it will be of little broader value to the learner. The connections between school and work, or other activities, alter the significance of schooling and the importance one might place on it. If we were able to anticipate these connections, then we would know more about how to allocate our energies in adapting to particular institutional contexts. We would know, for instance, what "really mattered" in school and what was locally arbitrary. Third-order learning would then change the standards according to which one judges a certain conception of "knowledge" or of "teaching" and "learning" to be adaptive.

#### CONCLUSIONS

While most contemporary theories select a single level of analysis, such as short run or long run, individual or social, Bateson's theory attempts to work across these levels. He posited a nested hierarchy of social contexts in which individuals communicate, much like the later Wittgenstein analysis of "expressions" within "language games" within "forms of life."<sup>33</sup> Learning may then be "about" objects at any of these levels, with higher-order learning serving to set the parameters within which lower-level processes vary, while the interactive behavior of lower-level processes helps compose that at higher levels. The result is a theory of coupled change at different levels of a system which draws upon both cybernetic control theory and the theory of communication outlined earlier. This multilevel approach is a natural complement to single-level theories, helping to interrelate the different strata on which the latter theories focus, such as learning and development or task and social aspects of change, by seeing each of these as aspects of a common process.

Consider, first, how learning and development may be related to one another in this view. One can think of "learning" as first-order change and of "development" as second-order change. Learning is then related to development in that any given learning situation is an example of a larger developmental pattern about which it "teaches." Instrumental conditioning tasks, for example, teach not only how to discriminate between particular stimuli, but also about instrumentality itself. Learning such second-order lessons may then increase one's rate of learning other tasks conducted in a similarly instrumental fashion, making it seem that one has moved to a new developmental "stage" since a whole range of specific tasks can then be learned more easily.<sup>34</sup>

Development may also be related to learning within this scheme. Each learner brings the results of prior second-order learning to the current task, framing problems differently, making different distinctions, and utilizing these distinctions in differing ways. What they learn depends upon this historical "baggage" that they bring to the current situation. In current jargon, their learning is the result of "aptitude treatment interactions." Thus prior development frames, alters, and enables current learning, while current

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33. For a consideration of human understanding based on Wittgenstein's hierarchy, see Toulmin, *Human Understanding*.

34. The notion that present learning points beyond itself by catalyzing future learning is of course also an element of Dewey's view of learning for "growth" (by which he did not mean movement through a linear sequence of stages, contra Kohlberg).

learning situations contribute to future development, the two sorts of change taking place at different tempos relative to each other.

It is interesting to note in passing that Bateson's view of development, which is implicit in a number of his essays, involves neither universal progression toward a single goal (as in Piaget) nor particularistic learning of different cultural frames (as in Schweder).<sup>35</sup> Rather, earlier commitments may constrain or canalize later ones (but not, in general, to such a degree as to select for only a single progression). In this view development builds upon itself, bootstrapping without a predetermined end. Development is then seen as a process that explores the range of viable possibilities, like evolution itself, making Bateson's view rather like Dewey's.

Bateson's theory also helps relate individual and social aspects of change. It does this, firstly, by highlighting the way in which learning is framed and affected by its social context. The task about which a person is learning is a part of the overall social activity in which it is embedded. The meaning and value of task performance depend on the relationships in which it is embedded and the ends which it serves. The same activity may have different value to the members of different groups or to the members of the same group at different times. Thus a fuller view of learning needs to take much more than the task itself into account. It needs to take account of the different meanings the task may have as a result of its social context. Secondly, Bateson's approach also helps to highlight the social implications of individual task learning. No task instruction can be done in a socially neutral way (although it may be neutral with respect to a particular issue). It must always have some style and exemplify some form of social relationship. Even the most bounded, well-defined, and controlled laboratory task cannot avoid having its social message and its implications for socialization. Rather different tasks could also have quite similar socialization implications, such as when various tasks are all taught using a similar instrumental conditioning paradigm, just as similar tasks may have different socialization implications.

By bringing these different aspects of behavioral change together into a single model, Bateson's theory helps show how they are different aspects of a common process rather than different things. Short and long run, individual and social, become facets of a common, multilevel process. They appear when different aspects of this process are emphasized or deemphasized. While the resulting model is more complicated than a single-level theory, since it involves interdependent factors changing at different relative rates, it also suggests some highly practical research problems. For instance, it suggests that we should investigate how one learning situation helps "set the stage" for another by helping to teach second-order lessons that facilitate adaptation to further new experiences. Thus rather than taking each learning situation as an independent experience, we should look at what sorts of further activities it helps (or does not help) to build toward. Similarly, the model also suggests that rather than looking at learning as a socially neutral activity, we look at the ways in which similar tasks have different meaning in different contexts. What seems like the same task may in fact be interpreted very differently in differing situations, suggesting that we should look at how similar tasks are learned in as great a variety of situations as possible, such as learning the same sort of thing in school or at home. Contextualizing learning in this way would help reduce the tendency to overgeneralize the "laws" of learning from one context to others in which very different things are actually going on. While these implications are obvious and only tap parts of Bateson's overall model, they are nonetheless highly relevant sorts of research for educators or others concerned with enhancing the learning of whole persons in "natural" settings. The surprising thing is how nonstandard are these "obvious" areas of research.

While Bateson's theory helps provide a framework for integrating these different aspects of behavioral change, it must be admitted that in another respect it is not a learning theory at all. It is not concerned with the particular mechanisms by which

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35. Richard A. Schweder and Robert A. LeVine, *Culture Theory: Essays on Mind, Self, and Emotion* (Cambridge, England: Cambridge University Press, 1984), 55.

people induce or deductively test hypotheses. It specifies no operators or search procedures by which induction might occur. Nor does it contain the sort of detailed theorizing on the development of mind or self contained in Mead's work.<sup>36</sup> It is properly viewed as a framework and not an elaborated theory. However, it can serve as a useful heuristic, helping to integrate the fragmented aspects of change, and perhaps as a harbinger of future multilevel, nonlinear models of change.<sup>37</sup>

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36. Strauss, *George Herbert Mead: On Social Psychology*.

37. For other multilevel, interactional approaches to change in biological and social systems, see Niles Eldredge, *Time Frames* (New York: Simon and Schuster, 1985); and Raymond Boudon, *The Logic of Social Action* (London: Routledge & Kegan Paul, 1979).

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