CHAPTER 2

Mechanisms Of Social Learning: Some Roles Of Stimulation And Behavior In Early Human Development

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PREFACE

In this chapter, current social concepts which have largely derived from informal cognitive, quasi-cognitive, motivational, socialization, and clinical theories, as well as from more formal social-learning approaches, will be examined, and an attempt will be made to cast the phenomena with which they deal into a consistent, operational, and parsimonious framework. To this end, simple and well-defined conditioning concepts will be used, in a way that readily meets the canons of objectivity and parsimony, to order behaviors ranging from the simple responses of infants to the complex responses of adults in complicated settings. The issues dealt with in this chapter are thus generic for all theories of social development, regardless of their orientations, their heuristic flavor, or their degree of formality.

We will begin our attempt by detailing some of the basic building-block concepts of a conditioning analysis, demonstrating their plausibility with examples from both research and life settings. For those readers who remain with us through this didactic introduction, our operational-learning approach will then be applied to a wide variety of substantive and practical issues, and analyses will be made of some focal behavior systems in life settings in a context where extant theories in the area have been characteristically informal or unsystematic and often posed in obscure cognitive or motivational terms. For these purposes, this chapter has been divided into the following main sections: an introduction to the

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milieu of social-learning theory; the definition of the social environment; key constructs of social-learning analyses and their operating modes; additional implications of the approach for life settings; the effects on behavior of gross shifts in the maintaining environment, and of privation and deprivation; an evaluation of abstractions often employed in social-learning analyses; two key social-learning processes—imitation-identification and dependence-attachment; and an evaluation of the role of motivational conceptions in social-learning analyses.

INTRODUCTION

The Milieu of Social-Learning Theory

Stimulus-response (S-R) approaches to the social learning and socialization of the child commonly attempt to order, in terms of basic S-R concepts and principles, many of the same phenomena and issues that have been highlighted by clinical-developmental theories, which have characteristically used less formal or explicit approaches to theory development and less systematic research procedures. Indeed, the early S-R social-learning approaches were inspired particularly by Freudian psychoanalytic theory with its implicit emphasis on learning conceptions and its explicit emphasis on the importance of early experience in determining later behavior systems, as well as by its treatment of specific issues, like anxiety, in the clinical literature.

Several general S-R approaches have set the tone for consideration of social learning in the past quarter century. In the 1940's and early 1950's, approaches in the Hullian tradition perhaps did most to attempt to bridge the gap between the laboratory and the life setting (cf., e.g., Hull, 1943). The outstanding contributions in that tradition were those of Dollard, Doob, Miller, Mowrer and Sears (1939), Miller and Dollard (1941), McClelland (1942, 1951), Mowrer and Kluckhohn (1944), Sears (1943, 1944, 1951), Miller (1944, 1948a, 1948b, 1951, 1959, 1963), Dollard and Miller (1950), Mowrer (1950, 1960a, 1960b), and Whiting and Child (1953). From the late 1940's to the present, Skinner (1948, 1953) began attempts to extend his general conceptions and mode of approach to the social case, and was rapidly joined by researchers and theorists influenced by him (e.g., Bijou, 1955; Bijou & Baer, 1961, 1965; Ferster, 1961, 1963). Their work has contributed much to the contemporary flavor of the field of social behavior and learning. And, in the 1950's, Rotter (1954) and his followers began to publish their applications of learning principles to social behavior, although to date their approach has not had its full impact on the field.

The present analysis will concentrate mainly on issues and potential solutions stemming from the learning traditions of Hull and Skinner. A number of writers have approached social learning and development from views not very different from those taken in this chapter, and some of these are noted throughout this chapter for both background and detail. A recent summary and appraisal of S-R strategies and tactics and social-learning theories of child development, written at an introductory level, can be found in A. L. Baldwin (1967); while a well-balanced systematic consideration of the scope of personality study (which overlaps social learning), the role of theory in it, and its relation to learning approaches can be found in Farber (1964).

In the last decade and a half, important technological advances have been made in the practical application to life problems of the concepts of acquired stimulus control over behavior, and the stimulus conditions (for the most part social) which maintain that behavior. Stemming mainly from the utility of Skinner's (1938, 1953, 1954) operational concepts, these advances were made in the applied areas of behavior modification and education. The impact of this technology has also served to confirm and broaden our understanding of generic stimulus-control issues in social-learning contexts (e.g., Ferster, 1961, 1968; Ullmann & Krasner, 1965; Baer, Peterson & Sherman, 1967; Lovaas, 1967; Etzel & Gewirtz, 1967). There have also been a number of specific attempts to devise, improve or update particularly the "motivational" constructs of social-learning approaches (McClelland, 1951; Skinner, 1953; J. S. Brown, 1953; McClelland, Atkinson, Clark & Lowell, 1953; Rotter, Seeman & Liverant, 1962; Miller, 1959, 1963; Hill, 1960; Bandura, 1962; Bandura & Walters, 1963; and Gewirtz, 1961b, 1967a, 1967b, 1968a, 1968b). Attention has also been given to the conditions which can function as *social reinforcers* (e.g., Bijou & Sturges, 1959; Gewirtz, 1956b, 1961a, 1961b; Bijou & Baer, 1963; Stevenson, 1965; Zigler, 1963b), and to *setting* (context) conditions which qualify the functioning of stimuli in their several roles, in particular stimuli from social sources (e.g., Gewirtz & Baer, 1958a, 1958b; Walters & Ray, 1960; Stevenson & Odom, 1961, 1962; Landau & Gewirtz, 1967; Gewirtz, 1967a, 1967b, 1969).

In the past decade there have also been conceptual and empirical advances in the substantive area of *early* social development and learning (e.g., Brackbill, 1958; Rheingold, Gewirtz & Ross, 1959; Gewirtz, 1961b, 1965, 1968b; Weisberg, 1963; Bijou & Baer, 1965; Walters & Parke, 1965; Etzel & Gewirtz, 1967), as well as in social-learning analyses and applications performed under a number of key, partially overlapping social-learning rubrics, including among others: *achievement* (e.g., McClelland et al., 1953); *aggression* (e.g., Sears, Whiting, Nowlis & Sears, 1953; Bandura & Walters, 1963; Walters & Parke, 1967); *attachment* (e.g., Gewirtz, 1961b; Walters & Parke, 1965); *conflict* and *displacement* (Miller, 1944, 1948b; Dollard & Miller, 1950); *conscience* and *morality* (e.g., Sears, 1957; Sears, Maccoby & Levin, 1957; Burton, Maccoby & Allinsmith, 1961; Aronfreed, 1963; Aronfreed & Reber, 1963); *delay of reward* (self-imposed) (Mischel, 1966b); *dependence* (e.g., Sears et al., 1953; Beller, 1955, 1959; Gewirtz, 1956b, 1961b; Sears et al., 1957; Bandura & Walters, 1963; Walters & Parke, 1964); *fear* and *anxiety* (e.g., Miller, 1948a, 1951, 1959; Farber, 1954; Bandura & Walters, 1963); *imitation* and *identification* (e.g., Miller & Dollard, 1941; Mowrer, 1950, 1960b; Seward, 1954; Sears, 1957; Whiting, 1960; Bandura, 1962, 1969; Bandura & Walters, 1963; Sears, Rau & Alpert, 1965; Gewirtz & Stingle, 1968); and *sex role* and *sex typing*

(e.g., Sears et al., 1957; Maccoby, 1959; Burton & Whiting, 1961; Sears et al., 1965; Mischel, 1966a; Bandura, 1969). Finally, a variety of analyses and reports published by theorists operating within traditions which have not emphasized learning conceptions (for instance, "cognitive-developmental" or psychoanalytic) may bear directly on social-learning issues or conceptions (e.g., A. L. Baldwin, 1955; Bronfenbrenner, 1960; Kohlberg, 1966, 1969; Lewin, 1946, 1951; Piaget, 1950, 1952; White, 1959).

Scope of this Chapter

In analyses of social learning, nonbehavioral theorists have used complex and often seemingly inefficient (unparsimonious) constructs to order the overlapping areas of cognitive and personality development, parent-child relationships, social learning, and socialization. A considerable gap has existed between the variables used in their empirical studies and the sequential details of stimulus-response interchanges required for learning analyses. In this chapter we attempt to bridge much of this gap. Rather than emphasize global concepts like environments or traits, which summarize stimuli or responses through lengthy time spans, our approach calls for a finer analysis of stimuli, responses, their interchange at a particular moment, and the sequences of such interactions across successive moments.

Empirical work to date shows that it is both reasonable and profitable to conceive of social behavior as following the general laws of behavior, but with the relevant stimuli mediated by the behavior of persons rather than by other environmental sources. On this basis, our study of human social behavior proceeds in the same way as learning-based studies of other behavior classes: by analysis of the variables in the environment, both in the present and of the past, that *control* behavior. Such concepts can provide a flexible model for ordering the complex developmental patterns characterizing the child's socialization, by detailing the changing conditions of environmental stimulation in family, school, and peer group settings accompanying this development. The changing capacities of the child through developmental processes such as those indexed in naturalistic approaches by the terms "organismic maturation," "stages," "critical periods," and the like (e.g., Piaget, 1951), might qualify this approach but would not change its essential features.

In this chapter, we emphasize mainly conditioning concepts for positive stimulus control, as they apply to social behavior systems. While fear- and conflict-based concepts are considered as a proper part of this, a detailed examination of those concepts and of the techniques of aversive control on which they are based is put off for another occasion. As it is unlikely that any significant features of social development and socialization are based exclusively on such mechanisms, this tack simplifies the analysis, and seems to result in little loss of explanatory power or scope. Indeed, it permits a more detailed consideration of the topics covered and a more complete treatment of some key methodological and theoretical issues. Finally, given that a minimal number of modifications of the basic concepts are introduced, this tack makes possible

a relatively unencumbered evaluation of the plausibility or adequacy of the use of basic operational concepts to understand how variations in environmental conditions (i.e., differential experience with stimuli) can affect social-behavior outcomes in early human development.

DEFINITION OF THE SOCIAL ENVIRONMENT

The terms "environment" and "stimulation" occur often in everyday discourse. These terms also occur frequently in analyses of child development, where, similarly, they have been employed more intuitively than precisely. Characterized as "wholesome" or "rich," these terms are frequently invoked as causes of certain patterns of development, and occasionally as labels for experimental or remedial treatments. However, there are neither universal definitions nor consensually defined operational indices of environment and stimulation, or of their derivatives "love" or "warmth," and as a corollary, such dimensions as "environmental wealth," that extend from poor or deficient to rich or abundant, can have no *a priori* meaning. Without behavioral criteria, these concepts are essentially useless both for understanding human social development and behavior technology, and may be best suited to literary ventures.

To be useful in an analysis of the impact of experience on the child's behavior, the concept of environment must have a basis in functional criteria, specifically the control of or impact on behavior by stimuli. Emphasis must be placed simultaneously on the environment and the behavior of the organism, for there can be no fruitful independent definition either of stimuli or of behavior. Environment, under our functional definition, is restricted to those stimuli impinging upon the organism that affect his behavior in some way. Under this conception, a large number of physical events that have no detectable effect on the organism's behavior would not be considered part of his environment; and, similarly, movements by the organism are not considered responses until they are observable and are shown to be under the control of stimuli.

The *social environment* consists of those functional stimuli which are provided by people; and *social behaviors* are those under the actual or potential control of social stimuli, in either their acquisition or maintenance, or both. It is arbitrary whether learning that occurs in a social context, but that is, or subsequently comes, under the control of nonsocial stimuli, is labeled social. Except that stimuli occurring in natural settings are likely to be more variable than stimuli in contrived laboratory experiments, and that the term social stimuli usually denotes those occurring in natural settings, there is nothing intrinsically special about stimuli provided by people or about social settings as contexts for learning. Thus, the term "social learning" simply defines a category of learning that involves stimuli provided by people but that follows the same principles as nonsocial learning.

We do not mean to imply, however, that because it has no special inherent qualities, social learning is not an important topic for study. Because of the nature of civilization, social learning, which is involved in man's dealings with other human beings, is perhaps the most indispensable class of human learning and

accounts for many of the distinctive behavioral qualities of human beings. So much cueing and reinforcement in complex human-learning situations is of a social nature, e.g., discriminative settings for parental, teacher, or peer approval, that if social stimuli have not acquired strong discriminative and reinforcing value for the child, his learning may not reach appropriate levels. Those who have a major deficiency in social learning are thus unable to fend for themselves in society; and they are, in some instances, called "autistic." For these reasons, the study of the social environment and of social stimuli and responses is most important. And this study must be carried out in the same way as the study of nonsocial learning: with a careful analysis of stimulus-response processes. For social learning is, after all, learning.

KEY CONSTRUCTS OF A SOCIAL-LEARNING THEORY AND THEIR OPERATING MODES

Before looking at socialization processes per se, it is essential to define the key constructs of an operational learning approach and to illustrate their basic operating modes. This will enable us to delineate our problems more clearly. These constructs are the same as those that have been used in analyses of other classes of behaviors. As typically used, learning concepts order environmental operations that effect systematic and reversible changes in definable, observable behaviors. The operational concepts employed in this chapter do not differ markedly from the empirical concepts of alternative S-R associative approaches to learning. The number of constructs and operations and the labels assigned to them in a learning analysis are arbitrary. Further, the area is open to the addition of new concepts and to the differentiation and refinement of already existing concepts. In this analysis, we will stress the paradigm of operant (instrumental) conditioning as being most relevant to social-behavior functions (including "perception"), although assuming that respondent (classical) conditioning may operate concurrently and be responsible for many types of social learning.[1] The list that follows is not intended to be exhaustive, but only to give an idea of typical learning procedures and to suggest how these terms and procedures may be applied to situations in the life setting.[2]

Responses

In instrumental learning, the concept of the response (operant) is one of the two basic concepts. A response is any movement of the organism that is under the

[1]Although we will treat operant and respondent conditioning as independent paradigms to simplify the didactic presentation of this chapter, we recognize that they may approach and even overlap each other at several key points.

[2]The technical conditioning terms and symbols used are derived mainly from Skinner (1938, 1953) and Keller and Schoenfeld (1950). Our usage parallels that of Bijou and Baer (1961, 1965), among others.

control of environmental stimuli. Thus, although a movement of the organism is not necessarily a response, it has the potential to become one. A major assumption in our approach is that at no level of analysis is there validity in specifying responses without close attention to the controlling aspects (stimuli) in the environment that affect those responses. Emphasis must be on the stimulus-response unit; a response can only be defined in terms of the preceding and following stimuli that control it, and a stimulus can be defined only in terms of the responses it controls.

Because the meaning of a response is given by its functional relation to the stimuli that control it (and vice versa), in a given context even an otherwise trivial response like a bar press, button push, ear-lobe pull, or eye blink can gain a functional status comparable to that of freely occurring clearly social behaviors in human interaction in representative life settings. For example, these responses may acquire a functional equivalence to an attention-getting dependence behavior or an imitative-identificatory behavior.

In the natural course of events in ordinary social environments, many responses of the developing child come to acquire considerable strength and social meaning, and some of these will routinely change in topography with the increasing capacities of the child. These responses include orienting, regarding, tracking, reaching for, holding, clinging, vocalizing, smiling, laughing, and the like. Furthermore, as we shall note repeatedly in later sections, there have been successful attempts in the laboratory to condition various socially meaningful responses in the very young human infant with diverse, mainly social, reinforcing stimuli (summarized in Horowitz, 1968; Lipsitt, 1963, 1967). These include eye contact, smiles, and decreases in crying by two months (Etzel & Gewirtz, 1967), and smiles (Brackbill, 1958) and vocalizations (Rheingold et al., 1959; Weisberg, 1963) around three to four months. (Further, there has been speculation that differences [Gewirtz, 1965] detected in smiles to a human face at four weeks of life between groups of infants from kibbutz and institution settings may be due to differences in conditioning opportunities before that time.) These social responses are in addition to a variety of responses that do not ordinarily become social in life settings but which also have been instrumentally conditioned in the laboratory in the first months of life. The latter include: head turning, conditioned as early as the first month (Papousek, 1967) for milk-formula reinforcement and at four months (Siqueland, 1964), and at two and three months for social and nonsocial visual-display reinforcement (Koch, 1965, 1968; R. F. Caron, 1967); nonnutritive sucking as well as nutritive sucking for milk-formula reinforcement (Kaye, 1967); and manipulative responses maintained by visual displays (e.g., Rheingold, Stanley & Cooley, 1962; Lipsitt, Pederson & DeLucia, 1966). Respondent conditioning of various autonomic responses has been demonstrated in the first weeks and months of life (as described in Brackbill, Fitzgerald & Lintz, 1967; Lipsitt, 1963, 1967; Horowitz, 1968; Papousek, 1965, 1967), but will not be emphasized in our treatment in this chapter for reasons that will be detailed later.

Stimuli

Stimuli are environmental events that affect the responses of the organism. They can play a number of roles defined by their temporal relation to the response (contingency): they may function to evoke, cue, or reinforce behavior. Before the immediate or long-term response outcome of a stimulus can be predicted, the role of the stimulus in the particular situation must be specified. It is axiomatic that no *acquisition* can occur in the absence of stimuli, and the limiting case for predicting acquisition, therefore, occurs when there are no stimuli available. Further, when reinforcing stimuli are available, their effects on behavior are qualified by such factors as the temporal gradients of delay between response and stimulus, schedules of reinforcement, and the program or temporal sequence of application, as well as by whether or not there are background events present that mask (or change) either the stimuli presented or competing responses to those stimuli. Thus, when environmental events do not occur in such a way as to affect behavior, they are not *functional* insofar as they do not constitute stimuli for the organism (Gewirtz, 1968a, 1968b).

Discriminative stimuli. A stimulus that systematically precedes a reinforced response can thus signal that the response, if emitted, is likely to be reinforced, and is termed a *discriminative stimulus* or *cue* (S^D). It controls the probability that the response will occur in the manner required by the reinforcement schedule. For example, a child may become conditioned to respond (e.g., by reaching out and smiling) to the appearance of his mother's face if these responses, when she appears, are systematically followed by functional reinforcers. In this case, the appearance of the mother's face would be said to function as the discriminative stimulus for the child's reaching out and smiling. The absence of this stimulus, or the presentation of other stimuli in whose presence responses are systematically not followed by reinforcement, is conventionally indicated by the label S^Δ ("S delta"). If stimuli are to merit these labels, the probability of the child's emitting the response must increase in the presence of the S^D and decrease in the presence of the S^Δ, as a result of such systematic differential association with reinforcement.

Reinforcing stimuli. Reinforcement represents one basic way that systematic changes in behavior can be affected by differential experience with recurring stimuli. When the critical stimulus apparently responsible for the strengthening or maintenance of some index of a response is identified in an operational learning approach, it is ordinarily termed a "reinforcing stimulus." There are at least two major paradigms for the operation of such stimuli. In the most frequently used paradigm, that of operant (instrumental) conditioning, a reinforcing stimulus is an event which systematically makes more or less probable (i.e., "strengthens" or "weakens") an identified response when made repeatedly contingent upon it. This usage has come to give the term reinforcement much of its contemporary tone. Under the respondent-conditioning (Pavlovian, classical) paradigm, each

presentation of a previously neutral (to be conditioned) stimulus is followed by an unconditioned stimulus that elicits an unconditioned response. This procedure is termed reinforcement when the result is a systematic increase in the probability that the originally neutral stimulus will elicit a response similar to or a derivative of the unconditioned response. Some experimental characteristics are unique to each paradigm; others operate in both. While the respondent-conditioning reinforcing operation is of a different order than the operant, both have been termed "reinforcing."

Thus, under an operational approach, any recurring event is labeled "reinforcing" if it makes systematically more (or less) probable a response which it regularly precedes (in the respondent paradigm) or follows (in the operant paradigm). The class of reinforcing operations is open, and the distinction between the labels "reinforcement" and "conditioning" is, for most purposes, one of semantics. Thus, under each conditioning paradigm any of a large number of stimulus-response contingency operations may in principle be classified as reinforcing when response strength is systematically affected by the provision of a stimulus. Also, there exist a large number of conditions (stimulus deprivations, response sets, and the like) which can qualify the effectiveness of reinforcing events. The remainder of this section is devoted to a detailed treatment of reinforcing stimuli as they function under the operant-conditioning paradigm.

Under the operant-conditioning paradigm, any stimulus is termed a *reinforcer* (S^R) when its presentation or removal contingent upon (i.e., immediately following) a response systematically affects certain attributes of that response (e.g., its probability, rate, amplitude, latency, resistance to extinction). A contingent stimulus whose systematic presentation leads to an increase in the strength of a response and whose removal leads to a decrease in its strength is termed a *positive reinforcer* (in the past often termed a "reward"[3]). And when the removal of a stimulus contingent upon a response leads to an increase in response strength and its presentation leads to a decrease in response strength, the stimulus is termed a *negative reinforcer*. Thus, the presentation of a positive reinforcer and the removal of a negative reinforcer by definition have a similar effect which may be termed *reinforcement*. For example, the removal of negative reinforcers, such as when the parent stops an older child from hitting his younger sibling, can be potent reinforcement for the child's seeking help from the parent (behaviors typically labeled "dependent," the acquisition of which is considered later.) The contingent presentation of a negative reinforcer and the contingent withdrawal of a positive reinforcer that has been previously available, similarly lead to a decrease in response strength and may be termed "punishment."

[3]The terms "reward" and "punishment," although flavored with hedonic tone, have often been employed by psychologists. As used in this chapter, these terms can provide historical context for some issues. However, my preference is to use in their stead the more neutral terms reinforcement, positive and negative reinforcers, contingent aversive stimuli, and the like.

It remains an empirical question which of the myriad potential stimuli in the human infant's milieu emerge at each growth point to function as unconditioned ("primary")[4] positive reinforcers for his behaviors to effect learning. Even so, it appears thus far that a very large variety of events can function as positive reinforcers in early human life, in addition to those which are thought to meet such organismic needs as food, water, and the removal of aversive cutaneous conditions including pain, cold, and wetness. However, with the exception of "food" (i.e., a milk formula) which has been studied extensively in the past decade (e.g., Papousek, 1965, 1967; Siqueland, 1964; Siqueland & Lipsitt, 1966; Kaye, 1967), even those positive reinforcing stimulus classes that have been emphasized most in social-learning approaches are only relatively well understood.

Thus, potential reinforcing stimuli that remain to be studied include the sensory stimuli provided through diverse tactile, olfactory, taste, auditory, and visual receptors. In certain contexts, some of these may be even more effective than food and water. Such events could also acquire discriminative (cue) value for behavior. It is likely that the potential stimulus events involving the different receptor systems will vary in terms of the absolute numbers of each which will occur in the infant's environment. Further, due simply to the mechanics of the receptors, different proportions of these potential stimulus events will actually come to function as stimuli for the infant. Thus, assuming that the events provided are above threshold level, the position of the head in relation to the visual event source and whether or not the eyelids are closed are examples of mechanical "gates" in the visual receptor system; whether or not there is an obstruction between the ears and a sound source is an example for the auditory system; and whether or not clothing can interfere with skin-contact events is a limiting factor for the reception of tactile events. Further, competitive or masking events for potential stimuli may be more frequent in the visual than in the auditory realms, and more frequent in the latter area than in the tactile sector. In this sense, when tactile events occur, they may provide more potent stimuli than auditory ones, and auditory events may provide more potent stimuli than visual ones.

It is recalled that in his early writings, Freud (1938b) speculated that contact stimuli to "erotogenic zones" of the body provided through rocking, stroking, kissing, and the like were very likely to be potent. In the conditioning language of this chapter, such events would be likely to function as reinforcing (as well as discriminative) stimuli. Further, there is evidence that visual stimuli can also function as potent reinforcers, at least for three-month-old children, as demonstrated by studies on the reinforcing efficacy of changing visual displays (Rheingold et al., 1962; R. F. Caron, 1967). Finally, there is suggestive evidence that even simple vocal and/or tactile replies can reinforce such infant responses as vocalizations, smiles, and eye contact (Rheingold et al., 1959; Etzel & Gewirtz,

[4]When a functional reinforcing stimulus terminating a chain has an unknown history, it is sometimes termed "primary" or "unconditioned" (e.g., appetitive stimuli, strong noxious stimuli).

1967). It is also likely that what some would term the "intrinsically interesting" (or "self-reinforcing") gross motor behaviors of the infant, such as his staring at gross movements of his hands or fingers, can be maintained by such specifiable extrinsic consequences (i.e., reinforcing stimuli) as breaking beams of light and making and changing patterns of visual stimuli.

Further, it has been shown that the opportunity for a response can function as a positive reinforcer for some other unrelated response that occurs at a lower rate, when the more frequent response is made contingent upon the occurrence of the less frequent one (Premack, 1959, 1962). Conversely, making a lower-rate response contingent upon a higher-rate response is equivalent to punishment of the latter (Weisman & Premack, 1966). This relationship, originally isolated in rats, provides a basis for the evocation and reinforcement of diverse child behaviors in social settings, with minimal concern for the stimuli which might be maintaining those behaviors. This principle is often implicitly used by socializing agents to bring infrequent behaviors into a child's repertory. Thus, in life settings a child who understands verbal instructions is often told that he will be permitted to engage in what is, for him, a frequent behavior *only after* he exhibits (a given rate of) an infrequent behavior or a specified novel response (one which he might not exhibit in the ordinary course of events). For instance, going out to play may serve to reinforce doing homework, reading, practicing a musical instrument, or repairing the deck. In a preliminary application in a nursery-school setting, Homme, de Baca, Devine, Steinhorst and Richert (1963) increased the rate of originally low-probability behaviors, such as sitting quietly in a chair and looking at the blackboard, by making contingent upon them such high-probability responses as running around the room, screaming, pushing chairs, or working jigsaw puzzles.

The association of a stimulus with a reinforcer can take various forms. By temporal association with an already functional reinforcer, a previously neutral stimulus can acquire functional reinforcing value, in which case it is termed a *conditioned (acquired, secondary) reinforcer* (S^r). Presenting a functional (e.g., terminal) reinforcer on an intermittent schedule with respect to a conditioned reinforcer will make that reinforcer more durable in maintaining responses (cf., e.g., J. Zimmerman, 1963). Thus, schedules can be devised to minimize, but never to preclude, the requirement for a conditioned reinforcer to be systematically associated with a functional reinforcer; at least occasional pairing will always be necessary. The conditioned reinforcer may thus function as a probabilistic "promise" that the functional reinforcer with which it is associated will follow. (This parallels the definition of a discriminative stimulus which, as we have seen, may be conceived as a cue that promises a certain probability of reinforcement *if* the correct response is emitted.)

A corollary of the concept of conditioned reinforcement (and the S-R chaining conception that is examined later) is that, relative to its efficacy in reinforcing a novel response (or a remote response in an S-R chain), a conditioned reinforcing stimulus will be more effective in maintaining the response that immediately preceded it in the original conditioning situation (in the chain

in which it acquired its reinforcing value), and it will do so as long as the contingency between it and the functional (terminal) reinforcing stimulus is maintained (assuming the latter retains its value for a child). The reinforcing efficacy of conditioned reinforcers (and chain stimuli generally) has been fleeting in many conditioning-test settings because researchers, often overlooking these properties, have at the same time both employed an entirely new response (with a very different topography) and removed the contingency between the conditioned reinforcer being tested and relevant functional reinforcers. Under such conditions, the conditioned reinforcer must, of necessity, rapidly decrease in effectiveness at the same time and through the same process by which it is evaluated.[5] (This issue will be elaborated further in our consideration of the concept of *functional autonomy of motives*.)

Analogous to the conditioned positive reinforcer, a *conditioned aversive stimulus* (or conditioned negative reinforcer) is a stimulus that systematically precedes the occurrence of an aversive stimulus and thus acquires many of the properties of that aversive stimulus. It can decrease responses when presented contingent upon them and increase responses when removed contingent upon them. It similarly requires at least occasional pairing with the functional noxious reinforcer to maintain its potency.

It is likely that under typical life conditions, a stimulus will be paired with more than one functional reinforcing stimulus. Such conditioned reinforcing stimuli, which could thus be effective under a wide range of setting conditions (for instance, different kinds and degrees of deprivation), have been termed *generalized reinforcers* (Skinner, 1953). It has been proposed that relative to a conditioned reinforcer associated with only one functional reinforcer, a generalized reinforcer is more effective in maintaining responses that precede it, its reinforcing efficacy is less likely to be qualified by the momentary conditions of the organism (e.g., deprivations), and it will be more resistant to loss of reinforcing value when no longer paired with a particular functional reinforcer.[6]

Many of the stimulus events which are reinforcing for behavior are supplied by people and thus may be termed *social reinforcers*. They represent stimulus complexes or elements, which for the most part are assumed to have acquired their generalized positive or negative reinforcing value for the young child by

[5]In addition to tests of conditioned reinforcer efficacy under extinction conditions and in contexts where the contingencies between such a stimulus and the functional reinforcer are maintained as in life settings (e.g., chained schedules), a third procedure is also available for examining the reinforcing efficacy of a conditioned reinforcer: the concurrent scheduling of primary and conditioned reinforcement. J. Zimmerman (1963) has found that a response can be indefinitely maintained by a conditioned reinforcer when a second response is concurrently maintained by the primary reinforcer with which the conditioned reinforcer is repeatedly associated. Like the chained schedule of reinforcement, and perhaps even more so, the concurrent schedule is typical of real life situations and thus a more rational mode of examining conditioned reinforcement than extinction procedures.

[6]Some researchers (e.g., Wike & McNamara, 1955, and Myers & Trapold, 1966) have found that the reinforcing value of generalized reinforcers (based on two primary reinforcers) has not been greater than that of reinforcers associated with only one functional reinforcer. Even so, this hypothesis has been supported by several studies (e.g., Wike & Barrientos, 1958; and Kanfer, 1960) and is still open to further experimental investigation.

being consistently discriminative for (or associated with) not one but a variety of functioning reinforcers, including such vital stimuli as food, water, and the removal of painful stimuli,[7] as well as other tactile, visual, and auditory events. (Social reinforcers, however, need not be generalized, as it is possible that, under certain conditions, they would be associated with only one functional reinforcing stimulus.) The human infant, helpless in early life, receives many of the stimuli which are reinforcing for his behaviors through caretaking. Moreover, concurrently in the interaction context, an infant will be responded to by adults, even when he does not exhibit an apparent "need," as when he has emitted a response which delights the adult, or at times simply because the caretaker thinks him "charming." These conditions are assumed to lead to the acquisition of strong reinforcing value by social stimuli provided by a caretaker or parent, for instance, her near presence, attention, approval, and component responses like her smile. Similarly, aversive social stimulus complexes, such as verbal disapproval, and component responses like frowns, acquire generalized aversive properties by being paired with various functional noxious reinforcers for the individual.

Whichever stimuli caretakers consistently provide preceding or concomitant with functional reinforcement to a young child are those which should subsequently function as social reinforcers for him. Hence, particular social stimuli will be differentially reinforcing for different children. Thus, attention or approval may become a positive reinforcer for one child, a negative rein-

[7]It is possible that even the conditions of the appearance of food or moderate degrees of environmental change per se may be effective as reinforcing stimuli not on an unconditioned basis but rather as conditioned reinforcers. Moreover, their reinforcing value should be extinguishable if the sequence in which they constitute an important occasion for reinforcement could be broken at some point. Thus, although the reinforcing effectiveness of food appears to be under the control of periodic, homeostatic conditions, the stimuli provided by its appearance, smell, taste, and the sounds accompanying its presentation, may each have acquired reinforcer value for behavior solely on the basis of its position in the usually invariant sequence of events which leads ultimately to some terminal "unconditioned" reinforcing event. This possibility is generally compatible with the informal observations made by researchers that rhesus monkeys only slowly learn to eat food. Perhaps the stimuli provided by food come to function as conditioned discriminative and reinforcing stimuli for the successive responses in S-R eating chains.

Similarly, *environmental change* in moderate degrees may be conditioned as a reinforcing stimulus class. As the child grows, an increasing number of his responses will be reinforced by a growing number of both apparently unconditioned and conditioned reinforcing stimuli provided by the increasingly direct effects of his ever-increasing success in operating on the environment. As a function of its contiguous occurrence with a large variety of potent reinforcing stimuli (perhaps even before most conditioned reinforcing stimuli have developed as such for a child), moderate environmental change per se may become a potent conditioned (generalized) reinforcing stimulus capable of maintaining the behaviors of the child under a wide range of conditions (Gewirtz, 1961b; Bijou & Baer, 1965). Thus, also, other stimuli which have generally been thought to operate on unconditioned bases, such as those provided the child through contact-holding, as when he is picked up to distract or otherwise quiet him at times when he is in apparent pain, or for feeding and other caretaking, may have acquired some portion of their reinforcing power through their association for the child with the potent reinforcing stimuli provided by the disappearance (through distraction) of the pain, by "interesting" environmental changes, or by feeding and other caretaking.

forcer for a second (as when it has consistently been made discriminative for aversive stimuli), and nonfunctional for a third. Apart from standing for particular stimulus complexes, terms like attention and approval often serve as helpful abstractions that loosely organize the great variety of component stimuli which the caretaking environment can provide incidental to reinforcement. These stimuli include those provided by diverse combinations of speaking, hugging, kissing, humming, singing, squeezing, smiling, nonsense vocalizing, and grimacing. When such abstractions are reduced, as they must be, to their component stimulus elements, it may be found that for some children, verbal approval may operate as a potent reinforcer for behavior whereas nods or smiles, also intended by an adult to indicate approval, may not be effective (Gewirtz, 1961b; Bijou & Baer, 1963). Even within such classes of social stimuli, the responsiveness of children will vary depending upon their differential experiences with specific stimuli. Thus, for a particular child one variant of an approval word may be a more effective reinforcer than another variant (e.g., *good* as opposed to *correct*), or than the mere absence of verbal disapproval. It is also likely that the reinforcing efficacy of social stimuli will vary according to the similarity of a given setting to the one in which the stimuli initially acquired their reinforcing value. Further, as will be seen in a later section on setting conditions, the source of social reinforcers may also determine or qualify their functional value for the recipient, depending on his experiential history with that source person. When provided by different people, what appears to be otherwise the same social stimulus could have quite different effects on the behavior of a young child. Thus, stimulus complexes which are intended to constitute "love" by the dispensing agency would not operate as reinforcing stimuli for a child if they had not been conditioned as such for him with respect to that particular reinforcing agent. Moreover, as will be seen subsequently, this child will also differ from others as to what constitutes a "sufficient" supply of the stimulus, the rate at which he has been conditioned to receive it, and the like (Gewirtz, 1961b).

S-R Chains

Responses and stimuli usually occur in S-R chains of varying lengths terminating with a functional reinforcer (S^R). The smallest functional chain consists of at least S^D–R–S^R. In longer operant chains, a response which occurs in the presence of a discriminative stimulus is followed by the discriminative stimulus for the next response. Since each discriminative stimulus can act as a conditioned reinforcer for the response it follows, stimuli that originally may have been neutral may acquire reinforcing value as they acquire cue value.[8] As long as their relationship to the functional reinforcer is maintained at least occasionally, these conditioned reinforcers can maintain behaviors preceding them in chains, and hence can support new learning (i.e., reinforce new responses when made contingent upon them).[9] Thus, each originally neutral stimulus in an S-R chain preceding the terminal reinforcer typically acquires two functions: it serves both as a discriminative stimulus for the response that follows it and as a reinforcer for the response that precedes it in the chain.

Traditionally, social learning analyses have emphasized the reinforcing role of chain stimuli. A stimulus that is found in many varied S-R chains will be discriminative for more than one functional reinforcing stimulus (as is the case with a large number of social stimuli such as attention or approval), and thus it may function as a *generalized reinforcer*. Since it can condition and maintain diverse approach responses under a wide range of conditions, the reinforcing value of a chain stimulus when it occurs relatively late in diverse chains is also emphasized in the present analysis. However, response strength in a chain may testify not only to the value of the conditioned reinforcer following it but also to the value of the preceding stimulus that functions as a cue for the next chain stimulus and for the terminal chain stimulus. Thus, when it characteristically occurs at points near the beginning of numerous chains of diverse composition, we will emphasize the discriminative value of a chain stimulus. In such instances, it can set the occasion for the occurrence of numerous response-reinforcement sequences, and thus, for our heuristic purpose, may be termed a *generalized discriminative stimulus*. Such generalized discriminative stimuli may perhaps have two additional roles: they may effect increases in any of the instrumental responses that have occurred in that context (conditioned facilitation), and they may become discriminative for conditioned approach responses specific to the person dispensing the stimuli. These two stimulus functions are corollaries of the chaining conception, but to date have seldom received conceptual or empirical emphasis.

Aversive chain stimuli can acquire generalized discriminative and reinforcing properties which are reciprocally analogous to the properties just noted for

[8] There has been some controversy concerning the conditions for establishing a stimulus as a conditioned reinforcer (i.e., whether a stimulus need be discriminative in order to acquire conditioned reinforcing value). Keller and Schoenfeld (1950) cite the studies of Schoenfeld, Antonitis and Bersh (1950) and Dinsmoor (1950) as evidence that discriminative stimuli and conditioned reinforcers are co-existent: a stimulus can function as a conditioned reinforcer only if it has also been established as a discriminative stimulus for some response. However, Kelleher and Gollub (1962) and Kelleher (1966) have cited studies (e.g., Ferster & Skinner, 1957; and Stein, 1958) in which stimuli were found to function as conditioned reinforcers without necessarily also functioning as discriminative stimuli. Moreover, it was found that discriminative stimuli occurring early in long operant chains did not necessarily function as conditioned reinforcers. Although the evidence on this issue is not yet conclusive, stimuli in S-R chains appear generally to function both as conditioned reinforcers for responses preceding them and as discriminative stimuli for responses following them.

[9] In passing, we note that several writers have remarked that the conditions determining the operation of conditioned reinforcement (particularly in the absence of the terminal "primary" reinforcer of the S-R chain) are operationally identical with frustration conditions, i.e., interference in an S-R chain of directed activity, even though conditioned reinforcement has equilibrium and approach connotations and frustration has disequilibrium and aversive connotations (e.g., Bower, 1963; Lott, 1967). As the issue is moot, and the possible operation of frustration is confounded with conditioned reinforcement on the level of analysis at which we are operating and does not affect our case, it may reasonably be ignored in our exposition here. When frustration is considered in a later section, note will be taken of Amsel's (1962) thesis that after reward conditions have become routine, nonreward can produce a frustration drive state affecting the incidence of responses generally.

conditioned positive discriminative and reinforcing stimuli. In addition to the effects of the contingent provision or removal of such (generalized) conditioned aversive stimuli, and their discriminative value for a variety of responses, they can have at least two other independent effects, depending on their relations to behaviors: they can decrease various ongoing responses in the context even without their contingent presentation (conditioned suppression), and they can become discriminative for behaviors avoiding the conditioned (or unconditioned) aversive stimuli (and decreasing or eliminating concurrent emotional respondents).

Whole chains or large segments of chains may come under the control of several different generalized discriminative and reinforcing stimuli, and may occur so regularly that they appear to be unlearned. When generalized discriminative and reinforcing stimuli are social, they come to control much of the interchange between people. The conditioned discriminative and reinforcing stimulus concept as used here can be employed to order the phenomena ordinarily classified under "acquired drive," and on that basis alone is a key concept for an operational analysis of social learning.[10]

It follows from our joint emphasis on the importance of co-defining stimuli and responses that our approach requires detailed attention to the sequential ordering of stimuli and responses in the study of interactions between two or more people, and that this approach has greater explanatory power than a "one-sided" approach that attends only to one person's responses (sometimes through lengthy time spans) and therefore misses important functional relationships operating between the interactors. Only by attending to the sequence of stimuli and responses is it possible to specify the conditions under which a response will occur, and then to modify the response by changing those conditions; thus the S-R chain is the most appropriate (and hence potentially useful) unit of analysis in social learning.

Stimulus Generalization and Discrimination

Stimulus generalization. The phenomenon whereby a response conditioned in the presence of one particular stimulus (which thus comes to be discriminative for it) is also emitted in the presence of stimuli which were not

[10]The occurrence of various originally unconditioned autonomic responses (i.e., "emotional" respondents such as increased heart rate, respiration, perspiration, or excretory acts) in the presence of such conditioned aversive stimuli, together with some of the just-noted properties of conditioned aversive stimuli, have sometimes been taken to reflect the presence of conditioned "fear" (where there is an identifiable aversive stimulus) or "anxiety" (where there is not, or where the effects of the stimulus are highly generalized). Moreover, they have served for some as indices of a "drive state," whose removal-reduction has been equated to reinforcement (Dollard & Miller, 1950; Miller, 1951). A critique of the adequacy of the discriminative and reinforcement facets of the conditioned reinforcer concept is considered in a later section on the role of motivation in social-learning approaches, where the postulation of "drive" is often gratuitous. The concept of "functional autonomy of motives" provides the focus for this evaluation, in which the bases for the introduction of terms like "drive" and "motive" are also considered.

earlier associated with the response, in proportion to their similarity to that training stimulus, is termed stimulus generalization. It is assumed that the response will be emitted (i.e., be generalized) to such new stimuli because of their "similarity" to the training stimulus, that is, because these stimuli may contain, along with irrelevant components, varying proportions of the relevant aspects of the training stimulus which acquired control over the response in the original acquisition context. Thus, also, it may be assumed that new stimuli, because they may be in new contexts or vary along irrelevant dimensions, will often appear to be different from the original training stimulus, although they are actually functionally identical to it.[11] Thus, stimulus generalization is likely to occur to the degree that the organism has *not* been consistently nonreinforced for responding to stimuli varying along salient similarity dimensions from the training stimulus. For instance, when a child conditioned to respond to the appearance of his mother's face by reaching out and smiling is presented with another face, the probability of his reaching out and smiling should at first be a function of the similarity of that face to his mother's; and subsequently a function of whether or not his smiles to that new face are reinforced. If the conditioned response either to the training stimulus or to its variants is not reinforced, extinction of the response will result. Generalization along a stimulus dimension which is defined not in terms of physical similarity but rather in terms of a learned functional similarity by the child (e.g., different words while varying along possible dimensions all belong to the same class) has sometimes been termed *mediated generalization.*

Stimulus discrimination. In contrast to generalization, the occurrence of a response to a training stimulus or in one stimulus situation, with a corresponding absence of that response to stimuli varying from the training stimulus, or in other stimulus situations, as a result of differential reinforcement, is termed stimulus discrimination. When the child is reinforced for responding to, or in the presence of, a particular stimulus (S^D) (or specifiable aspect of stimulation) but is not reinforced for responses in the absence of the original stimulus or in the presence of stimuli that vary in salient features from the original cue stimulus (S^Δ), or when he is reinforced for not responding to those different stimuli, his response comes under the control of the presence or absence of the stimulus. Responses under such stimulus control are said to be discriminated operants.

Extending our earlier example, if the child's reaching out and smiling to the mother's face is frequently followed by functional reinforcers such as may be provided by hugs, caresses, food, etc., and these stimuli are not provided (or are provided to a lesser degree) when he reaches out and smiles to others, the probability that the child will respond to others will decrease and a discrimination

[11]Such cases in which generalization maintains to the new stimuli which appear to be different from the training stimulus seldom appear in the basic stimulus generalization literature, but may ordinarily be found in other literatures, such as that on concept acquisition. They may, however, be basic for the use of "generalization" and "transfer" conceptions to explain the acquisition of complex behavior systems, such as language.

may be said to have been established. Hypothetically, if reinforcing stimuli were provided to a child nondifferentially by each of a large number of caretakers, the occasion for discrimination learning would be less likely to occur, and the child should be equally responsive to all caretakers (and perhaps to strangers as well). A child reared under such conditions, which would be more likely to occur in institutions than in family settings, would also not be given the optimal circumstances for acquiring differential "attachments" to people (which process will be discussed in a later section).

Thus, generalization and discrimination represent *reciprocal* definitions of the same phenomenon and provide convenient foci for the consideration of variations of the basic acquisition process of stimulus control of responses. Indeed, there can be postulated a dimension of treatment conditions involving varying degrees of differential reinforcement for the response to a stimulus, ranging from those which yield pure stimulus generalization (i.e., no discrimination) at the start of a test series to conditions which yield pure stimulus discrimination (i.e., no generalization). Gradients of response across stimulus dimensions are expected to fall more steeply from a maximum at the training stimulus as training (and test) conditions approach those for discrimination (Gewirtz, Jones & Waerneryd, 1956). In this context, it can be seen how the types of experiences a child has with the stimuli in his environment can affect his subsequent learning and the degree to which his responses will come under stimulus control. As much of social learning involves the acquisition by stimuli of discriminative control over the responses of the developing child, the discrimination-learning process outlined is particularly important in early life. Moreover, it provides a useful model for studying the development of early dimensional learning by the young child.

Dimensional learning. It is readily assumed that the discrimination-learning trials in which responses are followed by reinforcement constitute dimensional-learning trials. However, it is our contention that dimensional learning is also dependent upon the discrimination-learning trials in which responses are *not* followed by reinforcement. The assumption is that, in discrimination learning, the child learns to discriminate not only the occasions for reinforcement (S^D) but, at the same time, the occasions for nonreinforcement (S^Δ). On this basis, it is thought that a child comes to discriminate between stimuli varying along salient dimensions (e.g., height, area, brightness), and that his responding to sets of stimuli in terms of such dimensions constitutes dimensional learning. Moreover, it is assumed that the efficiency with which the child comes to discriminate these salient differences is a direct function of the positive S^D and negative S^Δ instances he has experienced, in terms of their number and range, the proportion of each set, and like factors.

It is therefore important that a child be provided with a wide range of diverse environmental events, through which he can acquire many varied dimensional discriminations. To facilitate such dimensional learning, environments might be designed to provide stimulus instances that fall much closer to each other along salient (simple and compound) stimulus dimensions (i.e., instances of negative discriminative stimuli that are increasingly similar to the positive discriminative stimulus), thereby requiring ever finer discriminations by the child. Insofar as the child is able to discriminate more and more subtle differences among stimuli varying along growing numbers of dimensions, the child's behavior systems come increasingly under more subtle and varied discriminative stimulus control.

Complex discriminations. Complex discriminations can be established that govern a subject's responses to a wide range of discriminative stimuli varying in content. Some have termed this learning "concept formation," and a useful label for many purposes appears to be *"conditional discrimination"* (Lashley, 1938; Cumming & Berryman, 1965). In simple discrimination acquisitions (involving simultaneous or successive contrasts), the correct response is made entirely on the basis of the presence or absence of a single discriminative stimulus (attribute) that sets the occasion for reinforcement of the response. In a conditional-discrimination situation, however, the correct response is made on the basis of attributes of two or more stimuli, for instance, the standard (i.e., the conditional stimulus) and comparison stimuli in the matching-to-sample conditioning case. In the general case, these would be termed the *conditional* stimulus and *discriminative* stimuli, and the relationship between the two stimulus sets need not be one of matching. Thus, the discriminative stimulus is not homogeneous as in simple discrimination learning where it is but a standard cue in whose presence the response may be reinforced and in whose absence it will not be; rather it varies across discrimination trials relative to the conditional stimulus which thus comes to function as a set or selector for discriminations. The conditional discrimination is therefore a setting concept that can provide the presumed basis for many complex behavior systems: the conditional stimulus(i) sets the occasion for the stimulus dimension(s) or the value(s) along the dimensions that control the response, i.e., it defines the discriminative stimuli for reinforcement. The analysis of imitation-identification made later describing two key complex social-learning processes is based on a matching-to-sample conditional-discrimination paradigm. Further, as is also noted later on, language acquisition may abound with conditional discriminations, which (through generalization-induction) function as grammatical rules; for instance, verbs are inflected one way in a present context and another way in a past context.

Acquisition and its Facilitation

Shaping. One process that can facilitate response acquisition is shaping or response differentiation. This procedure, which involves the differential reinforcement of successively closer approximations to the desired response (Skinner, 1953), is a means by which desired behavior outcomes previously unobserved in a child's repertory can be fostered. Initially, appropriate evoking stimuli may be necessary to facilitate the occurrence of primitive behavior

elements that can then be modified through shaping. In the child's socialization, his behaviors are continually being shaped as his changing capacities permit. However, it is often difficult, and for many purposes irrelevant, to specify which is the cause and which the effect, as shaping procedures may be responsible to a large degree for many of these changes in "capacities."

Fading. A process that is complementary to shaping, but involves a progressive change in the stimuli controlling the response rather than in the response itself, is stimulus fading. This fading process could involve changing from continuous to intermittent reinforcement, from a high potency reinforcer in acquisition to a lower-potency reinforcer in maintenance, or from one discriminative stimulus to another. For example, in discriminative-stimulus fading, an initially neutral stimulus can come to function as a discriminative stimulus for behavior when it is presented simultaneously with a functioning discriminative stimulus which is gradually withdrawn. By this method, the subject can learn difficult discriminations without acquiring the tendency to respond occasionally to the negative discriminative stimulus (i.e., to make errors), as is the case when the discrimination is learned by trial and error methods (Terrace, 1963a, 1963b). Fading methods can be especially useful for bringing behaviors under the control of verbal commands or requests. For example, Baer, Peterson and Sherman (1965, 1967) reported that an experimenter-model taught children to imitate his behavior by saying "Do this," emitting the desired response, and physically assisting the child to make the same response. On each trial, they lessened (i.e., faded) the amount of assistance provided until the child came to respond to the cues in the verbal command and the model's response alone.

A combination of both shaping and fading methods can be an effective procedure to facilitate the child's verbal learning, which is one of the most important components of socialization. A cogent example of the use of these techniques is the Lovaas, Berberich, Perloff and Schaeffer (1966) method for teaching initially nonverbal schizophrenic children to speak. In the initial stages of learning, the experimenters used shaping methods to make the sounds emitted by the child become more and more like those modeled by the experimenter. Once the child had learned to imitate the experimenter's vocalizations, the next step was to teach him to answer questions. Here fading procedures were used: the experimenter asked questions and prompted the child by telling him the answers. The experimenter then gradually faded out the prompt cue by saying the answer more and more softly, until the child learned to answer the question without prompting. Similarly, after speech was established in autistic echolalic children by shaping and imitation training, that speech behavior was transferred from imitative to appropriate stimulus control by fading in new stimuli and fading out the verbal prompts (Risley & Wolf, 1967).

Schedules of reinforcement. The contingency patterns in which reinforcing stimuli are provided play significant roles in the acquisition and maintenance of behavior (Ferster & Skinner, 1957). Reinforcement schedules

illustrate one form of control that stimuli can acquire over behavior, in that they determine the rate at which behavior is emitted. This reinforcement-pattern control, however, is secondary to the control over behavior exercised directly by reinforcing stimuli. The simplest reinforcement schedule is that of *continuous reinforcement* (CRF), in which a given response is reinforced each time it occurs. It was the schedule typically employed in the early studies, which attended to simple relationships between the response and reinforcement. Acquisition and extinction under CRF can provide baselevels in terms of which a consideration of intermittent reinforcement schedules can proceed. Under CRF, a response will be acquired most rapidly and will extinguish most quickly if reinforcement is withheld. Intermittent reinforcement schedules vary along two basic dimensions: ratio or interval, and fixed or variable. In ratio schedules, the reinforcer is presented according to the number of times the response is emitted, whereas in interval schedules the reinforcer is presented according to the amount of elapsed time since the previous reinforcement of the response. Furthermore, reinforcement according to either of these two types of schedules may be presented on a fixed or variable basis.[12] In general, ratio schedules result in high response rates with "bursts" of responding, and interval schedules produce low, steady response rates. A variety of other reinforcement schedules have been and can be devised, including differential reinforcement of low response rates (DRL) or simultaneous or successive combinations of any of these schedules.

Because under intermittent reinforcement a response becomes more resistant to extinction, these schedules may be thought of as a means of "fortifying" the organism against changes in response rate when contingent stimulation is removed or changed in provision rate. Most reinforcement in the child's development can be assumed to be on some sort of intermittent schedule, since the caretaker is often occupied with other children or with some task and is not able to reinforce (continuously) every one of the child's behaviors; or occasionally the caretaker may deliberately withhold reinforcement from the child to avoid "spoiling" him.

Correlated or conjugate reinforcement. Some ordered attribute of performance (e.g., response latency, duration, amplitude, rate) may directly determine the magnitude of a reinforcer or the speed with which it is dispensed following a response. The more closely a performance approaches the defined criterion, the greater the amount of reinforcement or the faster it is provided.

[12] In a *fixed ratio* (FR) schedule, every Nth response is reinforced, as compared to a *variable ratio* (VR) schedule, where on the average every Nth response is reinforced, but the actual number of response occurrences between reinforcement occasions varies randomly about the average characterizing ratio. *Fixed interval* (FI) and *variable interval* (VI) schedules are analogous to ratio schedules, except that in interval schedules the first response occurring after a fixed or variable time interval is reinforced; in VI schedules the time between reinforced responses varies randomly around some average interval. Under an FI schedule, "scalloping" tends to occur, with the response rate decreasing immediately following a reinforcement, and increasing as the time approaches for the next reinforcement occasion.

This mode of reinforcement provision has been termed "*correlated*" by Logan (1960), "*conjugate*" by Lindsley (e.g., 1963), and "*titration*" by Weiss and Laties (1963). For instance, panel-pressing was conditioned in 12-month-old children when the intensity of the reinforcing event, a light to permit the viewing of a moving object in a box, was increased in proportion to response rate (Lipsitt et al., 1966).

Correlated or conjugate reinforcement studies differ from instrumental conditioning studies employing the standard modes of reinforcement (previously discussed) in several ways. In the latter studies, ineffective low or possibly noxious high values of a potential positive reinforcing stimulus are ordinarily discarded from experimental procedures, after either an examination of the lore or prior pilot research (although these informal checks are usually only implied in the experimental report), and a single value of the reinforcer is then made contingent upon a single, defined value of the response. However, when correlated or conjugate reinforcement is used, both those values of the intended reinforcing event that may, and those that may not, function as reinforcers (under a standard setting condition) are provided within the same procedure. And *any* response, whether it be close to or (within a defined wide range) remote from the criterion level chosen for maximal reinforcement, is followed by some value of the intended reinforcing event. In such studies, therefore, it is the span of values of the intended reinforcing stimulus, known from previous lore or prior pilot research to function as strong positive reinforcers of behavior, that is coordinated with the response range around the criterion value (that value selected to receive maximal reinforcement). This is done either explicitly, as in Logan's (1960) work, where a defined intermediate response value provides the criterion that is to be maximally reinforced, or implicitly, as in the work of Lindsley (1963) or of Lipsitt et al. (1966), where some unspecified but high value of the response unit receives maximal reinforcement.

"Intrinsic" or "self" reinforcement. It is axiomatic that behavior acquisition and maintenance require the presence of stimuli. However, there are sometimes situations in which a systematic change in some aspect of behavior is identified but the extrinsic reinforcing stimuli (i.e., stimuli provided by environmental agents) strengthening or maintaining it are not. Such behaviors have sometimes been labeled gratuitously as "self-reinforcing" or "intrinsically reinforcing," this usage implying that the responses at issue occur "for their own sake" (e.g., Harlow, 1950; Aronfreed, 1967, 1969; Kohlberg, 1963). In a not dissimilar vein, others have written that such responses are "intrinsically motivated," based on a "motive" to exhibit the behavior, e.g., the motive of exploration, of curiosity, or the "manipulation drive" of Harlow, Harlow and Meyer (1950), and that organisms have a "need" for the sensory stimulation which ensues as a consequence. Kohlberg (1966) has conceived that "effectance" or "competence-mastery" motives or a motive for "interesting" events underlies "intrinsically reinforced" behaviors, a conception like White's (1959) "competency striving."

However, the analysis in this chapter assumes that many behaviors that

appear to be acquired on these bases may, in fact, be conceived as functionally attributable to the operation of extrinsic reinforcement provided by opportunities to manipulate or to attain specific consequences that may be assumed to involve mastery or interesting events. Thus, by using such labels for responses as "intrinsically reinforcing" or "self-reinforcing" and "intrinsically motivated" or "self-motivated," researchers may ignore some relevant observable determinants of a response's strength which may be of a different order from the ones usually involved in conventional reinforcement analyses. Further, under a competence-effectance approach as presently conceived by its various proponents, there is no provision for specifying, in advance of its occurrence, those conditions that will maintain a response. Such a conception seems to be more a device for discussing behavior that has occurred outside of the range of behaviors maintained by organismically relevant reinforcing consequences than a means for advancing detailed, directional hypotheses. Thus, also, Aronfreed (1968, 1969) has postulated that "pleasurable affective change" induced by the positive consequences of instrumental learning may become directly attached (conditioned) to the intrinsic correlates of a response so that the response's reinforcing affective consequences come to be elicited by the intrinsic perceptual cues or cognitive representations which are associated with performance of the act. For Aronfreed, the affective values of these intrinsic correlates provide the basis for the inherent reinforcing properties for the overt response in a process which he labels "internalization," in that he assumes "the behavior becomes independent to some extent of its external consequences" (although how behavior can become independent "to some extent" is unclear to me). Exactly what the scientific status is of these affective properties (e.g., in terms of independent indices), and how these properties which make acts intrinsically reinforcing can be removed so that the response, once established, can become extinguished, is not made clear in Aronfreed's thesis. Yet some responses do extinguish. (These issues are further discussed in later sections.)

Another proposed explanation for the continued occurrence of responses after the removal of extrinsic reinforcement is the notion advanced by some conditioning theorists that a behavior can be maintained by its response-produced cues which, having systematically preceded extrinsic reinforcers, acquire reinforcing properties (cf., e.g., Staats & Staats, 1963). This conception is perhaps more parsimonious than Aronfreed's, insofar as it does not contain his unobserved, hedonistically flavored processes. Even so, in assuming that a stimulus attribute of the response acquires conditioned-reinforcer value, thereby maintaining the response in the absence of extrinsic reinforcement, the conception has a limitation very similar to that of Aronfreed's: it confounds the conditioned reinforcer with the response whose occurrence it explains, thus precluding the conditioned reinforcer's having the independent status required for differential prediction. At the same time, this conditioned-reinforcer conception does not provide an appreciably better explanation for a functional analysis of behavior maintenance, in the apparent absence of extrinsic reinforcement, than does the simple conception of intermittent reinforcement schedules. In fact, emphasizing such a concept

in intermittent, extrinsic-reinforcement contexts can detract from the parsimony of a functional analysis. What such conditioning approaches must assume but do not emphasize is that the conditioned reinforcer will inevitably lose its reinforcing value if it is not, at least occasionally, paired with strong, active functioning reinforcers. It follows, since any conditioned reinforcer alone can maintain a response only for a limited number of trials, that the key to the explanation of behavior maintenance in the absence of identified reinforcers must be the (at least) occasional occurrence of extrinsic reinforcement.

In the present analysis, therefore, it is argued that use of the concepts intrinsic reinforcement or motivation, mastery-interest motives, or the conditioned reinforcement of response-produced cues is unnecessary, as the classes of outcomes for which they so imprecisely account appear to be readily explainable in an operational-learning analysis with the conceptions of functional response classes acquired and maintained under intermittent, extrinsic reinforcement. Moreover, the intrinsic-motivation or intrinsic-reinforcement concepts do nothing to expedite the tactical problem that provides the rationale for their being advanced or determining the environmental conditions (i.e., extrinsic reinforcers) that differentially affect acquisition and maintenance of the child's responses. To determine precisely the dimensions of those reinforcing consequences, and, where necessary, the relevant setting conditions that qualify them and the antecedent determinants of their efficacy, systematic empirical study is necessary. Our approach is further illustrated in a later section on the acquisition and maintenance of generalized imitation, where it is shown that imitative responses that have been assumed by some to involve intrinsic reinforcement and/or intrinsic motivation can be accounted for by intermittent, extrinsic reinforcement of members of the imitative response class. Nevertheless, these nonstandard conditioning examples can illustrate ways in which the reinforcement concept has been used and for our present didactic purposes can identify some interesting substantive issues that these uses index. The parsimony of intrinsic motivation concepts like effectance and of other drive concepts as used in analyses of human development and socialization is considered in detail near the end of this chapter.

Elimination of Behavior

Reinforcing incompatible responses. In the preceding sections, procedures for the acquisition of instrumental behavior, in which the incidence of a particular response is systematically increased through its reinforcement, were enumerated. It follows that reinforcement can be employed alone, or in combination with extinction or punishment (as will be detailed in the next two sections) to lower the incidence of, or to eliminate, an undesired response (whether or not the contingencies maintaining it have been identified) if the response selected for reinforcement is alternative to, or incompatible with, the undesired one. In cases where the contingencies maintaining the undesirable response are known but where it is not practical or (for some reason) desirable to withhold the reinforcer,

the reinforcement of alternative responses is a viable alternative to extinction. It would, of course, be necessary to make contingent on the alternative response a positive reinforcer that is significantly more potent than the one maintaining the undesired response.

Extinction. A basic procedure by which responses are eliminated is extinction, which involves the decrease in the rate of a conditioned response to its earlier baselevel when the contingent reinforcing stimulus previously maintaining it is withheld. Unlike *forgetting* in which the response does not generally occur, extinction is an active process in which the response occurs but is not reinforced. The extinction pattern of a response is determined by the schedule of reinforcement on which it was earlier maintained. Relative to continuous reinforcement (if the number of reinforcements has been constant under conditioning), extinction is prolonged after intermittent reinforcement, the type of schedule most often found in life settings.[13] Moreover, as will be seen in the next section, a response previously strengthened by the removal of a strong negative reinforcer will often be more resistant to extinction than one strengthened by the presentation of a strong positive reinforcer (the number of reinforcement trials having been constant).

Extinction of a response may be facilitated by reinforcing responses that are incompatible with the undesirable response. Socializing agents often find it difficult to remove contingencies maintaining undesired behaviors, perhaps because it is so hard for the well-intentioned adult not to respond to a child who may be "suffering" or in "need," as when he is crying, or "charming" when he exhibits other undesired behaviors. However, they can find extinction of an undesired response mixed with the reinforcement of incompatible positive responses much easier to implement unambivalently (Gewirtz, 1968b). Thus, after caretaker attention was identified as the reinforcing stimulus for such objectionable behaviors as high-rate operant crying, the attention was withheld, and the extinction process was facilitated by evoking and reinforcing eye contact and smiling responses to the experimenter's face at the same time that the attention contingency maintaining the infant crying was removed (Etzel & Gewirtz, 1967).

Punishment. A controversial means through which socializing agents may attempt to eliminate undesired behaviors is punishment. Punishment has been defined as either the contingent presentation of a noxious stimulus or the withdrawal of a positive reinforcer (e.g., Skinner, 1953). However, in this section the term will be employed to refer mainly to the contingent presentation of an aversive stimulus. Unlike extinction, in which the identity of the stimulus maintaining the response must be known so that it can be removed, for punishment

[13]Extinction following continuous reinforcement is relatively rapid with bursts of relatively few responses. Following ratio schedules, it is also fairly rapid but many responses are emitted at a high rate. Following interval schedules, it is prolonged with responses emitted at a low sustained rate.

knowledge of the contingency maintaining the response is not critical, since a noxious stimulus, whether or not earlier related to the response, is made contingent upon the response. Even so, such knowledge could be useful to socializing agents in that it would permit an estimate of how potent an aversive stimulus must be, relative to the reinforcing stimulus maintaining the undesired response, in order for it to eliminate that response when presented contingent upon it. Furthermore, in view of the reservations that will be made in this section about the effects of punishment on behavior, withdrawing the previous, continuously available maintaining stimulus may be a more effective procedure than punishment.

The use of punishment can be illustrated with the social-response class termed aggression,[14] which is often punished by socializing agents. An aversive stimulus, if strong enough, presented contingent upon a response class like aggression may suppress it. Also, pre-aversive stimuli, which may include response-produced cues from aggression and verbalizations about aggression in addition to events in the presence of which aggression has been punished, can become discriminative for avoidance, escape, and/or conditioned emotional responses (which some would term "fear" or even "anxiety") that are incompatible with emitting aggression. As conditioned aversive stimuli, they may also function to suppress the response class upon which they are contingently presented.

The use of aversive stimuli as in punishment is not infrequently employed by socializing agents as a means of eliminating (undesirable) behavior more rapidly than via extinction.[15] Punishment may also be employed by caretakers because often they understand better how to implement punishment than extinction, or because they hold the theory that a child is or may become evil if his transgressions are not dealt with immediately and sternly. However, the usually immediate suppressive effect of the contingent presentation of aversive stimuli may be only short-term. Indeed, after punishment, the response may recur in varying degrees ranging from no recovery to complete recovery of the original response strength (Solomon, 1964).

[14]Behaviors are ordinarily termed aggressive if they are maintained (by stimuli provided) by the hurt or damage caused to another (others). These "hurting" consequences may be physical or social in character. It is commonly thought that the aggressive response may be acquired on the basis that initially undirected physical acts prove to be instrumentally effective in removing noxious stimuli, including those stimuli that block ongoing behaviors or prevent S-R chains from going through all their cycles (i.e., frustration), and that the annoyance or pain cues from caretakers which follow the instrumental responses in the chain and are discriminative for the terminal reinforcement acquire conditioned reinforcer value for aggressive behaviors. Sometimes an infant's thrashing about and emitting high-amplitude verbal responses can be effective not only in removing a noxious stimulus, but can also result in other positive reinforcing stimuli, like "soothing" skin contact and similar unconditioned and conditioned stimuli received from the caretaking environment. The reinforcement contingencies listed here can establish the aggressive response class as a strong one for an individual.

[15]A study evaluating the relative effectiveness of procedures designed to eliminate behavior was performed by Holz and Azrin (1963). Stimulus change, extinction, satiation, physical restraint, and punishment were evaluated on the criteria of the immediacy, duration, extent, and irreversibility of response reduction. It was found that extinction was the only procedure which did not produce an immediate reduction of behavior.

Any outcome within this range can be produced by merely varying the intensity of the noxious stimulus (Azrin & Holz, 1961). However, the efficacy of punishment in eliminating behavior may also be determined by other important factors: the duration and frequency of the noxious stimulus, the delay in its presentation, whether its intensity is sudden or gradual, the strength of the response, the way in which it was initially acquired (usually difficult to specify in the case of long-standing responses), on what schedule it is being maintained, and whether or not an alternative response is reinforced during the response suppression period. In fact, in most experiments where punishment has been found to have only a temporary suppressive effect, the subject did not have (was not offered) an alternative for obtaining the positive reinforcer that was maintaining the punished response (Solomon, 1964). Although response suppression appears initially to generalize to other settings, ordinarily it is subsequently restricted to the setting in which the response has been punished. A reasonable assumption is that a response suppressed by punishment will be less likely to occur in settings varying from the punishment setting when an incompatible or alternative response has been positively reinforced in the punishment setting by the same reinforcer as maintained the punished response, or sometimes even by a different one. Another variable which may determine the effectiveness of aversive stimuli in controlling child behavior is the relationship between the agent of punishment and its recipient. The ways in which contextual factors like these can operate as setting conditions to determine or qualify the efficacy of stimuli for child behavior are considered in detail elsewhere (Gewirtz, 1967a), and are surveyed in a subsequent section.

In settings where escape or avoidance is possible, the punishment process may lead to behaviors which remove the organism from the controlling aversive stimuli and decrease or eliminate concurrent emotional respondents. Stimuli associated with the dispensers of punishment (i.e., socializing agents), as systematically part of the punishment setting, become discriminative for these escape and avoidance behaviors. Since a punished child may subsequently withdraw from interaction with socializing agents, the use of punishment can have socially disruptive side effects. A case known to me which involves the punishment of thumb-sucking behavior in a six-year-old child can serve to illustrate these points. The child's parent attempted to eliminate this undesired behavior by making contingent upon it verbal disapproval (in the form of shaming) and/or the physical removal of the child's thumb from his mouth. Subsequently, whenever that parent approached the child or entered his vicinity, the child would remove his thumb from his mouth or hide himself from the parent. Thus, the aversive stimuli employed by the parent seem to have controlled the child's thumb-sucking only in the parent's presence and even then only when the child did not attempt to hide his thumb-sucking from his parent. While the child did not cease his thumb-sucking completely, thumb-sucking and hiding behavior came under the control of the sight of his parent.

We have already noted that the use of aversive stimuli (and stimuli which systematically precede them) in the control of behavior, particularly when

avoidance or escape behaviors from the aversive stimuli are not possible in the setting, often evokes undesirable emotional and aggressive behaviors which may be incompatible with desired behaviors and thus disruptive for new learning involving these or other behaviors in the setting. The aggressive-behavior outcomes may include instrumental aggression directed against the punishment source as well as nondirected aggression against persons and objects present in the setting.

Concerning these emotional-behavior outcomes, it is important to note that Azrin and Holz (1966) have concluded from a summary of experimentation with animals and gross observations with humans that relatively few emotional-behavior outcomes of punishment persist as chronic maladjustive patterns. Even so, if the effects of punishment can be long lasting as many others have assumed, then the use of punishment may merely result in the exchange of one undesired behavior for another, that is, emotional, aggressive and/or escape-avoidance behaviors for the response that punishment was being made contingent upon to eliminate, precluding the acquisition of desired behaviors. While punishment is often employed by socializing agents in the belief that it will benefit the child, the advantage which may result from the cessation of the undesirable behavior may only be momentary and may be beneficial or reinforcing only for the punishing agent, while the effects for the child may be mainly detrimental and possibly long lasting. It is clear, however, that if punishment is used, it is likely to be maximally effective with minimal side effects when it is presented *immediately* contingent upon the objectionable response, and an alternative, preferably incompatible, response is positively reinforced.

In extreme cases, where undesired behaviors are so probable in the child's repertory that alternative reinforceable behaviors are not likely to occur until the objectionable behaviors are suppressed, the use of punishment (rather than positive reinforcement of alternative responses) would be unquestionably indicated. Thus, also, punishment may be necessary in order to suppress a response of the child that places him in great immediate personal danger. However, it will certainly be more effective in eliminating responses (even severe problem behaviors) and probably less likely to bring on emotional and aggressive behaviors as by-products when supplemented by the positive reinforcement of alternative, and preferably incompatible, responses. For example, the behaviors of "autistic" children have been effectively modified by presenting strong electric shock contingent upon obsessively repeated self-injurious behaviors and by removing the shock contingent upon the appearance of socially valued approach responses that are incompatible with the former behaviors (Lovaas, 1967).

A readily applied alternative to contingent noxious stimulation for eliminating a behavior is the *contingent withdrawal of a previous continuously available positive reinforcing stimulus*. Unlike extinction, which is the complete removal of the positive reinforcer which had previously maintained the conditioned response, this procedure involves the contingent removal of a reinforcing stimulus which is present in the setting prior to each emission of the response, regardless of whether or not the stimulus was involved in the acquisition of the

response. An example is provided by a study in which the rate of thumb-sucking was systematically reduced by turning off (i.e., removing from the screen) an animated-cartoon reinforcer whenever the child inserted his thumb into his mouth (Baer, 1962). As in the case of the contingent removal of an aversive stimulus (Lovaas, 1967), this disciplinary technique can be extremely effective in modifying behavior and less difficult for the socializing agent to administer when its termination is made contingent upon desirable behavior. Thus, Baer (1962) found that contingent reinstatement of the reinforcing event was highly effective in modifying behavior in directions desired by the experimenter. Another variation on the withdrawal of positive reinforcement is the use of "time out" sessions, occasions on which the response is never reinforced. This procedure has also been found to be especially effective in eliminating a response when there is an alternative response available that is maintained by the same reinforcer as maintained the response being eliminated (Holz, Azrin & Ayllon, 1963).

Thus, the main effect of the contingent removal of positive reinforcement on the response being modified appears generally similar to the main effect of contingent aversive stimulation, and it is suspected that many or all of the emotional responses which frequently accompany negative stimulation may be absent following the withdrawal of positive reinforcement that previously was continuously available. However, comparison of all of the effects of these two procedures remains an empirical question for each experimental case (just as it does when the operations of presenting two aversive stimuli are compared). A recent survey of the effects on child social behavior of punishment and related disciplinary techniques can be found in Walters and Parke (1967).

On the Relative Potency of Positive and Negative Reinforcing Stimuli

There has been frequent speculation about the relative potency of positive and negative reinforcing stimulus classes in terms of their effect on behavior. Thus, Miller (1944, 1948b, 1964) has directed attention to the fact that when the locomotor avoidance response to a training stimulus followed by an aversive reinforcer is stronger than or equal to the approach response to it followed by a positive reinforcer, steeper ("generalization") gradients across spatial stimulus dimensions occur for the former avoidance response than for the latter approach response. Further, a locomotor approach response may require many more training trials, with positive reinforcing stimuli, to attain the same strength that a locomotor avoidance response may reach with only one or two noxious contingency trials. However, the traditional paradigms for studying the effects on behavior of negative reinforcing stimuli have often been different and more varied than those used to study the effects of positive reinforcing stimuli, and thus some of the distinctions between the two types of reinforcing stimuli may be due mainly to differences in the operations used to study them. Thus, the identity of reinforcers is often confounded with their effects: escape and avoidance behaviors which are

typically maintained by aversive stimuli are emphasized relatively more than are approach behaviors maintained by positive reinforcers, particularly in natural settings.

Speculation as to whether noxious stimuli which function as negative reinforcers are generally more or less potent than stimuli which ordinarily function as positive reinforcers may be of limited theoretical consequence. Although aversive stimuli within the range of intensity values and setting conditions ordinarily studied generally do have a more potent (in the sense of rapid) effect on behavior than do positive reinforcing stimuli, in principle one could devise parallel paradigms for the study of positive and negative reinforcers such that they would be considered equivalent in potency, or even reversed. In such instances, the removal of the former could have the same impact on behavior as the presentation of the latter, and vice versa, particularly when setting-context conditions are also manipulated (as considered in the next section). Moreover, in such cases these operations may not only lead to equivalent outcomes in the behavior monitored, but they may also have equivalent concurrent responses associated with them. Frequently, however, it would be of limited utility to compare the general effects of positive and negative reinforcing stimuli, or to wonder if, in general, the withdrawal of positive reinforcement and the presentation of negative reinforcement have different emotional behavioral concomitants.

There is still a further sense in which the comparison of positive and negative stimuli is indeterminate if approached as a general case. Stimuli ordinarily conceived to function as positive or as negative reinforcers may do so only within a limited range of intensity values or setting conditions. For instance, stimulus events which normally function as aversive stimuli at high intensities can function as positive reinforcers at low intensities (e.g., a tingling shock). Further, there are stimuli that may function as positive reinforcers under one value of a setting condition and as nonreinforcers or as negative reinforcers under another value. Thus, food stimuli function as positive reinforcers primarily after they have been unavailable to the organism for a sufficient period, but as negative reinforcers when the food-satiated organism cannot avoid receiving them. Thus, almost any event can come to function as a strong reinforcing stimulus, a relatively weak one, as no stimulus at all, or even as a stimulus with reinforcing properties opposite to those ordinarily expected, depending upon its intensity-value or setting-condition context, such as an individual's condition of deprivation or satiation. The effects of setting conditions on stimulus efficacy and how they are qualified by an individual's long-term maintenance pattern for a stimulus are discussed in detail in the next section.

Contextual Determinants of Momentary Stimulus Efficacy

The effectiveness of stimuli for controlling behavior on a particular occasion, by evoking, cueing, or reinforcing it, is typically dependent upon the contextual

aspects of stimulus provision and may be enhanced or decreased by manipulating these contextual-setting conditions. Some of the most familiar of them involve the deprivation and satiation of appetitive stimuli (i.e., food and water). An often neglected context has to do with the circumstance (ground) present when stimuli (figures) are provided, as in perceptual research where the ground is often varied systematically to increase or decrease the salience of the stimulus figure. However, in learning experiments, which usually involve the attempt to vary performance to some set of focal stimuli, background stimuli are sometimes held constant and often overlooked. Although discriminative and reinforcing stimuli are usually described in sufficient detail in studies of child learning, the setting conditions that qualify the efficacy of those stimuli are rarely made explicit. All too frequently these conditions (e.g., time of deprivation for the stimulus class being tested, the subject's adaptation or maintenance level for that class, or the specific or general status of the person dispensing a discriminative or reinforcing stimulus) are only implied in descriptions of experimental conditioning procedures with humans.

The conditions which heighten or lower the salience of stimuli for behavior may operate: (1) at one time point concurrent with the functional focal stimulus (e.g., as the ground for the stimulus figure, or as masking effects); (2) immediately before the point of stimulus functioning (e.g., as a cue to the region in which the focal stimulus will appear); and (3) across time points before focal stimulus functioning (e.g., as deprivation or satiation contexts for a stimulus, or as fatigue effects). Further, we have noted in an earlier section on generalization and discrimination that the stimuli controlling higher-order discriminated operants (conditional discriminations) may also function essentially as setting conditions to qualify stimulus efficacy for behavior.

To illustrate how contextual factors may, in time, come to operate prior to the testing of stimulus functioning, the next two sections will emphasize deprivation-satiation functions governing the efficacy of given stimuli and the maintenance levels for given stimuli which, through some as yet poorly understood form of learning, can apparently also qualify their efficacy. We may thus concentrate here on some other conditions which operate concurrently with or immediately preceding the presentation of a stimulus to qualify its reinforcing efficacy. There is evidence that various stimulus attributes of the person dispensing a stimulus, including his sex, social-, or role-status, may come to qualify the reinforcing efficacy of that stimulus for behavior. In a number of studies, reinforcing stimuli dispensed by men have been found more effective in altering the behavior of girls than of boys, and the opposite effect has been found when women dispensed the reinforcers (e.g., Gewirtz, 1954; Gewirtz & Baer, 1958a, 1958b; Patterson, Littman & Hinsey, 1964). Some research and speculations about the role in the modification of child behavior of such characteristics of socializing agents are reported by Patterson (1967).

Furthermore, such setting conditions which operate concurrently with focal stimulus functioning can stem from an individual's history of reinforcement (e.g., the role the reinforcing source has played there), and thus, like the stimulus

maintenance conditions which will be discussed subsequently, must have their bases in learning factors.[16] An agent may routinely have been the source only of positive reinforcement, only of aversive stimulation, or of both stimulus types; or the types of interaction a child experiences with an adult experimenter during a single prior treatment session may have been positive, negative, or neutral. These prior conditions can qualify the efficacy for the child's behavior of both positive and negative reinforcing stimuli. For instance, positive and negative reinforcers were each found to be more effective for child subjects after sessions of positive interaction than after sessions of neutral or impersonal contact with an experimenter (see McCoy & Zigler, 1965, for positive, and Parke & Walters, 1967, for negative reinforcers). However, positive reinforcing stimuli were less effective for child performance after a positive- than after a negative-interaction experience with an adult (Berkowitz, Butterfield & Zigler, 1965). Furthermore, the absence of any reaction from an adult experimenter could come to function as a positive reinforcer for children who in an earlier session had received negative verbal reinforcement or as a negative reinforcer for children who had earlier received positive reinforcement (Crandall, Good & Crandall, 1964).

A stimulus can also come to function as a positive or negative reinforcer if it has been selectively associated with positive or negative reinforcement. Further, in a context in which an organism must respond and can choose between responses that have been followed by two different but nevertheless strong noxious stimuli, the weaker noxious stimulus can function as a positive reinforcer for the response upon which it is contingent. Thus, such setting conditions as an individual's previous experience with focal and/or ground stimuli or the matrix of his alternatives may qualify the efficacy of stimuli in controlling behavior, even to the point where a stimulus can come to function with reinforcing properties opposite to those ordinarily expected.

Although it has been generally assumed that stimuli of inherently high salience are not readily susceptible to modification, even the efficacy of these stimuli can be qualified, as shown by Bevan and Adamson (1960) who modified the reinforcing efficacy of cutaneous electric shock for human adults by earlier giving them different intensity distributions and average levels of shock. However, the concurrent or preceding setting conditions must themselves be quite strong to effect a change in the efficacy of such potent stimuli. Perhaps more important for social learning, an otherwise trivial stimulus may be made to function as a potent discriminative or reinforcing stimulus for behavior, if the contextual aspects of the environment are considered and properly manipulated. Indeed,

[16]There are diverse headings, including some more conventional learning categories, under which we might have listed the learning-*qua*-experience factors implied in the conception of maintenance-level or maintenance-pattern reference standards and of stimulus sources as qualifiers of stimulus efficacy. However, for convenience in this didactic presentation, we have arbitrarily chosen to emphasize how the outcomes of such experience factors can come to qualify stimulus functioning in ways that have no direct relevance to their experimental roles in a given investigation. Hence we have opted here to deal with these issues under the heading of setting conditions, and to leave their implications for the forms of learning that must be involved to a subsequent conceptualization.

these conditions must be considered if the potentially discriminative or reinforcing stimuli are to function effectively and uniformly, particularly in social contexts (Gewirtz, 1967a).

If successive presentations of a stimulus were to lead consistently to the same response, it would be unnecessary to consider the contextual aspects of the environment in which the stimulus was presented. Because this homogeneity in response attributes is rare, it is important to consider the conditions under which a stimulus is provided and the response which results. Many of these conditions have been labeled, or attributed by some to, "drive," but because of the often ambiguous (excess) meanings of that term, we have termed them "setting" conditions as some others have also done (e.g., Kantor, 1959; Bijou & Baer, 1963). Once the relevant setting conditions have been identified, and the functional relationships specified between them as background stimuli, the focal stimulus, and the response, the use of the term "drive" or of similar terms would be superfluous for many purposes.

Deprivation and satiation. Short-term deprivation and satiation relationships are illustrative of how setting conditions can operate across time points to qualify the effectiveness for behavior of stimuli presented on any particular occasion, e.g., as reinforcers. Deprivation of a stimulus refers to its removal, or to a decrease in the rate of its provision, leading to an increase in its effectiveness; and satiation for a stimulus refers to its repeated presentation, or an increase in the rate of its provision, leading to a decrease in its effectiveness. So defined, deprivation and satiation are reciprocal operations. Recovery from satiation, which involves an increase in stimulus efficacy brought about by a period (following satiation) during which the stimulus is not provided, is thereby the conceptual equivalent of deprivation. The reinforcing efficacy of a stimulus will thus be a direct function of the degree of the organism's deprivation for it at that particular moment, usually indicated by the length of time that the reinforcing stimulus has been withheld. Although it is conventional to consider stimuli such as food (or social stimuli such as approval or attention) as positive reinforcers, most such stimuli function in this role only within a narrow range of conditions, in particular when the organism for whom they can function as stimuli has recovered from being satiated for them (i.e., after having been appropriately deprived of them). Indeed, if an infant is well satiated for any one of a large number of stimuli which normally (i.e., in a wide range of settings) function as positive reinforcers (whether or not they occur as consequences of his behavior), he may find the stimulus aversive, whether it be food, light, sound, or a cutaneous stimulus (Gewirtz, 1961b, 1967a). Conversely, for an infant limited from receiving what is for him an important positive reinforcing stimulus, a normally aversive contingent stimulus may function as a positive reinforcer. For instance, "negative attention" from parents (via scolding) may positively reinforce a behavior of a child, especially if he is otherwise ignored by them.

Traditionally, deprivation-satiation functions were thought by many to hold uniquely for appetitive stimuli, with effects typically identified in the reinforcing

efficacy of these stimuli. Recently, however, deprivation and satiation relationships have been found to function for nonappetitive stimuli, such as visual and auditory events (Glanzer, 1953, 1958; Butler, 1957; Jones, 1964; Odom, 1964), word meanings (Lambert & Jakobovits, 1960; Jakobovits & Lambert, 1962), and a person's passive presence (Bacon & Stanley, 1963). Similar functions, involving the evocative or discriminative effectiveness of stimuli, have also been identified under the headings of *curiosity-exploration* and stimulus *novelty* (e.g., Montgomery, 1953; Berlyne, 1955, 1957) and response *habituation* or *adaptation* (Berlyne, 1955; Hinde, 1960; Welker, 1956). Moreover, similar short-term functional relations have also been identified for social stimuli (Gewirtz, 1967a, 1969; Landau & Gewirtz, 1967). Thus, the reinforcing efficacy of the stimulus word *good* (from a woman experimenter) in conditioning was an inverse function of the number of times it was presented to boy subjects during a treatment session immediately preceding the conditioning test (i.e., the degree of their satiation for the stimulus), and a direct function of the recovery interval between satiation treatment and conditioning test. While satiation and recovery for a social stimulus produced opposite, additive effects like those which characterize satiation and recovery (i.e., deprivation) functions for appetitive stimuli, it would be superfluous to apply in addition the term "drive," as has traditionally been done. Having identified a dimension of setting conditions, the description of the functional relation is sufficient for most requirements. The series of experiments just described on nonappetitive stimuli represents only a beginning in the identification of potentially many types of deprivation-satiation functions.[17]

The role of maintenance levels for stimulation. An individual's prior experiences with stimuli may also provide contextual determinants of stimulus efficacy at any given moment, with long-term performance implications. In particular, the summary abstraction (e.g., a central tendency) of some characteristic level of an individual's long-term maintenance pattern for a stimulus, for instance, the number, variety, range, or rate of stimuli experienced, may function as a reference standard to determine the efficacy of an implemented level of the stimulus for his behavior, even to the point where it can exercise close control over behaviors related to basic organismic requirements. This conception has been advanced by a number of theorists in diverse areas of psychology and stimulated much research (e.g., Baron, 1966; Bevan & Adamson, 1960, 1963; Gewirtz, 1967a; Glanzer, 1958; Helson, 1964; McClelland et al., 1953; Premack & Collier, 1962). A survey of various incongruity hypotheses and some problems in their use can be found in Harvey (1963).

[17] In connection with the deprivation-satiation conception, there remain empirical questions about: (a) the identities of the stimuli whose efficacy can be affected by deprivation-satiation manipulations; (b) the form of the functional relationship between each set of deprivation-satiation manipulations and the efficacy of each stimulus affected; (c) the identities of other setting operations that can produce comparable effects; (d) whether such operations affect different stimulus functions in the same or in different ways; and (e) the way in which the long-term pattern of maintenance conditions for a stimulus can provide referents that determine the impact of deprivation-satiation operations on the efficacy of that stimulus for an organism. When compared to the mass of functional relationships explored for performance and learning, it becomes evident that remarkably little attention has been devoted by behavioral approaches to the conditions (apart from those directly involved in learning) that determine the momentary efficacy of stimuli for behavior. But if a further understanding of the determinants of behavior (including social behavior) is to be acquired, it is these very setting conditions which theorists cannot afford to overlook.

An example of a stimulation-level summarizing concept is Helson's (1964) "adaptation level." Helson demonstrated how, for diverse stimulus-response systems, the weighted average of salient stimulus attributes the organism has experienced (and hence, as some would say, he comes to "expect"), may acquire the capacity (through some as yet inadequately identified learning process) to function as a reference standard or context to qualify the functioning of a subsequently presented stimulus of that class in determining behavior. For example, the organism may more readily respond to the average level of a distribution of an experienced stimulus than to an extreme, infrequently experienced value of that stimulus; or he may respond in a manner that will maintain or restore the level of stimulation when it deviates from the adaptation or maintenance pattern or level.

On the basis of this maintenance-level conception, one could predict an organism's approach to diverse stimuli, including a stimulus such as food, in the sense that its "hunger" at any given time would depend on temporal conditioning factors, based perhaps on some average time span between earlier feedings and the average number or amount of food stimuli received per feeding. If as we have been proposing, the momentary efficacy of diverse classes of stimuli may be qualified by an individual's long term maintenance level for them, then the deprivation-satiation functions of food and diverse other stimuli, and, indeed, their operational definitions, would also depend upon such reference levels. That is, 18 hours of food deprivation may be said to operate as a relative *deprivation* condition for organisms regularly fed more frequently (e.g., every 12 hours) and as a relative *satiation* condition for organisms regularly fed less frequently (e.g., every 24 hours). This outcome may constitute a paradox under the more conventional conceptions for the functioning of stimuli, for drive and setting conditions, and the like.

Overlooking what may be the irrelevant fact that stimuli like food are required for organismic survival, it is quite possible that operations for stimulus classes other than food may be similarly qualified by the distributional characteristics of the subject's experience with a particular stimulus commodity or with the range and other distributional characteristics of those classes of stimuli (Gewirtz, 1967a). For example, Gewirtz et al. (1956) found that subjects' generalization-discrimination response gradients for visual-angle stimuli within a particular range were displaced in the direction of the range of stimuli they had earlier experienced. (These findings are also consistent with what would be expected on the central-tendency basis of the concept of adaptation level.) Moreover, learned maintenance levels or standards may provide the context for an organism's responding to novel stimuli. One notion has been that elements sufficiently incongruent with stimuli presented in the past might evoke fear and avoidance behaviors, whereas more congruent but still novel elements might evoke curiosity and investigatory behaviors (cf., Hebb, 1946, 1949). For instance, Hebb (1966) reported that chimpanzees typically displayed strong fear

responses when presented with extraordinary (i.e., in terms of previous maintenance contexts) stimuli (e.g., the severed head of a chimpanzee or a model of one).

Thus, apparently through some as yet inadequately identified process of learning, the organism becomes conditioned to the maintenance pattern of the classes, rates, frequencies, ranges, and types of stimuli received, which can themselves function to control behavior. (This learning should occur readily when the rate of stimulation is regular rather than intermittent.) The control acquired over behavior by these maintenance levels as setting conditions might for the moment be included under the flexible rubric of learning we have been using. One of our early empirical tasks will be to investigate systematically how reference standards for aspects of stimulation are acquired. Although many approaches contain terms, such as novelty, whose meanings depend on the learning of background contexts and levels of stimulation, there is, as yet, no approach which can adequately account for them. If we are to gain a full understanding of human development, however, these contextual factors must be considered and adequately incorporated into any learning approach to the outcomes of early experience.

Ecological determinants of social behavior and learning. Social behavior and learning are affected by the physical and social ecology of a setting and can be facilitated or limited by the manipulation of ecological factors. As used here, the term ecology stands for the gross conditions of an environment which determine which events and behaviors can occur in a setting, and specifically whether or not a child can receive a stimulus or emit a response. Such facilitators and constraints are therefore as much setting conditions as are, for instance, deprivation-satiation operations for food stimuli. The amount of floor space available, the positions of walls and of furniture, all represent *physical* conditions that can grossly determine behavior systems. Similarly, the rules and regulations in a setting (explicit and implicit) represent *social* facilitators or constraints on behavior systems. Thus, ecological conditions can insulate a child against, or cause him to be exposed to, adults, other children, or their specific activities, and in that way can determine whether or not he can emit particular responses or "seek" particular ends.

The physical and social ecology of a setting can therefore impose effective constraints on behavior systems. In group settings, social rules and physical limitations can be employed to decrease the likelihood that individual children would interfere with group activities or with the activities of a particular child. In effect, such procedures prevent an undesired behavior from occurring simply by removing the individual from the situation in which the response may occur. However, that behavior will not be suppressed when the "motivation" set and opportunity for responding are again present. Social or physical confinement will be most effective in suppressing undesired behaviors only when combined with other procedures, particularly the strengthening of alternative, incompatible behaviors. (This issue was discussed earlier in the section on punishment.)

The ecology of a setting can also be employed to facilitate social learning.

Thus, in a group setting, the probability of various positive interactions among the children and of particular activities (as role or thematic play) can be increased by manipulating the number of children in a limited area. It is also possible to manipulate the kind of props and their ratio to space in order to foster constructive use of them or particular patterns of interactions. Further, the social ecology of a child's setting can be an important factor in his socialization. For instance, the availability of active adults and/or older children in a child's environment provides a range of behaviors for the child to use as models for his own behavior (as will be explored in a later section on generalized imitation and identification). Thus, in groups containing children of heterogeneous ages, caretaker-models are more apt to exhibit nurturant responses to young children which the older children may copy. Moreover, socialization-by-imitation (modeling) is simpler for the young child when there are a large number of older individuals in his environment who exhibit a variety of behaviors that he can copy, and for which he can often be reinforced, particularly when these models are of the same sex as the child.

Whether a child is part of a family unit or in a group-care setting, if the socialization process occurs in the *absence* of older models who could both provide examples for, and directly reinforce, a child's behaviors, it is more difficult for him to acquire the increasingly mature behaviors expected of him. In that nonmodeling context, the socialization process would have to depend almost entirely on direct instrumental training. Considering the number of response systems to be modified, this process would be time and energy consuming, for the socializing agent would have to monitor continuously the child's behaviors and be prepared to respond to them, and decide, on the basis of those behaviors assumed appropriate for the child's age level (or for the next higher age level), taking into account his existing behavior repertory and level of social (and physical) development, which of his behaviors to reinforce differentially.

Thus, the occurrence of various undesirable behavior systems may be inhibited and the occurrence of various desirable behaviors may be facilitated and subsequently reinforced by conditions brought about by systematic manipulations of the available space, the type and number of materials positioned in that space, and the type and number of peers and adults in that space (e.g., their status for the child, as described earlier). Although principles underlying such ecological manipulations are not as yet well understood, an illustration of their utility can be found in Shure (1963).

ADDITIONAL IMPLICATIONS OF THE APPROACH FOR LIFE SETTINGS

Emotional Behaviors and Conditioning in Social Contexts

Over and above their particular discriminative or reinforcing effects upon instrumental responses, conditioned and unconditioned positive and aversive stimuli may have many wide-ranging effects on a number of important response

repertories. While in molar-behavior analyses, the effects of presentations of positive (approach) or negative (aversive) social stimuli are indexed by changes in ongoing behavior systems, emotional behaviors (including autonomic respondents) are frequent by-products of their provision, particularly of aversive events. Moreover, even though there is no evidence that emotional behaviors or their autonomic correlates are critical determinants of instrumental responses (i.e., are more than concurrent with them) and it is likely that extreme and wide-ranging changes in many instrumental response systems often occur without such concurrent autonomic response changes, emotional-behavior sets are often considered to be causes of diverse instrumental responses.[18] Thus, it is often said that one does something for the "joy" it will bring him, or doesn't do it because he is "afraid." Further, caretakers are often even more concerned with emotional responses (particularly those assumed to be associated with "distress") than with more routine operants. Hence, apart from being concurrent with operants, emotional behaviors (or their expressive correlates) may be reinforced (as operants) by consequences like the receipt of "affection" or "sympathy" from others.

It is well known that it is often impossible to separate such emotional-respondent sets from one another without taking into account the controlling stimuli, the particular settings in which the behaviors are observed, or sometimes also their expressive-behavior correlates (e.g., facial or bodily appearance), even though the latter are known to vary widely with culture-group norms (sometimes more than with the stimulus context of the presumed emotional "state" being described). Indeed, in the context of knowledge of an individual's experiential history, such expressive responses may differentially index sets of emotional behaviors.[19] However, it is recognized only occasionally that the terms used to

[18]Emotional behavior, which appears to be largely respondent, has often been neglected in behavioral analyses. This is perhaps a result of the conceptual distinction between respondent and operant behavior and the greater attention typically given to the latter. However, the original distinction between the two paradigms, based on the conception that operants are skeletal responses while respondents are muscular or glandular responses under the control of the autonomic nervous system with only a few instances of overlap (e.g., Skinner, 1938) is, as has been pointed out increasingly in recent years (e.g., Hefferline, 1962), an oversimplification. Conditioned emotional behavior may accompany and even be involved in the maintenance of many behavior systems, and further, there is increasing evidence that some emotional responses can be instrumentally conditioned. However, even given these considerations, the fact that emotional responses often appear to follow straightforwardly the classical conditioning paradigm supports the possible utility for behavioral analyses of maintaining a heuristic emphasis on a distinct paradigm of classical conditioning. Thus, while our didactic analysis of social learning in this chapter emphasizes the operant-conditioning paradigm, at the very least it should be noted that the respondent-conditioning paradigm may operate concurrently with many instrumental behavior systems.

[19]Indeed, expressive behaviors like smiles and laughs seem to be readily conditionable early in human development, both on respondent and operant bases (discussed in Gewirtz, 1965). Thus, if the appearance of a (parent's) face (conditioned stimulus) is followed systematically by acts like lifting or tickling (unconditioned stimuli) which produce smiles and laughter in the child, or if his smiles to that face (discriminative stimulus) are followed by reinforcing stimuli, subsequent presentations of the face can come to evoke those "joyful" expressive behaviors from the child (Leuba, 1941; Etzel & Gewirtz, 1967). When such behaviors are concurrent with the receipt of positive reinforcement, they are likely to be reinforcing to, and reinforced by, the socializing agent dispensing the reinforcing stimuli.

describe emotional states are but labels for different families of functional stimulus-response relations. Thus, our everyday language is replete with overlapping terms for various sets of such emotional behaviors emitted in specific stimulus contexts, viz., anger, rage, frustration, fear, fright, anxiety, terror, guilt, shame, sorrow, sadness, depression, joy, happiness. And subjects' verbal behaviors concurrent with these emotional response sets may vary with the conditions under which they occur (i.e., that produce them). Thus, emotional behaviors and changes in directed behaviors following separation from a loved one (e.g., through his death) may be termed *sorrow* or *melancholia*,[20] while a similar behavior set following presentation of an identified aversive stimulus may be termed *fear* and one to generalized (i.e., many) stimuli where the controlling aversive stimulus is not apparent, may be termed *anxiety;* and responses occurring after a strong ongoing behavior chain is blocked may be termed *frustration*.

Thus, we have noted that, as respondents, emotional behaviors may be concurrent with various expressive behaviors and with the receipt of positive or negative reinforcers contingent upon instrumental responses. It is also thought that, as instrumental responses, they can come under the control of discriminative and reinforcing stimuli. Moreover, emotional responses may have an effect upon behaviors that do not appear to be related to the instrumental response that has been (positively or negatively) reinforced, i.e., the occurrence of emotional responses may increase the incidence of those behaviors that are compatible with them and decrease the incidence of those that are not.

Frustration. Operationally, conditions which interfere (block, interrupt) with a stimulus-response chain have been termed frustrating. Emotional behaviors are frequent concomitants or results of such interference (as will also be noted in a subsequent section on deprivation-separation as shifts in the maintaining environment). J. S. Brown and Farber (1951), who did much to introduce a conception of frustration within a larger theoretical framework (that of Hull-Spence), assumed that its operations added to general drive level to have a simultaneous impact on many responses and that it provided internal stimuli with which responses could become associated. Amsel (1962) has mostly explored nonreward (after reward) as frustration operations with drive results (see also the section on setting conditions). Insofar as incompatible responses to a stimulus in a conflict setting may involve the blocking of one response by the other, a frustration operation would be involved, and concurrent emotional responses and

[20]As will be seen in a later section on effects of shifts in the maintaining environment (and in Gewirtz, 1961b), effects termed sadness, melancholia, depression, and the like, may not represent emotional-behavior outcomes so much as they reflect simply the absence of a child's behaviors due to the removal of the stimuli controlling them, particularly the relevant discriminative stimuli which set the occasions for behaviors to occur but also the reinforcing stimuli which maintain them. When only the behaviors under the control of the earlier environment and not a wide range of behaviors are weakened, it is likely that these grief patterns reflect more the simple withdrawal of the relevant discriminative stimuli for a large proportion of the child's behavior systems than emotional "states" involving emotional behaviors incompatible with responding in the new setting.

other consequences might result. Thus, conflict phenomena could be subsumed under frustration for many theoretical purposes, particularly under a notion of frustration operations contributing to a theoretical concept of general drive level. However, as that issue is tangential to the purposes of the didactic analysis of this chapter, the issues involved and the approaches which emphasize it are only being mentioned here.

In an early social-learning analysis, Dollard et al. (1939), in their book *Frustration and Aggression,* postulated that frustration was an antecedent to aggression, whether or not that response was overtly exhibited. This postulate, however, was not derived from the social-learning theory within which these authors were working (and which several of them subsequently codified), but apparently stemmed from a conception of Freud. Even while their analysis was criticized at a number of points, it was a useful catalyst for diverse social-learning analyses.

Conflict. Consistent findings from various studies on deviant behavior indicate that many social behavior classes, generally considered undesirable, are maintained by reinforcing schedules provided by the social environment (Patterson, 1967; Gewirtz & Etzel, 1967). Indeed, it can often be observed that behavior classes like aggression are positively reinforced by socializing agents as well as punished by them. Moreover, at the same time that a child's deviant behavior may be punished by a teacher or parent, it may be reinforced by a peer or younger sibling. Consequently, in natural settings the discriminative stimuli controlling such response classes may come to be cues for incompatible approach and avoidance responses by the child, in which case a conflict situation is said to exist. It has been noted earlier that conflict often results in emotional responses (taken by some to index "fear" or "anxiety"), vacillation, and similar responses. (It has also been noted that after aversive stimulation contingent upon the response, events in the presence of which the response has been punished and cues from the occurrence of the response [and from verbal responses about it] can come to function as conditioned aversive stimuli to suppress the response.) The resolution of the conflict which can result from such mixed reinforcement patterns can take different forms, depending on the pattern of response strengths of the incompatible behaviors.

Extending some of Freud's (1920) and Lewin's (1938, 1946, 1951) conflict notions, Miller (1944) explored the effects of conflict involving several patterns of incompatible approach and avoidance responses along a spatial-distance dimension originating with the conditioned stimulus, under various combinations of positive and negative reinforcement. For example, positive and negative reinforcement for responses to a single stimulus will lead to approach-avoidance conflict. And when two stimuli associated with different combinations of positive and negative reinforcement are simultaneously presented, the results may be approach-approach, avoidance-avoidance, and double-approach-avoidance conflict. These patterns of conflict and their features of equilibrium (or disequilibrium) have proved to be heuristically useful in approaching a variety of social-behavior systems (e.g., Dollard & Miller, 1950).

Apart from implications of his useful conflict paradigm for the behavior outcomes of a frustration "drive," Miller (1948b) has applied it to the question of how objects of aggressive behavior are determined. Miller assumed a steeper slope and narrower generalization range of the avoidance (inhibition, based on punishment) than of the approach (excitation, based on reward) generalization gradient, and used the algebraic sums of response strengths at different points along that stimulus-dissimilarity dimension, points that differed increasingly from the parent socializers and corresponded to possible objects of aggression, to predict the identities of the objects to which aggression would be *displaced.* Thus, if parents sometimes strongly reinforce a child's aggressive responses and sometimes strongly punish that response class, assuming the resultant avoidance gradient is higher than the approach gradient at their point of origin, the response may occur (i.e., generalize) to objects increasingly dissimilar to the parents along some dimension of similarity from them. Thus, an aggressive response might be displaced to another child or to an inanimate doll like the parent in appearance (Miller, 1948b; Sears, 1951; Sears et al., 1953). Further, the response itself may be displaced by being transformed topographically into one less overt, e.g., a verbal epithet instead of direct physical hurting.

The Place of Verbal Responses in Social Learning[21]

The classes of responses with which we deal in this chapter include both motor and vocal (including verbal-language) responses. Although verbal responses need not be singled out for special emphasis in a general analysis of social learning like ours, such responses are involved in an important way in the human socialization process, and first-language acquisition is a significant correlate and outcome of that socialization. Indeed, some may view language as the central outcome of socialization. Further, language learning and usage is a key behavior characteristic often used to distinguish humans from other species, as not even the most advanced of the subhuman-primate species which have peripheral speech apparatuses similar to that of man speak or use language as we know it.

Yet, there appears to be nothing inherently special about verbal responses which could serve to differentiate the process of their acquisition from that of motor and other responses in humans. Indeed, motor gestures frequently play known language roles (and, in fact, provide the only basis for the language of deaf mutes), and motor responses are very often concurrent with or correlates of verbal responses. And although the concept of grammar is usually reserved for verbal-language processes, grammatical systems could be proposed for motor and other responses as well, though this may never have been done, apart from

[21] I am indebted to the Drs. Donald Boomer, Albert J. Caron, and Murray Glanzer for instructive discussions on language learning and for a critical reading of an earlier draft of this section. Dr. Caron was particularly helpful on the role of "induction."

the routine gathering of such phenomena into sets of functional relationships (Lashley, 1951).

Verbal behavior and language. Much work on language structure has been done in the academic discipline of linguistics. Hence, attention has been given through the years to many of the complex facets of languages, and some of the dimensions and features of the structure of language and its complexities are known to everyone, if only at an intuitive level. While a good deal of psychological research has been done on verbal behavior and its acquisition, and on language insofar as it is made up of verbal responses, very little systematic empirical work and theoretical analysis has been done thus far on the specifics of this system (e.g., on sequential and temporal patterns of responses [including verbal ones], on criteria of meaning of responses as symbols, and the like). In this context, relative to the various other important behavior systems, which are in principle at least equally as complex, the complexities of language structure and acquisition have become, as it were, "prematurely" visible. This condition is asynchronous, for the identified complexities of language are not readily explained by the extant simple principles which have otherwise been serving us well, and those principles thus tend to appear simplistic and less than adequate. Functional relationships based on these principles, however, have been identified in various other psychological areas which in principle involve systems at least as complex as verbal behavior systems termed languages, and in which the issues have been far less visible than those of verbal-language structure and acquisition. While there are as yet only primitive "grammars" identified for such systems (as, for example, involving visual-pattern discriminations or size constancy processes, where context "inflects" the nature of the figure seen [see the earlier section on setting conditions and Gewirtz, 1967a], or as involving generalized imitation or attachments), and although, at the moment, the principles we can bring to the organization of these systems appear commonplace, we expect nevertheless that a finite number of such simple principles will one day provide very adequate accountings of the complex aspects involved in each case. It is therefore likely that the turmoil of the "premature" exposure of the complexities of language would have a wholesome, catalytic effect, especially if, in identifying the great gap our principles must bridge, the scope of the problem obscures neither the fact that much systematic empirical work must yet be done nor the utility in other problem areas of the principles employed.

Language acquisition—innate or learned? There is considerable controversy about whether or not a straight experiential analysis of verbal-behavior acquisition, with extrinsic reinforcement and inductive principles playing a central role, is sufficient, or even able, to account for language learning and performance, which is perhaps the most complex behavior system characterizing the human. Indeed, it is thought in some quarters that the organization of verbal responses in language may depend upon an innate, nativistic, and maturational

structure (Chomsky, 1959, 1965, 1968; Fodor, 1967; Lenneberg, 1967).[22] Those theorists who have taken such a nativistic position on language acquisition have, on several grounds, questioned the utility of simple conditioning assumptions and models to order the generative grammars that an acquisition model for language behavior must explain. Thus, Chomsky (1965) has assumed that language acquisition is based on the child's innate knowledge of a theoretical model—a generative grammar—of his language, "many of the concepts and principles of which are only remotely related to experience by long and intricate chains of unconscious quasi-inferential steps." He has further contended that the limited sample of utterances to which the child is exposed, as compared to the complexity of the grammar acquired, and its independence of intelligence[23] and motivation leave little doubt that language structure cannot be acquired by a child without the operation of innate schemata. Thus, the general language structure is thought by Chomsky to reflect not so much experience as one's innate ideas and principles. He concludes that the "child cannot know at birth which language he is going to learn. But he must 'know' that its grammar must be of a predetermined form . . ." (1968, p. 66). Chomsky therefore further contends that what "evidence is now available supports the view that all human languages share deep-seated properties of organization and structure. These properties—these linguistic universals—can be plausibly assumed to be an innate mental endowment rather than the result of learning" (1968, p. 68).

Thus, these nativist critics have faulted the inductive principles of generalization and transfer in conditioning approaches as being unable to account for a speaker's ability to produce and instantly understand sentences dissimilar to those previously heard, and hence for not bridging the wide gap between associative principles and the apparent complexities of human language development, and as falling far short in handling the nuances implied in concepts of language structure.[24] However, in the context where there is a large gap between conditioning principles and the complexities of language behavior, and in the absence of any given definitive evidence for the claimed innate homogeneity of languages which could be evaluated, a researcher working in an empiricist tradition would approach this issue wondering whether, if homogeneity in any aspect were ever identified across languages, it might be due not to an "innate mental endowment"

[22] A succinct summary of several of the issues separating the innate versus the experiential theoretical approaches to first-language acquisition can be found in a recent book review by R. Brown (1968).

[23] Those who take the nativist approach to language have assumed a discontinuity between the intellective mechanisms of problem solving and those of language. A functional analysis like ours, on the other hand, approaches language behavior and its complexities no differently from problem solving and intellective behavior systems generally. In principle, we would expect under our posture to find performances in the higher segment of the quality range of problem solutions for individuals within some subhuman species that are superior to lower-range performance of some humans.

[24] Several features of this argument are not dissimilar from those which some theorists of complex human personality have earlier skeptically advanced regarding the utility of conditioning principles in accounting for complex personality functions (e.g., Allport, 1937).

so much as to the homogeneous experiences involved in the pan-human conditions of socialization (also possibly responsible for the degree to which infant dependence patterns seem homogeneous in diverse human groups).

We have seen that the claim of some nativists is that the structure and processes comprising the child's native endowment provides the basis for his acquiring the ability to speak his community's language. However, underlying such approaches there is a marked paucity of theory that specifies how and at what levels the innate substrate of language ability interacts with experience as learning. Further, no genetic process has been detailed that is capable of transmitting the types of endowed information that nativistic theories have postulated to underlie language acquisition. Hence, the approach of many who favor innate factors as the basis for first-language acquisition may come down to little more than the claim that language acquisition is the outcome of a brain, a voice box, a mouth, and two ears being innately present (and functional) in the child. If in fact this is the case, the utility of such an approach to language acquisition may be diluted. It is well realized that the empirical approach of this chapter is far from a complete solution to the problem. Even so, our contention is that, however incomplete an empirically based approach to first-language acquisition may be at present, it offers a reasonable posture that is potentially more profitable than a rational approach based on intuitive evidence.

Learning, verbal behavior, and language.[25] Shaping and fading procedures (which were discussed earlier), and direct imitative training and generalized imitation (which are discussed in a later section), can all play fundamental roles in the learning of language responses. However, it is the more advanced conditioning concepts in the area of stimulus control, in which "generalization-transfer" is viewed as the direct product of complex discriminated-operant or conditional-discrimination mechanisms (which were earlier described in the section on complex discriminations) (Lashley, 1938; Cumming & Berryman, 1965; Goldiamond, 1966; Terrace, 1966), that appear to provide a more promising basis for understanding the acquisition of distinctive cue and class values in language and of their operating roles. The potential role of complex discriminated operants and their *direct* "induction" to stimuli which, because they may be in new contexts or vary along irrelevant dimensions, only *appear* to be different from the control stimuli in the acquisition context, has been appreciated too little by both partisans and critics of learning approaches as providing a potentially important basis for an improved conditioning account of language acquisition and performance.

Language is characterized by grammatical rules which may stem from, or

[25]Examples of diverse conditioning approaches to language acquisition, more or less compatible with the one presented in this chapter, have been advanced by Skinner (1957), Braine (1963), Osgood (1963), Staats and Staats (1963), Jenkins and Palermo (1964), and Crothers and Suppes (1967), among others. It came to my attention after this section was completed that Crothers and Suppes (1967) have presented a critique, more formal than that made here, of the assumptions underlying some nativistic approaches to language acquisition.

be equivalent to, generalized conditional discriminations. Thus, the tense of a verb depends on the specific context in which it occurs, and is affected one way in the present context and another way in the past. In terms of conditional discriminations, "generalization" would derive from communalities in conditional stimuli, in comparison stimuli which contain the discriminative stimulus (e.g., verb inflections), in the relationships among them, or in the broader contexts in which both comparison and conditional stimulus classes appear. While experimental work has thus far rarely approached the level of complexity implied in such contexts-within-contexts discriminations, the concept of conditional discrimination and its derivatives provides a plausible basis for the acquisition of grammars, a basis continuous with the conditioning analysis of this chapter.

However, even this emphasis on the direct induction of straightforward stimulus-control concepts as a plausible empirical basis for accounting for language learning may constitute for critics a limitation of the conditioning model, insofar as it must carry so much explanatory weight and its implications are not yet entirely understood. On this last point, however, we note that there exist few scientific concepts that are in final form (including the nativistic concepts favored by some critics). And there has been an increasing awareness in recent years of the potential power of the conception of direct induction of stimulus-control functions on which conditioning analyses rely. Moreover, this conception of direct induction has recently successfully served the generalization function: a simple model like that for generalized-imitation learning, presented later in this chapter and in Gewirtz and Stingle (1968), can effectively illustrate how a simple variant of a basic instrumental-training conception (and the conditional-discrimination concept) can plausibly bridge the broad gap between simple conditioning settings and what many had considered to be a rather complex personality process, namely generalized imitation and identification (which processes would seem also to be involved in first-language learning).

In this context, and especially because conditioning assumptions seem to have relatively more constructive implications for ways of facilitating language development than do the alternative conceptual approaches, we feel it appropriate to illustrate in our analysis the continuity between verbal and all other functional response classes. It is our contention that both nonverbal and verbal responses can be conceived as following the same laws of learning, and it is therefore reasonable to include both in any detailed analysis of the mechanisms of social learning. The approach outlined here is particularly appropriate for the inclusion of the learning of verbal responses, for it is oriented to the interaction process between child and socializing agent, which means between "talker" and "listener" with these roles cycling between the two (whether motor or verbal responses or both are involved in an interchange). As such, the present approach can conceive of the verbal responses of one person as constituting both discriminative and reinforcing stimuli for the verbal responses of the other person. (Some of the responses involved may be imitative, a general process which will be considered in a subsequent section on imitation and identification.) Once verbal responses are acquired, they will be maintained by responses made

to them in conversational interchanges, according to the same principles as account for the maintenance of other responses.

The Child Conditions and Is Conditioned

The child as conditioner of his environment. It is axiomatic that the caretaker-child interaction setting provides many occasions for mutual stimulation and reinforcement. It follows as a corollary of the conception of interchange that *both* interactors can change, and that the stimuli they provide can acquire control over behaviors of the other, i.e., condition them. Thus, the socializing environment is also socialized! This conception of the behaviors of socializing agents adapting to the behaviors of the child has received little emphasis to date in analyses of caretaker-child interaction, where the orientation has usually been on how the caretaking environment affects child behaviors.[26] Yet, just as the caretaker can condition the child's behaviors by providing consequences that are valued by the child, so also can the child's behaviors mediate reinforcing stimuli that can condition behaviors of the caretaker. The child's smiling, vocalizing, reaching toward, eating "well," or ceasing to cry can heavily reinforce many of the adult's behaviors (Gewirtz, 1968b).

On this basis, "baby talk" or outlandish grimaces can enter the caretaker's behavior repertory, as a function of differential reinforcement provided by the infant. And a caretaker may become "attached" to her charge on the same conditioned-reinforcement basis that is thought to underlie the child's "attachment" to his caretaker: stimuli provided by the young child become conditioned reinforcers for the caretaker's behaviors because they are associated with diverse potent reinforcers (for her behavior).

Some of the conditioning of the behavior of the caretaking environment has unconstructive implications for socialization, as can be illustrated by the environment's response to high-rate instrumental crying of infants. Such crying has strong aversive qualities for most adults, and they will often stop some activity (in an institution, for instance, the care of another infant) to attend to the crier in the attempt to stop his crying. When a caretaker succeeds in stopping (the aversive stimuli provided by) his crying, she is heavily reinforced, and the likelihood increases of her picking up or attending to that child when he again cries. However, picking up the crying infant also constitutes a potent reinforcer for his crying. Thus, even though there is momentary relief for a caretaker each time

[26]For exceptions, see papers by Gewirtz, by Rheingold, and by Bell. Gewirtz (1961b) emphasized the ways the infant normally acquires considerable control over, and modifies, the environmental conditions impinging upon him, and how caretaker-parents become socially dependent upon and attached to their charges. Rheingold (1966) has similarly emphasized how the infant modifies the behavior of other persons in his environment. Bell (1968) reinterpreted the direction of effects in diverse researches on socialization outcomes, questioning whether child-behavior "outcome" variables thought to be determined by caretaking behaviors as "antecedents" might not often be equally well conceived as determinants of those caretaker behaviors.

the infant ceases to cry when he is attended to, the long-range effect is to increase the incidence of the very behaviors of the infant that are aversive for the caretaker. Gewirtz and Etzel (1967) have presented a detailed analysis of the mutual conditioning process inherent in such cases.

The environment as conditioner of the child. As is noted at several points in this chapter, there are unfortunate consequences that can result when a caretaker responds indiscriminately to a child in an attempt to show her "love" and "affection." Some of these detrimental effects, for both the caretaker and the child, can often be eliminated by modification of the caretaker's pattern of responsiveness to the child. If discriminative and reinforcing stimuli (the caretaker's "love" and "attention") are provided to the child under optimal conditions, in terms of an operational-conditioning model such as has been outlined, desirable results for both the child and the caretaker can be achieved simultaneously.

One desirable result is the child's acquisition of a variety of socially valued behavior patterns, including those which will not only insure that he will benefit maximally from his experiences, but will also allow him to learn to manipulate his environment to bring on such experience, independent of his caretaking setting. For example, when the child's high-rate instrumental crying is reacted to by extinction procedures rather than by caretaker "attention," his more socially desired behaviors, such as smiles or vocal responses, can be reinforced and thereby acquired as functional responses.

The second desirable result of the provision of optimal learning conditions is the satisfaction experienced by parent-caretakers when they feel that they are taking an active role in evoking and reinforcing the child's socially desirable behaviors. It is our experience that most caretakers are well-intentioned (i.e., "warm and loving") persons, but that they are often ambivalent to a child when they must respond to him on his terms, particularly given the vehemence of the injunctions and prescriptions in our society regarding the proper adult orientation to their charges. What such caretakers require is the means by which to translate their "love" for the child into effective reinforcement conditions, to be provided contingent upon those behaviors deemed desirable and important for him to acquire. By employing simple operational-conditioning procedures, the caretaker may thus experience considerable satisfaction from knowing *how* and *when* to provide her "attentive concern, care, and love" for the child. We have already seen that if this reasoning is not applied, and the caretaker only responds to the child on his terms, she may find herself in the paradoxical (and unsatisfying) position of reinforcing the very behaviors of the child she wishes to eliminate, that is, his immature or antisocial behaviors, such as his disruptive instrumental crying. Taking a focused, disciplined role by reinforcing particular socially desirable behavior patterns and not reinforcing antisocial or immature responses may require a greater sensitivity on the part of the caretaker than does undisciplined responding to the child, but it should also prove to be more satisfying

and to involve less ambivalence than should attempts to follow such vague maxims as "be good to the child" or "give infants as much tender loving care as they need."

Some Limitations of Conditioning Concepts for Social Learning

The learning relationships and theories, which are the basis of the conditioning approach to the impact of environment on early human adaptive and social behavior, are derived both from work with lower organisms and from simplified situations with humans in each of which a few apparently salient aspects of naturally occurring phenomena are systematically manipulated. In this approach, attempts are made simply to identify both the stimulus events in the environment and the key behaviors which they appear to control. There is, however, a fundamental limitation in this approach which often goes unrecognized when basic learning paradigms are applied uncritically to early human development and learning.

Typically, in investigations modeled on basic stimulus-response acquisition and performance paradigms with either lower organisms or humans in highly abstracted settings, some salient conditions are systematically manipulated in an *extreme* way, keeping minimal the number of cues or competing responses in a task setting, and employing operations to make the stimuli involved maximally salient for the organism (e.g., by manipulating background contrast factors). For example, if food is to be employed as a discriminative or reinforcing stimulus in a discrimination task with pigeons, the subjects are frequently reduced to about 80 per cent of their normal body weight and are, in addition, deprived of food for 24 or 36 hours. Further, the food stimulus is then dispensed in relatively small amounts, so as to preclude the subject's satiating markedly for it during the experimental session and to insure its homogeneous effectiveness throughout the session. Thus, in this example, the salience of the food stimulus for the organism is maximized by the implementation of conditions which fall toward the extreme of a postulated dimension of operations for food salience.

In experiments with young humans, however, it is rarely possible to implement such extreme conditions, and more than minimal operations along this dimension are seldom attempted. The impact of discriminative and reinforcing stimuli on their behaviors must be studied within the intensity ranges permitted by everyday conditions in those environments. Thus, experiments and systematic observational studies with humans often cannot be carried out as efficiently as can studies with lower organisms in highly contrived situations.

Only a surface aspect of the limitation inherent in the approach questioned here, however, is indicated by this last point. The basic reason for the limited scope of most of the work accomplished with lower organisms is, paradoxically, the success with which these contrived and extreme experimental conditions have been implemented. In the conditioning literature and in the deprivation-satiation motivation literature as well, remarkably little attention has been devoted to the functioning for behavior of stimuli through the lower and intermediate segments of their intensity ranges. The young, rapidly developing human, however, is normally subjected only to stimuli of lower and intermediate intensity values (e.g., he is not deprived of food for more than a very few hours) in situations with several competing stimuli and with only minimal contrast (setting) conditions that can operate to heighten stimulus discriminability. Hence, the generalizations that can be drawn from experimental work can only apply minimally to the developing infant. Thus, an understanding of the operation of stimuli in this *lower* portion of the stimulus-attribute ranges is precisely what is required for a more complete understanding of the impact of the environment on the behaviors of the young organism, and paradoxically, it is about this lower portion that we know very little. Although, in attempts to understand the impact on behavior of these less extreme conditions, the tendency has been to use concepts like "attention" and "vigilance," these concepts contain considerable excess meaning and have proved gross and unwieldy. They can aid little in providing an understanding of the human adult behavior for which they were devised, and much less in the understanding of the stimulus-response relationships that are focal in early life.

It is for these reasons that we have, earlier in this chapter, emphasized the variety of setting conditions that could qualify the impact of stimuli on behaviors (even in the lower portion of the intensity range of their functioning), including the apparently learned long-term background contexts for some classes of setting conditions. If we are to understand the functioning of stimuli in the lower segments of their intensity ranges and hence through the gamut of conditions in life settings, a deliberate attempt must be made in the study of early human development and learning to identify setting operations which qualify the functioning of stimuli for behaviors of the young organism.

SOCIAL LEARNING AND THE CONCEPT OF DEVELOPMENT

It was noted earlier that the changing behavior capacities of the child through developmental processes indexed by terms like "organismic maturation," "stages," and "critical periods" might qualify the behavior-development approach of this chapter but would not change its essential features. Similar assumptions are made in this chapter about various other factors which also, in principle, must be accounted for in analyses of the impact of experience on the behavioral development of young humans, and which also would qualify the present approach. These include apparently unlearned S-R associations, species-specific behaviors, individual differences in initial characteristics, and like factors. In recent years, behavioral scientists have found it of very limited utility (if not indeterminate) to attempt to separate behavior functioning from environmental context, as was the emphasis in, for instance, the nature versus

nurture controversies of a few decades back. Thus, it has come to be realized that concepts like "ability," "capacity," and "level of functioning" have limited meaning independent of behavior as it occurs and comes to be controlled within an environmental context. The relevant issue for all approaches to child development is therefore the modifiability of behavioral development. As A. L. Baldwin (1955) has observed, once it has been established in a given situation that both the factors ordinarily termed "heredity" and those termed "environment" play some role in determining a behavior system, the question of their relative effects may become insignificant for many purposes. We would add that this would be so at least relative to such questions as which stimuli control the behavior system at issue.

The Status of Developmental Laws in a Functional Learning Analysis

Our line of reasoning turns on the notion that there may be no fundamental difference between the laws characterizing behavior changes in early life and those characterizing behavior changes during other, later, time spans. All involve the determination of sequential, functional relations between stimulus input and behavior output in the individual's experience.[27] The term "development" in a molar psychological analysis is an abstraction for systematic changes in specific S-R patterns. Throughout the entire life history of an organism,

[27]There are several reasons why it is difficult to have a reasonable operational concept of development which can apply to the entire human life span, or even only to early life. The specification of those behavior systems whose sequential changes are taken to reflect development is arbitrary. Also arbitrary are the directional criteria usually employed for development, such as increasing behavioral *adaptiveness* and *complexity*. This is because relevant indices of these criteria will vary with (a) different environmental contexts, and (b) the portion of the life span being considered (i.e., behavior changes in early life may be scored in a different, even opposite way from behavior changes in later life). Further, measures of these criteria may not intercorrelate. Moreover, implicit in the concept of development as it has often been used is the assumption that behavior changes are *irreversible*, a notion which is incompatible with much recent thought in substantive areas that attempt to explain behavior change (e.g., in learning and perception).

Numerous exceptions can be found to the common assumption that advances in developmental level with age are reflected in the direction of increased *complexity* of behavior systems. Holding stimulus level constant, some inefficient responses that are complex, in the sense of being undifferentiated, unfocused, or of containing many components, may give way with experience to focused, simple and efficient responses. Thus, the direction of a systematic developmental change may be from the "complex" to the "simple," and thus may run counter to what is often considered a developmental advance. Similarly, holding the response level constant, a child's increased experience (learning) with a gross stimulus complex often results in his selecting out the salient stimulus elements. Hence, while his response steadily increases in efficiency by becoming controlled by fewer, simpler, and relevant stimulus elements, he attends decreasingly to irrelevant elements of the stimulus complex. Thus, here too what is often termed development may reflect changes in the direction of simplifying (rather than making more complex) aspects of a behavior system, in this case the controlling stimuli for responses.

Having questioned the directional criteria for defining development operationally, adaptiveness and changes toward complexity, and the assumption of irreversibility, it appears that developmental processes are not distinct from the processes underlying

training conditions can be implemented to produce behavior outcomes either quickly or slowly, relative to some "norm." As we shall demonstrate, providing the young organism with experience that is focused with reference to a particular outcome can facilitate the acquisition of behavior systems that, in the natural course of events within the range of settings ordinarily observed, characterize much older organisms. We also note the opposite possibility (which one would usually seek to avoid) of providing an older organism with patterns of experiences to retard or reverse (extinguish) the acquisition of behavior systems so that his behaviors would be like those ordinarily characterizing much younger organisms.

Some theorists seem to have stressed explicitly or implicitly the study of sequential and often rapid behavior changes comprising *early* development mainly because of the assumed unique dependence of those changes upon (or at least, their correlation with) gross changes in body structure (e.g., Munn, 1965), while failing to note that gross biological changes also occur during other segments of the life span, some of which undoubtedly correlate with behavior changes as rapid as those typically noted in early life. Hence, while there is a valid place for diverse research strategies and tactics directed to the biological substrate of molar receptor and effector functions, and to coordinating such variables with molar behavior, it must be noted that because changes in biological substrates and in behavior systems occur both in early and in later segments of the life span, the laws characterizing early development should in no way be different either in general flavor or in detail from the laws governing other psychological areas in which change in behavior provides the dependent variable.

Research issues in early development are distinguished from those in other areas of psychology, however, in that an organism in the first phase of his life has had relatively *little* cumulative commerce with his environment, and thus the context for the impact of experience on his behavior will be different from that of organisms in later phases of life who have had more cumulative experience. (However, it should be noted that there may be life sectors in which an older organism may have had little experience relative to a particular behavior outcome and, consequently, the impact of some new experiences upon that older organism may be functionally similar to the impact of new experience on

sequential behavior change studied under the aegis of process areas like those labeled perception, learning, cognition, and personality. The single, unique aspect of developmental psychology thus appears to be only that a variety of researchers, for diverse value reasons, have oriented their attention to identifying primarily those behavior changes that vary with gross chronological age units, and have labeled their interest developmental. The validity of this age orientation is questioned in the next section, where it is argued that process functions underlying behavior systems, and not age-related functions, should be the focus of study now, even for those researchers who are interested eventually in reducing these age-related behavior changes to process laws in which age is not a varible. For even though age-related functions can be reduced to process functions, they may still be biased to an unknown degree by factors that also happen to correlate with age but are irrelevant to the behavior systems in question.

the very young organism.) In view of this limited-experience context for the impact of experience on behavior, certain special issues that do not greatly characterize such other psychological areas as learning or motivation may characterize more the study of early development. These issues include maturation-learning and those involved in the requirement of stimulus input for certain structural systems to become and remain functional.

When a systematic short-term change in behavior cannot be attributed routinely to what is consensually termed a learning operation (i.e., the implementation of some recurring environmental stimulus contingent upon a response) or to some short-term performance operation (e.g., the implementation of changes in some setting or ecological condition), that behavior change has often been classified residually as due to "maturation." While the term maturation has been used in diverse ways, it is conventionally thought to apply in at least two behavior-change contexts: (a) when a topographically complete behavior suddenly appears in (enters) the child's repertory, either with or without an identified stimulus basis; or (b) when a primitive approximation of a behavior suddenly appears in a child's repertory, with or without an identified stimulus, that, with monitored practice or simply with the passage of time, approaches the behavior's final topographic form. An important implication of the maturation conception is that, within the normal range of conditions, the behavior change is essentially irreversible, in contrast to the corollary of reversibility inherent in the learning conception (i.e., that a behavior will revert to its original level when the conditions maintaining it are removed).

Thus, behaviors which appear to enter the growing child's repertory suddenly are often attributed to maturation, the innately determined unfolding with age of a gradual plan of development independent of experience. However, the sudden appearance of a new behavior may often be due to a rapidly implemented learning procedure unnoticed by observers, to other effects of experience not usually conceptualized as learning, or to other factors underlying the behavior such as changes in stimulus threshold ("capacity") that may also be conceived to be possible experiential-learning phenomena. The inability of a molar analysis, which emphasizes the impact of environmental stimuli on behavior, to specify plausibly the determinants of new behaviors in terms of experience and learning effects may imply only that the currently available concepts and observational and research techniques require improvement. It follows that the premature labeling of effects which are unexplainable under a given posture as due either to maturation or to learning may be unwarranted as it explains little and may obscure much.[25] In such cases, the introduction of

[25]Under a given conceptual posture, many questions may be phrased in an all-or-none manner (e.g., as behavior determinants being *all* maturation or *all* learning) to emphasize their conceptual salience, even though the researchers operating under that posture realize that it may be difficult to arrive at empirical answers that do not lie somewhere between the extreme alternatives they have posed, if only because all relevant factors are rarely taken into account in the early approaches to an issue. Thus, what may be considered unexplained variance ("error" factors) under one all-or-none posture (e.g., all learning) may be considered evidence by researchers under another all-or-none posture (e.g., all organismic maturation), and vice versa. While it is generally recognized, if only implicitly, that, in the extreme form in which they have been posed, such questions (as maturation vs. learning, heredity vs. environment) may be basically indeterminate, the increased salience of the question affected by an extreme posture can give direction to research and can aid in the eduction of diverse functional relationships under the aegis of the issue. And it is these relationships which inevitably facilitate refining the issue further, despite the fact that the issue initially may be couched in all-or-none terms.

the maturation concept to account for behavior variations not readily explained, especially when it is *un*accompanied by a systematic focus on the environmental events that may affect the behavior, may prematurely preclude the search for an explanatory principle based upon specification of antecedent-consequent relationships, and may be tantamount to the notion that age is the independent variable in developmental psychology.

Limitations of the Age Variable in Developmental Analyses

Chronological age has functioned for many as the central variable in the study of developmental functions because of its supposed convenience, as an ordered variable, in indexing successive changes both in physical structure and in behavioral systems of the organism. Spiker (1966) and Zigler (1963a) have viewed age as an index of the medium of time in which various processes can occur. On the other hand, Berlyne (1966) has maintained that chronological age almost automatically describes the developmental condition of the subject, and as such, is a necessary part (or qualifier) of any behavioral law. He feels that it is "... often impossible to predict what kinds of responses will be evoked by particular stimuli unless we also know the subject's age" (p. 72). However, age is actually a residual independent variable (of last resort, as it were), for it provides a relatively pure index only of the passage of time in the physical world. As it, by its nature, but imperfectly indexes changes in biological structure, in sequences and combinations of experience and in the resulting behavior systems, age does not provide the required indices of *processes* occurring in time and hence can only be an incidental variable for the sequential phenomena comprising development. A child will have cumulative, differential commerce with stimuli, representing a sequence of learning procedures (although not necessarily provided optimally for the organism). In this sequence, forms of learning may occur in which stimuli acquire control (direct and conditional) over instrumental responses, and may vary in terms of the order, salience or other criteria for the efficacy with which they have been presented to the organism. And while, on the average, these sequential processes may occur at different age points in a specifiable environmental group, there is no necessary correlation between their occurrence and age-*qua*-time. Under this conception, then, the "correct" time for implementing an environmental procedure to facilitate development is a *point in a sequence of experiences* and only incidentally a point in physical time. A corollary of this conception is that, insofar as the sequential order of a response system provides no clear evidence for a time-linked course, age would be of limited utility for process-linked issues.

I have noted elsewhere (Gewirtz, 1961b) that learning procedures to which the child is exposed in life settings are seldom optimally efficient in facilitating his acquisition of key behavior systems. This point becomes even more salient when one considers that optimizing development requires the efficient, rapid presentation to the child of a correct sequence of learning experiences. For instances, A. J. Caron (1968) has shown that seven-year-old performance on a conceptual-transfer task could be brought about in three-year-old pre-linguistic children by subjecting them to relatively rapid dimension-highlighting training, which stood, as it were, for the four years of relevant experience that seven-year-olds ordinarily receive between the ages of three and seven. That Caron was able to achieve this level of performance within such a relatively short time span dramatically demonstrates that those four years of experience in the life setting are ordinarily provided inefficiently, insofar as they involve inadequate and poorly sequenced learning procedures unfocused with respect to this type of task. In the context of results like Caron's, those (e.g., Zigler, 1963a) who have attempted to differentiate learning from development on the basis of the length of time (prescribed number of trials versus several years) required for a response change may in effect be equating development with the relatively inefficient learning in life settings that is often measured in large time units. The routine attention to age-linked performance changes would have missed entirely functional relations like the one Caron identified in this performance sector.[29]

An emphasis on the charting of assumed age-linked *performance changes* in standard stimulus settings, therefore, tends to preclude both an emphasis upon the *process* of development and an awareness of the relative *rapidity* with which a given process may effect a behavior outcome. An alternative approach is to focus upon the determination of *what combination and sequence of experiences can be provided by the environment* (in terms of stimuli and their contingencies with behaviors) in order for the organism to attain some given performance level[30] (which level may be age-associated, i.e., one that is ordinarily characteristic of individuals older than a given child). Given our current understanding of behavior technology, we have seen that when there is such a systematic joint focus on behavior and the differential environmental conditions provided to facilitate its occurrence, procedures may conceivably be implemented that would take rather few trials during sessions lasting only minutes or hours to produce any of a number of specified effects that, in the natural course of events, would occur only after many months or even years. Furthermore, there are also sequential behavior changes that may occur very rapidly in the life of the organism (e.g., within days, hours or even minutes) in natural as well as experimental settings which will rarely correlate with the larger age units typically used in developmental analyses, such as years, months or even weeks. These sequential behavior changes may be basically no different from those which, because they correlate with age, are routinely labeled developmental. When considered with the already noted possibility of facilitating or retarding the time course of diverse behavior sequences, the fact that sequential behavior change can occur in very brief periods of time also argues against the use of chronological age as a standard independent variable in the study of development, or, indeed, even as an important variable.

Hence, it is precisely because we are in general accord with such theorists as Spiker (1966) who view chronological age as merely a measure of the time during which diverse processes can occur and as a variable that will not be required in advanced theories of development, that we question the utility of an age-variable focus even now. In fact, we suspect that its current use may obscure rather than facilitate uncovering the process variables determining the ordered changes in behavior that are consensually termed developmental. We must therefore question Spiker's unqualified notion (and the similar implication from Zigler's [1963a] distinction between development and learning) that the concept of development be restricted to behavior changes that normally accompany increases in chronological age. It is possible that Spiker means his position to serve only as an initial definitional tactic of directing research towards the assembling of sequential behavior patterns by the identification and study of age-correlated behavior changes, which for him would comprise the "developmental" laws ultimately to be reduced into the advanced process-oriented theories of development that dispense with age as a variable. Even so, there are at least two grounds on which the utility of such an initial tactic could be questioned. First, unqualified by sampling considerations, such an approach to development can imply a homogeneity of experiential differences correlated with age, as well as resulting homogeneity of behavior outcomes among subsamples of subjects readily identified in terms of independent criteria. Therefore, such an unqualified age-related approach would be impeached by the identification of any behavior system for which there are found subgroup differences in age course, of which many examples can be found in the literature (e.g., Anastasi, 1958; Gewirtz, 1965; H. B. Gewirtz & J. L. Gewirtz, 1968a). Further, those behavior changes that do correlate with age and are consequently selected to characterize development initially, may be biased to an unknown extent by those conditions that, while they also happen to correlate with age, are

[29] After this section was completed, my attention was drawn to the fact that an argument much like the one presented in this paragraph and the next was made by Baer (1966) in an articulate, unpublished talk. Baer presented an example similar to ours of how early discrimination learning was facilitated, thus providing a dramatic illustration of how, when an experimenter perseveres, responses some would think impossible to facilitate could be brought into the child's repertory.

[30] Because the term *stage* often appears to have been used to represent a plateau within ordered sequences of behaviors that, by implication, characterizes an individual's performance for a lengthy time period and is ordinarily associated with an age range, the terms *point* or *level* are preferred for our use here. When stage is employed, as it were, as a still-photograph of a level in a continuous process of development, it would be synonymous with our usage of the terms level or point in an ordered sequence, and we would thus have no quarrel with that use of the term. However, some have employed the term stage to emphasize more the fixity, length of span, and/or association with given age levels of a behavior system. Thus, a convenient term which for some theorists seems to have heuristically evolved to indicate momentary points in sequential changes in development, for others appears to imply heuristically a long-term "stopping" of development in a process during which relevant sequential changes are implicitly assumed not to be taking place.

irrelevant to the processes underlying the behavior changes in question. Second, there is the possibility of arranging conditions (as Spiker has also suggested) that would greatly accelerate or that would retard development of a behavior system, once its determinants have been identified.[31]

Thus, in the conceptual context of this chapter, developmental level is used to stand not simply for the passage of time since the beginning of extrauterine existence (as indexed by age) but rather for an ordered point in the sequence of receptor and effector response occurrences cumulatively affected by stimuli. The fundamental question for many theoretical purposes then is to ask what sequences and combinations of systematically manipulated experiences can enhance (or compensate for) the routine experiences that children ordinarily receive in selected life settings to facilitate the acquisition of specific key behavior systems. This procedure is more in keeping with modal scientific approaches, for time is considered to be nothing more than an index of the occasions and the limits for the process of environmental impact on behavior, and never itself to be the major variable. Further, this concentration on process contributes more to a general understanding of behavior functioning and can yield clear principles that are immediately useful in providing engineering bases for bringing out the "full potential" of children as well as for "upgrading" the behavior systems of children from all types of life settings (including disadvantaged ones).

Important systematic changes in the S-R systems of children can be indexed in a number of ways. (Many of these changes would be conventionally termed "advances in developmental level.") Focusing upon the responses of the child, there can be increases in the number of sequences, in their length, in the smoothness or skill of their execution, or in the number of simultaneous responses occurring, and in the inhibition of certain responses and the occurrence of others in the presence of discriminative stimuli. However, in analyzing the sequential changes in the child's behavior, it would be an incomplete approach to focus on the response side of the S-R sequential unit to the neglect of the

[31]Our reservation about an age-defined concept of development has been seen to stem from the assumption that it is not age per se but rather the processes which normally occur with age in natural environments, but which can be expedited or delayed at various ages by environmental conditions, that are the immediate, relevant variables in the study of developmental psychology. Further, we have noted that age-related behavior changes may be biased in unknown ways by conditions which, while they happen also to correlate with age, are irrelevant to a behavior change being studied. Nevertheless, we recognize the possible use of age as a preliminary vehicle for identifying sequences of behavior or systematic behavior changes ordinarily taken to characterize development, in a context where the qualifications of such an approach are explicitly taken into account by the researcher and where the limited aim of such initial screening is merely to expedite immediate process-oriented studies of the pattern of environmental variables which account for the ordered behavior changes identified. This use of age as an initial screening variable is not unlike the use of classifications in process-oriented approaches to comparative and differential psychology, for the purpose of initially identifying culture or species differences in behavior (even though such classifications, unlike age, are usually not initially ordered along dimensions). The main research task for process-oriented approaches in both instances is to identify the determinants of differential behavior outcomes, i.e., to specify the process underlying those outcomes.

stimulus side, as has often been the case. Behavior changes can often be accounted for by increased "responsivity" to stimuli, increasingly fine discriminations between stimuli (Bijou & Baer, 1963), and by the increasing complexity of the stimulus patterns (e.g., number, type, range, and spatial and temporal relationship of the stimuli) that acquire control over various behaviors. For example, upon hearing any auditory stimulus, an infant may initially orient its head in the direction in which its mother is usually found, but will eventually perform this response only to particular tones, appearing at certain intervals of the day and in conjunction with a variety of other stimuli. Thus, the discriminative stimulus for head turning, insofar as it comes to involve a conditional discrimination, changes while the single head-turning response it controls remains unchanged. By directing attention to changes in the stimulus side of the S-R unit, it may often be found that systematic increases in the complexity of an older child's behavior, relative to that of a younger child's, are primarily due to systematic increases in the complexity of the stimuli provided by the controlling environment (in part, perhaps, because parents or teachers assume that only the older child is capable of responding to complex stimuli, although for many behavior systems this may not necessarily be so). Thus, the characteristics (some would term "developmental level") of a child's response systems could be determined by the range of functional stimuli to which he has been exposed (cf., e.g., Vince, 1961). That is, the development of the child's behaviors may often be limited by the nature of the stimuli provided by the controlling environment rather than by the child's "potential." Often, actually, a child might have exhibited the more complex and effective behaviors at an earlier chronological age if the more complex stimuli had been provided systematically then. An analysis of changes in the behavior *of the controlling environment* in such instances may explain more about the child's development than would an analysis focused only on the child's behaviors.

Such behavioral changes can be facilitated by continuous differential reinforcement of successive approximations of the child's responses to a desired level of complexity (or simplicity). Also, at any given level of complexity his responses can be differentially reinforced so that they come increasingly under the control of differentiated discriminative and reinforcing stimuli. Those unconditioned and conditioned stimuli which are discriminative and reinforcing for a child at any developmental-sequence point, in terms of their types, numbers, range, and spatial and temporal patterning, will then function to shape his responses in the direction of more efficiently attaining positive reinforcing stimulus consequences (both nonsocial and social), which subsequently will maintain those behaviors. At first, the child's performances will have only limited effects on the environment, but through approximations of increasingly differentiated and efficient responses, they become increasingly efficient in bringing on reinforcing consequences (Gewirtz, 1961b, 1968b). In this context, it is worth noting that Zigler's (1963a) view that a unique interest of developmental psychology (as distinguished from the interests of behavior theory),

demanding approaches, methodologies and theories having particular characteristics, is the study of "changes in the form or organization of responses over time as contrasted with the changes in the strength or accuracy of the response" (p. 345), may have lost sight of the long-standing concern of conditioning researchers, particularly those working on operant behavior, with changes in the topography of responses prior to and during shaping procedures.

In connection with changes in behavior capacities, however, it is axiomatic that the individual cannot perform tasks which require responses he is physically incapable of making. In a similar vein, unconditioned and conditioned stimuli must surely exhibit the beginnings of their effectiveness at different cumulative-experience points in the course of a child's development. Until a child's receptor and effector skills are sufficiently advanced on whatever basis, the number and types of stimuli from all sources to which he can respond and which can reinforce his responses are limited (Gewirtz, 1961b). That is, learning cannot occur until physical growth ("maturation") has reached the appropriate point (Hebb, 1966). (And, in keeping with what was earlier noted, even such conditions at best can be indexed only imperfectly by the chronological age of the child.) Further, as the child grows, some reinforcing stimuli may drop out functionally, to be superseded by others, or their relative importance for him may change. Thus, food may decrease in reinforcing effectiveness relative to (a small degree of) *environmental change* per se. Thus, also, it is likely that the essential nature of the event pattern which constitutes the reinforcing property of certain stimuli for the infant changes as he moves from one capacity "level" to a higher one. To illustrate, those stimulus changes which could be effected by rather gross movements of an infant's hands or fingers (e.g., interfering with light sources), originally produced by the most complex behaviors of which he was capable, might become increasingly less effective as reinforcing stimuli in the context of his increasingly complex response repertory. Thus, also, the conditioned social reinforcing stimulus of attention may be superseded in importance by that of approval (to be attained from the caretaker-parent by successively more complex performances) in restricted settings in which the caretaker's approval response mediates the receipt by the young child of most of the reinforcing stimuli which are important for him. A developmental analysis, such as the one proposed here, would examine the origins and changes in reinforcing stimuli as functions of the roles they play in behavior chains important for the child in the context of changes in the child's receptor and effector capacity due to sequences of experience.

Early Experience

There are several reasons why early (or, more generally, earlier) experience may significantly influence the development of behavior systems later in life. As has been noted, some structural systems which underlie behavior systems appear to require stimulus input in order that they become (or remain) functional. For example, a physically developed eye may not be functional until it has been exposed to the light (Hinde, 1966). Second, many behavior systems of the organism depend directly upon the previous acquisition of component response systems. Thus, all forms of ambulatory behavior require the earlier acquisition of the ability to stand and maintain balance. Third, and perhaps most salient for our purposes in this chapter, certain later behavior systems would appear to be more effectively established when supported by behavior systems that are usually learned early in life (such as eye contact, visual following, smiling, and vocalizing), and that can subsequently become the elements of diverse response complexes and S-R chains, including those directed at people.

These later behavior systems are often maintained by the same stimuli as maintained the earlier acquired responses, and on this basis, behavior systems acquired early in life may become pervasive, and may often appear permanent and irreversible. Nevertheless, it should be noted that these systems would extinguish if the conditions maintaining them were removed (Gewirtz, 1961b). Thus, the strength of these behavior systems is often due *not* to their "irreversibility," but rather to the *locking in* of the behavior of the environment with the child's behavior, so that, from the earliest acquisitions onward, the maintaining contingencies might not even appear to be operating to the untrained observer. Further, in this locking-in process, the appearance of irreversibility of some behavior systems may result from the transfer of stimulus control from the initial sets of maintaining stimuli to different sets, which, to the untrained observer, similarly might not appear to be operating (Etzel & Gewirtz, 1967). While strict elimination of reinforcement for such pervasive response classes is often unlikely to be implemented in life settings, it is possible in principle.

The effects of experience in early life are likely to be qualified by a variety of limiting conditions, and hence no general principle about early experience appears warranted. First, the assumption that later experience builds upon the results of earlier experience does not apply uniquely to the young child, but may hold for any time span in the life of an organism. It is also possible that the effects of only some early experiences are particularly important for development, in the sense that they directly or indirectly become the bases for later behavior systems considered important, or are required for some structural systems to become functional. On the other hand, the long-range effects of many other experiences of the young organism may be much less important. Thus, an older organism learning a new skill, involving long and complex S-R chains that must be mastered sequentially, may find that the experiences involved in learning the earlier part of a chain are more critical for learning later parts than are diverse experiences it may have had early in life in contexts dissimilar from that in which the new learning is taking place. Further, while certain kinds of stimulation may be required early in life to make some structural systems functional, stimulation may also be required throughout life in order to maintain the functioning of these and other systems.

The emphasis of the approach of this chapter upon experience is not meant to negate the effects of "heredity" upon the development of behavior

systems. It is obvious that certain learnings are guided (i.e., facilitated or inhibited) by structural and constitutional factors. Thus, some behaviors which appear to be unlearned, perhaps because of the suddenness of their appearance, may be partially explained by the hereditarily determined growth of the receptor and/or effector systems which make possible the very rapid learning of the behavior.

However, as noted above, it is our assumption that many of the behavior systems that may appear unlearned are dependent upon experience and hence learning to a much larger degree than is usually acknowledged. Thus, as Hebb (1966) notes, while a baby does not have to learn a temper tantrum (in the sense of practicing it or witnessing it in others) in order to perform it definitively on the first try, the baby must previously have learned to value something that is now beyond his reach or being withheld from him. Further, the behavior is modifiable insofar as the child's value matrix of relevant objects may be changed, and positive or aversive consequences may be made contingent upon the tantrum behavior (Etzel & Gewirtz, 1967).

Homogeneities in the early experience of children may also be responsible to a large degree for the common features of certain human behaviors which have caused some to consider them unlearned, "species-specific" behaviors. Perhaps because of the emphasis which many such theorists have placed on "instinctive" or "innate" behaviors, there has often been the failure to recognize the dependence of such behaviors on the experiences with stimuli that are normally inevitable for all members of a species, and on the common learning which can result from such opportunities (Gewirtz, 1956b). Thus, as we note at a number of places in this chapter, the extreme helplessness of the human infant in early life and the care he requires simply to remain alive constitute a pan-human circumstance which could lead to some relatively homogeneous outcome patterns in human behavior. These learned response patterns, then, would only appear unlearned and species-specific.

Critical and sensitive periods. The concept of *critical* period has often been applied to time spans, particularly in the early life of an organism, during which the organism's capacity for the acquisition of certain behavior systems may be assumed to be permanently lost if relevant experience does not occur then.[32] A related concept is that of *sensitive* period which has been applied to time spans during which it has been assumed that relatively large or rapid behavioral effects can be produced by lower magnitudes of environmental stimulation than would be required to produce such effects at other, presumably nonsensitive, time periods.

These concepts of critical and sensitive periods have often referred to a particular span (or spans) of time in the life of the organism bounded by

[32]At an orthogonal level of conceptual analysis, which is fundamentally irrelevant for a functional analysis of behavior growth, that time span may follow the assumed or known development of the underlying structures involved, whether that development be at birth or at some later growth point (e.g., Hebb, 1966).

numerical chronological-age points. Although use of these concepts may be coupled with mention of the significance of the sequential experiences that enable an organism to acquire specific behaviors during a presumed critical or sensitive period, often it is the time spans bounded by specific age points that have received focal emphasis and have been termed sensitive or critical. The usage of such age-linked time spans appears to connote a high degree of precision, yet the age limits involved are often qualified by such terms as "around," "about," "roughly," or "approximately."

Particularly as applied to the human, the age-linked conceptions of critical and sensitive periods are often tied only to those naturally occurring environmental conditions that are considered by observers, and thus may reflect with fidelity little more than the failure of those observers to find exceptions in this sampling context. That is, the labeling of a period as *critical* may stem solely from such negative evidence as not noting the appearance of the behavior system in question outside of the age limits within which it has appeared in the samples that happened to be studied. The label *sensitive* often appears to have been assigned to a norm-derived age span based almost entirely on the central tendency and dispersion or range of ages for the appearance of the behavior under scrutiny, and therefore, so used, this term too would be qualified by any limitations in subject or environment sampling conditions upon which observations were based.

Nevertheless, these age spans have often served as guideposts in practical application. For instance, the casually documented notions that infants cannot acquire attachments to an adult after "about" nine months of life if they have not acquired one before or that they may not be able to transfer their attachment if they have acquired one, and/or that they display an "eight-months' anxiety" involving a fear of strangers (e.g., Spitz, 1950), have sometimes guided foster- and adoptive-home placement procedures. In such cases, the more relevant and useful age-independent behavioral indices of the infant's capacity to adapt successfully to a new caretaker environment have appeared to be more or less neglected. At the infrahuman level, Scott's (1968) prescription for a dog (regardless of species) to establish satisfactory social relationships both with dogs and people is simply that he be taken from the litter and adopted into human society when between six and eight weeks of age.

As has been argued in the preceding sections with reference to development, any age-defined concept must be limited in utility to the extent that it ignores the relevant behavioral and environmental events occurring in time. A number of ethologists and psychologists now emphasize (to greater or lesser extents) the inadequacy of age-defined or even maturation-defined critical or sensitive period concepts, and maintain, as we do here, that the focus of research must be on process, and that a detailed analysis of organism-environment interaction is required (Caldwell, 1962; Hinde, 1966; Moltz, 1960). Once the *processes* whereby cumulative experience affect behavior systems are examined, we find that the notions of critical and sensitive periods lose the connotations of precision which their age-linked time limits suggest to many.

Thus, with reference to the postulated critical period for imprinting in ducklings, it has been demonstrated that the time during which it is possible to initiate the following-pattern indicating imprinting to a stimulus object can be extended considerably by reducing an animal's visual experience prior to its initial introduction to the imprinting situation (Moltz & Stettner, 1961). Similarly, the critical period for imprinting in chicks can be extended by rearing them in isolation (Sluckin, 1962).

In this context, a process-oriented theorist may still wish to retain a concept like critical period, or more accurately a concept of critical experience, notwithstanding its lack of functional precision, for the purpose of labeling and making salient certain features of development. Thus, he may use that concept to label a sequence of S-R experiences without which the capacity for a potential or actual behavior system could appear to be lost, i.e., due to the lack of experiences assumed necessary to insure that the behavior system can be acquired or become functional. The developmental points bounding the interval would be defined in terms of the relevant behavior systems in the organism's repertory. The loss of capacity to acquire the behavior system in question may be attributed to any of a number of factors, such as the acquisition of incompatible behavior systems or simply to the failure of the appropriate conditions for learning to present themselves at any time in the natural environment. Another possible basis for considering a span as critical could be that a behavior system acquired during the span may appear irreversible, due to its being maintained by environmental contingencies that have become routine and, for this or other reasons, are not readily apparent to an observer. An additional basis for process theorists to use sensitive or critical period terms may be to label some span between developmental-sequence points during which the acquisition of certain behavior systems could begin to occur, or could occur most rapidly, as a result of the child's receptor and/or effector systems having reached appropriate levels, as manifested in his being more receptive-responsive to particular stimulus conditions. These levels would reflect experience up to that point.

From a process-oriented point of view, even more important than demonstrating the ability to extend the length of an assumed critical period (as in some of the studies cited) is the general implication from such demonstrations that specification of the conditions that prevent the acquisition of a behavior system at any point or that give it the appearance of irreversibility may make it possible for the learning to be facilitated, or for the apparently irreversible behavior outcome to be reversed, through the use of appropriate techniques. This implication would further impeach the utility of a critical period concept. Thus, behaviors which have not been acquired during an assumed critical or sensitive period and therefore have appeared to some to be forever beyond the potentiality of the organism to acquire, could possibly be learned at later points in the life span by the deliberate manipulation of variables involved in the processes underlying their acquisition. For instance, if it could be shown that the acquisition of incompatible responses was the

factor preventing or impeding the acquisition of a particular behavior system, then techniques could in principle be devised to eliminate (for long or short periods) these incompatible responses from the organism's repertory. This tactic could facilitate learning of the desired behavior system (cf., e.g., Lovaas et al., 1966; Baer et al., 1967; Risley & Wolf, 1967). An example from the imprinting literature is relevant. It is assumed that chicks or ducklings fail to engage in object-following after some point because, having learned the details of the environment in which they are reared, they may then recognize objects as strange, which evokes distress responses and fleeing, the latter response being incompatible with following. On this basis, Hinde (1966) has suggested that enforced proximity to a strange object could result in habituation of the fowls' attempts to flee with a consequent increase in the tendency to follow.

The sensitive period concept of a unique time span of heightened or maximum susceptibility to particular environmental influences is similarly of questionable utility. The organism is changing continuously due to experience and to organismic factors, and its capacity to learn will therefore vary throughout its life span. Further, even within a narrow segment of the life span, the probability of learning at any given moment may vary greatly as a function of diverse setting conditions (Gewirtz, 1967a). Moreover, it has been noted that sensitive periods are usually not sharply defined and that the factors which define sensitive periods for learning are as diverse as the types of behavior involved (Hinde, 1966). Finally, the position taken in this chapter with reference to the use of the age variable and to the critical period applies to the sensitive period as well. That is, it is the process(es) which underlie any particular heightened sensitivity of the organism at one point relative to another that must be determined. And once determined, a process may be made to occur more efficiently, so that the receptivity and responsivity of the organism may be heightened and the relevant acquisition processes may thereby be facilitated.

EFFECTS ON BEHAVIOR OF GROSS SHIFTS IN THE MAINTAINING ENVIRONMENT

It is axiomatic that a child will bring to a new environmental setting into which he is placed behavior systems that have been maintained by (and possibly acquired on the basis of) the stimuli in the setting from which he has come. It follows that the child's initial behavior in response to stimuli in the new setting will be a function of the similarity of those stimuli to the stimuli that controlled his behavior in the earlier context. If the new stimuli are markedly dissimilar from the discriminative stimuli in his former setting, the child may infrequently respond there. When the child does respond, his behaviors will provide the basis for new adaptive learning in connection with the stimuli available in the new setting.

There are a number of possible outcomes of such environmental shifts. A sudden extreme shift from a setting in which the child's behavior systems have

been under close stimulus control to a setting in which they are not may lead to a considerable weakening or even a cessation of many of his behaviors. That is, because the former controlling stimuli are no longer available or are not provided in functional relations with the child's responses, behaviors exhibited by the child and the discriminations made by him in the new setting may be less complex, even primitive, relative to his behaviors under stimulus control in the previous setting. Behaviors in the new setting are also determined by the rate at which the child's responses to novel stimulus conditions will habituate, which may be a slow process with disruptive effects if the child is very young and the new environment contains abundant startle and noxious stimuli.

New Environments

The nature of the child's adjustment to the new social environment depends on whether or not the significant figures there (e.g., caretakers) recognize the relevant discriminative and reinforcing stimuli for his behaviors and provide them appropriately; whether or not the child, through learning occasions that are provided in the new caretaking setting, acquires responses appropriate to that setting; and whether or not stimuli in that setting (e.g., social stimuli from a new caretaker) acquire discriminative and reinforcing value for the child's behaviors. If caretakers in the new setting are inflexible and fail to shape the child's simple behaviors into behaviors appropriate to the new setting, the child may not acquire an acceptable substitute behavior repertory. These conditions may result in a vicious cycle: a caretaker responds to the child in terms of expectations based on the behaviors of other children of that age group whose maintaining environment has not been shifted, and if these responses of the caretaker are not appropriate to that child's present level of learning and thus do not function as discriminative or reinforcing stimuli for new learning by the child, the child will drop even farther behind in his behavioral development. These conditions may thus eventuate in the child's being labeled "unteachable." Another possible outcome is that nonreinforcement of formerly reinforced responses may lead to emotional responses or other maladaptive behaviors, which if reinforced by the caretaker's attention may become more and more likely in the new setting. Because these responses may be incompatible with new adaptive learning, another vicious cycle then occurs, which will probably also eventuate in a labeling of the child as "unteachable," but this time due to "emotional disturbance." A survey of adaptations to new environments and conditions for the establishment of substitute behavior repertories and attachments to new object persons is to be found in Gewirtz (1961b).

Another unfortunate, but not infrequent, problem-behavior outcome in children can stem from the arbitrary conclusions drawn by caretakers about charges recently placed in their care (or by parents about their offspring). On the basis of what they take to be the children's behavior limitations or from information supplied by some diagnostic procedure, these caretakers may conclude that the children are afflicted with some organismic anomaly (brain impairment or injury) or simply (and residually) that they are retarded (Gewirtz, 1968a). However, the children's "backward" behavior patterns may actually be the result of adverse reinforcement histories due to a paucity of functional stimuli during their lives up to that point (in a later section, such patterns will be termed *privation*); or the behavior patterns may result merely from the consistent absence of coordination between some stimulus classes provided (which might otherwise have been ample in number and type) and some child response classes (Gewirtz, 1961b).

This process wherein caretakers or parents define their charges as "backward" may be self-fulfilling, as the caretakers may then continue, or begin, to offer a restricted stimulus diet to their charges on the assumption that "backward" children cannot benefit from the stimulation it is possible to provide, or will even be harmed by it. An alternative possibility in this context has been noted by Bijou (1963). Under the rationale that such an arbitrarily defined "deficient" child "needs" more than the usual amount of attention because he is "handicapped," the parent-caretakers may differentially reinforce the child's dependent behaviors, both instrumental and social-emotional, and, at the same time under their humane rationale, may systematically extinguish or mildly punish independent activities of the child. This pattern would preclude the child's acquiring effective, resourceful, and mature behavior patterns and insure that he will remain helpless and infantile. Clearly this type of caretaking process soon justifies itself in terms of its outcomes: children who might otherwise have functioned rather well come to require the stifling "help" that has been imposed on them by their well-intentioned caretakers (Gewirtz & Etzel, 1967). Thus, because of the attitudes of their parents and caretakers more than because of their presumed or actual afflictions, these children frequently acquire stilted behavior patterns, having been made passive in child-rearing settings in which as active, responsive children they could otherwise have developed fully.

Indeed, whether or not a child's affliction is a real one (e.g., he is actually brain injured or limited in his motor coordination), the engineering problem remains the same: to optimize the environmental conditions so as to bring the child's performance up to their highest (asymptotic) levels. In fact, given the inefficiency of conditioning procedures in natural settings (which point is discussed in a later section), it is conceivable that when acquisition and setting conditions are optimized, the performances of so-called "afflicted" children may often be brought to functional levels higher than those characterizing the behaviors of so-called "normals" (e.g., for certain motor or verbal behaviors, etc.).

Concurrent Multiple Environments

A special case of changes of stimulus control conditions involves independent but sometimes overlapping environmental settings that differ in their discriminative and reinforcing stimulus control of the child's behavior (as in "multiple mothering"). Each caretaker essentially provides a different caretaking setting for the

child, defined by the discriminative and reinforcing stimuli provided and the responses considered appropriate by each caretaker. The child then has the problem of discriminating between caretakers and caretaker roles in the different environments. Difficulties may arise when a certain response to a stimulus is considered appropriate by one caretaker but inappropriate by another. For the child in an institution, or for one who is in a nursery school during the day or is raised jointly by several persons in a household (parent, relative, maid), these issues may be important.

I have suggested elsewhere (Gewirtz, 1968b) that infants in the care of busy or ambivalent caretakers, as in some institutions or family settings, might be subjected to a conditioning program so as to strengthen those responses in their repertories (e.g., eye contact, reaching toward, smiles, selected vocal responses) that are likely to function as potent reinforcers for the behaviors of caretakers. In this way, infants would be in a position to "compete" more effectively for the caretaker's limited attention, and a fertile interaction basis could be established to facilitate the mutual acquisitions of constructive attachment patterns by child and caretaker.

Privation and Deprivation as Environment-Deficiency and Shift Conditions

The environment-deficiency conceptions "privation" and "deprivation" have occupied a central role in formulations which have attempted to relate deficiency conditions of stimulation in early childhood, as antecedents, to aberrations in later behavior patterns of children as consequences (e.g., Bakwin, 1942, 1949; Bowlby, 1940, 1951, 1953b; Goldfarb, 1945a, 1945b, 1955; Levy, 1937; Spitz, 1946a, 1946b, 1949, 1954; Yarrow, 1961).

Following our earlier operational analysis (Gewirtz, 1961a, 1961b), we will reserve the term stimulus *privation* for a paucity of all, or particular, classes of stimuli through long time spans, usually early in life at the very time stimuli could support the early foundation learning that is being laid down. In some instances, abundant stimuli may be available but are nonfunctional because of an absence of appropriate setting or context conditions or because of an inept mode of provision (e.g., noncontingent on behavior). For example, if social stimuli are not made discriminative for behavior, they will not acquire cue or reinforcer value, and privation of social stimuli will be said to have occurred. The child developing under these conditions may become generally responsive to nonsocial stimuli but unresponsive to social discriminative and reinforcing stimuli. Children displaying these characteristics are usually termed "autistic" (Kanner, 1949; Ferster, 1961). As we have used the term, privation does not index conditions involving a gross shift in the maintaining environment. Nevertheless, it is surveyed here to provide a context for the concept of deprivation which can involve such a shift.

We will use the term stimulus *deprivation* to encompass both long-term and short-term effects of gross shifts or changes in the maintaining environment

brought about by the removal of stimuli that have become functionally significant for key behavioral systems of the child. This involves either lowering the level of stimulation from the child's accustomed level, making key stimuli from stimulus-response chains unavailable, blocking responses, changing the quality of stimulation by changing its source, or removing the setting conditions that enhance the efficacy of key stimuli. An example is a child's separation from a person to whom he is strongly attached or that person's sudden and continuing rejection of the child. As a result of such situations, the child may at first exhibit behavior patterns not unlike those usually found in the initial stages of experimental extinction, i.e., an initial increase in frequency of the response compared to the rate exhibited under reinforcement conditions, as well as irrelevant emotional responses, which may further disrupt the response pattern and preclude the learning of new adaptive behaviors.[33]

The deficiency conception. Attempts to explain the assumed consequences of privation and especially of deprivation conditions have generally been centered around a deficiency conception, which focuses attempts to order long-term phenomena according to a short-term homeostatic drive model. This latter model, however, is ordinarily used to order an organism's recurring and reversible requirements for food and water, but has been extended by adherents of a deficiency conception to include "hungers" or "needs" for such things as affection or love, and stimulation. Generally, this model seems to involve the assumption that if young children receive an inadequate supply of "essential" stimuli from their caretaking environments, they will develop atypical patterns of responsiveness to nonsocial stimuli, of dependence and attachment behaviors, or of adaptive behavior generally. The "deficient" stimulus supply may have been received from early life onward or it may have been implemented abruptly and continued for a period following an earlier adequate supply. These behavior-outcome patterns would include developmental arrest, depression, and apathy in younger children; and in others, no requirements, or apparently insatiable (and sometimes indiscriminate) ones, for the formerly deficient commodities (e.g., attention, affection) and a limited capacity for social relationships (attachments). For instance, Levy (1937) has written of behaviors characterized by a lack of "emotional response" and a "shallowness of affect."

One implicit motivational analogue of the deficiency model often used to explain the above outcomes is that of *hunger*. For example, Levy (1937) coined the phrase "primary affect hunger," and Spitz (1949) has written of "emotion-

[33]The conception of stimulus deprivation emphasized briefly in this section involves the unavailability in a setting of mostly conditioned stimuli which have maintained selected behavior systems there. As such, this usage differs systematically from one in which behavior aberrations result from shifts to such unusual environments as those that become unstructured or involve usually short-term stimulus impoverishment (sometimes termed "sensory deprivation"), as described, for instance, by Bevan (1967). A consideration of the results of the very extreme curtailment or rearrangement of stimulation often involved in such (often contrived) settings is beyond the scope of this chapter.

ally starved" children. This usage can be illustrated by Levy's (1937) classic statement:

> . . . affect hunger is . . . an emotional hunger for maternal love and those other feelings of protection and care implied in the mother-child relationship . . . a state of privation due primarily to a lack of maternal affection with a resulting need, as for food in a state of starvation (pp. 643-644).

This presumably analogous homeostatic hunger-drive model has usually been applied in other contexts to order the periodic and readily reversible requirements of organisms for such indispensable stimuli as food and water. An analysis of the hunger model, however, indicates that it cannot possibly order the reported conditions and results of regular, long-term deprivation: it operates only through hours, or at most a very few days; and it implies complete satiability after periodic deprivation, with no residual effects that could cumulate in time and manifest themselves in systematic changes in behaviors for the events of which the organism was earlier deprived. In fact, a close analysis of long-term food starvation effects indicates that a short-term homeostatic model is totally inadequate to handle even food deprivation if effected for protracted periods (Keys, Brozek, Henschel, Michelsen & Taylor, 1950). The deficiency model attempts to order through months and (more typically) years, not periodic and reversible but cumulating effects of recurring conditions of deprivation in the early life of the child, which result in systematic changes in some of his behaviors with reference to the stimulus commodities deprived. This model thus emphasizes a "need for stimuli" which through time can build up in strength if unrequited, i.e., if less than some (unspecified) adequate level is supplied to the child over relatively many occasions through the longer term, on either a regular or irregular basis. As earlier noted, the "need" which builds up in this way may lead later to the child's exhibiting apparently insatiable requirements for (and even the hoarding of) the stimulus commodities earlier provided in deficient supply, but sometimes it may lead to apathy or other aberrant behavior outcomes. In addition to the inherent difficulties of attempting to order long-term phenomena according to a short-term model, there is the further limitation that the drive concept inherent in these models carries irrelevant (excess) and even misleading meaning which derives from the usage of the short-term homeostatic drive model in contexts which are quite different in their essential properties from those in which the term "childhood deprivation" has been applied.

Application of the deficiency conception. Despite these arguments against the use of the deficiency model for ordering long-term phenomena, the model is still often used implicitly or explicitly by theorists, therapists, and caretakers alike. Under the deficiency model, the solution for dealing with inadequate conditions would be to provide a large number of stimuli without regard to their relationships with the behaviors emitted by the child. If this prescription were followed to the letter, the infrequent contingencies between responses and stimuli would minimally affect response acquisition, but could change the long-term maintenance level for stimulation in proportion to the rate of stimulus provision. A less likely outcome could be "superstitious" behavior: responses that happen to occur just before stimulus provision could increase in probability, and because of their increased frequency would be likely to be inadvertently reinforced again.

In actuality, however, it is unlikely that a caretaker or therapist will ignore the child's behaviors when she provides stimuli. Rather, the caretaker is likely to provide the stimuli, if only inadvertently, in some functional relation to particular response classes of the child, and the response classes that are reinforced may vary from one caretaker to another. Thus, without a predetermined specification of the desired responses, there are a number of possible behavioral outcomes. If the stimuli intended to constitute "sufficient" attention and love are provided contingent upon the child's disruptive or attention-seeking behaviors, those responses will be strengthened, and the result may be an unfavorable response pattern that precludes the learning of more appropriate adaptive behaviors. If, on the other hand, the caretaker provides those stimuli contingent upon more socially valued responses, such as responses typical of the child's age group or responses oriented more toward autonomy and achievement, these responses will be strengthened and the outcome will be more favorable.

Ironically, both of these behavior shifts can be used by advocates of the deficiency model to index the inadequacy of the previous setting. A high or increased incidence of attention-seeking behaviors or disruptive emotional responses could be assumed to indicate that the child has a "hunger" for those stimuli believed to have been inadequately provided previously, and to require even more stimulation to satiate or reverse. The opposite outcome, the relative increase in appropriate behaviors, may lead to the assumption that the new, more adequate environment has satisfied (satiated) the child's hunger for the stimuli, for he no longer appears to "need" as much attention and love and therefore appears more "secure," a result which is also interpreted as validation for the principles of the deficiency model.

The routine use of a deficiency model, whether for appetitive or nonappetitive (including social) conditions, is disadvantageous in that it discourages close attention to environmental stimuli and behaviors at the level of detail required by a differentiated learning analysis. By focusing on what appear to be minimal conditions for behavioral development, this model considers neither its range nor its potential upper limit. It also plays down the concepts required for ordering systematic and cumulative changes in behavior effected by recurring conditions (contingencies) of the environment, i.e., learning concepts. The deficiency model uses the network of empirical relationships implied in the reversible homeostatic-motivational conception, and, as such, is only aimed at, and capable of, summarizing recurring regularities in selected organismic behaviors involving no residual effects. Further, it tends to emphasize few behavior indices, which are assumed to return periodically to some routine level. This emphasis on few indices may reflect an implicit concern at a reduced analytic level with a physiological process that is a key to organismic survival. Hence, the conception is misleading for ordering either chronic starvation effects or cumulative long-

term functional relationships between the availability of stimuli and effects on relevant behaviors.

In contrast, a learning analysis would first specify the conditions of stimulus control over responses existing prior to the removal of stimulus classes in deprivation, as well as the changed contingencies between the child's behaviors and the stimuli provided in the new setting. Thus, the outcomes of environmental shifts earlier considered would be regarded in a learning analysis as reflecting an adjustment of the rate of the child's behaviors to the changed conditions of stimulus provision in the new setting, which includes new learning by the child resulting from changed response-reinforcement contingencies in the new setting. The basic assumption of a learning analysis overlooked by proponents of a deficiency conception is that, in order to understand the development of human social motivation under both normal and deficiency conditions of stimulation, it is not sufficient to focus simply on which or how many stimuli are provided to the child. Rather, one must take account of the circumstances under which given stimuli are made available, and in particular, whether these stimuli are functional and enter into effective learning contingencies with the child's behaviors.

ABSTRACTIONS OFTEN EMPLOYED IN SOCIAL-LEARNING ANALYSES

One-sided and Two-sided Summary or Index Variables

Nearly all extant theories of parent-child interaction and socialization are process-oriented. They therefore imply a focus on the sequential details of the interchange between the child and his caretaking environment, wherein stimuli provided by the appearance or behavior of the caretaker evoke or are consequences of the child's behaviors. Each S-R interchange unit involved is conceived to represent a point in a sequence and to contribute to the next point, within and across interchange episodes. Thus emphasis is on the *process* of interaction, and on the systematic changes in the child's behaviors (i.e., his learning) resulting from the provision of stimuli articulated at successive points with them. As has been noted earlier in the section on the infant conditioning the behavior of the environment, there is also a parallel learning process involved: the behaviors of the parent can systematically change too (see also Sears, 1951; Gewirtz, 1961b). However, as has been noted earlier, caretaker-socializer learning is hardly emphasized at all in approaches to parent-child interaction.

Yet when many process-oriented theories of parent-child relationships and the researches carried out under their auspices are examined, it is noted that neither their theoretical constructs nor the empirical constructs which are related to the theoretical terms via (usually implied but occasionally explicit) coordinating definitions are at a level of analysis that is optimally efficient for the level required by the emphasis on process pervading the theories. Rather than the direct indices of process required under these theories, the empirical constructs

instead only summarize through time spans (often lengthy ones) either the environmental events presumed to constitute the stimuli that are functional for the child's behaviors (e.g., "nurturance"), *or* those child behaviors (e.g., "dependence"), but not the interchange S-R units that are required to index successive points in the process of change. Indeed, even approaches to the process and outcomes of parent-child interaction that lean heavily or exclusively upon social-learning assumptions (e.g., Sears et al., 1957) have sometimes employed mainly "one-sided" (although defined) summary variables in research. Such constructs are relatively insensitive to the sequential details of interaction conditions that make possible studying the direct impact of the stimuli provided upon the child's responses, and are for most purposes, therefore, less than optimal indices of the learning-change considerations that pervade a process theory like learning.[84]

Furthermore, generalized-response trait variables for each side of the interaction process at best emphasize only the "average" response tendencies of the environment or of the child across situations and thus reflect minimally the successive details of the highly differentiated discriminative control that social stimulus settings can acquire over child behavior. Although approaches using such variables may find some differential relations both among the summary behavior indices used and between them and environmental variables, uniformly high relations or even homogeneous ones are seldom found, and, indeed, in most cases, should not be expected. This is because there is always the possibility that one response measure can enter into a higher association with independent variables than another, or simply enter into a different functional-relation form with them. This condition is attenuated when theoretical concepts are imprecisely defined and used, overlap each other in meaning and overlap differentially on particular questions, as well as when measures are differentially reliable. Further, such concepts are often imprecise, and what appear upon closer analysis to be fundamentally different phenomena are often grouped under one such concept (e.g., achievement, attachment, aggression, dependence, dominance, imitation, identification). Hence, at the very least, the discrepancy between the level of abstraction of the one-sided global summary variables and the level implied in learning concepts must inevitably limit progress in both theory and empirical research. The use of such summary variables within otherwise relatively articulate process theories (like learning) tends to limit the possibilities for the modification and improvement of such theories, particularly in terms of their internal consistency and the coordination of empirical indices with the concepts of those theories. Further, reconciliation of such a theory with the empirical relationships found between stimulus and response variables is unduly complicated by the use of summary terms, and discrepancies in the levels of analysis can result in inefficient utilization of research resources. Of course, the utility of these con-

[84] As will be seen later in the present section, this apparently inconsistent usage might be explained by occasional research purposes for which the use of summarizing and one-sided trait variables can be efficient and fruitful, even under an approach whose ultimate aim is to attend to successive details of the mother-infant interaction process.

cepts for research can be improved by delimiting the functional relationships which they summarize. In the present chapter, however, we concentrate instead on reducing such concepts to functional relationships.

Examples of one-sided variables frequently used to summarize aspects of the *environment* that can have impact on particular behavior systems often have as their assumed indices such demographic classifications as geographic area, culture group, institutional membership, social class, father's presence or absence, child's age, sex category, and sibling-status pattern, as well as mother's age, whether primiparous or multiparous, and whether or not she is employed outside the home, has household help, or there are several generations residing in the household. Caretaker-role variables, which include nurturance, warmth, love, and acceptance (often qualified by consistency, frustration, or conflict), are another type of variable used to summarize relevant environmental details. One-sided variables summarizing the child's *responses* are most usually typified by "trait" concepts, which index response classes likely to be emitted by him in diverse stimulus settings. Some examples of trait-like concepts summarizing child behaviors are dependence, dominance, and hostility (sometimes also qualified by anxiety, consistency, frustration, or conflict). Under a learning approach, such one-sided variables have limited utility except for preliminary purposes like summarizing and data-grouping operations or subject selection, as they only grossly index attributes of the stimuli that have been functional for a child; and, while in principle these gross terms are reducible to patterns of stimulation and their interchange with child behaviors (J. L. Gewirtz & H. B. Gewirtz, 1965; H. B. Gewirtz & J. L. Gewirtz, 1968a, 1968b), their use can preclude or delay specification of those required details. These global terms are thus not sufficiently differentiated to be more than minimally useful under a learning model. A statement of the amount of stimulation a child receives or has received cumulatively must therefore be supplemented by a functional analysis of the behavior relevance of the provision of those stimuli. Such an analysis would attend to such aspects as the discriminability and the pattern of provision of stimuli, the sequences of stimuli and responses which constitute S-R chains, the delay interval between behavior and reinforcement, the acquisition of discriminative and reinforcing value by previously neutral cues, the setting conditions affecting the efficacy of the stimuli, and like factors.

The utility of one-sided variables is further reduced by the fact that measures of them are usually derived from such sources as parent interviews or questionnaires, which are sometimes administered years after the occurrence of the parent-child interchanges being assessed, or from specific or global rating scales or projective tests. Even if these methods were to give reliable measures of verbal performance, it is often questionable (and rarely determined) whether they actually reflect the behaviors they are intended to assess. Furthermore, the parental values, attitudes, or child-rearing traits (or personality organization or conflicts) that such assessment devices describe may correlate only slightly (if at all) with the actual stimuli impinging on the child that are relevant to a behavior system under study. Similar to the measurement of stimulus summary

variables, the presence of a trait is often inferred from retrospective parental reports of the frequency of these response classes. Often no attempt is made to assess the events leading to and following members of such response classes or to take account of the stimulus conditions which differentially control the response class.

Thus, the limited value of a caretaker-role variable such as "love" or "warmth" is illustrated by the fact that the amount of love or warmth evidenced in the parent's attitude toward his child as expressed in interview or questionnaire data, global or specific rating scales, or projective tests may bear little direct relationship to the functional stimuli actually received by the child. To the young child with little or no appreciation of subtle verbal distinctions, stimulus qualities like love can only be perceived in the form of functional physical stimuli, e.g., as visual and sound patterns, skin contact, etc. The infant or young child does not discriminate "attitudes" or "feelings"; however, he may discriminate animated from expressionless faces, soothing from harsh sounds, gentle from hard squeezes, gradual from sudden movements, or one complex of these events from another. If the events implied by a gross variable are not discriminated by the child (or his caretaker) and do not affect in any way his (their) behaviors which are of theoretical interest, then they are irrelevant to a social-learning analysis of the child's behavior systems (and of the caretaker's). As the child's symbolic processes develop, he may at a later age come to discriminate increasingly subtle indications of approval and love. Even so, these stimuli, e.g., verbal ones, will have no relevance for his behavior if their value has not been conditioned by the functional provision of discriminable stimulation at an earlier age (Gewirtz, 1961b, 1968b, 1968c).

Further, the use of such one-sided variable labels can sometimes have unfortunate consequences when applied uncritically in the life setting. The labeling of a child's response class as a "trait" is sometimes accompanied by a belief that the trait is possibly innate, and will persist throughout life in some form or another. (The assumption of "motives" for the child's behaviors is fundamentally identical to this usage of traits.) Such beliefs will often result in self-fulfilling prophecies: a teacher who has been warned by another teacher that a particular child is hostile would tend to expect hostile behavior from that child and might, therefore, interpret his behaviors as reflecting the hostility which she expects of him. If, as is often the case, her negative attention functions as a positive reinforcer for the child, she will inadvertently increase the rate of his emission of hostile behaviors. Similarly, if she has been led to believe that a randomly chosen child is intelligent or creative, she will very likely prime and reinforce those of his behaviors that appeal to her notion of intelligence and creativity (Rosenthal, 1966).

The limitations of one-sided trait variables become clearly evident when one reviews the studies concerned with the relative importance in accounting for behavior in a given setting of the trait variable and the stimuli present in the period preceding an action. The latter were often found to be critical determinants of a child's behavior, and may be better predictors of consequent behaviors

than more long-term trait variables. Thus Rotter (1960) surveyed studies in which situational variables predicted an individual's behaviors as well as or better than test performance or other summarizing behavior indices; Raush (1965) found that when a child's immediately preceding interaction was considered together with setting variables, the combination constituted a more effective predictor of whether another child's behavior would be friendly or hostile than did individual differences among the children; Barker and Wright (1955) showed how specific settings can instigate interaction and how variations in structure of the environment can account for differences in interaction behavior; and Gellert (1962) found that the frequency of a child's dominant behaviors depended upon the behaviors of the person with whom he was in interaction—that is, his dominant behaviors increased in incidence when he was paired with the less assertive of two peers. Thus, both the setting conditions and the behavior of the first interactor (e.g., the parent) can differentially control the type of response emitted by the second interactor (e.g., the child). As will be seen subsequently, some behaviors of the parent might therefore result in copying behaviors by the child, whereas others might lead to complementary or antagonistic responses. Differential functional relationships such as these are obscured by long-term one-sided trait variables that measure only across settings and only the behaviors of one of two or more interactors.

Some uses of abstract summary variables. In general, inexplicit abstract concepts tend to be inefficient, and the phenomena they summarize can be dealt with best if they are reduced to, and thereby replaced by, more explicit variables (see the next section for such an approach to identification). Nonetheless, there may be research strategies for which the use of reasonably well-defined one-sided summary variables might be plausible, and even fruitful, at least at first. For example, even under an approach that attends directly to the successive details of the mother-child interaction process, the use of a gross trait variable for behavior might occasionally be a necessary research compromise, if only to facilitate data processing, including grouping and reduction, or to select subjects that would vary along some dimension of responses to and for stimuli. Further, demographic environmental variables may be gross indicators of the environmental constraints that limit parent-child interplay. For example, the sex of the adult determines to some degree his behavior toward the child, and the sex of the child determines some of the stimuli he receives as well as the behavior he emits. Similarly, the birth order of a child may influence the child's environment in that the experience of the mother in child-rearing and the amount of attention and time she could devote to the child would be affected (J. L. Gewirtz & H. B. Gewirtz, 1965). Moreover, by grouping subjects (parents and/or children) in terms of levels of index variables such as social-class strata or sibling-status groups, one could be reasonably assured of sampling widely disparate points along postulated dimensions of stimulation mediated by parents to their children. Such indices, therefore, might be useful in (or a by-product of) the first stages of an empirical analysis under a theoretical model that relates environment and

behaviors at an abstract level. For example, if one is interested in defining levels of a social-class variable, or in correlating social-class levels with parent-child behaviors, or parental attitudes or child-rearing practices with child behavior, a variable yielding a more heterogeneous distribution of scores may be more appropriate than even those that directly index stimulus-response interchange in the parent-child interaction process.

In those instances where it may be plausible to use summary variables, however, two-sided variables, which simultaneously emphasize both the environment and behavior, would have greater utility in principle than one-sided variables. Examples of such two-sided concepts that require further development are A. L. Baldwin's (1955) concept of "dispositional trait" and R. R. Sears' (1963) conception of "action system," which involve the organization of child or adult behaviors in terms of their relation to classes of stimulus events. Such two-sided summary variables may avoid some of the disadvantages of one-sided summary variables, such as the de-emphasis of the stimulus settings that exert differential control over behavior systems and the obscuring of the analysis of contexts in the controlling environment. Nevertheless, any gross variable may constitute a multiple predictor at a particular level of analysis, a predictor for which the various components may not even have been identified, much less precisely defined, and for which the loadings of the various factors are unknown and possibly indeterminate at that level of analysis. More precisely defined, limited variables, therefore, would still be more advantageous and beneficial for most purposes of both research and theory than even the best of two-sided summary variables.

Some Brief Comments on Theory

In approaches to child social development, there has been insufficient recognition of the distinction between what Reichenbach (1938, 1951) has termed the contexts of "discovery" and "justification" in the development of scientific theories. In using the verification criterion of empirical meaning, psychology has the same task as the other sciences: its concepts, however derived, must be reducible to observable conditions—stimuli and responses, and antecedents and consequents.

In this context, there are at least two functions of theory in psychology, the economic and the integrative (e.g., Farber, 1964). Under the *economic* function, a theorist may develop and use concepts to reconcile assumed relationships among operations in order to facilitate identification of the functional relations between determinants and effects that characterize a process. This function appears to be the one emphasized by Tolman (1938) and Spence (1948) in their use of "intervening-variable" terms as calculational devices, and it has been suggested that Skinner's (1953) occasional use of derived terms like "drive" to classify various antecedents under the same heading in terms of their homogeneous effects on behavior rate may similarly be economic (Miller, 1959; Farber, 1964). (However, as Estes [1955] has noted, one difficulty with the calculational-device

type of construct is its flexibility, for once advanced it could encompass or explain each new empirical turn with the help of *ad hoc* assumptions.) The *integrative* or unifying function of theories is to organize empirical relations within and among domains. Where the coordinating statements between empirical and theoretical concepts are sufficiently detailed, deductions for further empirical relations can be extensive and novel implications many. And it is always possible that one such theory may become integrated into another, even one that has quite different theoretical constructs and labels, and which organizes sets of empirical relations that were not thought related earlier (Spence, 1948, 1956, 1957).

When examining how these two functions of theory, the economic and the integrative, have been involved in psychological theorizing, and specifically in the area of the impact of environment on child behavioral development, it is noted that apart from the use of operationally tied-down concepts from the field of conditioning and of derived terms closely related to them, it is doubtful that child-development theories have often benefited from either the economic or the integrative utility function. Further, while a basis for choosing between two theoretical approaches or concepts would be their heuristic utility, such as the degree to which they generate new research, organize many and diverse phenomena, and yield general principles (Maltzman, 1966), such criteria have almost never been applied to theories in the domain of environment-child interaction. For the most part, researchers appear to emphasize or adhere to theories with which they are comfortable, on personal-value rather than on utilitarian grounds. Thus, many seem to favor concepts because of their mentalistic-reflective-cognitive flavor or their uniquely human flavor.

The development and use of theories by psychological researchers has long been valued, and, during the past four decades, there has been an increasingly self-conscious approach to theory in psychology. Our thinking has been that a theory generates research questions and then requires that the empirical answers be referred back to it and be taken into account to modify the theory as necessary. A good theory might be said to fit the Piaget assimilation-accommodation model: derived from existing observational facts, it assimilates new empirical data as they are, but also accommodates to them when required to do so. And, given its utilitarian purpose, a theory must be discarded when it fails to accommodate to new empirical data. It is often said that only a theory, however inadequate or preliminary, can point to the relationships among events that are important and provide guidelines for identifying and controlling irrelevant factors. It is also recognized that it would be nearly impossible to gather data independent of a theory (or theories), however informal or preliminary, or however difficult it may be for the investigator to articulate it. Thus, we have been schooled in ways to develop and evaluate theories and in how to judge the logical and psychological adequacy of the concepts and assumptions of a theory.

In their zeal to emphasize the utility of theory, however, many psychological theorists have ignored or played down other criteria for the efficiency of research, particularly prescriptions for the relationships between theoretical assumptions and research operations. To the degree that such criteria are met, it becomes possible to make selective modification of the theory for purposes of consistency,

of increasing precision of the concepts, or of fairly readily developing a more parsimonious statement within the framework of the theory. Hence, there is an emphasis on the adequacy or degree of coordination between the theory's terms and the empirical variables.

It is with these criteria in mind that the argument is made here for a more self-conscious emphasis on the articulation between empirical and theoretical concepts as the means of strengthening research approaches to parent-child interaction conditions and outcomes. For, there have been theories of socialization in child development that seem to emphasize neither operational definitions underlying their empirical terms, explicit definitions of their theoretical terms, nor coordinating definitions between theoretical and empirical terms that specify unambiguously the circumstances under which theoretical terms are to be used (i.e., their referents). We have in mind, for instance, diverse approaches to development which emphasize mainly cognitive and motivational concepts, like some that are soon to be noted in this analysis. As Farber (1964), using Reichenbach's distinction, has observed, theories that appear comprehensive through the use of terms with no specific referents may have suggestive value for the scientist operating privately in the context of discovery, but the ambiguity of these terms precludes rigorous test of their purported relations for the purpose of the scientist's justifying his theory to others.

Labels Are Not Explanations

One difficulty which is encountered when inexplicit, abstract concepts are employed is that there is often an obscuring of their ties to antecedent and consequent factors, with one result being that a label for the behavior process at issue may come to serve as the "explanation" of that process, e.g., the concept of "schema." Such concepts may also be used in theories containing a number of terms with no specific referents that, therefore, only appear to be comprehensive. While these ambiguous terms may facilitate the researcher's hunches about potentially interesting relationships as he operates within the pre-scientific context of discovery, it remains necessary for him to verify empirically the functional relations involved and to show through a sequence of discrete steps how his theoretical terms relate to his empirical ones. Otherwise, his continuing to use ambiguous terms would be a form of self-indulgence, for by remaining, as it were, within or on the fringes of the context of discovery, the researcher could not readily justify his theory to the scientific community (except perhaps to those who may believe they share his immediate experience and pre-scientific concept language). In addition, this researcher would benefit neither from the economic nor the organizing power of a theory, nor from its ability to generate new kinds of research. I shall consider this issue of explanatory terms in two parts, first for cognitive approaches and then, more briefly, for motivational approaches.

On some cognitive labels. The confusion of labels with explanation is especially evident in many cognitive approaches, for instance, in Aronfreed's (1967, 1969), Kohlberg's (1966), and Whiting's (1960; Burton & Whiting,

1961) approaches to identification, which are considered in detail in the next section. Thus, in attempting to explain the acquisition of identification behaviors by children, Aronfreed has assumed that children fairly rapidly form a "cognitive template" or "representational cognition" of the model's behavior, which serves for storage and retrieval of performance. However, he has proposed no clear basis for the acquisition of a "cognitive template," except to imply that it depends (in an unspecified way) on the capacity to exert verbal control over behavior and that it may be acquired through a form of observational learning; nor did he tie this term to imitative-identificatory behaviors. He has provided no coordinating definitions between his theoretical terms and operations indexing environmental and behavioral phenomena. This "cognitive template" concept, therefore, seems to offer an explanation for the acquisition of identification behaviors only insofar as we are told that the acquisition of one is the basis for the acquisition of the other. In a more general vein than Aronfreed's, Kohlberg (1966) has written of his theory being ". . . cognitive in that it stresses the active nature of the child's thought as he organizes his role perceptions and role learnings around his basic conceptions of his body and his world" (p. 83), and he stresses observational learning involving intrinsic rather than extrinsic reinforcement of one's own responses as ". . . cognitive in the sense that it is selective and internally organized by relational schemata rather than directly reflecting associations or events in the outer world" (p. 83).

In cognitive-developmental approaches, therefore, it appears that intrapsychic cognitive-act euphemisms phrased in common-sense or immediate-experience language are often employed to characterize heuristically the bases for a subject's behavior in a given context. However, in such instances, it is often difficult for a reader to determine where the line is drawn that separates such heuristic variables from the required empirical variables, between observation and inference, between interpretations and concepts, and between the private, pre-scientific context of discovery and the public, scientific context of verification. In the process, it is far from obvious whether the locus of such heuristic terms is meant to be the head of the subject or (the theory) of the scientist, or the immediate experience of the subject or of the scientist as if he were the subject. Thus, the distinction between the statement of a problem and its explanation can be obscured, and empirical questions can lose their importance or appear to be solved simply by the application of cognitive labels to them.

The notion advanced here and illustrated throughout this chapter is that well-defined and extensively used conditioning concepts can order social-behavior phenomena as well as or better than can more abstract, less explicit, cognitive terms (or motivational terms, as will be noted in the next section). This very brief consideration of the form of the concepts employed in some cognitive approaches can close with our taking note of what Maltzman (1966) has observed in another evaluative context. The heuristic value of the cognitive approach to development is not necessarily greater than that of alternative theoretical approaches nor does it contain a greater number of testable concepts or more assertions that have been proven true by test, nor have there been under

the aegis of theories using cognitive-flavored concepts any discoveries, empirical relations, or new environmental or response variables which logically could not be treated within some behavioristic approach, for instance, like the one outlined in this chapter.

On some motivation labels. A similar difficulty is often encountered in approaches where motivational (drive) terms are employed to account for a behavior process. As motivation is considered in greater detail in a subsequent section on its role in social learning, our discussion at this point will serve merely to highlight some limitations of motive labels in explanations of behavior, to parallel our consideration of the limitations of cognitive labels.

In principle, there is no argument being advanced against the use of cognitive or motivational terms per se, for they are only words and words can be employed constructively or obscurely, explicitly or loosely. What is being criticized here, however, is the imprecise, gratuitous, and uncritical manner in which cognitive and motivational terms are often employed in analyses of social development and learning, and the often inadvertent consequences of these usages. One inevitable result is an obscuring of the relevant functional relationships. Another is a decrease in the researcher's attention to the fine grain of the organism's behavior, to the details of the environment operating on the behavior, and to the contingencies between environmental stimuli and behavior. Expressed in such terms as secondary, acquired, or learned drives, motivational concepts have often been advanced to order behavior systems that appear only to be the outcomes of learning conditions occurring through long time spans. As is seen in a later section, these terms have often been employed in analyses of pervasive behavior systems, such as imitation-identification (e.g., Miller & Dollard, 1941; Bronfenbrenner, 1960; Sears, 1957; Hindley, 1957; Kohlberg, 1963) and dependence-attachment (Sears et al., 1953; Sears, 1963; McClelland, 1951; Whiting & Child, 1953). Further, various conceptions of innate drives "for" stimuli or for the attainment of certain goals have entered extensively into theoretical analyses of early social development (cf., e.g., Berlyne, 1950; Harlow, 1950, 1953; Hendrick, 1942; Hunt, 1963; Kohlberg, 1966; Montgomery, 1951; Ribble, 1943, 1944, 1965; White, 1959, 1963).

This preoccupation of psychologists to explain myriad behavior phenomena through the use of such diverse notions, which involve gross abstractions that only summarize the effectiveness for the child's behaviors of various social stimuli (e.g., those from his parent) and refer so imperfectly to one side of an interchange between a child and his environment, has resulted in a lack of parsimony and in confusion, and has severely limited the conveyance of meaningful information regarding the development of adaptive and social behavior systems. This inconsistent, inexact, and thus inefficient use of motivational terms has led not only to definitional ambiguity and an explanatory impotence, but also to a loss of precision in the specification of the functional relationships sought, the reasons for seeking them, and the theoretical language used to order these phenomena. As we have already seen and will further see in the subsequent sections of this

chapter, the behavior systems to which motivational (and cognitive) concepts have been applied can be both completely and parsimoniously accounted for in terms of the simple learning mechanism of acquired stimulus control over behavior. Thus, the addition of such concepts to these cases is, at best, gratuitous.

TWO KEY SOCIAL-LEARNING PROCESSES

This section will be devoted to a detailed examination of abstractions for a pair of two-phased acquisition processes and behavior systems which are focal in social learning: the first is imitation (including vicarious reinforcement and observational learning) and identification (including sex-typing); and the second is dependence and attachment. A consideration of these focal processes can illuminate the roles of the acquisition and maintenance of behavior, and can at the same time illustrate the stimulus and response content of socialization.

1. Imitation-Identification

There are conventionally thought to be at least two types of processes by which children acquire social-behavior patterns, and the values and attitudes these patterns reflect. Up to this point in our survey, we have emphasized only the first of these processes wherein social learning is based on *direct* instrumental training (tuition). In this direct training, reinforcing agencies tend to have particular socialization goals in view and are relatively more explicit about the responses the child must acquire, which they attempt to shape via differential reinforcement. This direct-training process may be more or less efficient. (A by-product of this process is emphasized in the section that follows, which deals with the acquisition and maintenance of behavior systems ordinarily termed dependence and attachment.) There is, however, a second type of socialization learning which is thought by some to proceed *without* direct tuition, at least without the type of explicit training that involves both differential reinforcement of child responses and relatively clear goals of socializing agents (e.g., Bandura, 1963), and to comprise the greater portion of socialization learning. This learning occurs through the process ordinarily termed *imitation,* in which the child *matches* his responses to the cues provided by the responses of another person (a "model").

Some Background on Imitation[35]

Miller and Dollard (1941) did much to bring imitation into a behavior-theory framework by suggesting that it is based on both the individual's capacity

[35]There is a relatively large literature on imitation and identification, a portion of which is summarized in a paper by Gewirtz and Stingle (1968), with extensive summaries and treatments to be found in chapters by Aronfreed, Bandura, and Kohlberg in this *Handbook*. Approaches to imitation have been presented by Humphrey (1921), Holt (1931), Miller and Dollard (1941), Piaget (1951), Maccoby (1959), and Baer et al. (1967). Approaches to identification have been presented by Sears (1957), Sears et al. (1965), Kagan (1958), Bronfenbrenner (1960), Whiting (1960), and Kohlberg (1963, 1966). Attempts to relate the concepts of imitation and identification have been made by Mowrer (1950, 1960b), Lazowick (1955), Sanford (1955), Hill (1960), Gewirtz (1961b), and Bandura (1962, 1969). A review of determinants of imitative-identificatory behaviors is presented by Bandura in Chapter 3.

to learn to imitate and environmental conditions that have positively reinforced him for such learning. Copying, which by their definition involves the copier's knowing when his response is the same as the model's, is learned in a trial-and-error fashion when an external "critic" (reinforcing agent) positively reinforces randomly occurring similarity and punishes dissimilarity, or when copying is followed by the same reinforcer that followed the model's response. Eventually, as the copier's discrimination improves, he emits anticipatory discrimination responses that produce anxiety if his copying response is different from the model's response or reduce anxiety if his copying response is the same. Thus, the copier in time becomes his own critic.

Also, in a learning-theory framework, Mowrer's (1950, 1960b) theory of imitative learning postulates that imitation (particularly of vocal behaviors) of a model occurs because cues from that model's behaviors have acquired reinforcing value through their pairing with primary reinforcers, and through generalization their imitation acquires secondary reinforcement value for the copier and is thereby maintained. Thus, imitation is learned through a process of self-contained trial-and-error learning, without direct (extrinsic) reinforcement for imitation.[36] In a preliminary analysis, Skinner (1953) briefly sketched how the cues from models' responses can become discriminative for the extrinsic reinforcement of matching responses but he did not develop the case for a functional matching-response class maintained by intermittent reinforcement.

The mechanism for the acquisition of imitative (-identificatory) behaviors stressed by Bandura (1962, 1965b, 1969) is that of *observational learning,* in which matching behaviors are acquired by an observer through simple exposure to a model's response, independent of the observer's overt response or of its reinforcement. Specifically, Bandura assumes that stimuli from the model's behavior elicit perceptual responses in the observer that become associated on the basis of the temporal contiguity of the stimuli provided by the environment (e.g., the model's behavior). After repeated contiguous stimulation, these perceptual responses come to form verbal or imaginal representations of the stimuli involved. These representational systems mediate response retrieval and reproduction in that they provide cues which elicit or are discriminative for overt responses corresponding to those of the model. Thus, according to Bandura, it is primarily on the basis of stimulus contiguity and symbolic mediation that imitative behaviors

[36]Mowrer (1960b) also lists but does not develop a form of "empathetic," observational learning in which the witness of the reinforced response of a model becomes inclined to reproduce the model's response. Our later evaluation of the concept of observational learning will apply as well to Mowrer's "empathetic" learning.

are acquired.[37] The rate and level of observational learning are conceived to be determined by a variety of what Bandura terms perceptual, motoric, cognitive, and incentive variables. Included under such categories are setting conditions (e.g., the saliency and complexity of modeling cues), the availability of necessary component responses in the observer's behavior repertory, and overt and covert rehearsal of the matching response. However, Bandura assumes that performance of imitative responses, once they are learned, is primarily governed by extrinsic, self-administered, or vicariously experienced reinforcing events. Bandura's conceptualization of observational learning is considered further in a subsequent section.

Varying cognitive approaches to imitation (and identification) have also been put forth by Piaget (1951), and more recently in different ways by Kohlberg (1966) and Aronfreed (1967, 1968, 1969). Kohlberg rejects an S-R instrumental-learning conception apparently on the basis of a narrow conception in which reinforcement is equated with organismic drive reduction. And although Aronfreed does not deny the role of instrumental learning for certain behaviors, he does qualify the learning mechanism with unindexed "representational" processes (as was earlier noted). Both theorists, however, minimize the importance of extrinsic reinforcement of the child's responses for imitative learning. Instead, they stress *observational learning* (as does Bandura), and *intrinsic reinforcement* of responses. As has been noted in passing in earlier sections and as is further detailed subsequently, Kohlberg assumes intrinsic reinforcement to result somehow from "motives" for "competence-mastery" and "interesting"

[37] As is argued later in this section, when an organism acquires a functional response class, in a sense a discrimination of similarity is made between his present response and his past responses that have been reinforced in the discriminative context (e.g., as in bar-pressing or in imitative matching responses). Thus, there is a sense in which all organisms must somehow bridge the gap between relevant experience and later response performance that depends on the earlier experience. What is not obvious, however, is the means by which this is accomplished; and theoretical approaches may differ in whether they attempt to bridge this gap only with their theory or also with operations that index successive aspects of the postulated process. They may also differ as to the utility of postulating such gap-bridging processes, particularly when indexing operations are not involved for assumed events thought to occur at different points in a long chain. For most heuristic purposes it has typically been assumed by conceptualizers of human and subhuman learning to be unnecessary to posit a special discriminative process over and above that implied in the functional response class as defined by the subject's overt responding. For, unless an independent operation is specified and ultimately employed to index a postulated representational or cognitive process, the parsimony and utility of positing the occurrence of such an implicit process to bridge the time gap between experience and subsequent performance is questionable, both for infrahuman and human subjects.

Bandura has assumed that his implicit cue-producing response mediators can be independently manipulated, and that they are conditionable and extinguishable according to the same laws as those governing explicit forms of behavior. Thus, he has shown that various setting conditions, such as attentional-highlighting or dimensional-appreciation procedures, or even an observer's verbalizing or attempting to visually code the details of the behaviors of a model while he is viewing them, can be implemented during prior training (observation) to facilitate subsequent test performance (e.g., Bandura, Grusec & Menlove as cited in Bandura, 1965b). (The functional relations into which these setting operations enter with imitative behaviors constitute a contribution to the body of available data about the imitative process, and thus have a utility independent of Bandura's theory.) However, as the only indices of implicit response processes are the very imitative-behavior outcomes the implicit responses are postulated to explain (or the differential operations that established them), it is difficult for us to see how the manipulation of such setting conditions (in what is termed an observational-learning setting) can be conceived as the independent manipulation of implicit responses. Nor do such operations necessarily provide support for the notion that imaginal or representational processes mediate the recall of copying responses. Indeed, explaining the effects on behavior of such training conditions in terms of implicit representational or cognitive responses that remain unindexed, however intuitively plausible such processes might seem to the researcher operating within his pre-scientific context of discovery (e.g., as if he were the subject, human or not), is gratuitous and can often be detrimental to the search for the relevant functional relationships at issue. These comments apply as well to Aronfreed's (1968, 1969) similar assumptions about cognitive representations and unindexed affective mechanisms, that have been discussed in the previous section of this chapter on abstractions (and particularly labels as explanations) and are again considered in the sections that follow.

Our purpose here, however, is to detail for the seemingly complex behavior systems of imitation and identification an instrumental-learning model that is parsimonious, operational, and reasonably complete, and that readily lends itself to empirical test. Hence, it is appropriate for us to attend primarily to relevant learning issues, and to leave to a subsequent analysis the more definitive comparison of simple conditioning theories like the one we detail with approaches that posit representational or cognitive processes. Such a confrontation would necessarily involve questions about the efficiency and parsimony of such implicit concepts relative to that of conditioning concepts like ours that are closely tied to stimuli, responses, and their sequential relationships. As was noted in the earlier section on abstractions in which such a comparison was begun, this issue has implications far beyond those of a simple analysis of imitation-identification.

consequences, while Aronfreed assumes that it derives from the child's observation of the model's behavior and the "affective" value that becomes attached (conditioned) to the model and his behavior as well as to the child's "cognitive representation" or "template" of the model's behavior. This last-mentioned implicit response representational concept appears to be not dissimilar to the concepts of Bandura surveyed earlier.

Explanations of imitative response acquisition in terms of observational learning may have stemmed from the difficulty some have experienced, under instrumental-training conceptions, in specifying some salient features of the imitative process. Such explanations may be due, at least in part, to the problem of identifying a matching response class whose content changes from trial to trial, but also in part to the difficulty of identifying the reinforcing stimuli for that response class when it has been specified. Explanations of the imitative process in terms of S-R contiguity learning (Holt, 1931; Humphrey, 1921; Maccoby, 1959; Piaget, 1951) may also have stemmed in part from the difficulty in specifying extrinsic reinforcing conditions for imitation. Possibly for these reasons also, covert rehearsal of the model's behavior has sometimes been suggested as essential in the learning of imitative behavior (Sears et al., 1957; Maccoby, 1959; Burton & Whiting, 1961).

An experiment by Baer et al. (1965, 1967) provides a dramatic demonstration of imitation learning with implications for practical application, as well as a useful point of departure for the conceptualization of imitation we shall propose. By physically assisting the child to make the desired imitative responses

initially and reinforcing each such response immediately, Baer et al. taught imitative responses to retarded children whose behavior repertories had been observed closely for a period and did not appear to include imitation. After training on a number of such responses, each subject could then imitate new modeled responses, and eventually response chains, without assistance. Further, the rate of a generalized imitative response that was never directly reinforced, but had been maintained when interspersed with reinforced imitative responses, declined when reinforcement was withdrawn from the imitative behaviors that were previously reinforced. Lovaas et al. (1966) have successfully used a similar paradigm for conditioning imitation of verbal responses in initially nonverbal schizophrenic children.

An Updated Social-Learning Approach

Our consideration of this topic can be introduced by a legendary story concerning the Rabbi of Kotzk. A townsman had requested that the Rabbi pray to insure that his sons would study the Torah diligently. In reply to this man's request, the Rabbi said: "If your sons will see that you are a diligent student, they will imitate you. But if you neglect your own studies, and merely wish your sons to study, the result will be that they will do likewise when they grow up; they will neglect the Torah themselves and desire that their sons do the studying." By implication, the Rabbi's assumption was that the father-model's exemplary behaviors, which could be imitated by his sons without extrinsic reinforcement, would provide a better basis for their acquiring studious behavior patterns than would direct training via reinforcement of the desired behaviors, implemented by the parent or by others. Without going into the merits of this assumption here, this charming story can set the stage for a consideration of the important twofold socialization topic of imitation and identification.

It is thought by many that, while a significant portion of children's socialization experiences occurs through direct training, by far the largest portion, and the most pervasive, significant, and long lasting of such patterns, is acquired through the active process of children's imitation of parent-models' behaviors. These often rapidly acquired imitative-behavior patterns (frequently also termed identification) are assumed to be matched to behaviors which socializing agents do not ordinarily attempt to teach directly, and indeed may not know how to train or even wish to train at all. These patterns may therefore be the opposites of those emphasized in direct training via differential reinforcement, and it is thought can often partially or completely nullify that direct tuition. Thus, the example of the nonstudious pattern set by the townsman of Kotzk might in certain contexts nullify much or all of his sons' studious behavior pattern that is maintained by direct reinforcement. It remains an empirical question whether or not a response in a given context can be acquired more efficiently or rapidly via direct instrumental training or via imitative learning (as conventionally conceived or in the matched instrumental-training sense as we conceive it in the sections

that follow). In fact, instances of direct tuition to the child at the same time may represent occasions for imitative learning, with the effects due to either process. For instance, physical punishment of a child for hitting others, which is intended as training that he should refrain from such acts in the future, may also provide the child with an example from a parent-model of how to hurt others, which behavior the child might subsequently exhibit when the appropriate social occasion arises (Bandura, 1962, 1969).[38]

My thesis in this chapter, however, is the *opposite* of the widely held current position that imitative responses and generalized imitation are acquired *without* direct instrumental training (e.g., Aronfreed, 1967; Bandura, 1963; Sears, 1957; and others). Using a basic operant-learning conception for the shaping and acquisition of functional response classes, my assumption is, rather, that imitative responses are simply instrumental responses that are matched to the cues provided by the responses of models, that the functional response class they constitute for the child (which we term *generalized imitation*) is acquired through extrinsic reinforcement from socializing agents, and that this functional response class is maintained by intermittent extrinsic reinforcement. It is my thesis then that matching or imitation learning is only a special case of instrumental learning, and that it is illusory to hold that the second type of socialization learning, generalized imitation and identification, takes place without the direct instrumental training from socializing agents that defines the first type (direct tuition). (The issue involved, of course, represents an empirical question which, in principle, can be tested through systematic observation in life settings.)

It is further assumed in this chapter that if socializers tend to focus less on particular socialization goals and to be less explicit about the responses the child must acquire through the imitative type of socialization learning, it is but an *artifactual* outcome of the very different and more general orientation in the imitative case as compared to the focus in instrumental training on single clearly defined responses and discriminable reinforcing stimuli in a well-defined discriminative context—i.e., with clearly specified outcomes. Indeed, the orientation in imitation learning is more toward a response class containing a potentially unlimited number of responses, varied in content and often matched to response-provided cues from many models (but which may be focused on one model), and often occurring in situations where the model is absent or where there is no extrinsic reinforcement for imitation. Because of the very large number of potential responses at issue, very few of the outcomes involved are specified in detail.

I shall now move on to a conceptual analysis of the process of generalized imitation and the conditions for its acquisition and maintenance, as well as of identification for which generalized imitation is the assumed basis. At the same time, I shall examine the process of observational learning and, relying heavily on

[38] It is assumed that the child will more readily match those of the model's responses that are of classes relatively high in the child's response hierarchy or that will occur in situations in which there are no strong incompatible-response tendencies.

assumptions and considerations emphasized by Gewirtz and Stingle (1968), shall attempt to account for this process by showing that it may be identical to the learning of generalized imitation.

Generalized Imitation

It has been noted that after the response of another (a "model") has been witnessed by a child, he will often exhibit a response resembling that of the model. Such a response (class) is termed *imitative* when it is emitted to match the cues provided by the model's response and not because of common stimulus antecedents or environmental constraints. Imitative responses, therefore, are not classifiable by content or by similarity alone. The term *generalized imitation* can be applied when many different responses of a model are copied in diverse situations, often in the absence of extrinsic reinforcement. My approach to generalized imitation assumes that a very simple learning model can encompass the complex behavior outcomes ordered under that concept and also many grouped under the heading of observational learning. A paradigm as elementary as the one that is presented here, in which imitation represents one variety of stimulus control over instrumental responses and is acquired on the basis of direct extrinsic reinforcement of imitative behaviors, has not been fully developed before now as the basis for the acquisition and maintenance of either imitative behaviors or observational learning (much less as the basis for identification).

The first imitative responses must occur by chance, through direct physical assistance, or through direct training (with shaping or fading procedures applied by a reinforcing agent to occurring responses). When such responses occur, they are strengthened and maintained by direct extrinsic reinforcement from environmental agents. After several imitative responses become established in this manner, a class of diverse but *functionally equivalent* behaviors is acquired and is maintained by extrinsic reinforcement on an intermittent schedule. Differences in response content of the imitative behaviors are thought to play a minimal role as long as the responses are members of the imitative response class as defined functionally *by reinforcing agents*. This process is thought to be the same as the way in which, for example, variations in the content of successively emitted plural nouns or first-person pronouns or even in the seemingly homogeneous free-operant bar-pressing output are irrelevant as long as most of the response variants are members of the response class reinforced.

Much past work on imitation (and even more on identification) has emphasized imitative responses as such, with only an implicit consideration of the relevant environmental stimuli that give that response class its functional meaning. The important difference between those approaches and the one presented here is that, in addition to an emphasis on the environmental stimuli (from the model's responses and discriminative settings) that cue the occurrence of imitative responses, we emphasize also those stimuli that maintain (reinforce) them as essential in the process. Thus, the term imitation implies for us just one type of stimulus control over responses. As with any functional response class

under some kind of stimulus control, the response class has no special intrinsic value independent of the stimulus conditions controlling it. In a given context, an otherwise trivial response class like bar-pressing can gain a functional status comparable to that of imitative responses in life settings.

An even better analogy to the functional class of generalized imitation is provided by the *matching-to-sample* conditional-discrimination learning paradigm. When a conditional (standard, "sample") stimulus and an array of discriminative comparison stimuli are varied from trial to trial, the subject's task is to respond to the comparison stimulus (i.e., the discriminative stimulus) that is the same as (or similar to) the previously presented conditional stimulus. Through extrinsic reinforcement of the class of matching responses (i.e., those made to each matching comparison stimulus), the subject acquires the relevant matching-response class that then governs his responses to a wide range of stimuli differing in content. Some may term this a "concept" of identity or similarity, while, if a label must be used to provide historical context, we would favor "conditional discrimination" (Lashley, 1938; Cumming & Berryman, 1965).[39]

On each trial, the subject's response to the comparison-discriminative stimulus from the finite number in the array that matches the conditional stimulus (the sample) is analogous to his selecting from his own repertory the response that matches the model's response in its stimulus context, i.e., the imitative response. Since reinforced matching responses in the functional imitative class are diverse, discrimination between matched behaviors which are reinforced and those which are not is unlikely to occur, and some copying responses that are never directly reinforced will persist, therefore, unless they are specifically punished or are incompatible with stronger responses in the child's repertory.

In principle, conditions could prevail such that imitative responses that are never reinforced could be discriminated from those responses that are reinforced, and thus they would not become part of the functional response class defined by extrinsic reinforcement from the environment. However, with the content of reinforced imitative responses differing from one occasion to the next and the functional response class being maintained on a schedule of intermittent extrinsic reinforcement, it is unlikely that efficient conditions for discrimination would frequently prevail. Then, insofar as there are recurring instances of reinforcement for imitative responses and ineffective conditions for subclass discrimination, even those imitative responses that are *never* themselves directly

[39] This is because unlike simple simultaneous or successive discrimination learning, in which the correct response is made on the basis of the presence or absence of a single discriminative stimulus that sets the occasion for the reinforcement of the response, in the (complex discriminated operant) matching-to-sample situation the correct response must be made in terms of the properties of two or more stimuli (the conditional or standard stimulus and the discriminative comparison stimuli). The significance of the discriminative stimulus varies with successive discrimination trials, changing relative to the conditional stimulus which preceded it, with the conditional stimulus thus coming to function more as a differential cue or selector of discriminations (or as a differential setting condition for them) than as a simple cue for individual responses.

reinforced may become part of the functional response class. On this basis, new matching responses will continue to enter the functional imitation class in the child's repertory.[40]

Some Issues Resolved by Our Generalized-Imitation Mechanism

Intrinsic versus extrinsic reinforcement. Our analysis with regard to the stimuli and responses in the imitative behavior chain was in part stimulated by earlier analyses by Baer and his associates (Baer & Sherman, 1964; Baer et al., 1965). However, our analysis differs from theirs (and from the approach of Staats & Staats, 1963, that is similar to it)[41] mainly in respect to which component details are emphasized, and in the fact that their heuristic account appears to emphasize an intrinsic-reinforcement mechanism and ours does not. In their analysis, conditioned-reinforcer value is assumed to become associated with the imitator's (unassessed) discrimination of similarity between his response and one previously emitted by the model, while the unit of our emphasis is the entire S-R chain, of which all elements are maintained by terminal extrinsic reinforcement.[42] (These elements could include the discrimination response and its assumed reinforcing value emphasized by Baer and his associates.) Our simpler assumption that a lack of discrimination between reinforced and nonreinforced members of the imitative response class serves the heuristic purpose equally well is similar to the usual conceptual accounts of behavior, and does not necessitate the introduction of an additional construct. The functional value of each element in the imitative S-R chain is due entirely to its association with the terminal reinforcer. Thus, a key feature of our analysis is that the environmental agency (and not the imitator himself) determines the occasion for reinforcement.

[40]In this context, it should be noted that the acquisition of the functional generalized-imitation response class, derived from the communality in responses as defined by extrinsic reinforcing agents, could have aspects in common with what, in the conceptual context of language acquisition and use, involves the organization of responses according to transformational grammars.

[41]It was brought to my attention, after this chapter (and Gewirtz & Stingle, 1968) were prepared, that in a brief analysis of the formation of verbal discriminations via matching, Staats and Staats (1963) have proposed that an organism could learn to match a stimulus produced by his own response to a stimulus produced by someone else and that the stimulus provided by the *match* could acquire conditioned-reinforcer value as a result of its being discriminative for extrinsic reinforcement. Thus, correct response matching itself produces secondary reinforcement. Although this point is not made explicitly by the Staatses in their approach to matching as a basis for verbal discriminations, or by Baer et al. (1967) in their conception, such a similarity stimulus would have to be followed often enough by active reinforcers for its conditioned reinforcer value to maintain. The reservations we will advance about the latter approach in the present didactic analysis would seem to apply as well to that of the Staatses.

[42]We have termed extrinsic any reinforcing stimuli provided by the environment. Even if a terminal reinforcing stimulus has acquired its reinforcer value through conditioning, it differs from the conditioned-reinforcement value that is assumed to be associated with the stimulus of similarity in the Baer et al. (1965) analysis, in that it can be observed in the chain, measured along some dimension, and controlled by a reinforcing agent.

In discussions in the literature of other functional classes, such as relatively simple bar-pressing on an intermittent reinforcement schedule by nonverbal organisms, there is usually no special heuristic emphasis on the subject's discrimination that he has performed a response like those that have led to reinforcement in that setting in the past. Although such a discrimination may be involved, and its assumed conditioned-reinforcer value has occasionally been used to account for continued responding between reinforcements in intermittent schedules (e.g., Denny, 1946; Kimble, 1961), operations are rarely if ever introduced for its study. In the same vein, the singled-out unindexed conditioned reinforcer based on a judgment of similarity does not seem critical for the Baer et al. (1965, 1967) analysis of what they consider to be a relatively complex case of imitative learning, and certainly not for an overall heuristic analysis. Indeed, as used by these authors, the intrinsic conditioned-reinforcer concept may carry surplus "cognitive" meaning. Even if the ultimate behavioral analysis of these implications proves more complex, for the moment at least Baer and his colleagues have made no case for treating the imitator's discriminative judgment any differently than analyses of the acquisition of other functional response classes would treat an organism's discrimination of the similarity between an emitted response and responses previously reinforced in that setting.[43]

It is similarly difficult to see the value of some other intrinsic-reinforcement concepts that have been postulated to account for imitation in the apparent absence of extrinsic reinforcement. These concepts include Aronfreed's (1967, 1968, 1969) "affective value," Kohlberg's (1966) "motives" for "mastery" and "interesting" consequences, and the conditioned-reinforcement concept as used by Mowrer (1950, 1960b). As they have no independent operational status in the imitation context, these concepts as presently formulated can only be inferred from the very imitative behaviors they have been devised to explain. Therefore, in no way do such concepts advance the analyses or facilitate the research purposes of those theorists, for each of them still has the tactical problem of determining the environmental conditions that differentially affect acquisition and maintenance of the child's imitative responding.

In contrast, our functional analysis has assumed that many behaviors that appear to be acquired on the basis of observational learning in the presence of "intrinsic" reinforcement may in fact be functionally attributable to the operation

[43]Their stress on the conditioned reinforcer apparently had two purposes: to explain the emergence of new, topographically different imitative behaviors prior to any reinforcement of them; and to account for the continued strength of those behaviors thereafter despite consistent nonreinforcement of them. D. M. Baer (personal communication) has indicated that the emphasis on the role of the assumed conditioned reinforcer in the Baer et al. (1965) analysis represents a preliminary attempt to conceptualize the mode of acquisition of functional response classes, and is thus concerned with the general issue involving the formation of all such classes and not just with imitation. In this connection also, the argument that systematic improvement in the topography of an imitative response without extrinsic reinforcement operating (as reported, e.g., by Lovaas et al., 1966) requires a conditioned-reinforcer concept like that of Baer and his associates is not tenable, without ruling out many conditions confounded with practice that could be the basis for this improvement.

of extrinsic reinforcers. It assumes also that mastery sequences and interesting consequences can (be isolated to) function as extrinsic reinforcers for child behavior. Hence, it represents one solution to the deficiencies noted in the above intrinsic-reinforcement approaches. The simpler model proposed in this section appears to be the most parsimonious of the extant models to account for the original acquisition and the subsequent maintenance of the imitative response class. It is based on relatively few, well-defined concepts that are the same as those used in analyses of less complex animal behavior, and it does not single out for special emphasis concepts that in principle should be observable, without making independent provision in the experimental context to index such concepts operationally.

Observational learning. Through the years, there has been considerable controversy among learning approaches, in the realms of both theory and research, as to whether or not (observational) learning can occur in the absence of responses by the viewing organism (and of reinforcement) (Kimble, 1961). Comparative-psychological research has also not been definitive as to whether or not (observational) learning can occur in some subhuman species independent of prior matching-response occurrence and reinforcement. In this context, Bandura (1962, 1965b, 1969) has catalogued evidence that children exhibit matching responses (even after delays) following observation of models' responses (whether reinforced or not), when there has been no apparent opportunity for the occurrence (practice) of the observing child's matching responses and therefore no extrinsic reinforcing stimuli provided contingent on those responses. On the basis of this evidence and the S-S learning assumptions he favors, Bandura has therefore opted to emphasize "no-trial" observational learning as the mechanism for the acquisition of imitative responses by children. In this context, he has faulted instrumental-conditioning theories for requiring that matching responses be performed and reinforced before they can be acquired. It has been noted that Aronfreed (1967, 1968, 1969) and Kohlberg (1966) similarly emphasize, although perhaps on different grounds, observational learning as the basis for the acquisition of imitation.

Even so, Bandura (1965a) has noted that extrinsic reinforcement of matching responses is inevitable during human social development, where models typically exhibit responses from cultural repertories proved effective in the stimulus settings. As he himself has observed, observational-learning effects apparently demonstrated in experimental work with children may thus simply reflect prior instrumental learning, for which the requisite control conditions cannot be implemented practically. (In fact, Bandura believes that definitive tests of this theoretical issue may require the use of infrahuman *S*s whose reinforcement histories can be readily controlled.)

Given the current theoretical indeterminacy of the issue of learning without response occurrence in instrumental life settings, and the fact that assumed observational-learning effects that are clearly free of prior positive (or even negative) extrinsic reinforcement for responses matched to those of models are

improbable in early-childhood contexts, we have chosen to emphasize how what Bandura and others have termed observational-learning outcomes can be plausibly explained by the routine intermittent extrinsic reinforcement of overt matching responses that provides the basis for generalized imitation. Our heuristic concern is thus to illustrate, in a manner continuous with analyses in the literature of other functional response classes in simple organisms and settings, how basic instrumental-conditioning procedures thought to be commonly involved in adult-child interaction can credibly account for the acquisition and maintenance of responses matched to (cues provided by) models' responses. That is, we attempt to show how one must *learn* to learn through exposure to models' responses.

It is our conception that intermittent extrinsic reinforcement for imitation of the varied responses of a range of models can account for the child's frequent (generalized) imitation of both the reinforced and nonreinforced responses of a model. The appearance that the child has not exhibited the response, and that he has not received extrinsic reinforcement when he did imitate, can be explained by the facts that: (a) there can be lengthy delays between the model's response and the child's imitation of it; (b) the functional, matching-response class will vary in content; and (c) the reinforcement is intermittent. Both observational learning and our concept of generalized imitation involve the subject's matching his response to the response of a model in a given discriminative context, and, in our view, therefore, may be functionally equivalent through the range of settings in which the two terms are used. As the generalized-imitation concept can account, in terms of a few key assumptions, for most or all of the phenomena grouped under the observational learning of young humans, and because extrinsically reinforced imitative performance is likely to characterize a child's experience in life settings prior to his exposure to a model in observational-learning research designs where this factor has been typically uncontrolled, the generalized-imitation concept would seem to be a parsimonious one for approaching the general problem of explaining behavioral matching. This concept can provide a useful context for much of the research that remains to be done, and, at the very least, a context for the controls that remain to be implemented in research on the question of observational learning in young humans.

Vicarious reinforcement is a special case of observational learning, in which positive *reinforcement* administered *to a model* contingent upon a particular behavior is said to increase the likelihood that an observing child will copy that behavior (cf., e.g., Hill, 1960; Bandura, 1962; Bandura, Ross & Ross, 1963). In our view a parsimonious (and plausible) explanation of this phenomenon is that the responses by the child which are similar to those for which a model is reinforced are frequently likely to be extrinsically reinforced in the same settings, whether emitted independently or matched to a model's responses; whereas the child's responses like those for which a model is not reinforced or for which he is punished are *not* likely to be reinforced. Often unknown to the viewer, therefore, the model's reinforced response is already in the child's repertory due to its having been extrinsically reinforced earlier. This is possible particularly if

the response is a likely one in the given context, and if extrinsic reinforcement is also likely there. Furthermore, after the child has been reinforced for imitation of several of a model's reinforced responses in a given context, reinforcement provided contingent upon a particular behavior of a model should come to function as a generalized cue for a high probability of extrinsic reinforcement to the child when he imitates that behavior. (Walters, Parke & Cane [1965] have similarly regarded reinforcement to the model in an experimental context as a cue indicating the "permissibility"of reproducing that behavior.) This conception would be one way to account for Bandura's (1965a) finding that, after observing a film in which various hostile-hurting behaviors of the model were reinforced, children emitted a greater variety of such imitative responses than did those children who saw the model's aggressive responses punished. Indeed, Bandura (1965b, 1969) and Aronfreed (1969) have noted this and several other ways in which reinforcing stimuli contingent upon the model's behavior could provide discriminative stimuli that facilitate or inhibit imitative behaviors, particularly in ambiguous settings.

In terms of this analysis, it would be expected that if the child has not already learned this discrimination pattern, its acquisition will depend only on his subsequent exposure to the proper discriminative occasions. Furthermore, if discriminative conditions were reversed, that is, if the observer were reinforced relatively less often for imitating behaviors for which the model is reinforced and more often for alternative behaviors, reinforcement to the model could come to serve as a discriminative stimulus for alternative behaviors, and vicarious reinforcement could thus be ineffective or its effects reversed in relation to the observer's behavior. For example, Miller and Dollard (1941) demonstrated that children could learn nonimitation of a choice response for which a peer model was reinforced, and that this learning could generalize to other situations.

Life Conditions for Learning Generalized Imitation

Conditions in life settings make our analysis particularly appropriate in accounting for the rapid acquisition of topographically accurate imitative behavior sequences that typically occurs. Theorists like Mowrer (1960b) and Bandura (1962) have argued that a trial-and-error process would be too slow to account for this rapid acquisition. However, that point does not seem cogent when one considers the abundance of extrinsic reinforcement occasions and efficient shaping processes during all stages of the child's development, particularly for response classes like imitation. Because these reinforcers come from a variety of sources, on an intermittent schedule overall, and for diverse imitative behaviors, generalized imitation will be acquired relatively early in the child's socialization, maintained at high strength, and be relatively resistant to change. This is in keeping with the observation that gross imitative behaviors appear to occur early in life (Walters & Parke, 1965). Although, as a learned social behavior, imitation should be reversible, its extinction would rarely occur, since strict elimination

of reinforcement for such pervasive response classes is unlikely to be implemented in complex life settings.

Parents often deliberately set out to teach the child to imitate, using direct tuition, shaping, and fading of the sort employed by Baer et al. (1965, 1967) or Lovaas et al. (1966). The child's imitation can be highly reinforcing *to* parents or models (i.e., when contingent on their behaviors). Sometimes a parent may himself imitate the child, either as a spontaneous response or as a step in the process of teaching him to imitate. Among other effects, this may facilitate the child's discrimination of the degree of similarity between his and the model's responses, and can constitute steps in a shaping procedure wherein the child's response is matched to the model's with increasing closeness through successive approximations. This procedure very likely plays an important role in the child's language learning.

Indeed, it is thought that generalized imitation constitutes a most important basis for the initial occurrence and acquisition of many language responses by the child, and for the subsequent expansion of his language repertory, and may play an even more important role in this acquisition than does simple direct instrumental training without matching. Once such verbal responses are acquired, they will be maintained by responses made to them in conversational interchanges, according to the same principles that account for the maintenance of any other responses.

Behaviors of the child that are in the direction of increasing competence and are thus reinforced by socializing agents are almost invariably behaviors the child has observed older models perform (e.g., walking, talking, writing), and his performance of those behaviors is frequently reinforced in the presence of models who are exhibiting them. In a sense, these behaviors are also imitative. Thus, reinforcement for progress toward increasing competence can at the same time be reinforcement for generalized imitation. As the child is subjected increasingly to the socialization process with age, the behaviors for which he is reinforced will change with his growing capacities. The agents reinforcing him will also vary and increase in number, each reinforcing on a different schedule and for different behaviors. In the face of this continual change, one thing remains constant for the child: the imitative response class continues to be reinforced at a high rate throughout his development.

Like other social behaviors, the appropriateness of imitative responses varies from one situation to another. Thus, the imitative behavioral unit usually includes a *discriminative occasion* indicating that an imitative response is likely to be reinforced. Reinforceable occasions may be preceded by an explicit verbal cue, like "Susy, do this" of Baer et al. (1965, 1967), or by a less explicit cue indicating that imitation is appropriate. The imitator learns to discriminate those cue stimuli from cues indicating that noncopying, complementary interactive responses—for instance, dependence—are appropriate. For example, based on differential reinforcement of the child's behaviors in the past, the model's *being oriented toward* the child (physically or otherwise), or his *not being occupied* in

some ongoing activity, may acquire discriminative stimulus value for the child's emitting *complementary* interaction responses and for suppressing copying responses, which would be clearly inappropriate. Imitative behaviors are more likely to be reinforced when the model is busily engaged in a *solitary* activity and can more readily reinforce the child's parallel behaviors (like imitation) than his approach or interactive behaviors (like dependence), since the model can then continue his activity without long interruption. If the child is frequently reinforced for making disruptive (dependency) initiations in this situation, he may not learn to discriminate that such behaviors are inappropriate and may interrupt the model at will, thus in extreme cases becoming what could be termed "spoiled." It is possible that such children do not learn to imitate to as great an extent as children whose models discourage interruptions of the model's task. It is also likely that at the same time they do not acquire autonomous task-oriented behavior patterns independent of frequent reinforcement from their socializing agents.

There remains a considerable need for a detailed analysis of the discriminative cues that indicate to the child, in specific and more general cases, when it is appropriate to imitate (i.e., when imitation is likely to be reinforced) and which model it is most appropriate to imitate when alternative models are available. An analysis from our intentionally simple approach would attend only in passing to developmental changes in imitative behaviors and learning that occur in typical life settings. Our conception of generalized-imitation learning is not incompatible with cognitive-developmental analyses based on observation of life settings, like Piaget's (1951) conception of "stages" of imitation (with developmental increases in its generality and autonomy) and other naturalistic approaches that stress changes in the child's capacities during the early years as well as developmental differences in the organization of imitative behaviors. However, we assume that the basic mode of acquisition and maintenance of imitation is not altered by such developmental changes.

Focused versus nonfocused generalized imitation. The generalized-imitation paradigm as we have used it until now has been relatively *non*focused with regard to the model imitated, summarizing imitation of diverse responses of many models. Yet an important case where such imitation appears to be *focused* on one particular model more than on others often occurs. This model is usually a parent, and the focused imitation involved is thought to provide an important basis for identification, as will be detailed in a coming section of this chapter. Such a selective imitation pattern can result from a combination of relatively frequent or even exclusive contact with (and chances to observe) one model and frequent reinforcement by the model or by others for imitating a variety of the behaviors of that model. That model's behaviors will therefore acquire discriminative value for the child, indicating that his imitation of them has an even higher probability of being reinforced than does imitation in general.

Much of the child's early socialization takes place in the family setting, where he interacts with parents and siblings. Although a differential distribution of the child's interaction with the members of his family is bound to result, it should be less important for his generalized-imitation learning than should differential reinforcement for imitation of those members. Children of both sexes typically interact more with their mothers than with their fathers, but the boy comes to imitate his father and the girl her mother because of differential reinforcement for copying each of them. As noted earlier, the child will be reinforced for imitating different models in diverse contexts. In the family setting, however, on the basis of being differentially reinforced for imitation, he will discriminate which single model it is usually most appropriate to imitate; and because of frequent chances to observe that model, the child will imitate an extensive range of his behaviors. More will be said on this issue in a subsequent section on sex-typing.

This distinction between focused and nonfocused generalized imitation is analogous to the one between focused attachment (to a particular object-person) and nonfocused social dependence (on a class of persons) made earlier (Gewirtz, 1961b), and is elaborated in the subsequent section on dependence-attachment.

Generalized Imitation Extended

We have shown thus far that generalized-imitation learning based on extrinsic reinforcement (a) can account plausibly for the acquisition and maintenance of imitative responses in the apparent absence of extrinsic reinforcement (a condition that has been termed "intrinsic" reinforcement by a number of writers), (b) can be facilitated by the heavy extrinsic reinforcement of developmental behavioral advances by the child in the presence of models performing those responses, (c) can be focused on a single model under the proper circumstances, and (d) can come under the discriminative control of gross behavioral settings in which the model is engaged. The generalized-imitation concept can account for related behavioral phenomena which will be relevant to our analysis of identification. These include imitation of the model's behavior in his absence, imitation of a large portion of a model's behavior role in play settings, and wide-ranging similarities in abstract values or attitudes.

Imitation in the model's absence. Delayed imitation, which includes imitation of the model's behavior in his absence, can be regarded as a simple variant of the generalized-imitation paradigm. Also pertinent to observational learning, this point becomes clearer when one considers that all imitative behaviors occur *after* the model's performance, providing the relevant cues, has terminated and often while the child is not looking at the model, and in that sense they are *always* performed in the absence of the model. The delay between the model's performance and the imitative behavior may be further lengthened through shaping techniques, implemented either deliberately or in an unplanned way by reinforcing agents. Immediate direct reinforcement for delayed imitation in the model's absence may frequently be provided by agents other than the model, and sometimes in the form of statements like "you are acting just like

your father" or "like a big boy." In addition, the agent may indicate explicitly that what is being reinforced is not only performance of the response, but its performance in the model's absence.

Imitation of the model in play. Imitation of large segments of a model's behavior role in play situations where the model is not present may also be facilitated by ecological factors. Props given to the child can be appropriate to the model's role, as in the case of toy kitchen utensils being made available to a young girl. Reinforcement can be provided through the reciprocal role play of other children, or through occasional direct reinforcement by the model or other adult witnesses. These toys may serve a dual purpose, in that they can also provide a sanctioned discriminable context for the child's imitation of a model's behaviors in his absence when these behaviors might be hazardous or inappropriate in their usual context.

Generalized imitation of values. The generalized-imitation concept can also be extended readily to account for wide-ranging similarities in abstract values (attitudes, life styles, or motives). For example, often a child will act as the model might in a situation even if he has not actually witnessed the model in that situation, or he will strive for the same goals as the model. (We shall see in the next section that these behaviors are often termed identification.)

An example of a model's value is "tidy housekeeping." A mother's behavior may exemplify that value, and her daughter either may be directly reinforced for nonimitative tidying responses or may exhibit these responses through simple generalized imitation (with or without extrinsic reinforcement). An important assumption for extending our analysis is that a daughter generally reinforced for acting like her mother may come to discriminate the common elements of responses exhibited by the model in a class of related stimulus contexts (such as housekeeping), which she might also inductively characterize with a statement like, "Mom keeps a tidy house." The child's value is based on her discrimination of such a functional class of the model's responses (some would term it a "concept"), which would then apply to situations in which the child, as generalized-imitator, may not actually have seen the model perform. The daughter may also exhibit verbal responses that reflect the value, for instance, "It's good to keep the house tidy," which have been acquired together with tidy housekeeping responses via generalized-imitation learning. Although some of the daughter's responses may be quite different in topography from those of her mother (because of changed climatic conditions, technological and socio-economic levels, etc.), they will produce the same outcome: a tidy house. Once the value has been acquired in this manner, the mother and other environmental agents are likely to reinforce the resulting responses, and the value will be maintained. As is true of all learned behaviors, however, the performance of a value will depend on the continuation of the same reinforcement matrix for the class of responses implying that value, and thus it is potentially subject to change.

Thus far, the analysis has stressed primarily those situations in which cues

from the model and extrinsic reinforcement to the child provide the context for the child's imitative behaviors. The above examples show the potential utility of the generalized-imitation paradigm in situations where some of the relevant discriminative and reinforcing stimuli for imitation are absent.

Identification

The concept of *identification* has been used, particularly in psychoanalytic approaches, to indicate the child's acquisition of the values, ideals, roles, and conscience of an important other person (the model), particularly those of his parents and especially the same-sex parent. The term has been used variously to refer to the process by which these characteristics are acquired, to the person's desire to possess the characteristics of the model and his belief that he does, and to the resulting similarity of behavior patterns. Several of these usages are often found in the same analysis. The identification term has also been used as if it were a unitary concept that involves a single, incompletely specified complex paradigm with demographically defined independent variables (e.g., gender of subject in an intact nuclear family) and no consensually valid dependent variable. In this analysis, the generalized-imitation paradigm, as detailed in the preceding section, becomes a parsimonious basis for the phenomena usually grouped under the identification concept.

The earliest approaches to the phenomena of identification occurred within the frame of psychoanalytic theory, and much of identification theory still relies on these early attempts. While Freud dealt with identification in a scattered way through half a century of his writing, and there were apparent variations in his approach, he seems to have employed the term in at least two ways: as a *process* and as the behavior-similarity *outcome* of that process. Thus, Freud (1933) regarded identification as the process by which "one ego becomes like another one, which results in the first ego behaving . . . in certain respects in the same way as the second; it imitates it, and as it were takes it into itself" (p. 90). And, in one of his writings, Freud's (1920) index of the outcome of identification was imitation of the model's behaviors. When assumed to result from complete instrumental dependence upon and an emotional tie to the model (typically the parent), identification has been termed "anaclitic" in Freud's approach and by Sears (1957; Sears et al., 1965) and "developmental" by Mowrer (1950); while "aggressive" or "defensive" identification (A. Freud, 1937; Mowrer, 1950) is assumed to result from fear of punishment from the model, with the child avoiding punishment by becoming like the model. The child's super-ego, the locus of self-observation, conscience, and ideals, is assumed to be based largely on this type of identification and to be built upon the model of the parents' super-ego rather than on their actual behavior.

Although many would agree that the child can learn to imitate a range of behaviors on the basis of simple instrumental (trial-and-error) learning (as involved in generalized imitation), imitation has typically been treated in the literature as somehow distinct from identification. Thus, despite an early instance

where Freud (1920) used imitation to index identification, the typical psychoanalytic view appears to be that the relatively precise matching to the model's overt behavior in imitation is a transient, symptomatic, surface process, whereas the wider ranging, less precise behavioral matching in identification results from a more fundamental and dynamic underlying process.

Kohlberg (1963) has proposed that identification differs from imitation in three ways: (1) identification is a "motivated disposition" because of the intrinsic reinforcing properties of perceived similarity to the model; (2) similarity between the behaviors of the subject and the model often occurs in the absence of the model; and (3) many aspects of the model's behavior are reproduced. These factors appear to have been the bases for many theorists' considering identification as a "higher-order" process than generalized imitation.[4]

Within the learning-theory tradition, Miller and Dollard (1941) in a brief comment suggested that imitation mechanisms are also involved in identification, while Seward (1954) suggested that identification is a high-level abstraction from numerous imitative habits. Bandura (1962) and Bandura and Walters (1963) have noted that observational learning is often termed imitation in behavior-theory approaches to personality development and identification in more traditional personality theories, with no substantial differences between the two usages. In our similar view, often the only reason that generalized-imitation learning is assumed inadequate to account for identification phenomena is that factors like a motivation to be like, an emotional attachment to, or envy of, the model that are assumed relevant for identification are just not considered at all relevant to generalized imitation and are often thought to be outside the sphere of simple learning.

Generalized imitation as the basis for identification. Such distinctions may have made the analysis of identification needlessly complex. They also point up the necessity for a more systematic approach to identification phenomena and their underlying mechanism(s). It was shown earlier that: (a) the seemingly intrinsic reinforcing property of certain behavior classes, including imitation, depends entirely upon occasional extrinsic reinforcement of members of that class; and that (b) the performance of diverse imitative behaviors in the absence of the model is also accountable by straightforward application of the generalized-imitation paradigm, as is (c) the tendency to focus generalized imitation on one model and to imitate not only a range of his overt behaviors, but also behaviors implied in such general dispositions as are often termed motives, values, or attitudes. In this way, it has been automatically proposed under the functional approach of this chapter that most, if not all, of the phenomena usually grouped under the rubric of identification may reasonably be assumed to be the direct consequences of generalized-imitation training, and thus can be reduced to that more parsimonious instrumental-training conception.

[4] More recently, Kohlberg (1966) has proposed that attachment follows (generalized) imitation, and that the combination of these two factors leads to identification, but it is not clear what the roles of the above three criteria are in his recent approach.

It appears that another distinction implicit in most definitions of imitation and identification is that while both terms refer to behaviors matched to those of a model, the latter behaviors are maintained exclusively by social stimuli while the former may be maintained by both social and nonsocial ones. Thus, all identificatory acts may be imitative but not all imitative acts are identificatory. Because the specification of which stimulus contexts and reinforcers are social is often arbitrary, we contend that in a similar manner the distinction between identification and imitation is to a large degree an arbitrary semantic one with no fundamental differences in the way in which they are learned. Under a learning analysis, the major reason we would prefer to use a single term like social imitation rather than both imitation and identification is that the use of both terms implies that such differences exist and are meaningful, an implication that can only cloud the issue. The use of more learning-oriented terms precludes such interpretations and facilitates the fitting of existing and future data on identification processes into a framework that allows us to tie in other important aspects of the learning process more easily.

Thus, it often appears that the only real distinction between identification and generalized imitation may be in the less precise, more complex, and more inclusive way that the identification process is typically defined: the major response class subsumed under the identification concept is that of generalized imitation, controlled by the discriminative stimuli provided by the model's behaviors. (For some, this apparent identity would eliminate the need for a separate concept of identification.) Further, a large number of loosely related and often overlapping terms at varying levels of conceptual analysis, like introjection, incorporation, internalization, modeling, rote copying, and sex-typing, all of which lead to similarities between the model's and the identifier's behavior patterns, are included under identification. This situation has further complicated the concept of identification and appears to have implied, as an artifact, a larger number of seemingly distinct processes than is warranted. The level from which such concepts typically are approached makes it difficult to make clear-cut differentiations between identification and overlapping concepts like introjection or sex-typing. Reduction of these terms to the same level of analysis in basic paradigms open to a learning analysis is necessary and may show that apparent differences among them can be attributed to the methods of measurement, the segments of the stream of behavior emphasized, the particular stimuli evoking the responses, and the functional reinforcers available, factors that do not ordinarily justify separate paradigms. Such a reduction can be implemented by regarding identification concepts as based on the simpler generalized-imitation paradigm, with behavioral similarity as the outcome. For example, *introjection* is often defined as the act of incorporating a value system in its entirety, with identification as its result (Fuchs, 1937). Thus, while introjection appears to refer to the acquisition process and identification to its result, those terms may only reflect emphasis on different stages in the behavior process by which generalized imitation is learned and maintained, with introjection pointing to a somewhat earlier phase of the learning than does identification. The use of two

different terms therefore seems to emphasize arbitrarily what may for most purposes be a trivial distinction.

Similarly, *sex-typing* usually denotes identification by the child with models of his own sex, and has itself been broken down further into sex-role identification, sex-role preference, and sex-role adoption (Lynn, 1959). Thus, the term sex-typing refers to the shaping of the child's behaviors to match behaviors specifically appropriate to his gender. These behaviors are usually assumed to be acquired through observation of a model or a class of models. So defined, they can be regarded as the result of generalized imitation, with the gender of the model serving as a discriminative stimulus for a higher frequency of extrinsic (immediate or delayed) reinforcement for imitation. Kohlberg (1966) has reported that a shift from generalized imitation of the mother to imitation of the father typically occurs in boys between ages four and seven, which he interpreted as reflecting changes in boys' conceptualization of age and sex roles. The approach being advanced in this chapter is open to such possibilities, but we would conceive them as resulting from a systematic shift in the discriminative conditions under which imitative behaviors are reinforced. Mischel (1966a) has reviewed a number of other results of sex-typing studies done to date and interpreted them from a learning approach very much like ours.

At this point in its evolution, the research area of identification can benefit from a deliberate approach, both theoretical and operational. In the context of a profusion of overlapping concepts and the need to reduce the frequently used demographic independent variables to component functional stimuli, the salient issues for our analysis must be operational, such as whether or not discriminative stimuli for imitation are present and whether or not functional extrinsic reinforcers follow imitative responses. In addition to reducing demographic variables to a more useful level of analysis, such factors can provide the basis for distinguishing among possibly diverse paradigms. By attending to the actual stimuli, responses, and the sequential details of their interaction, this level of analysis makes possible a flexible, individual-oriented approach to identification phenomena. Although in representative life settings some general outcomes do occur, e.g., children typically do imitate behaviors appropriate to their sex category, this approach provides greater precision and flexibility in detailing the history of the individual child in question in terms of what similarity behaviors have been acquired and how they are evoked and maintained. But equally important, it can also highlight the conditions responsible for a failure to acquire particular identification behaviors and the conditions that may facilitate, extinguish, or otherwise modify such behaviors. Reversibility or change in identification-behavior patterns is almost never assumed or tested, yet is a perfectly reasonable corollary of the conception of learning, in representative life settings as in the laboratory. A functional analysis such as we propose would also make it possible to determine which antecedent process determines a particular behavior-similarity outcome and whether or not there are different combinations of antecedents that could lead to an identical outcome. The continuous differentiation process involved would lead routinely to new concept groupings and

labels, with previously unidentified but relevant phenomena brought under the identification concept and ordered by novel or derived paradigms.

Empirical research studies of identification have quite reasonably employed behavioral similarity[45] between the child and his parents as a measure of identification (though often, when verbal reports have provided these indices, the variables generated were at too removed a level to allow precise leverage on the process). At the level of analysis emphasized here, direct measures of similarity between the child's and the adult's responses (including those summarized as traits) in structured stimulus settings would be useful operational indices of identification, with variations in discriminative and reinforcement parameters as independent variables. It will be necessary to show in such settings that the behaviors of the child that are termed identification are acquired under the control of the discriminative cues provided by the model's behaviors rather than being determined by environmental constraints or independent but parallel acquisition processes, and that they are, in the absence of the model, under the control of the same discriminative stimuli as were the model's behaviors.

The present approach, then, regards the development of identification behaviors as due to extrinsic reinforcement of the child's imitation of his parent's (or model's) behaviors. The degree to which a child is identified with a particular model is thus grossly determined by the value to the child of the reinforcers contingent upon his imitation of that person's behavior. His identification will also be a function of the amount of exposure to other potential models and reinforcement for imitating them, the frequency of reinforcement for original, nonimitative behaviors, and the value of the reinforcers provided for each of these behavior classes. In this way, as is seen in a later section on whether or not dependence-attachment and imitation-identification are sequentially related, attachment may enter peripherally, in that it grossly abstracts the discriminative and reinforcing value of stimuli dispensed by a particular person. Identification with the model at the level of abstract values may require finer discriminations by the child but, as has already been shown, should follow the same principles as generalized imitation.

The advantages of this functional approach are evident when one looks at such work as that by Lovaas (1967) with schizophrenic children. Besides teaching the children to imitate vocalizations and to converse, as was described earlier, Lovaas reinforced nonverbal imitation in order to teach behaviors in the areas of personal hygiene, games, drawing, and affectionate behavior, with the intention of eventually shifting the control of these behaviors (by fading procedures) away from the model to control by more appropriate or general stimuli. Noting that the behaviors learned by these children were neither as representative nor did they occur in as wide a range of settings as those covered by such terms as identification, Lovaas nevertheless implied that bringing about this more extensive imitation is not incompatible with the procedures he has been using and may primarily involve increasing the reinforcing value of stimuli from the model and

[45]For instance, in responses to projective tests or paper and pencil questionnaires.

others. Thus, besides permitting a more precise evaluation of the factors involved in the child's failure to identify, this approach suggests specific areas of attack to remedy the deficiencies.

Let me at this point summarize the argument developed thus far in this chapter. After basic instrumental-conditioning and S-R chaining concepts were employed to order many of the assumed complexities of generalized imitation, it was proposed that the phenomena usually grouped under the rubric of identification can also be reduced, under a discriminated-operant learning model, to this more parsimonious conception of generalized imitation and its direct extensions. We have not advocated this approach for the sake of reduction per se, but rather to bring these phenomena to a level at which they will be dealt with more productively. Since identification phenomena involve systematic changes in behavior effected by recurring environmental conditions, a learning analysis is appropriate, and its use makes immediately available a wealth of knowledge about the functioning of stimuli and responses. Under a systematic learning approach to identification phenomena, the relevant behaviors are potentially subject to acquisition, discrimination, facilitation, extinction, and other modifications, according to well-established laws of behavior. The study of such modifications would be in contrast to the typical approach to identification, in which the effects are for the most part assumed to be long-term, and reversibility or change in the process is never tested and almost never even assumed.

The role of motivation in identification. Hindley (1957) has assumed that an acquired drive underlies imitation when, following acquisition based on extrinsic reinforcement, it continues to occur in the absence of extrinsic reinforcement. Bronfenbrenner (1960) has argued that the identification concept cannot be reduced to a notion like "acquired similarity" because in the process one would risk losing sight of Freud's view of identification as what Bronfenbrenner termed a "sweeping and powerful phenomenon" involving the tendency of the child to take on a *total* pattern of the parental model's behavior with an emotional intensity that implies a powerful "motive in the child to become like the parent" (p. 27). Within a learning framework, Sears (1957) has written similarly of a *motive* to become like the model as the basis for the child's adopting total patterns of the parent model's behavior without apparent specific training (although he later questioned the utility of the motive construct [Sears et al., 1965]). As the mother's nurturant responses become secondary (conditioned) reinforcers for the child, he is conceived by Sears to acquire a secondary dependency drive and can partially gratify this drive by performing similar responses himself (an assumption not unlike Mowrer's [1950]).

Apart from these remarks, neither Bronfenbrenner nor Sears has detailed the implications of the use of a motivational concept for identification. They may intend it only to reflect the pervasiveness of the imitative behaviors across many behavior contents and settings or, with Hindley (1957) and Kohlberg (1963), to reflect the apparent intrinsically reinforcing properties of such behaviors, or with Kohlberg to reflect its involving a particular model. However, we have seen that

the generalized-imitation response class discussed in this chapter is also pervasive, can occur without apparent extrinsic reinforcement, and can be focused on one model. Moreover, Kohlberg (1966) has recently written of the acquisition and performance of imitation and identification as being motivated by a "drive" for "competence-mastery" and "interesting" events. This conception in no way advances his analysis either, for there still remains the tactical problem of determining the conditions that differentially affect the child's imitative responding. Finally, because of their excess meaning, there is no advantage to introducing motivational terms in analyses such as these, when these terms can be readily replaced by concepts more coordinated to operations—like intermittently reinforced generalized imitation indexed by behavioral similarity.

The role of reinforcement in identification. One issue on which the approach to identification in this chapter differs from many others is in the importance we assign to extrinsic reinforcement of imitative behaviors in the acquisition of identification. Our approach also differs from some others in that they implicitly or explicitly employ cognitive-flavored abstractions or intrapsychic euphemisms as mechanisms to account for identification phenomena, while we rely entirely on sets of responses maintained by extrinsic reinforcement. Thus, Kagan (1958) has assumed that the child identifies with an adult whom he sees being rewarded because he *believes* that by possessing the model's characteristics and thus becoming similar to the model he, too, will command the attractive goal states that the model controls. In a similar vein, regarding the caretaker as the mediator of valued resources, Whiting (1960) and Burton and Whiting (1961) have assumed that the child's identification with the caretaker (as in learning his role) is motivated by *envy* of him because he can withhold the resources from the child or receive and consume them himself (implying control). In both analyses, extrinsic reinforcement of the child's imitative behaviors is only implied and is not considered essential for identification.

A basic assumption in our approach is that the child comes to copy diverse responses performed by his parent-models because he is consistently reinforced directly for diverse representatives of that class of behaviors, perhaps even more consistently than for behaviors that he initiates on his own. The class of copying responses is highly likely to culminate in extrinsic reinforcers in a variety of settings and from many sources, both social and nonsocial. The assumption here is that many imitative behaviors may occur without extrinsic reinforcement, but only *after* the response class has initially been established in the child's behavioral repertory by direct reinforcement and only if it is still being directly reinforced at least occasionally. Then will the child appear to fit Kagan's or Whiting's specifications. Regardless of how often the model is rewarded in the presence of the child, we do not conceive of the child's imitating him (identifying) unless the child himself is at least occasionally rewarded for it. Likewise, the withholding of reinforcement from the child can be effective only if in other situations or for other behaviors such reinforcement is not withheld. In the terms of our analysis, the model would make the withheld resources available to the

child contingent upon various classes of behavior, one of which is likely to be imitation. What seems appreciated too little by many theorists is the ability of intermittent, even infrequent, extrinsic reinforcement to maintain an extensive class of behaviors, many of which are *never* reinforced, as has been well established by the research of Baer et al. (1965, 1967) and Lovaas et al. (1966) and the context of behavioral technology from which these studies spring. At the same time, such research clearly demonstrates the necessity of at least occasional reinforcement in the acquisition and maintenance of a behavior class.

Fear and identification. For heuristic simplicity, this analysis has avoided the use of "fear" concepts (e.g., of rejection or of punishment, or "anxiety") often used in identification theories. An example is the assumed fear basis of defensive identification (A. Freud, 1937; Mowrer, 1950). The paradigms for those defensive concepts are compatible with the ones advanced for the acquisition and maintenance of generalized imitation, except that they may imply different classes of reinforcers, such as the removal or avoidance of a noxious stimulus. Self-critical responses and others labeled "guilt" or "resistance to temptation" reflecting "internalized controls" or "conscience" can undoubtedly be reinforced by such consequences, but they can also be acquired through the direct positive reinforcement processes we have emphasized.

2. Dependence-Attachment

In this section, we examine some theoretical and research issues that have characterized the behavior systems grouped under the rubrics of dependence and attachment. We have already seen that the problem for the molar behaviorist is to articulate the manner in which differential stimulation facilitates and comes to control the behaviors of the organism. Under this logic, and with the results of the research to date kept in the forefront, the attempt is made to reduce to simple terms the complexities of the behaviors which characterize dependence and attachment, and to posit basic acquisition processes to relate those behaviors to the multiplicity of environmental conditions to which children are typically subject. As did our earlier examination of imitation-identification, the analysis proceeds in simple conditioning terms, using the concepts of responses, discriminative and reinforcing stimuli, and the conception of sequential contingencies or chaining.

An analysis of the behavior organizations termed dependence and attachment is considered fundamental for an understanding of the key controlling attributes of human social life, at all developmental points. In our previous survey of instrumental learning in social contexts and its application to generalized imitation, emphasis was placed mainly on the principles of behavior acquisition and maintenance, and hardly at all on content. However, the analysis of dependence and attachment upon which we are now embarking emphasizes the identities (content) of classes of stimuli and responses in addition to assumptions about behavior acquisition and maintenance, and promises another basis for bridging the present gaps between basic learning and performance concepts and principles that have been identified, and the actual conditions of earliest parent-child interaction. Our purpose, then, continues to be the eduction of some specific laws of learning to the special case of the developing human, but in this case, in addition, it involves an increased emphasis on stimulus and response content.

Meaning and Usage of Dependence and Attachment

To date, few articulate theories have been advanced on the nature or dimensionality of socioemotional *dependence* (dependency) and *attachment* (relationship, bond, tie) or on their antecedents. It seems reasonable to approach questions about the mechanisms underlying the development of dependence and attachment in terms of assumptions about the nature of social learning and to order the conditions characterizing the acquisition of and changes in relationships between the initially helpless child and the persons in his environment in terms of conditioning concepts. This is done with a view toward charting the acquisition of various forms of dependence and attachment, in the context of transformations in response systems and changes in the identity of other persons involved as occur during the course of an individual's development.

In such an analysis, dependence and attachment are best conceptualized as abstractions for classes of functional relationships involving the positive stimulus control over a wide variety of an individual's responses by stimuli provided either by a class of persons (dependence) or by a particular person (attachment). Thus, in dependence, an individual's behavior systems are controlled by discriminative and reinforcing stimuli which may be dispensed by any member of a *class* of persons who share certain stimulus characteristics (e.g., as those involved in sex, race, age, or caretaking role). In contrast, in attachment, the efficacy of discriminative and reinforcing stimuli in controlling an individual's behavior systems depends upon the unique physical and/or behavioral characteristics of a *particular* "object" person dispensing those stimuli (e.g., his facial stimuli, tactile characteristics). In principle, a child could be said to form attachments to more than one person, in the sense that certain of his behavior systems could be controlled by the (discriminative and reinforcing) stimuli provided by the unique characteristics of a particular person, while other of his behavior systems could be determined by different stimuli provided by the unique characteristics of another person. This type of differential control by a very few individuals is not to be confused with the pattern of stimulus control over child behaviors that we have termed dependence, which involves the homogeneous power over a set of child behaviors that is exhibited by the common stimuli that may be provided by any one member of a large class of persons. This distinction between nonfocused social dependence and focused attachment points up the differences between the two sets of phenomena, but it also emphasizes the

similarities and overlap as well as the probable communalities of antecedents. That is, attachment can be conceived as a form of (social) dependence of the behavior systems of one person upon the unique physical and behavioral stimuli provided by a particular other person (or a very few individuals), for instance, a child and his parent or caretaker.

Instrumental dependence involves the acquisition by the child of help-seeking responses, based on his requiring physical help in a variety of contexts. While this concept provides, in one way or another, an important basis for nearly all approaches that are to be listed here, writers and researchers in this area have emphasized in addition *either* nonfocused social dependence (e.g., Sears, 1951, 1963; Sears et al., 1953; Whiting & Child, 1953; Heathers, 1955a, 1955b; Beller, 1955, 1957, 1959; Gewirtz, 1956a, 1956b; Sears et al., 1957; Kagan & Moss, 1962; Bandura & Walters, 1963; Sears et al., 1965) *or* focused attachment (e.g., Bowlby, 1958; Ainsworth, 1963, 1964; Schaffer & Emerson, 1964), but not both social dependence and attachment. (An exception can be found in Gewirtz, 1961b, who distinguished among all three concepts.) These two terms have therefore been subject to variable and inexplicit usage, and have often been employed idiosyncratically in research, so that they are sometimes used to order the same phenomena with the distinction between social dependence and attachment ignored.

A number of writers, in different ways, have also made the distinction that we emphasize in this analysis between "instrumental" or "task-oriented" dependence and "social," "emotional," "affectional," or "person-oriented" dependence (cf., e.g., Heathers, 1955a; Gewirtz, 1956b, 1961b; Kagan & Moss, 1962; Bandura & Walters, 1963). In the present discussion, the term social dependence is used synonymously with the term dependence, as that term has been commonly used, and instrumental and social dependence are defined orthogonally. The essence of instrumental dependence is that some response of another person is required in order for the individual (e.g., child) to attain some stimulus (like food or the removal of a noxious stimulus) that is reinforcing independent of the characteristics of either the helping response (e.g., attention) or the appearance of the helping agent (e.g., mother). This distinction therefore depends upon the identification of the reinforcing stimulus. That is, if a young child requests help from a parent in obtaining an object from a high shelf only because it is physically impossible for him to reach, this would be an instance of instrumental dependence. If, however, that same child asks for help in obtaining an object which he has at other times gotten himself (or if he is seen placing an object on a shelf only to ask for it when his parent appears), this would be classified as an instance of social dependence. The identification of the reinforcing stimulus, which is necessary in principle if the dependent act is to be properly classified as instrumental or social, is therefore sometimes difficult to make in life settings. In this context, it is not surprising that different theorists may occasionally have made little attempt to distinguish between these two types of dependence (cf., e.g., Beller, 1955; Stendler, 1954). In those cases where writers have made such a distinction, it has most often been thought that the form of social interaction involved in instrumental dependence may constitute the main basis for the acquisition of noninstrumental, social dependence on people in general, as well as of attachments to particular persons.

Perhaps as a result of the abstract and vague way in which the concept of dependence has often been used and of the inadequacies of the indices employed to identify it, there has often been difficulty in defining the limits of its dimensional features. Thus, regardless of whether or not a distinction has been made between instrumental and social dependence, there has often been the tendency to view "independence" (self-reliance, autonomous achievements, assertiveness) as the opposite of dependence, and several authors have written of or implied bipolar (and confounded) dimensions for instrumental independence-dependence and socioemotional independence-dependence, extending to "overdependence" (e.g., Levy, 1943; Stendler, 1954). When the term independence refers to the quality and types of behaviors employed by the child for (i.e., that are maintained by) various reinforcers, social and nonsocial, in a particular context, it would seem less confusing for most purposes to adopt the convention of transforming the implied bipolar dimension(s) into unipolar one(s), and to classify behaviors as instrumental or social dependence. Under such a unipolar conception, the assumed dimensions would extend from low to high instrumental dependence and from low to high social dependence, with individuals having a relatively high incidence of self-reliant, self-assertive, autonomous behaviors assumed to fall at points in the lower portions of those scales. Under this convention, autonomous, achievement-oriented behaviors apparently maintained by (performed for) others' approval would be characterized as involving relatively low instrumental dependence but relatively high social dependence; and similar behaviors that appear oriented to mastery of tasks and self-assertion and not to the receipt of someone's approval would be conceived to reflect, in addition to low instrumental dependence, low social dependence (or "emotional independence" as Heathers [1955a] has termed it).

Analyses and research dealing with dependence-attachment phenomena have often involved variables (like deprivation) too extreme or too vaguely understood to be well implemented experimentally with humans. The terms dependence and attachment are themselves gross abstractions or summary variables which are perhaps only properly used as open-ended headings to group various classes of behavior or to label an area of scientific interest. Nevertheless, the tendency has been to use these terms as though they represented a unitary process, a conception which, through the inclusion of loosely defined motivation (drive) terms and of terms like affection and reassurance, has often amplified the imprecision of research on human development. (As we shall detail in a later section, the drive concept itself has usually contained surplus meaning in that the operations implied in its use are generally inexplicit, numerous, often incompatible, and may not represent clear alternatives to one another.) As a consequence of the use of inexact terminology and the inclusion of imprecise

motivational terms, there has often been a failure in developmental and parent-child relationship research to distinguish observation from inference, definition from explanation.

The acquisition of dependence and attachment. Through roughly the first half of this century, the theory most generally held in connection with the acquisition of social motivation, dependence, and attachment (particularly of the child's bond to his mother), was that of "acquired" or "secondary drive." The central features of this theory were the concepts of discriminative and conditioned (generalized) reinforcing stimuli (e.g., provided by incidental caretaker appearance characteristics) which acquired and maintained their reinforcing value by being discriminative for a limited set of apparently unconditioned reinforcing stimuli conventionally thought to be satisfiers of physiological needs (in particular food, water, and the removal of noxious stimuli). In general, the responses that were cued and maintained by the conditioned stimuli and that comprised the dependence-attachment behaviors received little emphasis, and by implication could be of almost any class. This appealingly simple secondary-drive approach was at the core both of Freud's (e.g., 1938a, 1938b; Fenichel, 1945; A. Freud, 1954) theory of cathexis and object formation and of standard conditioning approaches to acquired motivation (e.g., Miller & Dollard, 1941; Mowrer & Kluckhohn, 1944; Dollard & Miller, 1950; Sears, 1951, 1963).

In addition to what may be the gratuitous use of the term "drive" in this formulation (since the behaviors which are assumed to be determined by an infant's motivation could be accounted for completely in terms of conditioned discriminative and/or reinforcing stimulus control), in the past two decades the adequacy of the "secondary drive" theory has come to be questioned on two main grounds: the first question, influenced by ethological research on unconditioned and sometimes species-specific behavior patterns (and by conditioning studies of response topography), concerned the nature and organization of the responses involved in dependence attachment; and the second question, influenced by conditioning and performance research in a number of topical areas showing that diverse stimuli functioned as reinforcers, as well as by the posture of the operational approach to conditioning, was whether there was not a greater diversity of functional reinforcers operating for the behaviors of the developing infant than those that seemed organismically relevant.

Because of the findings of such research, an operational approach like the one in this chapter emphasizes the assumption that many and diverse classes of events can come to function as discriminative and reinforcing stimuli for numerous child behaviors, in addition to the limited number of stimulus events provided through caretaking that are thought to relate directly to organismic survival. Thus, it is our assumption that diverse near (i.e., proximal) events as well as events provided at a distance (i.e., distal), may function initially as unconditioned stimuli, or may come to acquire conditioned value, as evoking, discriminative, or reinforcing stimuli for the acquisition and maintenance of an

increasing variety of infant behaviors. These behaviors include approaches, visual orienting, regard, and tracking, as well as smiles and vocalizations. In addition to the proximal stimuli such as are provided through the infant's being touched, held, caressed, and raised in the air, or through warmth and similar conditions, the distal stimuli may include visual events like those provided by the sight of people, and such aspects of their appearance as hair color, facial features, size, and their characteristic behaviors like gait, approach, and successive movements in space; auditory stimuli like sounds made by approaches and other movements, and by speech; and olfactory stimuli.[46]

It is our thesis that the behavior classes termed dependence and attachment are initially acquired and subsequently maintained on these pervasive bases. It is assumed also that the behaviors of the object person or persons who function in a caretaking-socializing role at the same time will come under the control of appearance and behavior stimuli provided by the child. These processes will account for progressively longer S-R interaction chains between the infant's responses and the stimuli provided by his caretaking environment. Some of the stimuli and responses will be parts of one or of very few chains, while others will occur in many different chains and, hence, will acquire generalized value (which process was earlier described in the section on key social-learning constructs and their operating modes).

We have noted that the concepts dependence and attachment represent gross, preliminary, and often vague abstractions for a set of functional relationships which characterize the control[47] over a wide variety of the behaviors of the child exercised by the discriminative and reinforcing stimuli provided by the appearance and behaviors of a class of persons (dependence) or a particular other person (attachment). The acquisition process for dependence and attachment, therefore, summarizes the details of two intimately correlated processes which begin when the infant is helpless and relatively immobile: the conditioning of various behavior systems, including remaining near, touching, smiling, vocalizing, approaching, eye and facial orienting, and visual regarding and tracking with respect to a class of persons or a person (like the caretaker-mother) according to the principles outlined; and the conditioning of the physical and behavioral appearance characteristics of those persons as discriminative and reinforcing stimuli (many of which are generalized), that maintain the child's behaviors and can account for the acquisition and maintenance of many new behaviors as well. Thus, at the very same time that the conditioning of appearance aspects of the mother-caretaker as generalized reinforcing stimuli is

[46] Although there have been writers (e.g., Bowlby, 1953a, 1958) who have proposed that some stimuli in the preceding list have unconditioned ("releasing") value for infant approach behaviors, this general assumption (which is testable in principle), need not concern us in the present social-learning analysis.

[47] Though we shall emphasize positive control in this analysis, situations characterized by negative control are also relevant (and, indeed, may play key roles, as in attachment associated with defensive identification), though we imagine most often they comprise a lesser portion of the functional relationships that characterize the behavior systems of dependence or attachment.

taking place, the child is heavily reinforced by diverse stimuli for approaching, following, orienting toward her, clinging, and generally for proximity responses which preclude the caretaker's getting out of sight or earshot, the complexity of his responses increasing with his developing capacities.

It follows as a corollary from this conception that (1) the greater the number of behavior systems of the child under the stimulus control of persons or of a particular person, (2) the greater the number of behaviors under their stimulus control *relative* to behaviors under the stimulus control of others, (3) the greater the degree of control over each behavior system, and (4) the greater the number of stimulus settings in which the control operates, the *"stronger"* the dependence or attachment may be said to be. This notion would apply where an overall summary statement is required by a researcher. Further, for the purposes of a particular analysis, one might define subvarieties of dependence or attachment to cover particular patterns of behavior or of stimulus control conditions. For the didactic purposes of the present illustrative social-learning analysis, however, such distinctions are premature.

Some "pre-learning" approaches to attachment. The preceding line of reasoning may be usefully illustrated in some detail by an examination of the attachment conceptions of Bowlby and Ainsworth. In their present state, both may be termed "pre-learning" approaches because, although they are entirely compatible with learning considerations in that reciprocal interaction is emphasized very generally in both positions, they stop short of specifying the role of learning in attachment formation. Both approaches also differ from the one proposed in this chapter in that they reflect quite different theoretical orientations and less of a concern with method. Further, their definition of attachment may overlap that of social dependence in terms of our distinction.

Recent thought on the process of infant attachment to significant figures has been influenced greatly by Bowlby's approach. In place of the traditional secondary-drive learning conception,[48] Bowlby (1958, 1960a, 1960b) has proposed that, like that of many lower species, the initial attachment or bond exhibited by the human infant to his mother involves a number of primary, unlearned component "species-specific behavior patterns" (that he also labels "instinctual response systems") in the infant's repertory, that are readily evoked by available stimuli. These are originally independent of each other, mature and develop at different times and rates during the child's first year, and together have high survival value. Of the five instinctual-response systems Bowlby identified, those in which the infant is the active partner, which insure close proximity and caretaking, and which require only a limited reciprocal response from the mother are *sucking, clinging,* and visual, auditory, and locomotor *following* (i.e., not letting her out of sight or earshot). These instinctual-response systems lead the infant "to attach himself with vigour at first to any mother-figure and later to a particular mother-figure and to remain so attached for a long time" (Bowlby, 1960a, p. 314). In the normal course of development, these response systems become integrated, focused on a single mother-figure between about three and six months of age through (an unspecified form of) learning, and form the basis for the strong attachment of the infant to his mother, which Bowlby assumes does not begin to wane until around the infant's third birthday. Bowlby (1958) identified the remaining two instinctual-response systems, in which the infant's responses provide releasing stimuli to activate or evoke the unlearned instinctual behavior patterns of the mother and to bind her reciprocally to the child, as *crying* and *smiling*. (These two systems were not emphasized in some of Bowlby's later analyses [1960a, 1960b, 1961].)[49]

The instinctive response systems in Bowlby's approach may be intended to

[48]Bowlby's (1958) critique of the early "secondary drive" conditioning approach to attachment (and its psychoanalytic counterpart which he has faulted for its emphasis on orality and its view that the child's relation to his mother is initially one of "cupboard love"), which was already being challenged and superseded by the open-ended, operational approach to instrumental learning before Bowlby's 1958 paper was written, was in great part based on his notion that the class of reinforcers that could operate in the acquisition of attachment under a secondary drive or conditioning approach was limited to include only those provided through caretaking, namely food, water, and the removal of noxious stimuli. He pointed out that other unlearned behavior systems (and by implication reinforcing stimuli), which had little if anything to do with the appetitive stimuli that the early secondary-drive conditioning theories emphasized, as well as stimuli for mothers' behaviors, appeared to play critical roles in the formation of human attachments. However, Bowlby's implicit equation of the functioning of a limited set of organismic reinforcing stimuli with a conditioning approach (the secondary-drive theory) was unfortunate in a context where an operational-learning approach to attachment acquisition (like that emphasized in this chapter) remains completely *open* with respect to the identities of the stimuli and the behaviors involved in the acquisition and maintenance of attachment at different points in early human development, and emphasizes (as he does implicitly) the reciprocal interaction between infant and mother-figure.

It has been brought to my attention that Bowlby appears to make precisely the same error in a recent manuscript of a book on attachment and loss that has been circulated privately prior to its impending publication. Bowlby still appears to be unaware of operational, open-ended instrumental conditioning approaches. This is remarkable considering that he commented appreciatively in print (Bowlby, 1961) on precisely such an approach to attachment which I made (Gewirtz, 1961b). Ainsworth (1964) takes a similar posture to that of Bowlby regarding the secondary-drive theory of attachment, and appears to be similarly unaware of open-ended conditioning theories like the one mentioned. This is a pity, for, as we shall see, neither Bowlby's nor Ainsworth's related approaches are incompatible with learning assumptions. Indeed, the weakness of their analyses in great part stems from a limited appreciation of the ways in which experiential learning can affect their behavior indices.

[49]It is my understanding that, in an as yet unpublished manuscript, Bowlby goes farther than he has in earlier papers in specifying organizational and sequential details of child and parent behaviors that are relevant to their attachment for different ages of the child. He apparently includes additional responses as contributing to attachment (which he now views as one context for interaction) and organizes them into classes based on which responses will be "evoked" by what he conceives to be low and high overall intensities of attachment. It also appears that he postulates that, while the same five behavior patterns listed above remain important, during the first year of life they become incorporated into more sophisticated goal-directed systems that are organized and activated to maintain a child in proximity to his mother; and to take some account of situational determinants (e.g., mother's whereabouts) for the various behaviors which he feels mediate attachment and for various other responses (e.g., exploration) which are incompatible with attachment behaviors. Thus, some of the criticisms in this chapter, based on Bowlby's published works, might be qualified when his forthcoming theoretical statement is published.

represent more possible contexts for mother-infant interaction from which the attachment develops than specific behavior indices of attachment. Even so, by implication, the composite strengths of sucking, clinging, and following, as well as crying and smiling, the primary "instinctual response systems mediating attachment to a mother-figure" (Bowlby, 1960a, p. 315), would reflect the child's attachment to her. From soon after birth onward, conditions of isolation tend first to activate crying and later clinging and following; and "until he [the infant] is in close proximity to his familiar mother-figure these instinctual response systems do not cease motivating him" (1960b, p. 93). Bowlby maintains that until the infant attains proximity to his mother, his subjective experience is that of "primary anxiety"; when he is close to her, it is that of "comfort." Thus, Bowlby has also assumed that, once these instinctual response systems are activated, any interference (e.g., through separation from the mother) with their termination must lead to distress and anxiety, as will frustration of other "primary instincts." Hence, the distress and protest responses to separation from the mother reflect "primary anxiety," and are related to the fear responses exhibited by many species to aversive (often including novel) stimuli, in that both are reduced not simply by avoidance behaviors but by escape to a place of safety, like that provided by the mother. (When separation continues, the result includes despair, and later, emotional detachment.)[50] Thus, after an attachment is acquired, Bowlby assumes that the distress brought about by either separation from the mother or the presence of aversive stimuli may be reduced by the same condition: physical proximity to the mother. Hence, the same behavior systems which Bowlby holds are involved in, and, we presume, index, attachment may, in the context of threatened or of actual separation from the mother, also index distress and may be viewed as disorganization behaviors.[51]

Ainsworth (1963, 1964), whose approach derives from Bowlby's, identified thirteen behavior patterns that she took to mediate the attachment of the infant to his mother. Of these thirteen indices, eleven reflected positive stimulus control. Each of these responses normally enters children's repertories at different time points during the first half-year of life, and the indices may thus involve several

[50]Bowlby has conceived of *protests* as involving especially the issue of separation anxiety, *despair* that of grief and mourning, and *detachment* that of defense (Bowlby, 1960b). Schaffer's (Schaffer & Emerson, 1964) results for protest responses suggest to Bowlby that the child's separation anxiety on losing his mother is not exhibited by him before about 28 weeks. These findings are considered later in this section. The earlier section which questions the utility of age variables in the study of development is pertinent here also.

[51]Harlow's approach to the reciprocal attachment pattern of the rhesus macaque infant and mother, which details the developmental course of these systems, appears to be conceptually rather similar to Bowlby's. Thus, Harlow (1959, 1961, 1963; Harlow & Harlow, 1965, 1966) has described the affectional system of the infant macaque for his mother as proceeding through a series of overlapping developmental stages (that reciprocally complement the maternal stages). These developmental stages he has termed: reflex, comfort and attachment, security, and separation or independence. (We will consider primarily the first two stages here, as they relate to Bowlby's assumptions. The reciprocal maternal stages are: attachment and protection; transition or ambivalence; and separation or rejection.) During the first 10-20 days of life, the neonate's survival is insured by his "reflex" behaviors, which include those that facilitate his proper orientation to the mother's body, nourishment (via sucking), and physical support (via hand and foot grasping, clasping, etc.). The basic social relationship between infant and mother develops after the second week of life, during the comfort and attachment stage. The infant's responses are now mostly under voluntary control, and he maintains close physical contact with the mother through nursing and particularly through clinging. (This latter response is also the most prevalent behavior of the infant during the security stage, as evidenced by the observation that mere contact with the mother-figure is apparently sufficient to alleviate the infant's fear [of strange objects or surroundings].) Further, the infant follows (by both visual and locomotor means) the mother and imitates her behaviors, a facet of his development which Harlow considers an important factor for macaque socialization.

Harlow considers these basic mechanisms that bind the macaque infant to his mother as homologous to those Bowlby (1958) has described for the human infant: primary object sucking, clinging, and following. Further, it would seem that Harlow (like Bowlby) considers the differential behaviors of the infant for his mother, and particularly those falling under the headings listed, as the indices of the attachment (and as the behaviors which result from separation from the object of attachment).

developmental levels. The eleven positive stimulus-control indices Ainsworth used were differential smiling, differential vocalization, visual-motor orientation, following, "scrambling" over mother, burying face in mother's lap, exploration from mother as a secure base, clinging, lifting arms in greeting, clapping hands in greeting, and approaching through locomotion. Her two negative indices were differential crying (crying when held or comforted by another person relative to crying shown to mother), and crying when mother departs. Ainsworth assumed that during the first year of life infants pass through four partially overlapping social-behavior phases, which are indexed by different patterns of the thirteen indices: undiscriminating responsiveness to people; differential responsiveness to the mother; sharply defined attachment to the mother, with striking waning of undiscriminating friendliness; and attachment to one or more familiar figures other than the mother.

Bowlby bypassed the issue of the interrelationships among attachment indices (which, at most, he only implied); and while Ainsworth informally grouped subsets of indices, like Bowlby she detailed neither the acquisition process for attachment nor the relationship between social dependence and attachment. For reasons that are not specified but which Ainsworth indicates stem from her conception that attachment involves affection and discrimination as to object person, and that its formation depends upon active interchange with the object whose response is reciprocally affected, she implicitly treats the term attachment as a gross rubric for the study of various interaction-response patterns between mother and child. Hence, while Ainsworth has written of attachment as if it were an entity reflecting a single underlying dimension, with all thirteen attachment-behavior patterns somehow becoming organized together in relation to the mother as object (through an unspecified process), she has also written that attachment soon afterwards becomes directed to other "favorite figures" (which, unspecified as to form, may border on what we have termed social dependence and hence may obscure the distinction between nonfocused and focused dependence), and that not all thirteen behavior patterns need be included in, or essential for, a particular attachment. On this last point, Ainsworth reported that "the attachments of some infants seemed chiefly mediated by crying when mother leaves, by following, and later by clinging. The attach-

ment of others seemed more conspicuously mediated by greeting, smiling, vocalization, and visual-motor orientation" (1964, p. 57). While in this report she did not attempt to classify these or other outcome patterns as distinct varieties of attachment, in an earlier study. Ainsworth (1963) classified infants with outcome patterns like the above as "insecure attached" and "secure attached," and termed a third pattern "non-attached." Thus, it is not actually clear whether Ainsworth preferred to assume that diverse subpatterns nevertheless reflect a unidimensional conception of attachment, or whether she preferred to classify them as distinct varieties of attachment.

It has been seen that both Bowlby and Ainsworth in their complementary approaches to the emergence of attachment state that the various component behaviors of the infant they have emphasized become organized and focused on the mother figure through learning (i.e., experience with the environment). However, as we have noted, neither theorist details the conditions for the acquisition of attachment in even a preliminary fashion to show the form of the learning through which those component responses become integrated and focused, nor do they detail whether those responses undergo topographic changes during development. It has been shown that responses like those Ainsworth used and Bowlby implied as indices, particularly eye contact, smiling, vocalizing and crying, can be instrumentally conditioned (or extinguished) in the early weeks of life (e.g., Brackbill [1958] for smiling; Rheingold et al. [1959] and Weisberg [1963] for vocalizing; Etzel & Gewirtz [1967] for eye contact, smiling, and crying), and that the age of their onset and selective discriminative control may vary in diverse environmental settings (Gewirtz [1965] for smiling). However, Ainsworth did not attempt to detail the impact of learning on her response indices except to argue (gratuitously) that the behavioral components of attachment patterns initially "are clearly unlearned"; and like Bowlby, she conceives of these responses as becoming "tied into attachment patterns . . . only when they become differentially directed towards different figures . . ." (Ainsworth, 1964, p. 57), but does not detail how this organization comes about. This may be tantamount to saying that a child will be conceived to have an attachment whenever any of the thirteen response indices are directed differentially toward persons.

Further, we have noted that although Bowlby's five instinctual response systems (and Ainsworth's parallel behavior patterns highlight some key settings for intensive mother-infant interaction in which there are potentially many recurring conditioning opportunities that a sequential-learning approach to attachment must ultimately detail, Bowlby makes no attempt to detail the learning processes involved. Yet there is an extensive research literature which suggests the countless ways in which learning (in the sense of systematic increases of behaviors in particular discriminative contexts) can readily be affected by recurring stimulus conditions. Thus, various S-R sequences are surely involved in the complex clinging context, with sequentially occurring responses in the presence of sequentially provided stimulus events; and the component responses of these chains would be in the position to be potently reinforced, for instance, by

stimuli provided via contingent physical contact from the mother. At the same time, those appearance characteristics of the mother that are discriminative for such reinforcement could become conditioned reinforcing stimuli; thus constituting an aspect of attachment learning. The interaction settings of Bowlby and Ainsworth and the latter's phases and selected indices all reflect the stimulus control (mostly positive) over the behaviors of the child that is exercised by the appearance and behaviors of the object mother (and a very few others) that I have argued is the essence of an attachment and can be analyzed in the simple learning terms outlined.

Despite the fertile context for rapid conditioning that the reciprocal social interaction setting comprises, the assumption that the infant's crying and smiling behaviors innately release species-specific attention and care patterns in the mother was strongly reaffirmed by Bowlby (1961) in his rejoinder to my attempt to fault that position (Gewirtz, 1961b). Bowlby argued that ". . . the suddenness with which maternal feelings often make their appearance and the overwhelming compulsion they bring to attend to and care for the baby seem to require some other explanation [than learning]. Since species-specific behaviour patterns are so clearly at work in other mammalian species, why need we baulk at postulating their presence in man?" (pp. 301-302).[32]

In this rejoinder, Bowlby ignored the difficulties which I had pointed out (Gewirtz, 196lb, pp. 233-234) in postulating innate releasers of species-specific caretaking behaviors. These were: first, Bowlby's assumption would be difficult to validate, for it requires that we exercise a sufficient degree of control (which is not easily done) over the histories of human adults to rule out the possibility that the control exercised over caretaking behaviors by the stimuli provided by infant smiling and crying is not acquired through learning. On the basis of abundant evidence that, relative to lower animals, a rather large proportion of human adult behavior systems would seem to be determined by experiential

[32]Scott's (1967) view of social attachment is not unlike Bowlby's and Harlow's. Like Bowlby, Scott contends that such responses as crying and smiling are elicited by innate releasers (e.g., the presentation of a face) and are neither products of learning nor contributors to an attachment formation in accordance with operational-learning conceptions. (Scott feels he does differ from Bowlby, however, in that the five child responses the latter emphasized do not themselves mediate the attachment bond, but rather, they represent positive behavioral mechanisms which lead to close contact with the mother and thus make possible the formation of the bond, the basic requirement being merely prolonged contact between child and mother.) Further, Scott appears to share Bowlby's narrow view that the class of reinforcers that can operate under a conditioning approach is limited to food, water, and the removal of noxious stimuli. Thus, as evidence of the inability of an operational learning approach to explain attachment formation, he cites studies like Harlow's (1958) which have been interpreted by Harlow to indicate that feeding by the mother is an unnecessary prerequisite for the formation of an attachment-bond between child and mother. And Scott therefore concludes that the process of social attachment is "something which takes place entirely within the animal, not being under the control of external stimulation" (1967, p. 503). While the findings cited by Scott are not disputed, they do not provide sufficient evidence to invalidate an approach like ours, for what Scott and others holding a similar view have neglected to consider is the wide variety of other reinforcers dispensed by the mother that could function in the formation of the attachment in accordance with the operational-learning principles described in this chapter.

learning, it is at least equally plausible to assume that the possibly homogeneous aversion (negative reinforcing properties) of infant crying or the uniform delight (positive reinforcing properties) of infant smiling for parent-caretakers of both sexes, could be products of learning that may reflect the nearly universal value orientations placed on these infant behaviors. There are several possible reasons for the reinforcing effectiveness of infant smiling and crying for caretaker behaviors. First, the human infant is, generally speaking, an enigma to his caretakers. His smiling and crying (which are similar to the responses of adults in certain contexts) can serve to communicate to them important information about his overall well-being, which is of great concern to them. Thus, caretakers will consider a child's crying as a response to (the presence of) aversive stimuli which they must remove. Crying can also be aversive to the caretaker because of its implication of inadequate caretaking behavior on her part. On the other hand, an infant's smiles to his caretaker could provide positive reinforcers for her behaviors (as she may associate the smiles with the valued conditions of being liked, appreciated, recognized, or preferred to strangers). Smiling may also serve as a discriminative cue for the adults that other (interesting and charming) reinforcing stimuli may be forthcoming, such as vocalizing or reaching for them (as objects). Thus, caretaker behaviors which are followed by the cessation of crying or by the initiation of smiling can be strengthened, whereas those which are followed by the cessation of smiling and the initiation of crying can be weakened.

We reiterate then, that while unlearned and species-specific behavior systems of the human infant or of his mother might well be involved in their early interaction, as Bowlby and Ainsworth have proposed, it is a fundamental assumption of a conditioning approach like ours that these systems would more likely establish the context and limits for the reciprocal social dependence or attachment learning of the infant and of his mother, but do not in a direct manner themselves represent dependence or attachment. As the assumptions of Bowlby and Ainsworth can readily be translated into the standard social-learning principles discussed in this chapter, it is assumed that the organization and focusing that, for them, is the key to attachment formation would take place according to such conditioning principles, and that the interaction arenas they emphasized provide key opportunities for that acquisition.

In the conditioning approach advocated, the issues remain open concerning the specific organization of behavior systems under the headings of dependence and attachment. Hence, the following issues remain to be resolved: which stimuli for the infant's behaviors are initially unconditioned (releasers); which unconditioned infant responses are most likely to occur to the stimuli that are initially present in the child's vicinity; whether any of these responses are species-specific; which developmental changes occur in receptor systems (i.e., discriminative capacities) and effector systems (i.e., responses); which reinforcing stimuli are likely to condition cue aspects of the mother-figure as conditioned reinforcing stimuli; and which of the attachment behaviors (e.g., orientation, approach, and following responses) come to be maintained by

those conditioned-reinforcing stimuli. It is kept in mind that some of these questions are also applicable to the reciprocal attachment formation of the mother-caretaker and others to their charges. Further, our conditioning approach does emphasize (and is open to) the potential reinforcing efficacy of stimuli provided through the response of following (e.g., those termed environmental changes) and through skin and other contacts (e.g., via clinging) (Harlow, 1960, 1961, 1963; Harlow & Zimmermann, 1959). Hence, on these issues, Bowlby's ethologically influenced theory would complement a learning approach like the one proposed, and would seem completely compatible with it, given the current level of specificity of his theory and the openness of the learning approach.[53]

The choice of relevant attachment-dependence indices. Given the present limited degree of specificity of theoretical contexts in which such concepts as dependence and attachment have evolved, and the consequent absence of close coordination between the theoretical terms and the empirical operations, we have seen that there are often what appear to be fundamentally different phenomena that could be grouped under each concept. Yet the two concepts are often defined identically. However, if they are defined at the same level of abstraction, attachment and dependence behavior indices need not correlate with each other, or within themselves, in any simple manner, or even at all. In the context where the relevant theories have not progressed sufficiently to detail the behavior chains characterizing the sequential contingencies in interactions, many and diverse behaviors might be reasonable indices of either attachment or dependence, or simultaneously of both.

The typical behavioral indices of dependence are naturally occurring approach responses which are maintained by positive stimuli provided via the

[53]The preceding points, together with a number of others that have been involved in considerations of the acquisition of dependence and particularly of attachment, have been detailed in an earlier extensive analysis in social-learning terms of the acquisition and maintenance processes at issue, as well as of the modes of operation of possible unconditioned stimuli in early human life (Gewirtz, 1961b). In addition, that analysis considered such related issues as: the implications for dependence and attachment of ethological research on releasing stimuli, species-specific behaviors, and species differences; the apparently unconditioned and conditioned reinforcing stimuli that may operate in the early months for the human infant; the similarities between imprinting and attachment learning (which analysis was misinterpreted by Salzen [1967], who cited my position as emphasizing the critical importance [rather than merely the likely operation] of contact for attachment learning in humans and in animals); forms of substitute attachments and how they are acquired; the role of a limited environment ("privation") or a gross shift in the maintaining conditions of the environment ("deprivation," as through separation) upon outcomes in dependence and attachment behaviors; the role of particular infant response systems (e.g., clinging, orienting toward, smiling, vocalizing) in possible human imprinting, and in the acquisition of dependence and attachment; a critique of Bowlby's (1958) ethological approach to infant attachment, which included suggestions about various points in Bowlby's conception of the formation of an attachment at which instrumental-learning considerations could enter; and lastly, possible bases were considered for the acquisition of a dependence and/or an attachment by parent-caretakers *to* their infant charges. Some of these issues are also considered in two of my recent papers (Gewirtz, 1968a, 1968b).

behavior of other persons, and hence index positive stimulus control. Included are responses such as bodily contact, nearness, appeals for reassurance, and seeking attention or approval (including the approach index of deviation [from standard] or annoyance behaviors for attention) (e.g., Beller, 1948, 1955, 1959; Gewirtz, 1948, 1954, 1956a; Sears et al., 1953; Sears, 1963) that may be stratified, for instance, by object class (whether made to adults or children) or by degree of mother's availability (Sears et al., 1965). On the other hand, the behavioral indices of attachment may include similar direct indices of the positive stimulus control acquired by the object person over a child's behaviors, but they also typically include, and may be almost entirely restricted to, emotional behavior (symptom) indices which reflect behavior disorganization effected by disruptions in the opportunities for the child to exhibit those responses (reflecting positive stimulus control) he ordinarily would show in the presence of the stimuli provided, either because the stimuli are simply no longer forthcoming in that context, e.g., through removal (separation) from the child's proximity of the "object" person who has typically provided those stimuli, or because the child is blocked from receiving the stimulus or from making a response to stimuli from the object person. These disruptive emotional responses may include protests, crying, anxiety, and tantrums, as well as misery, apathy and emotional detachment as the separation continues (cf., e.g., Bowlby, 1958, 1960a, 1960b; Ainsworth, 1964; Schaffer & Emerson, 1964; Cairns, 1966). (Some of the determinants and effects of behavioral disorganization were detailed in an earlier section on the effects of shifts in the maintaining environment.) Cues provided by the mother's departure (which Bowlby [1960b] regards as evoking a form of "primary anxiety") or by the presence of stimuli that are for any reason aversive to the infant may also evoke responses which, while in other circumstances may function simply as approach behaviors maintained by positive stimuli, in these stimulus contexts may be viewed by some as "security-getting" behaviors. These may include approaching, remaining near, and physical contact (including clinging) responses, which are often strong and can seriously disrupt ongoing S-R sequences.

It is clear that both diverse approach responses (including approaches for security) and diverse disorganization responses could provide plausible indices of dependence and of attachment, that a given orientation could emphasize indices from both classes, and that depending on their particular purposes, it could be an efficient tactic for theoretical orientations to emphasize some particular index or different sets and proportions of indices from each of the two classes. Thus, we have seen that Ainsworth (1964) used eleven approach and two disorganization indices for her purposes. In my earlier analysis (Gewirtz, 1961b), I opted implicitly for a strategic emphasis on diverse, simple approach response indices rather than either approach indices based on security behaviors or disorganization indices. My underlying assumption was that, relative to disorganization indices, approach indices more directly, and hence more efficiently, reflect the positive stimulus control process at issue. Even so, it could be an efficient tactic to emphasize security behaviors or disorganization indices in a research approach whose purpose is not to deal directly with issues of positive stimulus control over relevant behaviors as such, but rather to understand the disorganization brought on by interference with attachment behaviors, or disorganization generally.

There are serious problems concerning the choice of behavioral indices and the generality of inferences to be drawn from them. For one, explicit recognition is almost never given to there being, under the standard conceptions of dependence or attachment, many and diverse potential indices of those concepts, a factor that should qualify inferences from any set of indices that are not representative under the theory of a researcher. Further, a number of tactical assumptions are often at issue in the use of indices in research done under abstractions like dependence and attachment. An implicit and unwarranted assumption that is often made is that the various indices of each of these two concepts are alternative measures of the same unitary process, that, therefore, they should intercorrelate highly (in principle, unity), and that the values of a single intercorrelation matrix should characterize all subjects in all situations. However, by the very fact that such numbers of variegated indices are used for each concept, many of which appear to have been selected somewhat arbitrarily for use by earlier investigators (e.g., Beller, 1948; Gewirtz, 1948), there is bound to be some overlap among these indices and they should intercorrelate on this artifactual basis alone. Another implicit and often unwarranted assumption is that there is independence between the occurrence of a behavior (index) and the settings sampled. Where that assumption is not tenable, the intercorrelation matrix would be biased by the sample of behavior settings that happen to be selected. If, in fact, in a given situation or across settings the indices represent either mutually exclusive or alternative responses (i.e., either one particular response, or any of a set of alternative responses, is appropriate in the setting), the correlations among responses for any group of subjects could be either positive, negative, or zero order, depending upon the imperatives and constraints in the situations represented and the relative response strengths based on the reinforcement histories of the subjects involved. Closely related to these points is the often neglected consideration that independently defined subcategories may overlap in physical stimulus qualities. Thus, it is difficult to conceive of a case where a child is held or caressed by an adult when he is not simultaneously touched or provided with positive attention, if not also with approval or affection. Similarly, a child who ordinarily or frequently would exhibit a behavior that is maintained by positive attention might, in a situation in which those around him are quite busy, exhibit negative deviations for attention. What often seems to be missing from analyses using such indices, however, is an awareness of these factors, a deficiency which often makes the research on dependence and attachment artifactually complex as well as arbitrary.

Thus, an expectation of finding that one set of correlation-matrix values will characterize the response interrelationships for some set of randomly selected subjects in a group may be an oversimplification. By the very nature of the life

setting with which we are dealing, it seems reasonable to suppose that the individual histories of children would differ in regard to each of the responses comprising the subcategories of such summary variables as dependence or attachment. On this basis, different subgroups may be expected in any sample of children studied, each with its unique characteristic intercorrelation matrix for behavior indices to reflect the different conditioning histories that could be involved. Thus, while in a sample or across samples of children we may find, on the average, a particular pattern of interrelationships among these subcategories (which finding, to be sure, would be of limited utility), we would expect there to be large individual differences among children on the interrelationship of these variables in a particular stimulus context. Consequently, generalizations about the relationship among the indices or between them and environmental settings would be limited due to these factors that would determine (bias) the intercorrelation matrix.

A number of studies in the past 15 years have all approached dependence in a fairly homogeneous manner, some of them using the same five behavior categories for dependency or slight variations on them (Beller, 1948; Gewirtz, 1948; Sears et al., 1953; Sears et al., 1957; Sears, 1963). Under an open-ended definition of dependence similar to Murray's *n succorance* (1938), these categories included behavior for physical contact, nearness, positive attention, negative (deviation for) attention, and reassurance, and the sum of all was taken to constitute a total dependency score. While the emphasis in these studies was generally directed to examining relationships between the total dependency score and various demographic and historical variables, attention was often given to the organization of dependence, i.e., the relationships among the five (or more) subcategories, the implicit thesis apparently being that the dependence subcategories should intercorrelate highly, at one time, across several time points, and across situations[54] (excepting as some might be less reliable than others or that the sampling conditions might have been more conducive to the occurrence of some subcategories than of others). Such subcategory intercorrelations or those between gross summary indices like total dependence and, e.g., some identification score, however, may prove to be of little theoretical consequence when abstractions like dependence and identification are reduced to their component functional relationships involving acquired stimulus control over responses. Only at this level of a functional analysis can one avoid what are difficulties at the more abstract levels, for instance, the fact that individual children display different or opposite patterns of behaviors or that some emit behaviors which are accounted for by the indices used, and others do not.

Further, while there might be something like a standard S-R interaction

[54]More recently, Sears (1963) has interpreted his analyses of the dependency subcategories to indicate that it is not warranted to conceive of the organization of dependency subcategories as reflecting the existence of a common trait (in Allport's [1937] sense), but rather that it would be more fruitful to consider each of the five subcategories separately with respect to its origins. Nevertheless, for his sample Sears, too, intercorrelated the five subcategories and correlated each of them with assorted demographic and historical measures.

chain that characterizes sequential attachment behaviors for an identified sample of children homogeneous in history or within a particular setting, it is plausible that the behaviors of individual children would be organized according to quite different patterns of interaction chains, and further that some responses used as indices may have a certain relation to other responses in the chain, for instance, one response may be a precondition for another response. Thus, in the standard (and perhaps artificial) setting in which assessments are made, Child A might be (misleadingly) scored higher on nearness behaviors and lower on negative attention-seeking (crying) behaviors than Child B, simply because the first response of Child A to stimuli early in an attention-seeking chain pattern might be moving near while that of Child B might be crying. Further, at later phases in the learning, there may be "short-circuiting" of the chain as it becomes more efficient, with fewer behavior steps leading to, for instance, approval or attention, than had been involved at an earlier point. There are also dynamic implications from the standpoint that if a response to a stimulus close to the end point of the chain cannot occur (due, for example, to the imposition of some barrier), it is possible that the child would employ with greater frequency a response to the stimulus which occurs earlier in the organization of the sequence. Thus, if only selected responses are observed while the entire S-R chain and its history are overlooked, an incomplete, even misleading, impression of the child's behavior pattern may be obtained.

A conception of a common S-R chain can illustrate some of the reasons why we would not expect the subcategories of dependence or attachment to relate to each other in a homogeneous way, or necessarily even at all, especially for children selected for study without regard to their S-R chain histories. Furthermore, the particular situational conditions in which behaviors occur may dramatically affect the operation of a chain. That is, in some environmental settings (such as those involved when a child is ill) one set of segments or patterns of chain responses would be likely to occur, while in another environmental setting a quite different organization of the subcategories might occur. Further, the momentary setting conditions involved (such as when a child is hungry) would differentially affect the efficacy of stimuli and hence the behaviors for which they are discriminative or reinforcing. Thus, an understanding of the stimulus conditions comprising the situation, and of the setting conditions operating, is critical for the comprehension and prediction of the pattern in which the dependence or attachment responses are organized.

There is a further issue with regard to the behaviors which generally serve as indices of dependence or attachment. There have been many laboratory studies of the reinforcing efficacy of social stimuli as reflected in changes in the attributes of responses upon which those stimuli were made contingent. While such reinforcing stimuli (e.g., the word *good*) and the responses they control are not ordinarily considered to be related to dependence behaviors usually studied in life situations, these stimuli are often similar to, or identical with, those maintaining behaviors classified under dependence. Hence, it should be instructive to examine the functional relationships into which these social stimuli enter.

At the very least, they may illustrate the utility of using a single response (index) in research.

As has been shown, there are in use many and variegated indices of dependence. Some detrimental consequences of using uncritically a large number of such indices have already been noted. One point should perhaps be reemphasized, however: the use of several presumed indices of a process is not in itself detrimental, *if* the possible consequences of this practice and the complexities involved are taken into consideration. A related point that is only too seldom considered in the dependence-attachment research area is the possibility of using a single behavior index (e.g., all attempts to get some response from another person) and a single measure of that behavior (e.g., its rate or latency on each trial). This tactic (which is a convenient one), based on the finding that various alternative measures of response strength relate only imperfectly to each other,[55] has often been fruitfully used in conditioning studies, e.g., of bar-pressing. Thus, a single response class may be sufficient for a researcher's purposes if found (1) to be reliable, (2) to be either representative of the range of the stimulus control process or reflective of response(s) that are representative, and (3) to enter into some reasonable relationships with independent variables under the researcher's expectations.

In contrast to the half-dozen or so behaviors typically used to index dependence, the number of attachment indices (with the exception of the thirteen used by Ainsworth [1964]) may be small (even one, as might be the case when a protest or fear index upon separation is employed). The practice of employing few indices is not, in principle, unreasonable, for, as has already been noted, there are research contexts in which a single representative response index may make possible considerable research progress, such as the finding of significant relationships with independent variables that are important under a given theoretical approach. Thus, much has been made of the differential reinforcing efficacy of the word *good* for a choice response following differential deprivation and satiation pretreatments to which subjects were exposed (Gewirtz, 1967a, 1969; Landau & Gewirtz, 1967). There are, however, still several reservations which should be noted regarding the use of a small number of attachment indices. The first consideration already noted stems from the fact that attachment indices have been mostly disorganization responses, and because they are indirect may be less sensitive to a stimulus-control conception, and in that sense less efficient than are direct stimulus-control response indices. Since disorganization indices may not operate in the lower portion of a hypothetical disorganization dimension (e.g., due to there being an operative threshold), it might require a large degree of disorganization to provide a nonzero score on that index. A potential limitation like this one would be less likely to operate were direct indices of positive stimulus control used.

[55] It is recalled that Osgood (1953) reports that the correlations among indices like resistance to extinction, latency, and amplitude are heterogeneous; and that Hull (1943) emphasized primarily resistance to extinction as his index of response strength.

A second consideration when a single response is used to index attachment in life settings is that the response could actually be under some special form of social-stimulus control independent of that implied in attachment. Thus, the utility of single indices is limited by the difficulty of insuring that they are not simply reflections of idiosyncratic conditions in children's unique conditioning histories, for, in the case where they are, these single indices may be unrepresentative of the broader set of positive stimulus-control functions that is implied by the term attachment under most theoretical orientations. For instance, we have already noted that Etzel and Gewirtz (1967) have shown that crying can be very easily maintained (i.e., reinforced) by caretaker attention (i.e., her hovering around the child, talking, picking him up) even in the early weeks of life (which is also well before the time many would conceive that an "attachment" could have been acquired). Thus, if a single index is used as in the Schaffer and Emerson research (1964), such as one that summarizes (interview) reports of the occurrence, intensity, and direction of protests after seven different separations of children from the parent, the single crying-fussing response index of attachment under this practice may in reality reflect merely the fact that the children had been heavily reinforced for displaying such behaviors in similar (or certain other) situations (for instance, whenever their mother was about to leave their vicinity.).[56] In this case, therefore, protests in separation situations, which might otherwise index the children's strong tie to their mother, would only reflect the limited fact that their mother reinforced protest behaviors and that such behaviors were merely a part of the child's conditioned response repertory. Indeed, differences in such specific training conditions, particularly in the discriminability of the unique cues provided by the object mother, might account, in part at least, for the pronounced individual differences in the age of onset of specific attachment found by Schaffer and Emerson. Further, a single index might be extremely unrepresentative, as children might show rather little attachment by other indices that reflect either positive or negative stimulus control. We have already seen that different subject histories in regard to the responses comprising subcategories of such global variables as dependence and attachment confound the difficulties of interpreting the results of studies which rely on a method such as that of intercorrelating indices for an unselected sample. A functional behavior-oriented analysis of the stimulus conditions that have acquired control of relevant responses of the individual could help to eliminate such confounding factors (whether single or multiple indices are used).

The basic point to be made is that the use of such abstractions as dependence and attachment can obscure the fundamental characteristics of the processes

[56] This possibility is not listed for the purpose of impeaching the Schaffer and Emerson findings on the relationships between age and protest scores (and age and scores from systematic observations of the infant's response to various degrees of approach by the interviewer), for by employing their response index in various situations they may have had the equivalent of several indices. However, in studies conducted in life settings, the validity of research findings may be qualified by the use of a single index of attachment when account is not taken of the issues raised here.

loosely grouped under these rubrics. Thus, the emphasis of theorists using such gross abstractions has been primarily on summarizing behavior, and almost not at all on the stimuli which control and maintain such behavior. And even when stimulus conditions have been considered under summary abstractions, the moment-to-moment differences in behavior caused by the moment-to-moment changes in the controlling stimuli have not been considered. Neither has there been an adequate tie-up between presumed dependence or attachment behaviors as outcomes and various extreme conditions as antecedents. Research approaches in the past have tended to rely on the method of studying generalized patterns of stimulation provided by the environment, such as nurturance, consistency, and frustration, and of relating them to comparable traits in the behavior of children, such as dependency, insecurity, and attention-seeking. These gross abstractions have by their nature limited the analyses of both the stimulus conditions and the behavior of the child. This is because they have tended to index only some average characteristics of the behaviors through extended time spans and have precluded the necessary articulation between the stimuli provided by the environment and the relevant behaviors of the child. That is, by dealing with the environmental stimuli and the child's behaviors under such generalizations, researchers have tended to neglect the sequential relationships of the discrete stimuli and the discrete responses. Such a method cannot help but miss the subtleties that various of the extant theoretical approaches would consider relevant and important.

Progress in the direction of understanding dependence and attachment would seem to require that more careful attention be given, for instance, under the social-learning theoretical formulation we have outlined in this chapter, to specifying more clearly the indices for these abstractions and examining more closely the empirical relationships involved. For example, as has been noted it is necessary to discover which unique (physical appearance and behavioral) aspects of the object person could serve (1) to reinforce and subsequently to maintain a variety of the child's approach and other behavior sequences, and (2) to provide, in the context of the child's behaviors, discriminative stimuli in the appropriate sequential order for the many interaction behavior chains which would be involved. It would be important to know also under which conditions the removal of particular stimuli provided by the object(s) might lead to crying, "sadness," disorganization and the like. This required analysis would encompass the identities, frequencies, varieties, and ranges of stimuli provided, and, for an analysis of the learning process, their sequential and timing relationships with such behaviors as smiles, which could constitute opportunities for those behaviors to become conditioned according to the classical or operant paradigms. The moment-to-moment impact on, and control of, behaviors, both by preceding and consequent stimuli—the meshing and interweaving of sequential environmental events (provided by the behaviors of the parent) with sequential behaviors of the child, in effect, the very essence of the interaction process—has often been directly ignored in analyses which employ gross variables, and is in fact at issue whenever summary concepts are employed.

Are Dependence-Attachment and Imitation-Identification Sequentially Related?

It has been common for theorists of social learning to assume a relationship between the two focal social-behavior systems we have considered in detail, dependence-attachment and imitation-identification. The factors assumed to contribute or relate to a child's identification with his parent-model, i.e., his pervasive imitation of the model's behaviors, include nurturance or love from, or social-emotional dependence on, the parent, and a personal attachment, strong tie, emotional intensity, or warm relationship between the child and the parent (e.g., Freud, 1933; Miller & Dollard, 1941; Mowrer, 1950, 1960b; Whiting & Child, 1953; Sears, 1957; Sears et al., 1957; Kagan, 1958; Bronfenbrenner, 1960; Sears et al., 1965). An alternative possibility suggested by Walters and Parke (1965) and Kohlberg (1966) is that imitative behaviors may precede the learning of specific attachments and that, by increasing the child's responsiveness to others, may thus directly or indirectly contribute to attachment learning. In our view, these issues may be artifacts of the gross level of conceptual analysis from which imitative-identificatory and dependence-attachment phenomena have been typically approached.

In life settings, social dependence-attachment behaviors and imitative-identificatory behaviors may be acquired concurrently or sequentially from identical or similar stimulus conditions, as both behavior classes are emitted in the presence of many of the same discriminative stimuli and are maintained by many of the same reinforcers provided by the parents. As changes in the social stimuli (and their efficacy) provided by the parents may be reflected in both imitative-identificatory and dependence-attachment behaviors, the acquisition of these two processes is not likely to be independent. Even so, one behavior class is not necessary for the acquisition of the other; they involve separate response systems that in theory can be represented by distinct paradigms, interdependent only in their use of some of the same stimulus elements for their acquisition and maintenance. Indeed, although the imitative response class is ordinarily defined more in terms of response similarity than in terms of the social stimuli that cue or maintain the matched responses, imitation is like other response classes that are under the type of social stimulus control implied and summarized by the concepts of dependence and attachment. In this special sense, imitation-identification behaviors that are evoked and maintained by social stimuli may be considered a subset of dependence-attachment behaviors, insofar as the former behaviors are a means by which the child can attain social stimuli from a parent (model).[57]

[57]There is no reason to expect, however, that the person to whom the child is most strongly attached—i.e., from whom discriminative and reinforcing stimuli (e.g., approval) should be most effective for his behaviors—will necessarily be the model for the child's behaviors. However, through differential reinforcement that person may determine who the model will be, as in the case of the mother who reinforces her young son for acting as his father does.

Thus, from our functional approach, the existence of a dependence or attachment to the parent-model, the quality of the relationship with him, or the degree to which nurturance and affection were earlier received are gross abstractions which summarize and index social-stimulus efficacy from a person (e.g., the parent) or a class of persons in functioning as discriminative stimuli and generalized reinforcers for the child's responses, *including* his imitative-identificatory ones. But such broad concepts are inevitably nonspecific about the details of these contingencies. It follows that, because a large class of imitative behaviors are maintained by social discriminative and reinforcing stimuli, the correlation between the strengths of imitative and attachment behaviors may be high, but this should not be taken to indicate that attachment is a precondition for generalized imitation, or vice versa. The search for such correlations, e.g., by Sears et al. (1957) and Payne and Mussen (1956), among others, may therefore provide information that is of limited theoretical relevance when both abstractions are reduced to functional relationships involving acquired stimulus control over responses, as in the functional analysis of this chapter.

THE ROLE OF MOTIVATION IN SOCIAL LEARNING

The phenomena usually grouped under *motivation* (the terms "drive," "need," and "motive" are assumed to be synonymous for our purposes) are important or relevant for nearly all theoretical approaches. In recent years, however, there has been an increasing realization that even our best conceptualizations of those phenomena have been far from adequate. Motivational terms have been used to serve diverse functions, and there has often been confusion as to which function a particular motivational term has been advanced to serve at a particular time. For example, drive concepts have sometimes reflected a focus on an energizing function for behavior, at other times, a focus on a reinforcing function or simply on the persistence of behavior. Further, drive concepts have sometimes been used to stand for assumed physiological states and sometimes simply to order or label specific antecedent operations assumed related to those states (e.g., deprivation-satiation for food or water). At the same time, drive terms have served as intervening variables or abstractions that focus in a loose way on organizations of specific behaviors or changes in their characteristics. These varied usages of motivational terms have led to a lack of parsimony and confusion. In this context, Cofer (1959) has wondered whether a distinct concept of motivation might not disappear as functionally unnecessary; and Skinner (1938, 1953) has routinely found the need for a special concept of motivation essentially unnecessary.

There is no argument in this chapter against the study of the events usually grouped under the heading of motivation, for they include most of the phenomena which our approach to social learning and those of others ordinarily attempt to order. Nor is there an argument against the use of motivation labels, for a label is only a word, and words and the syntactical relations in which they occur can be employed tightly or loosely, constructively or obscurely. However, after taking

note in this section of various ways in which drive terms have been used in early adaptive- and social-learning analyses and the often inadvertent consequences of these usages, it is our thesis that diverse concepts commonly grouped under the heading of conditioning can provide a more adequate heuristic account of most social-behavior phenomena, including a substantial portion of those ordinarily grouped under the heading of drive, than can less explicit motivation terms. The advantages of such an approach have been illustrated in an earlier section, in which relatively well-defined and extensively used conventional learning concepts were generally found better suited to the heuristic explanation of long-term privation and deprivation outcomes than was the short-term, deficiency-homeostatic, motivation model.

The consequences of various uses of drive conceptions are considered in this section under two main headings: unlearned motives in early social development, in particular so-called "natural motivation," and learned drives. And for the most part without employing drive terms, alternative and seemingly more parsimonious ways are presented that heuristically account for long-term and some short-term phenomena that such motivational terms are often posited to order. In the main, concepts that reflect acquired stimulus control of social behavior will be emphasized.

Some Unlearned Drives in Early Social Development

Various conceptions of innate "drives" for stimuli or for the attainment of certain goals have entered extensively in theoretical analyses of early social development. Several theorists have attempted to explain the functioning of selected stimulus events for infant behavior by postulating instinctive "needs," such as an "innate need of the child for a loving relationship" (Ribble, 1943, 1944, 1965), an "attachment need" as the motivational force behind the tendency to seek proximity with members of one's species (Schaffer & Emerson, 1964), or a need to value things that are consistent with or like the self (Kohlberg, 1966). As we noted earlier, drive terms have also been used in connection with behavior patterns labeled "curiosity" (Berlyne, 1950) and "exploration" (Montgomery, 1951) as conceived in the drive-reduction tradition, and those labeled "intrinsic motivation" (Harlow, 1950, 1953; White, 1959) and "manipulation" (Harlow et al., 1950) as conceived in the need-for-stimulation context. Various overlapping conceptions which attempt to subsume other nonphysiological drives, and which in many cases have been employed as explanations for such social phenomena as imitation or attachment, have included White's (1959) "competence" or "effectance" motivation (also Kohlberg, 1966) and Hunt's (1963) "information-processing" motivation. These terms have been introduced to account for empirical evidence accumulating during the past two decades which stands in contrast to the widely held homeostatic view, represented particularly by the approaches of Freud and Hull, that the organism whose biological needs (in the traditional meaning of that term) are satisfied and who is not threatened (by noxious events) is passive and essentially unresponsive.

In the psychoanalytic tradition, there have been parallel attempts to introduce an energy basis for ego psychology. Thus, sources of ego energy have been postulated ranging from Freud's tentative notions of desexualized libido, as broadened and systematized by Hartmann, Kris, and Lowenstein (1964) since 1939 to include the reversible neutralization of both sexual and aggressive drives, through Hendrick's (1942) postulation of an independent ego instinct of "mastery," and White's (1959, 1963) broadening of it to a position holding that the ego has energies of its own whose expenditure brings natural satisfaction (e.g., in dealing with reality).

The preoccupation of psychologists with homeostatic drives, drive reduction, energy, manipulatory-exploratory drives, mastery motives, and the like to explain the occurrence in early life of behaviors oriented to or maintained by stimuli has resulted in a lack of parsimony and in confusion. In all of these instances, the *only* index of the postulated drive is the occurrence of the behaviors that the drive itself has been posited to explain. Moreover, the gratuitous use of explanatory drive notions, which refer so imperfectly to only one side of the interchange between a child and his environment, has severely limited the conveyance of meaningful information regarding the early development of social phenomena.

Since "natural motivation" conceptions appear to have been postulated by theorists only to stand broadly for the occurrence of nonorganically driven behavior (Kohlberg, 1966), a parsimonious alternative would be to rid ourselves of the extraneous gear of "drives," "needs," "motives," "energies," and "urges" and to make the straightforward assumption that it is a fundamental property of a species like man, at all ages, to be potentially responsive to and in active commerce with the myriad stimuli in the environment, even when organismic requirements (for food, water, sleep, and the removal of noxious stimulation) are satisfied. This conception that responsiveness and action are simply part of the definition of the living organism is not a new one and has been advanced in very different ways, implicitly or explicitly, by theorists and researchers from diverse conceptual traditions (e.g., J. M. Baldwin, 1906; Piaget, 1952; Skinner, 1938; Woodworth, 1958; White, 1959), by researchers on animal and child play (e.g., Beach, 1945; Welker, 1961), and by collectors of normative data on infant responses to diverse stimuli (e.g., Gesell & Thompson, 1934).

It thus seems reasonable to propose that the organism's responses can be evoked and maintained by a great variety of environmental stimuli (both conditioned and unconditioned) that have no apparent survival value, at least in terms of traditional conceptions of organic drives. Once this *property of the species* is specified and listed in its proper place, the behavioral researcher, now unencumbered by imprecise drive notions, can instead concentrate on the strategic and tactical problems of determining the conditions under which a child is differentially responsive to particular environmental stimuli functioning in their evocative, discriminative, or reinforcing roles. In the last analysis it remains necessary to specify the conditions under which events are differentially "interesting" or worthy of "mastery."

A similar line of reasoning is applicable to the psychoanalytic notion of

neutralization of energy, which postulates that libidinal or aggressive energies can be turned from their original aims and can become useful to achieve the aims of the ego. For the researcher, once the energy is transformed the original aims are of no consequence, and he is still left with the problem of empirically identifying the new aims for which the energy is utilized. Thus, the energy conception is not only superfluous in this case, but may actually interfere with the careful specification of observable events.

An unfortunate consequence of the use of drive terms in this context of "innate drives for stimuli" is that these conceptions tend to obfuscate the reasonable assumption, which is perfectly compatible with operational analyses of learning, that various unconventional consequences (very different from food, water, and the removal of noxious stimulation) may account for the acquisition and maintenance of behaviors, i.e., function as reinforcing stimuli. The proposal made when this topic was first touched upon in our discussion of intrinsic reinforcement in the section on key constructs and their operating modes was that the outcomes for which such underlying "effectance" drive notions have been postulated can be conceived as functionally attributable to the operation of extrinsic reinforcement provided by opportunities to manipulate or to attain specific consequences. Thus, when "interesting" or "mastery" consequences are identified, they can simply be conceived as discriminative and reinforcing events. So defined, the competence-mastery drive approach of White, Kohlberg, Hunt, and others would be entirely compatible with operational analyses of the determinants of behavior and learning (like Skinner's [e.g., 1953] or our own similar approach to the issues in this chapter).

Further, the behavior ordered by such notions as competence or mastery motives may be conceived, under the operational-learning model being emphasized in this chapter, as resulting from certain pan-human conditions of learning, for it is certainly likely that in almost any caretaking situation various active behaviors in relation to the environment are heavily reinforced. On this basis, therefore, a competence or mastery motive would simply be a learned response tendency.

In this context, it is remarkable that explorations of short-term conditions (which have been termed "setting" or "drive" conditions) that determine the momentary impact of both conditioned and unconditioned stimuli on behavior have been so few in number and so narrow in range. This is noteworthy considering that (a) the functional relations involving those short-term conditions, especially deprivation and satiation effects, are perhaps the only set of relations many theorists would agree to classify as drive functions, and (b) the determinants of the "interesting" or "novelty" qualities of a stimulus could function as short-term setting conditions to affect its reinforcing efficacy (Gewirtz, 1967a). However, it may be that so little attention has been devoted to setting conditions in social-learning analyses because the casual use of the drive term has resulted in a loss of precision and a confusion in objectives, and has obscured the important relationships involved. Alternatively, given that the drive term has been applied so readily to setting conditions for appetitive stimuli, this lack of attention may

reflect the narrow belief on the part of many researchers that setting conditions are relevant only for stimuli pertinent to organismic needs.

An approach oriented to stimulus control would attend to the stimuli impinging on the child in early infancy, their temporal relationships with the child's behaviors, and the contextual conditions that account for variations in their discriminability and efficacy. It would concentrate on cataloguing the behavior of infants in terms of the number and variety of stimuli that potentially may evoke and reinforce behaviors in early life, rather than on singling out and perhaps reifying a few vaguely defined stimuli from the very large number that might be operating. Thus, a functional learning analysis such as we propose would have directional implications, which are lacking under drive models of social behavior, to indicate which behaviors will be affected and in what manner.

Learned Drives

Motivational concepts, also, have often been advanced to order behavior systems that are thought to be the outcomes of learning occurring through long time spans. These concepts have been expressed in such terms as *secondary, acquired,* or *learned* drives, which many have held affect human behavior even more than do recurrent organismic drives. These drive notions have been used in diverse ways and to explain myriad behavior phenomena in human development, contributing to definitional confusion and ambiguity as well as to an overlapping of concepts, surplus and inexact meanings, and an explanatory impotence. In particular, the inefficient use of motivational terms to explain the operation of simple conditioned reinforcers has led to a loss of precision in the specification of the functional relationships sought, the reasons for seeking them, and the theoretical language used to order these phenomena. The addition of the concept of learned drive to an analysis, while intended to serve a theoretical purpose, is often little more than gratuitous. Clearly, the functional relationships involved do not generally warrant the additional implications that stem from bestowing drive terms to the functioning of stimuli in the control of behavior.

In Hull's tradition, Dollard et al. (1939), Dollard and Miller (1950), Miller (1951), Miller and Dollard (1941), and Mowrer (1950) have written of "learned drive" and "conditioned fear," and Sears has advanced models for social learning parent-infant interaction employing concepts like nurturance "drive" (e.g., 1951). The points to be made here can be illustrated with the work of Miller and of Sears, whose drive conceptions appear to derive in part from Hull's notion of the "fractional anticipatory goal response" (r_g-s_g) mechanism by which the internal stimuli (s_g) assume drive value and can become associated with a variety of responses. Miller assumed that "learnable" drives are the product of responses that produce strong stimulation, and that conditioned reinforcement is the result of responses that reduce strong stimulation. Sears has conceived that the fractional anticipatory goal response-produced stimuli become integrated into the total stimulus constellation that instigates future behavior sequences. Although only the results of conventional learning

operations appear to be at issue in nearly all such analyses, with the behaviors involved completely explicable in terms of acquired stimulus control and with no unique effects on performance involved, the concept of drive has been retained. This usage of the drive concept may represent an attempt to be consistent within a particular theoretical approach (in the case of the theorists just cited, Hull's) or with labeling conventions that have long been established and maintained in given conceptual areas despite their ambiguities. As a consequence, some attention has been diverted from the stimulus control operations occurring and is instead concentrated on inferences regarding internal processes and the relative strength of various drive tendencies.

Motivation is treated not too differently by Rotter (1954; Crowne & Marlow, 1964) as an abstraction in his social-learning theory. Although Rotter has not employed drive terminology in his experimental analyses, he has introduced drive concepts into his theoretical work such as the highly connotative term "need," which he often uses to replace his habit terminology. He has defined a "need" or "motive" as a functionally related set of behaviors directed toward the attainment of a goal, which is conceived to be a set of operationally conceptualized, related reinforcers. (The determination of major goals or needs, assumed to be acquired through the law of effect and through association with physiological "primary" drives, is an empirical problem.) The means by which these needs eventually function autonomously to direct behavior remain unspecified, and Rotter's use of the term "need" may therefore be gratuitous, as it functions only to label behaviors under the control of a family of reinforcers.

Some learning theorists have attempted to explain certain persistent habit systems by postulating an avoidance-conditioning paradigm based on noxious stimulation that results in a motive to respond because of "fear" or "anxiety" (McClelland, 1942; Miller, 1951, 1959). Others have proposed that such an anxiety conception may be a basis for social-approach behavior systems, like those termed "affiliative" (e.g., Schachter, 1959), or that anxiety is the drive that energizes behaviors for money, prestige, achievement, or affection (J. Brown, 1953). These theorists apparently found the simpler conception of aversive stimulus control an insufficient basis for explaining such behavior systems. Their conceptions, however, tend to group behaviors with indeterminate terminology, thereby leaving the actual details of the relationship between various behaviors and environmental events unclarified.

The aversive paradigm, and not that involving positive reinforcement, has been emphasized for acquired drives in part because experimental attempts aimed at definitively establishing an "externalization of drive" (Anderson, 1941) based on positive appetitive reinforcement were either not sufficiently controlled (e.g., Calvin, Bicknell & Sperling, 1953) or have failed (e.g., Myers & Miller, 1954), whereas a "drive" based on aversive stimulation is easily established (Miller, 1948a, 1951). The justifications that have been given for the use of a drive label are that avoidance conditioning shows little extinction over many unpunished trials and that new responses can come under the control of the stimuli whose presentation cued the original avoidance response and whose removal reinforced

it. However, both characteristics may simply reflect the organism's failure to discriminate between extinction and maintenance conditions (thus delaying the extinction which must eventually occur if there are no further aversive contingencies), and the natures and relative potencies of the negative and positive reinforcers typically used in such experiments. The use of drive terms here, therefore, may be gratuitous, as the reinforcement of behavior by the removal of a noxious stimulus is solely a question of stimulus (reinforcer) control.[58] Further, although some persistent habits may fit an avoidance-learning paradigm, there is no evidence that all of them do or that a positive-reinforcement paradigm does not simultaneously affect those habit systems. An attempt to place all learned approach behaviors under this rubric would ignore a variety of other equally likely possibilities, many of which may be both more parsimonious and more inclusive of phenomena.

Many secondary drives proposed in the learning tradition appear to be little more than terminological transformations of what were at one time considered unlearned "instincts" or "purposive actions" (e.g., James, 1890; McDougall, 1950). As a consequence of Bernard's (1924) survey of these instinct systems which indicated that they invariably involved learning, many behavior systems classified as instinctive appear to have been simply transformed conceptually into learned-motive systems (e.g., Shaffer, 1936). Further, other learned motives, of which Murray's (1938) "psychogenic needs" seem representative, have been added to the large inventory. These needs include, among others, aggression, dominance, affiliation, succorance, and nurturance (the last three of which we have considered earlier together with behavior systems termed attachment or dependence). In such instances as these, therefore, the postulation of learned drives may have been more a relabeling of terms than a conceptual or theoretical advance.

We have seen in an earlier section that motivational terms have traditionally also been applied to *pervasive* behavioral systems such as imitation-identification, particularly when a behavior, acquired on the basis of extrinsic reinforcement, systematically continues to occur in the apparent *absence of that reinforcement.* Thus, Hindley (1957) applied the acquired-drive term to imitation occurring in situations without apparent reward, a usage bearing some resemblance to Allport's functional autonomy conception (to be examined in the next section), and Kohlberg (1963) has similarly proposed that one way in which identification differs from imitation is that the former is a "motivated disposition" because perceived similarity to the model has "intrinsic" reinforcing properties.[59] In the analysis of generalized imitation and identification presented at earlier points in

[58] It was not until much later that Miller (1963) formally considered the possibility that such drive terms and the theoretical framework from which they were derived may have been entirely unnecessary for the functional relationships at issue. At that time he formulated a new system built around a "go mechanism," which does not seem to differ substantially from an operational conception of reinforcer functioning.

[59] Kohlberg (1966) has subsequently proposed that the motivation for imitation is the same sort as that involved in curiosity, exploratory and mastery behaviors. This motive conception has been critically examined in several earlier sections of this chapter.

this chapter, however, it was proposed that the response class comprising generalized imitation (and identification) is acquired through extrinsic reinforcement of its members by reinforcing agents, and that it is maintained by intermittent extrinsic reinforcement. This very simple learning mechanism for acquired stimulus control over generalized imitation can account for its pervasiveness and strength, its focus on one model, and its occurrence in situations where the model is absent or where there is no extrinsic reinforcement for imitative responses, the very details of a response system that have prompted theorists like Bronfenbrenner (1960), Hindley (1957), Kohlberg (1963) and others to apply to it the term "acquired drive" or "motivated disposition." The application of drive conceptions to imitative-identificatory learning is therefore also unnecessary.

In a similar vein, Sears (1963) has referred to dependency as an acquired drive, and McClelland (1951) has postulated various learned needs, such as approval and succorance, which underlie such behavioral systems as dependence-attachment. We have seen in an earlier section that in each of these cases the use of drive conceptions may be gratuitous, as the approaches involve the use of gross abstractions which only summarize the effectiveness for the child's behaviors of various social stimuli, e.g., those from his parent or another adult. The phenomena involved could be better accounted for on the basis of the discriminative and reinforcing roles of stimuli, as the only factors at issue are those of acquired stimulus control over behavior, i.e., learning.

Some have felt that the use of a drive term is justified by the pervasiveness, strength, and persistence of learned behavior systems, even though such researchers treat their data as they would simple outcomes of learning. Ironically, a basic inconsistency in all these systems is probably the term "learned drive" itself, for in a sense it represents a contradiction in terms in a learning approach: the typical and least disputed usage of the term "drive" is in reference to shorter-term or momentary performance effects, while "learning" typically refers to longer-term systematic acquisition effects. This distinction between learning and performance has arisen and evolved in learning analyses and should nowhere be as valid as in learning approaches where, as my illustrations have shown, it is often obscured. In this context, there seem to be only two meanings of the term "learned drive" that are at all consistent with the consensus of the way setting or drive conditions that affect response performance have been employed. The first, referred to by Brown (1961) writing in Hull's tradition as "learned sources of drive," is that manipulation of a conditioned stimulus or response will affect other responses in the same way as will standard motivational operations like food deprivation, either by increasing "nonspecific drive" and affecting all responses, by producing distinctive cues, or both. How the determinants of the learning of a response operate as motivational variables when the response interacts with other responses is the question at issue in this usage. The second use of the term "learned drive" consistent with consensual usage is the labeling of a setting operation for a conditioned stimulus (e.g., deprivation or satiation) that heightens or lowers the efficacy of that stimulus (Gewirtz, 1967b). Both of these uses, however, require a precise specification of the stimulus operations and

the responses they affect, an approach which has not been routine in drive analyses.

The functional autonomy of motives. The persistence of various learned behavior systems in life situations that is said to reflect the complex "motive" structure characterizing the human adult has given rise to the notion of *functional autonomy of motives* (Allport, 1937). Allport conceived that these learned behavior systems come to be functionally independent of the maintaining-reinforcing conditions (and biological, tension-based needs) from which they were originally derived in early childhood, and become transformed in adulthood into varied, self-sustaining motive systems which are different in character and purpose. This process of "transformation of motives" Allport termed "functional autonomy." Observations of this phenomenon have been reported by Allport even under seemingly unfavorable conditions, such as when behaviors under those systems are punished or when they require much time or effort and lead to no identifiable extrinsic reward. This loosely formulated principle evoked considerable interest when it was first advanced, and it continues to play a role, if only to index the weakness of alternative learning conceptions. Even so, the functional-autonomy conception has been criticized on a number of grounds (e.g., Bertocci, 1940; McClelland, 1942; Rethlingshafer, 1943). And there have been ambivalent emphases on functional autonomy as a model for the acquisition of motives, probably due in part to the difficulty of subjecting the conception to experimental test. The functional-autonomy conception will be dealt with in detail in this section for two complementary reasons: to illustrate how basic learning principles can be used to account for important, contemporaneous human behavior systems and, at the same time, how the gap can be bridged between basic learning conceptions and complex personality functions.

Allport's anecdotal illustrations for functional autonomy reflect rather complex phenomena and settings where relationships between outcomes and their presumed antecedents are postulated many years after the original learning was assumed to have taken place. Because the level of the human behavior systems to which the term "motives" has been applied is remote from the level of the acquisition of stimulus control over responses of lower organisms typical of experimental analyses of conditioned reinforcement, some seem to have overlooked the fact that the phenomena at both levels have much in common. Reinforcement occasions, which can be so readily controlled in the laboratory, may and do often occur in life settings, but their control is harder to manipulate and their identity thus harder to establish there. Another difficulty lies in the fact that the reinforcement in the life setting is often intermittent, thereby making the discrimination between maintenance and extinction conditions difficult for both the subject and the observer. It is quite possible, therefore, that what appears to be functional autonomy is simply the result of an observer's failure to identify the reinforcers that are, in reality, maintaining a behavior system. Indeed, examples have been presented throughout this chapter of cases in which the maintaining conditions for a behavior system have not been obvious. In most

of these cases, observers, using various nonoperational theoretical frameworks, have routinely failed to identify the reinforcers operating.

A notion like functional autonomy for complex personality functions, even in the apparent absence of extinction, is thus premature[60] to a thoroughgoing analysis of the factors that may be responsible for the maintenance of a behavior in question. As has been suggested by McClelland (1942) and by Dollard and Miller (1950), we need first ask such questions as whether or not the original controlling stimuli were correctly identified and are now really absent, and then we must determine the effect of changes in contextual conditions on the retardation of the extinction process, for extinction may be occurring but so slowly as to go unnoticed. In addition, we must consider the possibility that in cases where the original reinforcing stimuli have been removed, the control of the behavior may have been transferred to a different set of maintaining stimuli, the process being unnoticed by the observer.

Rather than concentrate on the more constructive theoretical issue of whether or not reinforcement conditions for a behavior were maintained, some learning theorists have tended to concentrate on the lesser of the issues involved, the failure to find behavioral evidence of the extinction of "motives" in the complex contexts discussed by Allport (e.g., Dollard & Miller, 1950). Under laboratory conditions, responses followed by conditioned reinforcing stimuli that were previously on a continuous reinforcement schedule but are no longer functionally paired with effective, terminal reinforcers (as in S-R chains) undergo a rapid decrease in their rate of emission, signifying the loss of power by the conditioned reinforcing stimuli.[61] Although it is unreasonable to assume that this rapid loss in reinforcing value by the conditioned stimulus on a continuous reinforcement schedule provides a proper baseline for the functioning of conditioned reinforcers on intermittent reinforcement schedules in life settings, many motivational theorists have made this unreasonable assumption.

Because conditioned reinforcement is the key concept by which conditioning approaches account for much of human behavior, Hall (1961) has called for the demonstration of the efficacy of conditioned reinforcers over long time spans without their even occasional association with primary reinforcers. Some learning theorists, therefore, have felt it necessary to attempt to show that conditioned

[60] This argument parallels the one earlier advanced when we considered the utility of conditioning principles for understanding another complex behavior system, first-language acquisition and performance.

[61] If in this issue the focus is on the removal of the terminal, functional reinforcer in the chain that has followed the conditioned reinforcer and the preceding response it maintains, then the relevant behavior paradigm for the decrease in the rate of the response monitored would seem to be that of *extinction:* all responses in the chain undergo extinction. However, when the emphasis is on the fact that, with successive contingent presentations of a reinforcing stimulus, whether it be of unknown history, apparently unconditioned, or conditioned, a new response (e.g., one that was *not* part of the original S-R chain in which a conditioned reinforcer may have acquired its value) systematically decreases in its rate of emission, the paradigm that fits this phenomenon most closely is that of ***habituation.*** Even so, this loss of reinforcing value for behavior by the contingent conditioned stimulus has sometimes been indiscriminately termed "extinction."

reinforcement value, when acquired and maintained on an intermittent schedule with respect to primary reinforcement (conditions thought to be characteristic of those available in life settings), can be made more resistant to extinction than ever before shown. By implication, these results would provide the required demonstration of how, in the life setting, conditioned reinforcers can maintain responses almost indefinitely. For instance, Mowrer (1960b) and others have emphasized the finding of D. W. Zimmerman (1957) that by creating S-R chains in which each stimulus element is on an intermittent schedule with respect to the next, behaviors can be maintained for a relatively long period in the absence of functional, terminal ("primary") reinforcement. A succession of such intermittent schedules appears not unlike that of the life setting in which functional reinforcers follow the conditioned reinforcers dispensed by a caretaker only intermittently, and these conditioned reinforcers in turn follow the child's behaviors only intermittently.

Such results as these have clearly extended our knowledge. However, even with potent conditioned reinforcers operating in the life setting, their loss of reinforcing power for responses must eventually, and rapidly, occur if the original maintaining conditions are removed and there has been no substitution for them. Thus, demonstrating a heightened resistance to loss of reinforcing power by conditioned reinforcers in the life setting does not take incisive hold of the main issue implied in Allport's (1937) postulate that the relationship between acquisition conditions and behavior outcomes is historical rather than functional, with the behavior systems involved assumed to be autonomous of the acquisition conditions. Nor does this demonstration take into account the questioning within conditioning approaches of the adequacy of the conditioned-reinforcement concept. In a context where it is not recognized that the conditioned reinforcer must rapidly lose its efficacy in the absence of at least occasional pairing with a functional reinforcer, the utility of the conditioned-reinforcer concept as well as the general utility of conditioning approaches to complex human behavior for which this concept is the cornerstone is impeached.

Both these issues are resolved in our treatment. It is our contention that effective pairings between conditioned and functional reinforcers continue to occur in life settings, as do the conditioned-reinforcement contingencies maintaining key behavior systems, so that the conditioned reinforcers retain their value and the behavior systems they maintain do not extinguish. Further, many conditioned stimuli become generalized as they function in many S-R chains. This basic condition is apart from the fact already noted that reinforcement in life settings is often intermittent, thereby making the discrimination between maintenance and extinction conditions difficult for both the subject and the observer. It is quite possible, therefore, that the de-emphasis of these basic points and the misplaced emphasis on the failure to observe extinction have been detrimental to social-learning analyses, in that they have made it easier for many to cling unnecessarily to a functional autonomy notion and to miss the stimulus-response contingencies that are likely to be operating in the acquisition and maintenance of social behavior.

Some Additional Consequences of the Use of Drive Notions

Sampling some of the diverse ways in which the term "drive" has been used in analyses of human adaptive and social learning, we have seen how behaviors exhibited in connection with certain stimuli have by fiat been taken to reflect "unlearned drives" for those stimuli, how similarly, learned response systems have often been gratuitously characterized as "drive" systems, and how "drives" have often been nothing more than labels for behaviors they purported to explain. We have also noted that the inconsistent and inexact use of motivational terms has led to a loss of precision in the specification of the functional relationships sought, the reasons for seeking them, and the theoretical language used to order these phenomena; and that the relationships sought under this usage may not even be the most pertinent.

Casual usage of drive terms can be even further illustrated by the practice in the literature of presenting a lawful relation between several measures, and assuming that one of these measures reflects a construct, like that of a "learned social need" for approval (Crowne & Strickland, 1961; Crowne & Marlowe, 1964) or "need achievement" (McClelland, 1951; McClelland et al., 1953; Atkinson, 1965). Thus, a social-desirability questionnaire to assess "approval need" or TAT performance to assess "achievement need" has been used to predict the reinforcing efficacy of approval stimuli or performance under an achievement set. Such research merely provides a straightforward "response-response" relationship between data for two or more seemingly alternative empirical operations for the importance of a set of stimuli constituting approval or achievement, as some of the theorists involved occasionally have noted (e.g., Crowne & Marlowe, 1964). However, even when this is realized, the researchers may still fail to give sufficient attention to the possibility that both response variables may be joint outcomes of the same antecedents, which issue they generally do not attempt to study. There is, therefore, a tendency to disregard and even to question the utility of close analyses of stimulus control and reinforcer efficacy and to concentrate instead on the less interesting problem of relating responses as a means of validating a system's constructs; and a commonplace relationship may be reified by its presumed support of a drive conception. Thus, the postulation of a learned social need, which researchers such as Crowne and Marlowe consider to give theoretical consistency to results, may sometimes obscure the relevance of a search for what would be more interesting causal relationships. And although the empirical relationships found may have their valid place, the level of theory involved may not be very productive and the results disappointing, even in the context of the expressed purpose of investigators like those just listed. Finally, if findings such as these are used as a basis for construct validation for a learned motive, a more complete theoretical network must be devised to account for antecedents, changes in the relationship, or negative findings. Even in that case, however, the term "motive" is most often gratuitous, especially in the unqualified way it is frequently introduced.

It is paradoxical that even some researchers who ordinarily use a learning

approach have often seemed to ignore standard learning concepts of acquired stimulus control as they proceed to postulate drives in their analyses of social learning. This has been true not only in their research, but also in their attempts to deal with such special engineering problems as maternal-environmental-cultural deprivation, separation from the mother, shifts in the maintaining environment, differences between institutional and family environments, and the like. As we have emphasized, when a researcher postulates a drive in the organism or when he places an emphasis upon cognitive processes (perhaps together with competence or novelty motivation) as determinants of behavior, the result seems almost inevitably to be a decrease in his attention to the search for the functional relationships involving contingencies between environmental stimuli and the behavior system under scrutiny. The resulting de-emphasis of the conditions governing the acquisition and maintenance of behavior makes it easy for difficult-to-test assumptions like the functional autonomy of motives to be retained. Under these casual approaches to social learning, it is difficult to design new and improved environments or to effect child therapy, and it is not hard to be pessimistic about the possibility of systematically changing a child's behavior. Only under an approach that strictly separates learning from performance-drive functions can we clearly distinguish how a behavior comes under the control of the environment through long time spans (acquisition), how that control can be reversed when the maintaining conditions no longer exist (extinction or counter-conditioning), and how a variety of short-term contextual-setting conditions can determine momentary stimulus efficacy for performance. In summary, then, a functional-learning analysis obviates any supposed necessity for postulating either externally or internally aroused drives to explain an organism's response to external stimuli. In most instances, we need only know that the organism is alive, and, therefore, has the potential for behavior. Our focus then becomes stimuli, responses, and the conditions of their interchange.

SUMMARY

An approach has been outlined in this chapter for conceptualizing the roles of environmental stimulation and social experience as they affect child behavior and social learning in early development. It has been our assumption that to be meaningful in such an approach, the concept "environment" must be defined in terms of stimuli which affect behavior, and, at the same level of analysis, behavior must be defined in terms of its functional relationships to controlling stimuli. Global concepts like environment or trait, which only summarize through lengthy time spans the occurrence of either stimuli or responses but not both facets of the S-R interchange, are typically removed from the level of analysis required by the process theories which have spawned their use in research. Rather than emphasize such summarizing concepts, our approach to human social learning has proceeded as a detailed functional analysis of stimuli and responses, their interchange at a particular moment (i.e., the stimulus-response unit), and the sequences of interaction across successive moments (i.e., the stimulus-response chain). The conditioning concepts we have employed thus order environmental operations that effect systematic and reversible changes in observable behaviors. And the approach we have detailed remains open to the addition of new concepts as required, and to the differentiation and refinement of the concepts in current use.

While assuming that the respondent-conditioning paradigm may operate concurrently, we have emphasized the operant-conditioning paradigm as being most relevant to social behavior functioning, stressing its key constructs and their operating modes. We have considered the various functions of stimuli in controlling behavior, i.e., evocative, (generalized) discriminative, and (generalized) reinforcing stimuli, and how these stimulus roles are acquired. Contextual factors (also termed "setting" conditions) which can affect the momentary efficacy of stimuli were also detailed. As a by-product, various conditioning procedures were outlined for fostering socially valued behavior systems and for eliminating undesirable ones. These procedures provide conceptual leverage on training techniques for bringing out the full potential of children in both privileged and underprivileged settings, one of the most important problems of our age. Further, conditioning concepts were used in attempting to posit a plausible account of the child's acquisition of verbal-language (in a milieu where the nativistic approach of Chomsky and his associates has done much to set the recent tone) and emotional behaviors. It was seen, too, how at the same time that the child is being conditioned by his environment, he comes to control that environment by effectively dispensing reinforcers valued by parents and caretakers.

The place of developmental changes in an approach to the adaptive and social learning in early life was also considered. Development was conceived to represent points in a sequence of experiences (i.e., receptor and effector response occurrences cumulatively affected by stimuli) and only incidentally as points in physical time. It was thus proposed that diverse concepts commonly grouped under the heading of learning can provide a parsimonious, yet flexible, model for ordering the complex developmental patterns characterizing the child's socialization. By detailing the changing conditions of environmental stimulation accompanying development, this approach appears to index focal aspects of those changes in the child's behavior systems ordinarily termed development more effectively than does an index like age.

Behavior changes due to *deprivation* (involving gross and often dramatic shifts in the maintaining environment, as in separation) and to *privation* conditions of stimulation (involving an inadequate supply of functional stimuli for the child during the early years) were also considered. In this context, it was suggested that "backward" behavior patterns by a child may result from severe limitations in the number and variety of functional stimuli made available to him, as well as by reinforcement of his instrumental dependence.

As it has been our contention that an operational-learning approach is potentially more fruitful for understanding and enhancing the process of environment-child interchange than are approaches using abstract, "one-sided" summary concepts, only basic instrumental-conditioning and S-R chaining concepts have

been employed to order many of the assumed complexities of the two-phased acquisition processes of imitation and identification (including sex-typing) as well as of dependence and attachment. Under a conditional-discrimination learning paradigm, imitative responses were conceived to be simply instrumental responses varied in content and matched to the cues provided by the responses of models, constituting a functional response class for the child which contains a potentially unlimited number of responses (which we have termed *generalized imitation)* that is acquired through extrinsic reinforcement by socializing agents of some members of that response class and is subsequently maintained by intermittent extrinsic reinforcement. This conception can account for the pervasiveness of imitation, its focus on one model, its occurrence when the model is absent or when there is no extrinsic reinforcement for it, and its resulting in behaviors that can be quite different topographically from the model's. A functional learning approach, therefore, can account for the very phenomena which have prompted others to postulate seemingly unparsimonious and nonempirical principles such as the operation of intrinsic reinforcement or cognitive processes as well as of observational learning and vicarious reinforcement. Further, without the use of conventional motivational constructs, the generalized-imitation paradigm can parsimoniously account for the phenomena usually grouped under the process of identification, by which the child is said to acquire the motives, ideas, and values of another (or others).

Dependence and attachment have also been evaluated critically and models advanced for their acquisition and maintenance. These phenomena were thought best conceptualized as classes of functional relationships involving the (mostly) positive stimulus control over a wide variety of an individual's responses by stimuli provided either by a class of persons (dependence) or by a particular person (attachment). When the phenomena classified under these two terms are not conceptualized in a functional way, the distinction between the terms and their fundamental characteristics may be obscured. As gross abstractions, dependence and attachment can be indexed by various combinations of approach (positive stimulus control) and disorganization (following separation) behaviors, and considerations have been detailed for the selection of indices under different research strategies and tactics. Under a functional approach, rather than being either a precondition for, or an outcome of, imitation-identification, dependence-attachment was conceived to be relevant to imitation-identification only insofar as it can index the discriminative and reinforcing value for the child of stimuli dispensed by the model or others.

In the realm of motivation, the concepts of innate drives for stimuli (i.e., "natural motivation") and learned drives and their utility in analyses of generalized imitation and identification as well as of emotional dependence and attachment have been examined. Our approach was critical of the innate drives, including competence or effectance motives, that have been postulated as underlying various components of infant responsiveness and of learned drives, and has led to the conclusion that these uses of the drive conception in analyses of socialization are gratuitous and actually detrimental in that simple, routine

learning concepts can order efficiently most of the phenomena that those drive concepts have been advanced to explain.

It has thus been argued that diverse social behaviors of the child which have been "explained" by cognitive, intrinsic-reinforcement, motivational, and observational-learning concepts may in fact be efficiently accounted for by conditioning concepts in common use. These social-behavior phenomena are functionally attributable to the operation of explicit, extrinsic stimulus control, and can be more adequately characterized by parsimonious statements of the functional relationships involved. A functional learning approach such as we propose, which requires emphasis upon the sequential details of environment-organism interaction, i.e., stimuli, responses, and their interchanges, focuses upon the environmental conditions by which child behaviors can be acquired, maintained, extinguished, or otherwise modified, and thus upon the conditions by which the behavioral development and social learning of the young child may be enhanced.

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CHAPTER 3

Social-Learning Theory Of Identificatory Processes

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Among the various processes involved in socialization, identificatory learning is generally assigned a prominent role regardless of whether explanatory theories favor psychological or sociological variables. There are several reasons for this emphasis. It is evident from informal observation that the complex repertoires of behavior displayed by members of society are to a large extent acquired with little or no direct tuition through observation of response patterns exemplified by various socialization agents. This is particularly true of behavior for which there is no reliable eliciting stiinulus apart from the cues furnished by the responses of others.

The provision of social models is also an indispensible means of transmitting and modifying behavior in situations where errors are likely to produce costly or fatal consequences. Indeed, if social learning proceeded exclusively on the basis of rewarding and punishing consequences, most people would never survive the socialization process. Even in cases where nonsocial stimuli can be relied upon to elicit some approximation of the desired behavior, and errors do not result in perilous outcomes, people are customarily spared exceedingly tedious and often haphazard trial-and-error experimentation by emulating the behavior of socially competent models. In fact, it would be difficult to imagine a socialization process in which the language, mores, vocational and avocational patterns, the familial customs of a culture, and its educational, social, and political practices were shaped in each new member by selective reinforcement without the response guidance of models who exhibit the accumulated cultural repertoires in their own behavior. To the extent that people successfully match the behavior of appropriate societal models, the social-learning process can be greatly accelerated and the development of response patterns by differential reinforcement can be short-circuited.

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