

*BEHAVIORAL CUSPS: A DEVELOPMENTAL AND  
PRAGMATIC CONCEPT FOR BEHAVIOR ANALYSIS*

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Most concepts of development explain certain behavior changes as products or markers of the invariable succession of emerging periods, stages, refinements, or achievements that define and order much of an individual's life. A different but comparable concept can be derived from the most basic mechanisms of behavior analysis, which are its environmental contingencies, and from its most basic strategy, which is to study behavior as its subject matter. From a behavior-analytic perspective, the most fundamental developmental questions are (a) whether these contingencies vary in any systematic way across the life span, and thus make behavior change in a correspondingly systematic way; and (b) whether some of these contingencies and their changes have more far-reaching consequences than others, in terms of the importance to the organism and others, of the behavior classes they change. Certain behavior changes open the door to especially broad or especially important further behavior change, leading to the concept of the behavioral cusp. A behavioral cusp, then, is any behavior change that brings the organism's behavior into contact with new contingencies that have even more far-reaching consequences. Of all the environmental contingencies that change or maintain behavior, those that accomplish cusps are developmental. Behavior change remains the fundamental phenomenon of development for a behavior-analytic view; a cusp is a special instance of behavior change, a change crucial to what can come next.

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Conceptualizing the development of behavior over the life span has been an enduring problem in psychology. Organismic theories postulate an invariable succession of emerging stages, periods, achievements, differentiations, refinements, or products; they

suppose that much behavior develops in obedience to that sequence. And, because the sequence is invariant, it requires an explanatory logic, which most often takes the form of its apparent goal, as if the sequence were self-organizing: The individual is seen as traveling epigenetic roads to uniquely adult stages of development, much like a train stopping at various stations before it reaches its final, always scheduled destination, or a butterfly passing through the embryo-larva-pupa-imago stages to the inevitable fluttering forth (see Overton & Reese, 1973; Reese, 1991; Reese & Overton, 1970; Spiker, 1966). Whereas the teleological sequence implied in such approaches is that an embryo is just a butterfly's way of making another butterfly, it is equally plausible to

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argue that a butterfly is just an embryo's way of making another embryo. Perhaps the concept of "development" is sometimes a way to ignore an arbitrary half of the evolutionary process.

Behavior analysis is different; it has no comparable guiding metaphor to explain patterns of behavior change throughout the life span. At least, none is intrinsic to its present logic. Of course, one or several such metaphors might be added. But that addition would seem apt only if it were done in the natural-science style that has guided the development of behavior analysis so far. That means it must be more than a metaphor; the premises justifying it should be verifiable.

Behavior analysis currently offers its well-known behavior-shaping contingencies as its basic analytical processes; and it offers them, so far, without specifying any distinctive, reliable patterning of them over the life span. If a concept of development is to be added, that concept must posit a reliable pattern of how these contingencies are applied over the life span. Stated this way, the possibility of a reliable pattern of behavior-change processes over the life span becomes a matter of facts to be determined rather than as a theory to be imposed. We can ask whether the application of these contingencies, by nature and by people, varies in any systematic way. We can ask whether the behaviors to which they are applied vary in any systematic way, and if so, whether that is by nature or by idiosyncratic societal convention. Discerning those kinds of systematic patterns of contingencies across the life span appears to be an implicit theme of two recent texts that describe development from a behavior-analytic perspective (Novak, 1996; Schlinger, 1995). These texts are oriented toward undergraduate readers; their mission is to show how traditional developmental topics are amenable to a behavior-analytic interpretation. But we can also ask whether some of the resul-

tant behavior changes have more far-reaching consequences than others. Here, we address that question by describing the concept of developmental "cusps" (Rosales-Ruiz & Baer, 1996) and suggesting some criteria for "far-reaching."

#### A PRAGMATIC CONCEPT OF DEVELOPMENT FOR BEHAVIOR ANALYSIS

Consider a cusp as a behavior change that has consequences for the organism beyond the change itself, some of which may be considered important. That requires us to develop the criteria of importance. To approach those criteria, we must expand the definition of cusp: We take as axiomatic that any behavior change results from changes in the interaction between the organism and its environment. What makes a behavior change a cusp is that it exposes the individual's repertoire to new environments, especially new reinforcers and punishers, new contingencies, new responses, new stimulus controls, and new communities of maintaining or destructive contingencies. When some or all of those events happen, the individual's repertoire expands; it encounters a differentially selective maintenance of the new as well as some old repertoires, and perhaps that leads to some further cusps.

Consider, for example, what can happen as a result of learning to crawl. The baby suddenly has increased access to the environment and its contingencies. Now the baby can get to toys, family, and other things more easily, or can stumble into obstacles, all of which produce interactions that will further shape the baby's behavior. Some of these interactions initiate the shaping of other behaviors that will soon contribute to walking, others will shape responsiveness to visual cliffs (e.g., Campos, Bertenthal, & Kermoian, 1992), and still others will produce a variety of parental contingencies,

some delighted, some dismayed, that will further shape how much more and how much less of the physical and social environment will be open to the child's further interaction. Thus, if walking, safety, and the immediate next direction of socialization are important for that baby at that time, crawling is a cusp.

This argument does not deny the development of the many small, sequential skills that culminate in crawling. Perhaps each of them is a prerequisite for the next, and thus for crawling. But the important point here is that none of these skills alone suddenly open the child's world to new contingencies that will develop many new, important behaviors. Instead, each of them opens the child's world only to the next skill. Their end point, crawling, is a cusp.

By contrast, consider a child who has all the prerequisites for walking, yet continues to crawl; an early study by Harris, Johnston, Kelley, and Wolf (1964) dealt with such a case. They systematically shaped walking in a preschool girl who almost always crawled. Walking made it possible for her to participate in the upright, fast-moving games her peers played, which was most of their games. A host of new interactions typically will follow from walking. If leg strength and participation in peer socialization were important to that girl at that time, walking was a cusp for her. Or perhaps it was a cusp for her parents and teachers: Perhaps the girl's behavior showed that walking and peer games had little importance for her at that time; it was her parents and teachers who believed that leg strength, coordination, and peer participation would have consequences that would be important to her later.

Teach a child to read accurately and fluently, and suddenly and systematically a vast amount of further development, and a new, drastically more efficient method of teaching, are operative. If any of that is important to the child or to the child's future, then

accurate, fluent reading is a cusp. Teach a child with developmental disabilities generalized imitation, and future expansion of the child's repertoire can suddenly and systematically be as explosive as the social environment cares to make it, simply by modeling new skills, not necessarily intentionally. If any of that is important, to the child or to those responsible for the child, generalized imitation is a cusp. Teach an infant to discriminate between positive parent attention and disapproving parent attention, and you end the paradoxical reinforcement of inappropriate child behavior, which suddenly and systematically will alter the child's and the parents' futures, especially their joint futures. If gentle social guidance is important to the child at that time, then coming under the conventional stimulus controls used naturally by almost every parent (and almost every subsequent teacher) is a cusp. Give young adults the first sizable, dependable, disposable income of their lives, and suddenly, systematically, and enduringly, new sources of teaching will emerge that may alter and expand some of their criteria for and some of their practice of what constitutes food, housing, transportation, entertainment, travel, family, and responsibility. If any of that is important to the young people, to their society, or to its economy, disposable income is a cusp. (The parallel argument for elderly people who can retire with a disposable income is obvious.)

These examples show that the concept of cusp always depends on the phrase, "If that is important . . .," as if the audience must decide if that is important. We suggest that in these arguments, importance most often is indeed a social phenomenon. In biology, perhaps importance is unquestionably survival. In development, survival is rarely clear, so importance is very often a matter of something else, usually social validity. A cusp may unquestionably open new environments for a child, and we may view what those new

environments will produce as being important; but if we inquire, we often will find that others do not. More than one preschool teacher has told parents that their child is a social isolate and that the teacher can remediate that, only to be told by the parents that they prefer their child to be a social isolate, because the parents think that isolation is important to the child's artistic, intellectual, or political development.

Not all new cusps need be seen as positive or desirable. Introducing a child to an addiction is an obvious example of a terrible cusp (for the great majority of us); teaching a child that the correct first response to any new problem is to seek help rather than to persist in independent tries is a more subtle example (for many of us).

Sometimes changing only one behavior will create a cusp; sometimes it will be necessary to change a class of behaviors. A cusp may be easy to accomplish, or it may be difficult, tedious, subtle, or otherwise problematic; yet if the cusp is not achieved, little or no further change is possible in its realm (and perhaps in several other realms). But, when the cusp is achieved, a set of subsequent changes, important to someone, suddenly becomes easy or highly probable. And when that cusp brings the developing organism into contact with other, subsequent contingencies crucial to further, more complex, or more refined development in a thereby steadily expanding, steadily more interactive realm, that will connote the conventional label of *developmental*. In traditional theory, the connotations of increased complexity or refinement often are put forward as causal and explanatory, in a teleological sense. The cusp explains in a different way. It points out that certain behavior changes cause subsequent broad or important behavior changes, in the sense of making those subsequent changes available. If we want to explain those subsequent changes, we need to know the contingencies that shape them and the

cusp that makes them available for that shaping.

The logic of cusps is implicit in earlier discussions by Baer and Wolf (1970) and Baer, Rowbury, and Goetz (1976), who considered behavioral "traps" and the responses that enter such traps (cf. Martin & Pear, 1978; Stokes & Baer, 1977). A behavioral trap is a community of reinforcement in the natural environment that could maintain and potentially shape much new behavior of its members. Preschools, universities, and other social organizations are traps waiting for new members to enter and so, probably, to be shaped. To the extent that these traps shape behavior beyond the entry responses, and to the extent that those behaviors are important to someone at some time, the entry responses are cusps. For example, a child's rudimentary social skills could be trapped in the natural community of peers' social reinforcement by reinforcing responses that result in proximity to other children. The contingencies practiced by those peers on the behavior of anyone in steady contact with them will differentiate, discriminate, schedule, and maintain a much larger, more refined, and more complex set of social skills (e.g., Allen, Hart, Buell, Harris, & Wolf, 1964). In this example, the cusp is the behavior change of being proximate to the group. That is a very small behavior change and relatively easy to program; but it is also a cusp because of the extent and importance of what happens next.

Some arguments by the Koegels and their colleagues (Koegel & Frea, 1993; Koegel & Koegel, 1988; Koegel, Koegel, & Schreibman, 1991) embody the cusp concept. They call "pivotal" any behavior changes that "result in collateral changes of other behaviors as well" (Koegel & Frea, 1993, p. 369). They suggest that many children with autism do not persevere in problems as do typically developing children. But programming more reinforcement across a variety of prob-

lem-solving opportunities can remediate that, and thereby increase the children's repertoires; when that happens, it widens the range of situations that evoke teaching from the teachers. The result is new and improved skills not specifically targeted by the initial program; Koegel and Koegel (1988) cite tying shoes, buttoning clothes, and restaurant skills as examples. Similarly, Koegel and Frea (1993) report that effectively teaching students eye contact and appropriate facial expressions may decrease some abnormal behavior and increase effective conversation. To the extent that these collateral behavior changes prove to be important or introduce the organism to new shaping environments that prove to be important, they are cusps as well as pivotal behaviors. If, for example, the collateral behavior changes seem to be only brief, stereotypic conversations about very few topics, they remain collateral behavior changes, but their importance to the child or to others seems problematic, and thus they may not be cusps. Cusps are behavior changes that systematically lead to either widespread further changes or to important further changes.

Again, the criteria for importance are usually situational. Most often, they hinge on what the behavior changes are and on what their consequences are for that organism, not in their own right, but relative to what that organism wants, what its caretakers, advocates, and teachers want for it, and what a disinterested audience sees as significant for that organism, or for any organism in their society or species. These "wantings" may be pragmatic, or they may reflect an allegiance, even an implicit one, to some theory about what is important to any developing organism. Behavior analysis is not such a theory, apart from its usual endorsement of evolution as an inevitable process and of survival as a near-universal reinforcer of exceptional importance. That is, behavior analysis is a theory about how behavior is

changed, not about how it should be changed. That it can be changed by procedures that are so prevalent in the natural world, and that are so easily open to social intervention, probably reflects great survival value.

Thus, cusps are behavior changes, sometimes simple, sometimes complex, that systematically cause other, further, not formally programmed behavior changes that are significant either because of their breadth or because of their importance to the organism or its species. That importance is seen sometimes by the organism, or by parties concerned for that organism, or by its relevance to the selection pressures of the environment, or all of those. Cusps often accomplish that kind of extensive or important collateral behavior change because they increase the organism's exposure to the relevant teaching contingencies.

Restated, the importance of cusps is judged by (a) the extent of the behavior changes they systematically enable, (b) whether they systematically expose behavior to new cusps, and (c) the audience's view of whether these changes are important for the organism, which in turn is often controlled by societal norms and expectations of what behaviors should develop in children and when that development should happen. Most of that is ultimately judged by survival, but "ultimately" is a long time and is extremely difficult to predict in advance. It is the third criterion, including our guesses about survival, that often prompts us to see only certain behavior changes as developmental.

The cusp concept is focused on understanding the importance of what happens after any behavior change, in order to define development. Other approaches, by contrast, define development by asking what new level of ability or complexity the behavior change represents. Yet, cusps can be simple: Access to other environments sometimes re-

quires only a simple response, like dialing the critical number, or keyboarding the critical address, or extending the stimulus control of an existing response. They can also be as complex as the task analysis of conservation, seriation, transitivity, or self-instruction. In other approaches, the ability to read might be valued as developmental because of the time required to teach it, the extensive skill it represents, or the mental functions it is inferred to represent. However, if teaching reading were to have little effect beyond the achievement of reading, it would, for this behavior-analytic view of development, be irrelevant to development; it would not be a cusp. It would be typical of modern applied behavior analysts to ask how to repair an environment in which reading did not lead to broad further changes. (It might be typical of near-future applied behavior analysts to ask what behavior change—what media skill?—is, in that future world, better than reading for producing those broad further changes.)

As mentioned, cusps can range from quite large to quite small behavior changes. An obvious example of a large cusp is generalized imitation. An example of a small cusp is seen in an anecdote from a parent rearing a child with profound retardation: Teaching this child to manipulate the door latches that separated her from the outside fenced yard transformed her from a child who asked often all day (and often unsuccessfully) for doors to be opened for her into a child who could manage them herself. The child's new skill greatly expanded her opportunities for learning and activity from mainly indoor ones. It obviously enhanced her control over some of her daily life. It transformed her family's perception of her as an eternal problem to a learner whose skill acquisitions could improve everyone's life—from someone to be managed into someone who now could be taught more independence. A cusp whose size is less easy to assess is chaining

the elements of verbal behavior (e.g., teaching the chunking of verbal messages; cf. Case, 1987). At the least, it transforms a listener from one who must be spoken to with slow-paced, one-word messages into one who can respond correctly to ordinary sentences, which may not be seen as a very important change. But, given enough of other related skills—of other cusps passed—it can also transform that listener into an efficient student.

Normal children get through many cusps to what follows in their various worlds, usually by extensive if casual teaching (e.g., imitation and spoken language), and aided by various skills acquired through prior cusps that made them increasingly better at self-teaching (e.g., self-regulation). Less fortunate, less endowed, less skilled, and less well-taught children do not get through as many of those cusps and become problems that attract diagnostic labels and remedial teaching.

The point of these examples is that cusps can vary in size, particularly in the length or intensity of their teaching programs, yet have similarly important consequences for what can happen next. It is not their management, their complexity, or the complexity of the behavior they target but their behavior-change outcomes that define their importance. Thus, cusp transcendence is pragmatic, but pragmatics do not change the laws of behavior or the principles of behavior management. However, they may well change management tactics, because the nature of cusps is that the developing organism's situation changes in systematically important ways.

#### SMALL CONVERGENCES OF TRADITIONAL AND BEHAVIOR-ANALYTIC VIEWS

Organisms are always doing something and are always doing new things; there are

no holes in the stream of behavior (Bijou & Baer, 1961; Schoenfeld & Farmer, 1970; Skinner, 1953; Watson, 1926). The question has always been whether that stream has a structure. Some developmentalists organize it as a progression of stages, often according to what they call the complexity of behavior. They describe how behavior increases, not in amount but in complexity, during certain parts of the life span, from early and simple to late and complex. In most arguments, that sequence is predictable and uniform. Thus, a stage of development is a portion of the organism's life, qualitatively different from the preceding or subsequent stages, whose content is often (but not necessarily) described as a mental structure that guides action and is said to be universal, and is relevant to many outcomes, especially emotional, cognitive, and moral ones. Its timing is seen as modifiable, but only a little; and its sequence is seen as even more resistant to change (e.g., Bickhard, Cooper, & Mace, 1985; Flavell, 1982; Glasersfeld & Kelly, 1982; Lerner, 1986; Overton & Reese, 1973; Reese & Overton, 1970; Wohlwill, 1973).

Stage concepts of development are often challenged, even within the scientific community that generated them. Piaget's stages of cognitive development (1971), Freud's stages of psychosexual development (1905), Kohlberg's stages of moral development (Kohlberg, Levine, & Hower, 1983), and Erikson's stages of psychosocial development (1950)—four prominent examples—have been criticized on many grounds, most of which reflect the vagueness of three sets of criteria: those that define a stage; those that tell the theorist how many stages are needed to explain development; and those that define the transition from one stage to the next (see Brainerd, 1978, for a heuristic example of these unresolved questions). These are criticisms not of the stage strategy but of its topical tactics. In effect, these criticisms as-

sume and applaud the stage strategy by asking that it find better tactical criteria.

Some modern theories of development do not postulate a stage-specific mental structure that explains all developmental phenomena. Some theorists now see cognitive development, for example, as highly diverse and seamlessly continuous: Individuals use multiple rules, strategies, hypotheses, and so forth, changing them from one kind of problem to the next; these structures range simultaneously from simple to complex; the competence of each one may change at any time; and each one is more likely to be specific to a small domain (e.g., speech perception, reading, arithmetic, language, categorization, or reasoning) rather than to be generalized across them all (see Case, 1987; Fisher, 1980; Flavell, 1982, 1992; Howe & Pasnak, 1993; and Siegel, 1991, for reviews of this shift in conceptualization).

The general stage concept is still used, even so. For example, Flavell postulates developing capacities to process information and to resist interference, which, if they exist, should allow more complex cognition across all relevant domains (see Flavell, 1982). Within a domain, though, it is levels of skill competence rather than stages of qualitative changes that are assumed to proceed in an orderly sequence (Fisher, 1980; Fisher & Silvern, 1985; Siegler, 1981).

The thesis that developing an ability or competence will open a much larger realm to improvement is not new; like most theoretical overreaches, it has seen its waves of endorsement and rejection. As the 20th century began, educational psychologists often supposed that training any specific skill (e.g., matching colored sticks) would educate the senses and make them hospitable to many untrained discriminations, just as studying any small discipline (e.g., Latin, mathematics) would improve reasoning in general. Later, that thesis was refined: Not *any* training or study would lead to generalized re-

sults; only *certain* kinds of training or studies would do that. A specific ability would benefit a larger domain (mathematics would improve reasoning) only if both contained sufficient common elements (see Thorndike, 1903). That was the logic of *transfer* (e.g., Grose & Birney, 1963). It automatically recommended training in larger categories, so as to sample more of the elements that are operative in the larger domains to be benefited. It also warned the teacher that the benefited domain would be no larger than the common elements justified. Clearly, the concept had moved behavior-ward. But it was still as vague as any stage theory in offering criteria for identifying "common elements."

Thus, it was not long before a psychologist like Ferguson (1954, 1956), apparently following Spearman (1927) and Thurstone (1938), would see little use in constructs as general as intelligence. These constructs could only denote subsets of more real abilities, which in turn were properties of the ultimate reality, behavior. So Ferguson's concept of development was to list the skill masteries that together would justify the term *ability* and to catalog their transfer functions (generalizability) at different stages of learning and at different ages. The developmental question had become: What prior learned abilities transfer to what untaught abilities, and how, and under what conditions? The converse question became: What new abilities alter prior abilities, and in what ways?

Forty years later, cognitive scientists would be asking: What prior abilities, learned or otherwise, lead to what changes in development? They would answer the question of how by inferring cognitive mediators such as memory access, information organization, inference itself, and strategizing (Glaser, 1992, p. 249); they would answer the question of under what conditions by inferring developing levels of function for those inferred mediators.

From a behavior-analytic point of view,

the small domain to which these relatively new cognitive-analysis tactics were applied was admirable. Smaller arenas of analysis allow a much more intimate interaction between research and data and allow more of the data to be experimental. More important, smaller domains of analysis allow, and almost insure, at least a partial intersection of the logic of behavior analysis and cognitive analysis: (a) We all analyze behavior, even when it is not the fundamental unit of our theory; (b) behaviors are readily changed by environmental contingencies; and (c) we know any behavior can contact different environmental contingencies than other behaviors do. These three points tell us that different behaviors can come under different control (even though some theories need some very similar behaviors to be under similar control). To the extent that even similar behaviors do come under different control, then an overarching stage-like organization of great quantities of behavior is improbable, although not impossible to program. Our research ought to look first for regularity in much smaller domains, then seek experimental control of as much of that regularity as proves to be possible (and ethical), and then ask if that control can be extended (experimentally) to a domain large enough to justify a stage concept.

For behavior analysis, behavior classes as large as "intelligence" have never seemed useful, or even real. Response classes have been defined by the experimenter's ability to prove that all members of the putative class are in fact under the same control (antecedent, consequent, or both) and have been understood by the experimenter's ability to make them. Similar response classes that result from similar histories of programming then have been seen as possible events in natural development.

In behavior analysis, the stage concept seems neither essential nor explanatory, but it is still heuristic. Bijou (1993, p. 46) argues

that it can guide analysis; he sketches a sequence of foundational, basic, and societal stages, much as Kantor proposed in 1959 (see Bijou, 1989, 1993). When the changes described by a stage concept show great generality across behaviors and contexts, for many children and for a specific period of the life span, then, and only then, does the concept of stage become correspondingly heuristic.

But, when a discipline knows, or thinks it knows, how to diminish or disassemble or how to create or intensify some of the generality described by the stage concept, and when a discipline can do so by fairly straightforward environmental interventions (as has been done for at least some cases like conservation skills, Kuhn, 1974, and generalized imitation, Baer, Peterson, & Sherman, 1966), then the concept of stage becomes correspondingly more fragile and arbitrary. Behavior analysis has always at least asked if its processes could create or intensify or diminish or disassemble that kind of generality, and has succeeded often enough to make this argument viable.

In fact, learning to manage the detailed composition of stages may soon prove to be more interesting than the generalities the stages describe. For stage theory, those generalities are described rather than experimentally analyzed. By contrast, the management of their components is almost always experimentally analyzed; that is what management means in behavior analysis. Then why not shift interest to the often dramatic changes in behavior that become possible with experimental mastery of those components? For example, one way in which children expand their vocabularies is the disambiguation effect described as part of the mutual-exclusivity bias (Merriman & Bowman, 1989). Around 2½ years of age, most children begin to learn new words when presented with a novel name in the presence of a novel object (one whose name has not

been learned) and a familiar object (one whose name has been learned). These children typically select the novel object and thus learn the name of the novel object. Before the age of 2½, children usually select the object whose name already controls their behavior. However, children as young as 2 years also have demonstrated the disambiguation effect when correction and reinforcement procedures are used. In behavior analysis, this phenomenon has been experimentally investigated in persons with mental retardation, with both spoken and visual stimuli and with visual stimuli in matching tasks (cf. Dixon, 1977; McIlvane & Stoddard, 1981, 1985). It has been demonstrated that learning by exclusion permits an economical way of expanding the repertoire of individuals—a way that the teaching community could use to produce almost error-free behavior changes, even when other teaching methods have failed (e.g., de Rose, de Souza, & Hanna, 1996). Learning by exclusion is a cusp that along with other cusps may lead us to an understanding of the behavior changes and the environments that are required to produce the vocabulary explosion typically seen at around 18 months of age (Smith, 1926).

Studies looking for cusps will eventually produce a long list of organism–environment interactions, some of small importance for what can happen next, others of great importance for what can happen next, and still others of importance conditional on what other cusps have been attained. Thus a cusp may be universal, but it need not and rarely will be. Similarly, a cusp may have wide generality, but need not. One child's cusp may be another child's waste of time.

In metaphor, cusps often are steps in an orderly path. Perhaps more often they are like the branches of a tree: They stem from an earlier branch or trunk, and new branches may stem from them, where their structure in conjunction with the environment

allows for that. But their mutual order, size, and probability of twigs are not very thoroughly predetermined. Sequences, whether necessary or merely societal, can be essential to this concept; but it is the cusps that need to be analyzed first. As we come to understand them, we will then be in a better position to learn when their sequences are crucial or conditional.

As behavior changes that proved to be cusps for one child or another, or many, are listed, any reader is free to chunk that list according to the reader's criteria, which may be a predetermined notion of complexity, sequence, or growth. Some readers no doubt will chunk them exactly that way; others will find a variety of alternative logics. However, a list of cusps, defined as they are here, is a list of teachable behaviors, a set of teaching procedures that accomplish them, a shaping community of reinforcement, and a description of the systematic consequences of doing so, including the consequences of the consequences. Teachable cusps are susceptible to experimental analysis, and experimental analysis allows us to identify their consequences. Nonteachable cusps are susceptible only to correlational analysis; correlational analysis allows us to say only what their accompaniments are. A truly developmental analysis needs more certainty about what causes what. An illustrative example of such analysis is the case of the "disappearing" stepping reflex. Newborns held upright with their feet on a surface display well-coordinated step-like movements; these responses disappear within the first few months and are seen again towards the end of the first year. These changes have been explained as correlates of the maturation of the voluntary cortical centers. We could suppose that those centers first inhibited subcortical or reflexive movements and later facilitated them at higher levels of control (McGraw, 1943). After all, inhibition is what a center should do to make one of its skills disappear, and fa-

cilitation is what it should do to make that skill reappear. This explanation remained unchallenged for 40 years until Thelen and Fisher (1982) demonstrated experimentally that the disappearance of this reflex was due to an increase in the baby's weight and to the changing mechanical demands of its posture. They restored the stepping reflex by submerging infants in torso-deep warm water and inhibited it again by adding weights. Once again, the value of an inferred central control had varied inversely with the application of experimental analysis.

The cusp concept defined here is most powerful when it is limited to those changes that can be experimentally taught and the consequences of which can be experimentally verified. Correlational analyses that look for the sequelae of a cusp will not easily separate cause and effect; experimental control will be required to meet the definition. A stage theory may be as unverifiable as the theorist wishes; then it can be made to embrace everything the theorist needs to explain. By contrast, to the extent that cusp assessment must be verifiable, cusp-based development will automatically be a set only of already-tested facts and procedures. This cusp concept will not embrace everything that a developmental theory needs to explain, because ethics and practicality bar experimental analysis from many parts of that domain. Teaching reading to see its consequences fits the cusp concept; awaiting complete myelination of the nervous system to see its consequences does not. But if myelination should ever become experimentally manageable and ethically acceptable to manage, it might then be tested for its cusp qualities.

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