Newtonian mechanics had asserted that it was possible to explain physical phenomena by assuming that simple forces acted between inscrutable particles. Hence, if one knew the mass, the velocity, the direction, the location, etc., of material particles one could accurately predict what would occur when a number of them interacted. Every change of motion, according to Newton, is due to a force which arises either through impact, as in the case of a baseball being struck by a bat, or by an attraction exercised mutually by the bodies upon each other, according to his law of gravitation. The gravitational force between bodies (for example, between the sun and the earth) was assumed to act instantaneously to produce action at a distance. Space and time were treated as the absolute, fixed framework within which the movement of a particle occurs; that is, they were removed from the process itself.

A series of brilliant experiments by Oersted and Faraday on electromagnetic phenomena challenged the notion of simple forces acting instantaneously at a distance on particles in an empty space. These experiments demonstrated that it is useful to think of regions or fields through which electromagnetic forces are spread and to assume that these forces exist even when there are no material particles present to which the forces are applied. It was found that a knowledge of the properties of the electromagnetic field is sufficient to explain electromagnetic phenomena and that, given this information, knowledge about the source of the electromagnetic field is unnecessary. In other words, the electromagnetic field has a definite reality which is not in any way the end result of distinct, individual particles or sources. As Einstein and Infeld (1938, p. 159) have pointed out: "It needed great scientific imagination to realize that it was not the charges nor the particles but the field in the space between the charges and particles which is essential for the description of physical phenomena."

Clerk Maxwell systematized and gave mathematical form to these experimental findings in his field equations. Einstein and Infeld (pp. 152–153) described the difference between mechanical laws and field laws in these terms:

All space is the scene of these laws and not, as for mechanical laws, only points in which matter or charges are present . . . . Maxwell's equations enable us to follow the history of the field, just as the mechanical equations enabled us to follow the history of material particles . . . . However, they do not, as in Newton's laws, connect two widely separated events; they do not connect the happenings here with the conditions there. The field here and now depends on the field in the immediate neighborhood at a time just past . . . . They allow us to increase our knowledge of the field by small steps. In Newton's theory, on the contrary, only big steps connecting distant events are permissible.

Einstein's theory of gravitation, formulated at the beginning of the twentieth century, rooted the concept of action at a distance from its last remaining stronghold in the physical sciences. The notion of a space filled with material ethers vanished from physics and was replaced by a conception of space as a definitely distributed system of gravitational and electromagnetic forces and stresses. In the field conception the distribution of forces in a given environment determines what an object with certain properties will do in that environment. Thus, when we know the object and observe what it does in a specified environment we can deduce the properties of the field in that environment.
The field concept in physics has served as a stimulating analogy for scientific workers in other areas. Essentially, "field theorists" in the nonphysical sciences have attempted to consider the phenomena they investigate as occurring in a field; that is, as part of a totality of coexisting facts which are conceived as mutually interdependent. In other words, "field theory" as it is employed in the social and biological sciences does not refer to theories about physical phenomena, for example, gravitational or electromagnetic phenomena; rather, it refers to a "method of analyzing causal relations and of building scientific constructs" (Lewin, 1943a, 1951b). This method, in a manner analogous to that of field theory in physics, assumes that the properties of any event are determined by its relations to the system of events of which it is a component and that "changes here and now depend on changes in the immediate neighborhood at a time just past."

The term "field theory" in psychology has been applied primarily to the work of the Gestalt psychologists, and it has been employed to characterize particularly the work of Kurt Lewin and his students. However, in view of our previous discussion of the meaning of "field theory," it should be evident that there are many possible approaches to theorizing in the social sciences which could be "field-theoretical" in spirit.

THE METATHEORY

We shall describe some of the main features of the way of thinking which characterizes the field-theoretical approach to psychology. Many of these are not unique to Lewin's approach. The wide impact that Lewin and Gestalt psychologists have already had on theorizing in psychology, as well as an increasing interest in the nature of theory construction among all schools of psychology, have led to a considerable overlap in their basic viewpoints.

A good proportion of Lewin's writings is devoted to the metatheory of psychology. We shall not attempt to quote his writings in any detail but rather shall present the essentials of the way of thinking which characterized his approach. The reader, however, may find it useful to consult his relevant writings in Field Theory in Social Science, A Dynamic Theory of Personality, Principles of Topological Psychology, and The Conceptual Representation and the Measurement of Psychological Forces.

We shall discuss the characteristics of Lewin's approach to theory building under the following headings: (1) the psychological approach, (2) an emphasis on the total situation, (3) systemic rather than historical causation, (4) the constructive rather than classificatory approach, (5) the dynamic approach, (6) mathematics and field theory.

THE PSYCHOLOGICAL APPROACH

Despite Lewin's use of terms which have the flavor of physics, such as tension, force, and fluidity, his theoretical approach is consistently psychological. His use of such terms is not an attempt to derive psychological concepts from physical ones, but is rather a reflection of his view that what he termed the laws of dynamics might be similar in the various sciences. He took the stand that psychological phenomena must be explained in psychological terms, just as physical phenomena must be explained in physical terms. Let us briefly attempt to characterize what is meant by an explanation of psychological phenomena in psychological terms. Our discussion is much indebted to Heider (1943), Tolman (1952), and Wright and Barker (1950), and is related to the distinction between modular and molecular which Littman and Rosen (1950) have thoroughly reviewed.

First of all, this approach assumes that it is scientifically respectable to describe the phenomena in which psychologists are interested in terms that are not reducible or equivalent to the terms of physics or physiology. Second, it postulates that psychology is concerned with the individual's behavioral transactions with his internal and external environment. Behavior is a transaction of an individual, not merely of some part of the body. As Wright and Barker (1950, p. 78) pointed out, the individual

... does not sweat or salivate, nor does he often bend his knees in walking, manipulate his tongue in talking, move his eyeballs in reading, or bend at the waist in sitting down. He walks, talks, reads, or sits down, leaving his glandular and motor apparatus to take care of the sweating, salivating, bending, manipulating, and all such molecular units of behavior which, as molecular, are lost to the person in what he actually does.

The behavioral transactions of an individual with his environment are mediated by physical and physiological processes; these processes are the mechanisms or tools for behavior, not behavior itself. It would make no more sense to describe the latter as behavior than to describe the snowfall of a storm snow as behavior when a construction worker is employing it to dig a foundation for a building. This is not to assert that a tool process may not at one time or another be the object of behavior. This is particularly likely to be the case when the individual is learning how to use the given tool; for example, as the baby learns to walk, his behavior is directed at movements of his legs.

The psychological explanation of behavior assumes that all behaviors have directional characteristics. Hence, it is concerned with the purposes which underlie behavior and the goals toward or away from which behavior is directed. There is little direct interest in tools or mediating processes per se, apart from the interest in how they are learned or acquired and in how desirable and effective they are considered to be by the individual.

The scientist who works with the assumption that psychological phenomena are realities, even if they cannot be expressed in physical terms or located in physical space, is more apt to investigate them than is the scientist who assumes that they are merely "constructs." We recognize that people in everyday affairs use such concepts as hope, desire, action, ability, and ought to characterize others as well as themselves, and he has acknowledged that these phenomena have reality in their own right, he is more likely to feel that the concepts of this everyday psychology are legitimate and important objects for investigation by a scientific psychology (Heider, 1958). He is more apt to concern himself with the psychological phenomena which occur in everyday life than is the scientist who feels that he is not using scientific unless he can either say that "hope" is really a specified pattern of neural excitation in a certain region of the brain or that "hope" is really a certain pattern of bodily movements which can be expressed in physical terms. This is not to say that the psychologist who employs a psychological approach in theorizing will be content to stop at the level of description
of the phenomenal properties of psychological events. He will want to know how "trope" can be characterized in terms of the constructs of a psychological theory. Lewin, in his writings, has continuously stressed that the understanding of causal relationships requires one to proceed from the more accessible, phenomenal properties of psychological events to their underlying dynamic or genotypic properties.

Emphasis on a psychological explanation of psychological events leads to an avoidance of achievement concepts (that is, concepts which define behavior in terms of what it accomplishes), since, as Lewin (in Rapaport, 1950, p. 90) wrote, it is impossible "to subsume, under unitary psychological laws, processes defined by achievements." More generally, Lewin objected to the use of simple external criteria to identify or define a psychological state or process. His point is that to develop psychological laws we must deal with psychological processes—with the perception of the external event, and not with the event itself; with behavior, and not solely with its effects. Thus, we ought to be concerned with the psychological impact of a reward, whether it is perceived as a "bribe" or as a "sign of accomplishment," rather than simply with the external situation of reward. In essence, one has to deal with what exists psychologically, what is real for the person being studied. If a stimulus object does not exist for an individual, consciously or unconsciously, the object cannot be thought of as having any psychological effects; similarly, if the behavior effect is not consciously or unconsciously motivated, it cannot be thought of as being psychologically determined.

Emphasis on the study of the person and the psychological environment as it exists for the person has led critics (for example, Brunswik, 1945) to characterize Lewin's approach as "postperceptual and prebehavioral." Lewin's lack of detailed discussion of perception and of action provides a justification for this criticism. Nevertheless, Lewin denied this, asserting that perception and action are, in his view, legitimate problems of psychology. He wrote (Lewin, 1943a; 1951b, p. 57):

"This view is a necessary consequence of the field-theoretical approach according to which the boundary conditions of a field are essential characteristics of the field. For instance, processes of perception which should be related to the boundary zone depend partly on the state of the inner part of the psychological field, i.e., upon the character of the person, his motivation, his cognitive structure, his way of perceiving, etc., and partly on the "stimulus distribution" on the retina or other receptors as enforced by physical processes outside the organism.

Lewin was fully aware that the scientist cannot depend on intuition in order to apprehend what is psychologically real for another person. Rather, he must infer or construct this reality from observable data, such as the course and consequences of the person's actions and the situations in which action is occurring. Nevertheless, Lewin's interests and his views regarding a fruitful strategy for psychology led him to a relative neglect of problems of perception and action in favor of an emphasis on motivational problems. As a consequence, he used a rather "make-do" methodology for identifying the specific properties of a given individual's psychological field or life space. The tool most commonly employed in his experimental studies was simply that of verbal report: the subject described in his own terms what a situation meant to him or what he intended. Despite Lewin's awareness of the liabilities in employing verbal report, he was not blind to its assets when studying capable human subjects.

Lewin's use of verbal report as a "make-do" methodology and his emphasis on describing the psychological environment in terms of "what exists for the person" rather than in "objective physicalistic" terms has led some critics (for example, Spence, 1944) mistakenly to characterize Lewin's theoretical approach as "phenomenological." Lewin, first of all, never equated "what exists for the person" with "awareness," "consciousness," or "ability of the person to describe verbally"; he realized that many important psychological influences operate unconsciously. Thus, in the sense that he was concerned with more than what exists in awareness, Lewin was not a phenomenologist. Second, Lewin realized, as do all sophisticated scientists, that the concepts and methods of psychology must be intersubjective and, in this sense, psychological processes in another person can only be apprehended from externally observable data. Hence again, in the sense that Lewin never assumed that verbal report or phenomenological descriptions were simple portraits of the "raw truth," he was not a phenomenologist. On the other hand, he was interested in what people are aware of and he was sensitive to the insights into psychological processes which could be obtained from subjective reports. Although Lewin believed that the employment of achievement concepts would prevent the development of unitary psychological laws, he recognized that any long-range or detailed prediction of individual behavior requires a knowledge of non-psychological facts. If one wishes to predict what a particular individual is going to do during a Sunday drive into the country, one must be able to predict whether or not the individual's automobile will get a punctured tire, whether or not there will be a traffic jam, etc., as well as what he seeks in his excursion. The specific prediction of what the individual will do or what he will become at some future time requires a knowledge of the future situations to which he will be exposed. The task of discovering what part of the physical or social world will determine the "boundary zone" of the life space during a given period has been called psychological ecology by Lewin. We shall discuss psychological ecology in greater detail in a subsequent section of this chapter.

AN EMPHASIS ON THE TOTAL SITUATION

The most fundamental construct for Lewin is that of the psychological field or life space. All psychological events (thinking, acting, dreaming, hoping, etc.) are conceived to be a function of the life space, which consists of the person and the environment viewed as one constellation of interdependent factors. Individual psychological processes are, in Lewin's words, "always to be derived (from the relation of the concrete individual to the concrete situation, and, so far as internal forces are concerned, from the mutual relations of the various functional systems that make up the individual" (Lewin, 1935b, p. 43).

The emphasis on the interrelatedness of the person and the environment was one of Lewin's major contributions to psychological theorizing. Until recently, much of psychology has been dominated by what he has termed an "Aristotelian" mode of thinking (Lewin, 1935b, Chapter 1). In such thinking, psychological events are determined by the characteristics of the individual—moods, heredity, intelligence, needs, habits, etc.—relatively independently of the situation. Since Lewin it has become increasingly evident that it is meaningless to speak of behavior without reference to both the person and his environment. Statements such as the following, which ignore the situation, are viewed as unacceptable by an ever increasing number of
psychologists: "he is psychotic because of his heredity"; "the rigidity of his problem-solving behavior is due to his ethnocentrism"; "he became the leader of his group because of his personality"; "her emotional outburst was due to her hysteria"; "friends work better together than do strangers"; "a highly cohesive group will be more productive than a less cohesive group."

Lewin's emphasis on the "relation of the concrete individual to the concrete situation" leads the scientific investigator to a more explicit realization that the understanding of behavior requires not only a knowledge of the person (his past experiences, his present attitudes, and his capabilities) but also a knowledge of his immediate situation. This is true for his understanding of everyday behavior and also of the behavior of subjects in carefully controlled experiments and diagnostic testing situations. In these latter instances, interpretation of the responses of a subject requires a knowledge of the psychological significance of the total experimental or testing situation. To cite a simple example, the responses of subjects in a locked room to smoke pouring through the cracks in the floor and to shouts of "Fire!" from outside are determined largely by whether they consider the smoke to be part of an experimental hoax or part of a real fire (French, 1944).

The emphasis on the total situation has consequences for research methodology. Instead of picking out one or another isolated element within a situation, field theorists find it advantageous, as a rule, to start with a characterization of the situation as a whole. After this first approximation, the various aspects of the situation undergo a more and more detailed analysis. The procedure (Lewin, 1936a, p. 17)

...is not to add disconnected items but to make the original structure more specific and differentiated. This method therefore proceeds by steps from the more general to the particular and thereby avoids the danger of a "wrong simplification" by abstraction.

In essence, the emphasis in research guided by field theory is on study of psychological events in their relations of interdependence rather than as isolated abstractions torn from their relational significance. In contrast with this approach is the study of relationships between variables (for example, between intelligence and school achievement) by examining a large number of cases, none of which is studied in any detail from the point of view of the concrete relations of the variables to the specific situations. The assumption sometimes underlying this latter approach is that the relationship between variables such as intelligence and school achievement is independent of the other properties of the situation or of the person. Field theorists, on the other hand, assert that the relationship between any two variables of this sort is almost inevitably influenced by the total situation, and from this they conclude that their relationship ought to be established only after the properties of the total situation have been sufficiently characterized.

SYSTEMATIC VERSUS HISTORICAL CONCEPTS OF CAUSATION

In the introductory section of this chapter, it was pointed out that field theory in physics destroyed the notion of action at a distance and replaced it with structural equations in which "the field here and now depends on the field in the immediate neighborhood at a time just past." Lewin, in a similar vein, has emphasized that psychological events, that is, changes in the life space, must be explained in terms of the properties of the field which exists at the time when the events occur. He has pointed out that past events can only have a position in the historical causal chains whose interweaving creates the present situation; they cannot directly influence present events.

This is not to deny the significance of the past in affecting behavior indirectly. However, even though a past event can create a certain condition which carries over into the present, it is, nevertheless, the present condition that is influential in the present. Strictly considered, linking behavior with a past event is an extremely difficult undertaking; it presupposes that one knows sufficiently how the past event affected the psychological field at that time, and whether or not, in the meantime, other events have again modified the field. Although the notion that only the present is influential in the present is an obvious concept, one still can find accounts in abnormal-psychology textbooks of how an event in childhood "caused" a neurosis. A more adequate explanation would describe the "neurotic trends" resulting from the childhood event, the vicissitudes of these trends during the period between the event and the neurosis, and the interactive nature of the present situation and the neurotic trends which "result" in the neurotic symptoms.

While Lewin emphasized the principle of contemporaneity as one of the basic characteristics of field theory, he realized that the determination of the meaning of any psychological event requires one to take into account an appropriate time period. His use of the term contemporaneous or the phrase "situation at a given time" actually does not refer to an instant without temporal extension, but to a certain time period. Time differentials in psychology, which determine what is to be viewed as contemporaneous, must be conceived in terms of the duration of meaningful psychological units; there is no reason to make the prior assumption that psychological space-time is infinitely or arbitrarily divisible. That is, psychological units must be conceived to have extension in regard to both field and time dimensions, and unless the duration of the time period is appropriate to the unit, meaningful psychological units will not be observable.

Lewin's emphasis on employing units of sufficient time extension has methodological implications. He wrote that "the first prerequisite of a successful observation in any science is a definite understanding about what size of unit one is going to observe at a given time" (Lewin, 1943b; 1951a, p. 157). He pointed out that in social psychology we have often misunderstood the scientific requirements of analysis and have tried to observe as small units as possible; in so doing we have frequently torn the observed units from their context and disregarded the fact that there is frequently no way to distinguish among different possible classifications of an action if the observation of it lasts only a few seconds. Thus, if two persons A and B are running one behind the other, it may mean either that A is leading B or that B is chasing A. Only by observation which is sufficiently comprehensive to include both A and B and to extend through a period sufficiently long does the proper interpretation of the activity become possible. (For a further discussion of systematic versus historical causation, see Chein, 1947.)

THE CONSTRUCTIVE VERSUS THE CLASSIFICATORY APPROACH

Lewin's orientation to science was much influenced by the work of Ernst Cassirer, a German philosopher who was concerned with the nature of concepts in mathematics and the sciences. In his book Substance and Function, and Einstein's Theory of Relativity, Cassirer (1923) emphasized the opposition between two modes of theorizing which
are distinguished by the different values they place on thing concepts and relation concepts. The classificatory approach, which emphasizes the primacy of thing concepts, assumes that concepts are derived by abstractions from particular objects to an ideal object that embraces the essence of the particular object to which it refers. Relations, as a rule, are considered among the nonessential properties of a concept. As we go to higher and higher concepts (from one to animal to living object), the conceptual pyramid reaches its summation in the abstract representation of something, the all-inclusive entity to which every possible content is relevant, but which at the same time is totally devoid of specific meaning.

The constructive approach stresses relation concepts. Here, the meaning of any concept is determined by its relations to other concepts in the system of concepts of which it is a part. The reality of a specific phenomenon is derivable or constructible from the relevant constructive elements, which are called constructs.

In the constructive approach, the ideal scientific concept is not an abstraction which disregards the peculiarities and particularities of the specific objects to which it is relevant, but rather a concept which seeks to show the necessity of the occurrence and connection of just these particularities. In other words, according to the constructive approach, there is no antithesis between general laws and the individual case if adequate scientific concepts have been developed. By introducing parameters appropriate to the individual case one can derive individual behavior from a formula which is applicable to all cases.

Lewin attacked the attempt to develop concepts by a process of abstracting from phenotypic or historic-geographic data, that is, data in which the similarities are defined in terms of external rather than psychological characteristics. He wrote (1942, 1951b, p. 61):

If one "abstracts from individual differences," there is no logical way back from these generalizations to the individual case. Such a generalization leads from individual children to children of a certain age or certain economic level and from there to children of all ages and of all economic levels; it leads from the psychopathic individual... to the general category, "abnormal person." However, there is no logical way back from the concept "child" or "abnormal person" to the individual case. What is the value of general concepts if they do not permit prediction for the individual case?

Phenotypic data must be transformed into the language of constructs (genotypes, to use Lewin's term) before one can hope to develop general psychological laws which will be applicable to individual cases. The development of general psychological laws, however, not only requires the coordination of data to constructs by definite rules of correspondence and by explicit operational procedures, but also presupposes that the linkages or relations among constructs take into account the conceptual dimensions of the constructs. As Lewin (1944, 1951b, p. 37) pointed out, "(1) Only those entities which have the same conceptual dimension can be compared as to their magnitude. (2) Everything which has the same conceptual dimensions can be compared quantitatively; its magnitude can be measured, in principle, with the same units of measurement."

Although Lewin did not discuss "conceptual dimensions" at any length, he drew several major distinctions which we shall describe more fully when we discuss his specific concepts. Briefly, he distinguished between structural concepts (position, cognitive structure) and dynamic concepts (force, tension); between concepts which refer to different regions of the time dimension; between concepts which refer to different levels of reality; between concepts referring to potential and concepts referring to actual; etc. For example, "position" is a spatial relation of regions, while "locomotion" refers to a relation of positions at different times. "Hope" refers to a relation between the structure of the reality level and the wish level of the psychological future. "Guilt" refers to the relation between the structure of the reality and the wish level of the psychological past.

Lewin's stress on clarification of the conceptual dimensions of psychological constructs reflected his feeling that the emphasis on "operational definitions" of scientific concepts was being misconstrued in psychology. He felt that some psychologists naively assume that the meaning of a concept is exhausted by its operational definition; for example, "intelligence is what is measured by intelligence tests." Lewin, on the other hand, emphasized that completely adequate scientific concepts not only require explicit operational definitions which provide linkages to observable facts, but also conceptual definitions which establish the linkage between any given concept and other concepts in the system of concepts (or theory). One might go a little further and say that the possibility of an unequivocal and consistently repeatable operational definition of any psychological concept is dependent on the state of psychological theory. That is, one cannot give a precise statement of what is being done (a statement of all the relevant variables which interact with one's measurement procedures and the variable being measured) as one measures intelligence, for example, unless one has a theory which permits specification of the variables which may influence either intelligence in the situation of measurement or the testing procedure by which intelligence is measured.

THE DYNAMIC APPROACH

The common denominator of the various dynamic approaches in psychology is the conception of living things as systems which tend to maintain a dynamic equilibrium in relation to their environments. The individual is conceived as a system whose components maintain a relative flexibility of interrelations; variation in one aspect of the system may induce compensating changes in other aspects, thus maintaining the integrity of the system. The notion of dynamic or organismic equilibrium stresses the fact that the "whole" remains the same only because of a patterning or organization which persists in the midst of change. In contrast with the model of dynamic equilibrium is that of mechanism. The model of mechanism (K. Deutsch, 1951, p. 234)

... implied the notion of a whole which was completely equal to the sum of its parts; which could be run in reverse; and which would behave in exactly identical fashion no matter how often those parts were disassembled and put together again, and irrespective of the sequence in which the disassembling or reassembling would take place. It implied consequently that the parts were never significantly modified by each other, nor by their own past, and that each part once placed into its appropriate position with its appropriate momentum, would stay exactly there and continue to fulfill its completely and uniquely determined function.

Arising out of the conception of the individual as an "equilibrium-maintaining system" is an interest in the processes by which equilibrium is restored once it is disturbed. In psychology, this interest is reflected in an emphasis on motivational
processes—the arousal of need tensions, the setting of goals, goal-directed action, the release of tension. Much of the research of Lewin and his coworkers was directed toward an understanding of motivational processes. Lewin’s theoretical approach is, in the sense of the preceding sentence, legitimately grouped with the approaches of McDougall and Freud as a motivational or dynamic psychology.

All theories in psychology which use the concept of equilibrium include more or less conspicuously the thesis that behavior or any other kind of psychological change is caused by directed entities. In Lewin’s system these directed entities are called psychological forces. Field theorists explicitly recognize the vectorial nature of psychological forces and are attempting to develop a mathematics which can handle adequately the concepts of magnitude and direction implicit in the concept of the vector.

MATHEMATICS AND FIELD THEORY

Lewin stressed the need for clear understanding of the formal properties of scientific constructs, and he insisted that the determinants of behavior would have to be represented in mathematical terms if psychology were to become a rigorous discipline. He devoted great effort to attempts to formulate and apply geometrical concepts which would be of value in psychology. His most elaborate effort in this connection was his development of a geometry which he termed hodological space (Lewin, 1938).

Although it cannot be said that hodological space was well developed from the mathematical point of view, it represents an ingenious attempt to develop a geometry whose basic spatial concepts could be integrated with dynamic concepts. In hodological space, the distinguished (preferred or psychologically best) path which is used in establishing the direction between any two points is determined by the attractiveness rather than the shortness of the path. Direction is influenced by such factors as the degree of differentiation of the space into subregions, the relative prominence of whole versus parts, and the properties of the field at large. Using the concepts of hodological space to define psychological direction seems particularly helpful in giving insight into behavior in conflict situations, in situations which are cognitively unclear, and in situations involving roundabout ways; these concepts are also useful in understanding the difference between escape (or withdrawal) and goal-seeking (or approach) behavior, etc. It permits an answer to the question why, although different behaviors may have the same physical direction, we must ascribe different psychological directions to these behaviors if their goals are different.

Although Lewin constantly directed his energies to the development of a more adequate formalistic system, he felt that an enthusiastic for formal systems might lead to substitution of mere verbalisms for empirically descriptive theories. Premature formalization and mathematization may lead to the building of a logical superhighway that turns out to be a “dead end leading nowhere.” A young scientist, if it is wise (Lewin, 1940, 1951 b, p. 3),

... follows the same procedure used in the exploration of a new land: small paths are pushed out through the unknown; with simple and primitive instruments, measurements are made; much is left to assumption and to lucky intuition. Slowly certain paths are widened; guess and luck are gradually replaced by experience and systematic exploration with more elaborate instruments. Finally highways are built over which the streamlined vehicles of a highly mechanized logic, fast and efficient, can reach every important point on fixed tracks.

BASIC CONCEPTS OF FIELD THEORY

AS DEVELOPED IN INDIVIDUAL PSYCHOLOGY

Although much of Lewin’s writing is concerned with the metatheory of psychology, he has also made a major effort to develop a specific psychological theory. In this section, we shall outline some of the major concepts employed in his theory, particularly the concepts which were developed in his study of individual psychology, and shall attempt to indicate how these concepts were employed in research. It is well to realize at the outset that Lewin’s theoretical system was never fully developed nor was it formalized into a hypothetico-deductive system. As a consequence, there is a vagueness and lack of precision about many concepts.

We shall divide our discussion into four main parts: (1) the life space, (2) structural concepts, (3) dynamic concepts, (4) concepts dealing with change in the psychological environment (psychological ecology).

THE LIFE SPACE

Lewin employed the term life space (or psychological field or total situation) to refer to the manifold of coexisting factors which determine the behavior of an individual at a given moment. Behavior, in other words, is a function of the life space: $B = f(\mathbf{L})$. The life space is in turn a product of the interaction between the person ($\mathbf{P}$) and his environment ($\mathbf{E}$). In symbolic expression, $B = f(L) = f(\mathbf{P}, \mathbf{E})$. Unfortunately, Lewin used each of his crucial terms, environment, person, and behavior, in several different ways.

Environment

The term environment is often used to refer to the objective environment or stimulus situation (that is, the objective situation which confronts the individual at a given moment—the situation which acts upon the individual’s perceptual apparatus and upon which his motor apparatus acts). It is this meaning of the term which is appropriate to the statement that the life space is “a product of the interaction between the person and his environment.”

Lewin also uses the term “environment” to refer to the psychological environment, which is conceived to be the environment as it exists for the individual. The psychological environment is a part of the life space, and hence its properties are determined not only by the characteristics of the objective environment but also by the characteristics of the person. The fact that the psychological environment is an interactive product is more evident in instances in which the psychological environment is not veridical to the objective environment; by way of example one might consider any of the perceptual distortions common under conditions of intense need. In addition, a little thought will reveal that regions of the psychological environment often have certain characteristics (for example, the attractiveness or repulsiveness of certain objects) which do not exist in the objective environment independently of its relation to a given person.

Person

Lewin employed the term person in three ways. First, he used it to refer to those properties of the individual (his needs, his beliefs and values, his perceptual and
Symbols: M, motor-perceptual region; P, peripheral parts of inner personal region; C, central parts of inner personal region; E, environment; Bp, dynamic wall between C and P; Bp, dynamic wall between inner personal region and M.

Fig. 1. Relations among various strata of the person in different circumstances. (a) The person in an easy situation: the peripheral parts P of the inner personal region are easily accessible from outside. E, the more central parts C are less accessible; the inner personal region influences the motor region M relatively freely. (b) The person under stress, on state of self-control: the peripheral parts P of the inner personal region are less accessible than in (a); peripheral and central parts (C and P) are more closely connected; communication between the inner personal region and M is less free. (c) The person under very high tension: unification (primitivation, “regression”) of the inner personal region. (Adapted from Lewin, 1936a.)

motoric systems) which in interaction among themselves and with the objective environment produce the life space. One might say that here Lewin was referring to the individual or organism considered psychologically rather than physiologically. One could say that person in this sense is the life space at a time just past, which, as a consequence of its interaction with a subsequent objective environment, has produced the present life space.

In a second usage, Lewin employed person as equivalent to “life space.” His representation of the person (see Fig. 1) and his representation of the life space (Fig. 2) may be viewed as different ways of representing essentially the same psychological facts. Figure 1 is more convenient for representing changes in tension systems, and Fig. 2 for representing changes in the psychological environment.

Lewin also used the term person to refer to the “person in the life space.” The person in the life space or “the behaving self,” to borrow a more expressive term employed by Tolman (in Parsons and Shils, 1951), is the individual as related to the other entities in his life space. Just as the psychological environment may be thought of as the perceived environment, so the behaving self may be thought of as the individual’s perception of his relations to the environment he perceives. The psychological environment and his behaving self are interdependent components of the life space. Most observable behavior can be thought of as paralleling changes of position of the behaving self from one region of activity in the life space to another. It should be stressed that the properties of the behaving self are completely expressed in a statement of its relations and relative position to the other objects in the individual’s life space. Thus there are no internal relations within the behaving self, and hence for representational purposes it may be considered as an undifferentiated region.

There is some evidence to indicate that Lewin would have disagreed with our view that he employs the term person in the different meanings described above. For example, in his Principles of Topological Psychology he has a chapter entitled “The Person as a Differentiated Region in the Life Space,” and in this chapter he advances two major reasons why the “person in the life space” should be considered as a highly differentiated object. He states that different parts of the body often carry out different activities at the same time and, second, that a person cannot be considered a unit since a change in one part does not change all parts in the same direction and to the same extent. His second reason clearly explains why the “person” of Fig. 1 must be considered as being differentiated. (The differentiation in the life space would, of course, reflect the differentiation in the person.) The first reason (that is, the possibility that “the person in the life space” is engaging in more than one activity simultaneously) is adequately handled by assuming that the behaving self is in an overlapping situation (a concept much employed by Lewin), or that there is more than one behaving self. Apart from many other considerations, the notion of a differentiated “person in the life space” makes it rather difficult to apply the concept of a force acting upon the person, since the point of application of the force is ambiguous.
Behavior

The term behavior has been employed to refer to any change in the life space, that is, any change which is subject to psychological laws. Thus, not all movements of the person nor all changes in the environment resulting from actions of the person are considered behavior. For example, if a child is moved from an automobile to his home while he is asleep, his movement does not represent behavior; and if a boy hits a baseball and the baseball accidentally breaks a window, the breaking of the window cannot be considered to be part of the boy’s behavior. Behavior, in this sense, takes place in the life space rather than in an observable space, or, to use Koffka’s (1935) terms, in the behavioral rather than in the geographical environment. It is clear that according to this usage behavior is not directly observable; it must be inferred. That is, just as the attractiveness of any region in the life space must be inferred, so too must change of attractiveness; similarly, change of position of the behaving self, as well as its initial position, must also be inferred. Lewin has also used behavior in its more commonsense meaning of the observable interaction between the individual and the objective environment.

The characteristics of the life space (or person) are deduced from observed behavior in an observed environment. However, because many features of the life space tend to remain the same over long periods of time (for example, a person’s enjoyment of tennis on certain types of occasion) despite momentary variations in other characteristics, knowing these characteristics and knowing the observable behavior enables us to make inferences about the objective environment. For example, knowing that (Jakobson, Deutsch, and Cook, 1951, p. 46)

... the people who feel at home in a given community, who seem to fit best, are either highly dependent or authoritarian in personality provides some insight into the characteristics of the community. In a similar way, if, upon investigating the individuals who feel thwarted by a situation, we find that they are the young and ambitious people, the individuals with considerable personal initiative, the nonconformists, we would also be likely to develop some appreciation of the nature of this situation.

The dimensions of the life space

Lewin described the life space of the newborn child as a field which has relatively few and only vaguely distinguishable areas. Future events or expectations do not exist; the child is ruled by the situation immediately at hand; he has no conception of his past experiences. His life space, in other words, has no time dimension.

An outstanding characteristic of the change of the life space during development is increasing differentiation. This includes an increasing differentiation in the time dimension (see Fig. 3 for a representation of the time dimensions in the life space). Plans extend further into the future, there is an increased tolerance of delay, and activities of increasingly long duration are organized as one unit. As the individual matures, his picture of the possibilities which exist in the future plays an increasingly important role in determining his morale.

The differentiation of the life space brings with it a differentiation of the reality-irreality dimension (see Fig. 3). The different degrees of irreality correspond to different degrees of fantasy. They include both the wishes and the fears. A daydream, a vague hope, has in general less reality than an action; an action has more reality than

\[ \text{Symbols: C, child; R, level of reality; I, level of irreality; P_s past, psychological past; P_s present, psychological present; P_s future, psychological future.} \]

Fig. 3. The life space at two developmental stages. The upper drawing represents the life space of a younger child. The lower drawing represents the higher degree of differentiation of the life space of the older child in regard to the present situation, the reality-irreality dimension, and the time perspective. (Adapted from Lewin, 1951b)

a “talking about it”; a perception is more real than an image; a faraway “ideal goal” is less real than a goal that determines one’s immediate action. Dynamically, the level of irreality corresponds to a more fluid medium and is more closely related to the central layers of the person. This fact is particularly important for understanding the use of play techniques and projective techniques in the study of personality and of the use of games in the study of social interaction (Lewin, 1946a; 1951b, p. 245):

The level of irreality in the psychological future corresponds to the wishes or fears for the future; the level of reality to what is expected. . . . Hope corresponds to a sufficient similarity between reality and irreality somewhere in the psychological future; guilt to a certain discrepancy between reality and irreality in the psychological past. To the young child, truth and lying, perception and imagination, are less distinguished than in an older child. This is partly due to the fact that the younger child has not yet developed that degree of differentiation of the life space into levels of reality and irreality which is characteristic of the adult.

STRUCTURAL CONCEPTS

Topology may be defined as a branch of geometry which investigates the properties of figures that remain unchanged under continuous transformation or “stretching.” These are the qualitative relationships of connection and position. Early in his career, Lewin felt that topology might be particularly fitted to the special problems of psy-
Fig. 4. Topological representation of the psychological situation of a student considering four ways of spending his evening. The individual, $P$, is in the position of choosing among four activities: visiting a sick friend, $a_1$; writing a paper, $b_1$; seeing a movie, $c_1$; or earning some money, $d$. He sees the path to $a_1$ as involving calling the hospital, $a_2$, and traveling to the hospital, $a_3$. The path to $b_1$ is twofold, consisting of either going to the library, $b_2$, reading at the library, $b_3$, taking notes at the library, $b_4$, or of working with the books and notes already at home, $b_5$. The path to the goal of seeing a movie is seen to require a trip downtown, $c_2$, and the buying of a ticket, $c_3$. The individual perceives no path leading from his present position to region $d$.

Psychology. The concern of Gestalt theorists with part-whole relationships, with "belongingness" and "membership character," suggested the relevance of topological concepts to psychological questions.

Although topology is a young mathematical discipline which has been developed almost exclusively within the past 50 years, it is now a complex and high-powered mathematical tool. The topological concepts employed by Lewin are, from the point of view of mathematical topology, of a rudimentary nature and are torn out of their mathematical context. Mathematicians have sometimes seen little relationship between them and mathematical topology. Regardless of the mathematical vigor of Lewin's topological concepts, however, they serve the important function in his theoretical system of allowing one to determine which events are possible in a given life space and which are not. Dynamic concepts are necessary, in addition to topological ones, in order to determine which of the possible events will actually occur in a given case.

Let us illustrate Lewin's use of topological concepts to characterize "which events are possible" by reference to Fig. 4, which depicts the life space of a student who is considering how to spend his evening. Let us assume that the student envisages only four possibilities: visiting a friend in the hospital, writing a term paper, seeing a movie, and earning some money; let us assume that only these alternatives exist psychologically and that therefore only these are part of the life space. From the diagram, one can see that “going to a movie” requires that the student “go downtown” and “buy a ticket to the movie” before he “sees the movie.” “Seeing a movie,” in other words, is only possible if it is preceded by the activities of “going downtown” and “buying a ticket.” We would expect that if by chance he found that he did not have the money to buy the ticket after going downtown, he would not see the movie, since the only region connected with “seeing the movie” is “buying a ticket.” The regions of “sneaking into the movie” and of “getting someone else to buy his ticket” do not exist psychologically; thus, if he cannot buy a ticket, it is impossible for him to see the movie. The other alternative ways of spending the evening could be similarly discussed.

Let us employ Fig. 4 to illustrate some of Lewin's specific topological concepts. One of his basic concepts is that of region, which may be defined as any distinguishable part of the life space (or person). Regions of the psychological environment refer to present or contemplated activities rather than to the objective areas in which activities occur or to the external objects with which activities are linked (Leeper, 1943, pp. 92-95). A child who is using the back porch as a stage and a chair as a throne is in the region of "play acting" (on the porch with a chair as a throne), rather than in the region of the "porch." It should be obvious, however, that the characterization of any activity will be facilitated by knowledge of its behavior setting (including its time and locale) and of the behavioral objects with which it is concerned. In Fig. 4, all the areas enclosed by a line represent regions (for example, the region of "considering how to spend the evening," the region of "going downtown," the region of "buying a ticket"). Some regions might include subregions; for example, "visiting one's friend in the hospital" may include subregions of "giving him a present," "encouraging him," and "amusing him." However, psychological activities are not thought to be indefinitely divisible. The degree of differentiation of a region refers to the number of subparts within a region. Any region which has no distinguished subparts may be called a cell.

The position of the behaving self, $P$, is defined by the activity region in which it is located. Any change of position of any region within the life space is conceived to be a locomotion. This term, however, is used primarily in reference to locomotion of the behaving self rather than in reference to locomotion of parts of the psychological environment. In Fig. 4, a locomotion would take place if $P$ were to move out of the region of "considering how to spend the evening" into any other region, or if some restructuring of the psychological environment were to take place so that (for example) the student would view "visiting his friend" as leading to, rather than away from, "seeing a movie." This might occur, say, if he were to call up the hospital and find that they were showing movies to the patients and their visitors.

Locomotion from one region to another involves movement of the behaving self from its present to its terminal position through a path of neighboring regions. Two regions are neighboring if both regions have a common boundary and are otherwise foreign to each other. The boundary of a region consists of those cells in the region for which there is no surrounding boundary that lies entirely within the region. Regions $A_1, A_2, \ldots, A_n$ are said to form a path if $A_1$ is touching $A_2$, $A_2$ is touching $A_3$, and so on. In Fig. 4, there is no psychologically existing path between "considering how to spend the evening" and "earning some money," while there are two possible paths between "considering how to spend the evening" and "writing a paper." The distinguished path between any two regions is the path along which the individual expects that he will locomote if he chooses to proceed from one region to another. It is, in other words, the preferred or psychologically best path.

As we have pointed out in an earlier section, Lewin developed a geometry he called hodological space to represent direction in the life space. As in other geometries, the concept of direction is based on the concept of distinguished path. However, it is evident from the preceding paragraph that the concept of distinguished path in hodological space takes into consideration the cognitive structure and dynamic prop-
entities of the life space. A change in the psychological environment (that is, in the cognitive structure) or in the attractiveness of its various features is a sufficient condition for changing the direction between regions.

Direction at A toward B is defined as the relation between the regions A and B which is determined by the beginning step of the distinguished path from A to B. Four types of direction of locomotion can be distinguished:

1. Direction toward: any locomotion from one region to another which increases the force toward or decreases the distance from the terminal focus of locomotion, or goal region.
2. Direction away: any locomotion from one region to another which decreases the force toward or increases the distance from the terminal focus of locomotion.
3. Opposite direction: Two paths have opposite directions if the distinguished path for locomotion toward one goal region corresponds with the most unfavorable path for locomotion toward the other goal region.
4. Direction at "right angles": A path is at right angles to another if locomotion along it does not change the strength of force toward the terminal focus of the other path, or if locomotion along it does not change the distance to the terminal focus of the other path.

These four definitions are adapted from Leeper's (1943) modifications of Lewin's original definitions.

In addition to the preceding types of direction, Lewin distinguishes between equal and partly equal directions. If one compares two paths from one region to different goals which share the same first step, then the degree of equality of direction at the starting point approaches zero if (1) these paths show a high degree of psychological unity, so that all steps in the path tend to be fused as part of an inseparable whole; or if (2) each shows a very low degree of unity, so that each step is viewed as relatively separate and independent from the other steps in the path. Forces with partly equal directions summate, but not as completely as forces with fully equal directions.

Without elaborating, let us point out that Lewin's discussion of the psychological unity of a path requires that a path, such as the chain of regions A-B-C-D-E connecting A and E be conceived as a series of overlapping paths which consist of A-B, A-B-C, A-B-C-D, and A-B-C-D-E. If the potency of A-B-C-D-E is high, then there may be no distinguishable subunits on the path. If, on the other hand, the potency of any sub-path is high, the total path A-B-C-D-E may not exist as a psychological unit. (For a discussion of the concepts of overlapping situations and priority see pp. 432-433.)

Although the factor of psychological distance is of crucial importance in studying problems of the strength of forces, Lewin developed the concept of distance only sufficiently to indicate that one path is longer than another if it includes the other path within itself; however, the fact that one path is longer than another does not imply that it includes the shorter path within itself. However, in a subsequent "Analysis of the Concepts Whole, Differentiation, and Unity" (Lewin, 1941, 1951b), he defined the minimum distance between any two cells as the minimum number of boundaries crossed by a path from one of these cells to the other. This later definition, which has also been employed by Bavelas (1948) in a modified form, runs into the difficult question of whether it is fruitful to consider all cells, that is, all undifferentiated psychological activities, as being of the same size.

We have said that direction in the life space is dependent on the cognitive structure. Thus, if the individual has no clear knowledge of the sequence of steps necessary to achieve a given objective (for example, to solve a mathematical problem, to influence a policeman to not give him a speeding ticket, to escape from a burning building), he does not know the direction of locomotion necessary to obtain his goal. Most new situations are cognitively unstructured, since the individual is likely to have no knowledge of "what leads to what." It follows that in such situations the individual is unlikely to know what direction he should follow to achieve his objective. His behavior will be exploratory, trial-and-error, vacillating, and contradictory rather than parsimonious. As he strikes out in a particular direction, he does not know whether it is leading him toward or away from his goal. If reaching the goal has positive significance and not reaching it has negative significance for the individual concerned, then being in a region that has no clear cognitive structure results in psychological conflict, since the direction of the forces acting upon him are likely to be both toward and away from any given region. There will be evidences of emotionality as well as cautiousness in such situations. In addition, the very nature of an unstructured situation is that it is unstable; perception of the situation shifts rapidly and is readily influenced by minor cues and by suggestion from others. However, as Zajonc and Morissette (1960) have demonstrated, uncertainty tends to decrease with repeated exposure to the same situation. They also suggest that an increase in uncertainty may be a necessary condition for a change in judgment or opinion.

This characterization of some of the psychological implications of cognitively unstructured situations is of considerable usefulness to social psychology. For example, Lewin employed the concept of the unstable cognitive structure to give insight into the situation of the adolescent. He pointed out that the change from childhood to adulthood is a shift to a more or less unknown position (Lewin, 1939a, 1951b, pp. 138-139):

"Entering a new social group can mean something very similar to being thrown into a cognitively unstructured field, being forced to stand on unknown ground and not knowing whether the "right thing" is being done. The uncertain character of the adolescent's behavior and his conflicts can partly be explained by the lack of cognitive clarity concerning the adult's world which he is going to enter. It follows that this uncertainty is greater the more the individual has previously been kept out of the adult world and has been kept in the dark about it... (In addition) the time of sexual maturity brings with it changes which make this part of the life space, which is so close and vital to the individual, strange and unknown. In this case the change does not mean merely the usual uncertainties of a new and strange environment, but, in addition, a region which previously appeared to be well known and reliable becomes now unknown and unreliable. This change necessarily shakes the belief of the individual in the stability of the ground on which he stands and perhaps even in the stability of the world at large. Since the region of the body happens to be very important and central for everyone, this doubting might be rather fundamental.

The concept of lack of cognitive structure has also been fruitfully applied to characterize the situation of members of an autocratic group in which decisions are made arbitrarily (or on a basis which is unclear to the members) by the person in authority. It has also been used to give insight into the psychological situation of minority group members (Lewin, 1935a, 1948), of people suffering from physical handicaps (Barker, Wright, and Genick, 1946), of the nouveaux riches, and of other
persons crossing the margins of social classes. It may be applied to any situation in which the consequences of behavior are seemingly unpredictable or uncontrollable, in which benefits and harms occur in an apparently inconsistent, fortuitous, or arbitrary manner, in which the individual is uncertain about the potential reactions of others to his being in a certain activity region.

Zajone (1954, 1960) has systematically characterized such properties of cognitive structures as their degree of differentiation, degree of complexity, degree of unity, and degree of organization. Experimentally, he has investigated the effects of the person's role in the communication process (as transmitter or as receiver of information) upon the cognitive structures which are activated. His results indicated that subjects who expect to transmit information activate structures which are more differentiated, complex, unified, and organized than those activated by subjects who expect to receive information. A further experiment indicated that the differences between "transmitters" and "receivers" are reduced when all the subjects expect to be in a subsequent situation of conflict. Cohen (1961), in a study which supplementates Zajone's, concluded that transmission requires a tight and well-bounded cognitive "package" which can be readily communicated. However, being a receiver enables one to maintain a more flexible and unclear structure that may forestall the quick polarization which results when one is required to communicate what one knows.

Rokeach (1960), in his thorough study of The Open and Closed Mind, has also been much influenced by Lewin's characterization of cognitive structures. Rokeach's central thesis is that we organize the world of ideas, people, and authority basically along the lines of belief congruence, liking those with similar beliefs and discounting those with dissimilar beliefs. There are individual differences in the absolute extent to which different people are willing to accept or reject others on this basis; these differences reflect the structured "openness" or "closedness" of the belief systems. A system is open to the extent that the person can receive, evaluate, and act on relevant information from the outside on its own intrinsic merits. Structurally the "closed mind," as compared with the open one, is characterized by less differentiation of its belief systems (particularly its disbelief systems), more isolation of its parts within and between belief and disbelief systems, a narrower time perspective, and more dependence on external authority for the specific content of the beliefs and disbeliefs. Rokeach, like the authors of The Authoritarian Personality (Adorno et al., 1960), stresses the role of an enduring state of threat in creating the closed mind; his view of the origins of the closed mind is similar to their view of the origins of the authoritarian personality.

The concept of overlapping situations has been employed to characterize instances where a person is on more than one path at the same time. The simplest example is that of divided attention: a student eating his lunch and trying at the same time to study for an examination. One could analyze most instances of experienced conflict as being examples of overlapping situations, for example, the role conflict experienced by some career women between being "professional" or being "feminine" at any particular instant.

Barker, Wright, and Gevik (1946) have pointed out five aspects of overlapping situations:

1. Consonance: The extent to which the overlapping situations require activity that is more or less congruent is called their consonance. Overlapping situations can vary from situations leading to identical behaviors, in which paths have the same direction, to situations requiring completely antagonistic behavior, in which paths have opposite directions.

2. Potency: The influence of one situation relative to all simultaneously acting situations is called the relative potency of the situation. A person in the overlapping situations of "reading the paper" and "talking with his wife," in which the latter situation is of relatively higher potency, will predominantly converse with his wife, with perhaps an occasional glance at the headlines or a slight feeling of annoyance.

3. Valence: This characteristic is an index of the relative desirability of overlapping situations.

4. Barriers: The nature of the perceived barriers or obstacles in each of the overlapping situations is an important characteristic.

5. Extent of common parts: This characteristic refers to the extent of the parts common to the overlapping regions.

Lewin's topological representation, of which Fig. 4 is a typical example, is most adequate for describing the activities that an individual perceives as necessary for the attainment of a given objective and, thus, for depicting alternative courses of action as these appear in the life space of the acting individual at the planning or decision-making stage. It should be made clear that the relations represented in a topological diagram can be translated without loss of exactness into statements. However, the diagram is often a more convenient way of expressing the relations among a limited number of facts than would be a series of statements. On the other hand, the topological diagram is very awkward; it is even a hindrance, at times, when one attempts to depict certain types of perceived possibilities. This is true when the means-ends relations are numerous or complex. Moreover, Heider (1958) and Leaper (1943) have pointed out that the topological diagram is inconvenient when one wishes to represent the sufficient rather than the necessary conditions for an event. For example, a child may perceive a "eating jam" as being a sufficient but not a necessary condition for being punished. The fact that "eating jam" irreversibly leads to punishment in the child's view is difficult to represent without the use of arbitrary devices; on the other hand, there is no difficulty in representing high school graduation as a necessary condition for entering college. Heider has also pointed out that the topological diagram is inconvenient when the perceived source of change in the life space is not the actor but someone else or an impersonal source. Thus, it is difficult to represent topologically the expectation that "if my boss gives me a raise, I shall be able to buy a new car." Similarly, it is difficult to represent topologically instances in which an individual is the object of an event: for example, the instance in which a child expects to have a good time when his grandparents visit.

In addition to the foregoing difficulties often encountered in topological representation, Lewin's attempt to go beyond topology and treat problems of distance and direction in a manner suitable for psychology in his hodospatial space was not mathematically successful. Although the concept of distance is basic to the definitions of direction employed in hodospatial space, it was itself never more than passively defined. Lewin was well aware of the provisional nature of hodospatial space and in his last years was engaged, with the aid of some of his students and some mathematicians, in attempts to develop a more adequate geometry. Bavelas (1948), one of the most ingenious of Lewin's students, developed a mathematical model which has considerably more mathematical rigor than the model of hodospatial space. Some
of his concepts have been used profitably in experimental studies of different types of communication structures in groups (Leavitt, 1951). More recently, Brady, Norman, and Cartwright (1965), working at the Research Center for Group Dynamics, have applied the mathematical theory of graphs (a branch of combinatorial topology) to the study of communication networks, group structures, and interpersonal relations.

Let us conclude this section by indicating that, although Lewin's topological and hodological concepts are not much more than diagrammatic representations of his brilliant theoretical and experimental insights, it would be foolish to neglect the suggestive value of his imaginative effort to develop a geometry suitable for psychology. He pointed out the need for a new mathematics based on axioms different from those of the mathematics developed for the physical sciences. He indicated some of the properties that would be required of a geometry adequate to handle psychological space and he stimulated a more widespread interest in the development of such a geometry.

**DYNAMIC CONCEPTS**

In Lewin's system, dynamic concepts have the function of enabling one to determine which of the possible psychological events will occur. Just as his geometrical concepts are not independent of dynamic factors, so too his dynamic concepts are defined in a way which presupposes an adequate geometry. However, despite this independence of concepts in his formal "topological and vector psychology," many of Lewin's basic dynamic concepts were formulated prior to his explicit use of topological concepts.

The concept of tension system

The beginning of Lewin's dynamic conceptions can be traced back to his controversy with Ach. Ach (1910) reported a series of experiments on the learning of paired nonsense syllables. In these experiments, subjects first learned certain associations and then received test instructions which conflicted with them. These test instructions called for a type of response different from that acquired in the initial learning situation. For example, the subject might have learned to respond to "rik" with "rik" in the first phase; and the new instruction, to invert the stimulus syllable, would require the response "kir" to the stimulus "rik." Ach found that reaction time in the test situation was influenced by whether the associative tendency acquired in the initial learning coincided or conflicted with the determining tendency that resulted from the instructions in the test situation. While Ach's experiments convincingly demonstrated conflict and delayed reaction time, Lewin argued that the conflict was not between associative and determining tendencies, but between two determining tendencies. It was his belief that there is no "force" within mere association to lead to reproduction, but that reproduction itself must be motivated.

To prove his contention, Lewin conducted a series of experiments (Lewin, 1917, 1922a, 1922b) that were much like Ach's except for a few minor modifications. They demonstrated that the existence of an association per se is not sufficient for recall of the associated syllable on presentation of the stimulus syllable, and therefore is not sufficient for interference with a different response to the stimulus syllable. He reaffirmed that an association (or, to use his term, a "cognitive structure") does not provide the motor for mental activity. A tension system is always necessary for activity, including the activity of reproducing previously learned nonsense syllables.

The concept of tension system played a central role in Lewin's theorizing, and it has prompted a series of ingenious experiments on recall and sumption of interrupted activities, substitute activities, and satiation. It is most appropriately applied in connection with the person as represented in Fig. I (see p. 424). A system in a state of tension is said to exist within the individual whenever a psychological need or an intention (sometimes referred to as a quasi-need) exists. Tension is released when the need or intention is fulfilled. Tension has the following conceptual properties: (1) it is a state of a region or system S which tries to change itself in such a way that it becomes equal to the state of its surrounding regions \( S_1, S_2, \ldots, S_n \); (2) it involves forces at the boundary of the region S in tension.

There exists a definite relation between tension systems of the person and certain properties of the psychological environment. In particular, a tension may be related to a positive valence for activity regions in the psychological environment which are perceived as tension-reducing, and to a negative valence for the region in which the behavior self is located at the moment. However, the existence of a region of positive valence, that is, a goal region, depends not only on the existence of tension but also on whether or not there are perceived possibilities for reducing the tension. The behavior of the individual who has no conception of how to reduce a tension, and who therefore perceives no goal region, is determined by his desire to leave his present negative region for another, and to leave that for another, and so on. His behavior is characterized by locomotion in the direction away from his present region, that is (in terms of observable behavior), by restless movement; his behavior occurring in the situation where the individual knows a goal region exists but does not know its location, has many similarities to restless activity, but it is distinguished from it by the fact that the direction toward the goal is dominant and the leaving of the present region is only a means to that end (Lewin, 1938, pp. 62-63).

When a goal region which is relevant to a system in tension exists in the psychological environment, one can assert that there is a force propelling the behavior self toward the goal. A tension for which there is a cognized goal leads not only to a tendency to actual locomotion toward the goal region but also to thought about this type of activity. This may be expressed by saying that the force on the person toward the goal exists not only on the level of doing (reality) but also on the level of thinking (irreality).

From the foregoing assumptions about systems in tension, it follows that the tendency to recall interrupted activities should be greater than the tendency to recall finished ones. Zeigarnik (1927) and many others have conducted experiments in which subjects were given a series of tasks to perform and then prevented from completing half of them (selected at random). Later, the subjects were asked to recall what tasks they had performed. The results were presented in the form of a quotient, commonly called the Zeigarnik quotient (ZQ):

\[
\text{ZQ} = \frac{\text{unfinished tasks recalled (RU)}}{\text{completed tasks recalled (RC)}}
\]

Zeigarnik predicted a quotient of greater than 1. The obtained quotient was approximately 1.9, clearly supporting Lewin's assumptions. However, since many com-
pleted tasks were also recalled, it was obvious that additional factors were involved. Analyzing the situation of the subject at the moment of recall, Zeigarnik concluded that in addition to the force acting on the person to make him think about, and hence to recall, the uncompleted tasks, there was also a force making him recall both uncompleted and completed tasks. This latter force was induced by the experimenter’s instructions to “try to recall the tasks you worked on earlier.” The Zeigarnik quotient could be viewed as a function of the relative strengths of the induced force toward recall of all tasks and of the force toward recall of the uncompleted tasks. As the strength of the induced force increases in relation to the force toward the task goals, the quotient should approach 1; as it decreases in relative strength, the quotient should increase beyond 1. These additional predictions, which follow from an analysis of the situation at recall, were borne out in experiments by Zeigarnik and others. Thus, if the strength of motivation associated with the interrupted task is relatively high, or the strength of the experimenter’s pressure to recall is low, or if the task is interrupted near its end, the Zeigarnik quotient will be high.

A number of more recent experiments have indicated that the situation of recall is frequently even more complex than indicated above. If failure to finish a task is interpretable as a personal failure, for example, in an experiment in which the tasks are presented as measures of a socially esteemed ability, and if recall of this failure threatens one’s self-esteem, the Zeigarnik ratio tends to be less than 1; as it does also, if the recall of a task successfully completed raises a lowered self-esteem. For a more thorough discussion of the effects of self-esteem involvement on the Zeigarnik quotient, see Alper (1946, 1948), Glickman (1949), and Hall (1961), Iverson and Reuder (1956), Prentice (1944), Rosenzweig (1943), and Zeller (1950).

It should be noted that the terms “unfinished” and “completed” in the Zeigarnik quotient should refer to the subject’s view of the tasks rather than to whether or not they were objectively completed. If the subject achieves his goal in the task, even though objectively it remains unfinished, one would expect no force toward recall; and, conversely, if the subject does not achieve his goal even though the task is objectively completed, one would expect the tension to persist. Data from Zeigarnik’s experiment and from an experiment by Marrow (1938a, 1938b) support the notion that psychological rather than objective reality is what is significant here in predicting an individual’s behavior.

From the general assumption that when there is a need present for a certain goal there is a corresponding force which causes a tendency to locomote toward the goal, it follows that so long as a task is psychologically incomplete the subject should continue to try to perform the task (provided there are no sufficiently strong counterforces). Ossivanka (1928) created conditions such that the subject thought he had been interrupted by chance and at a later time he was left free to do as he wished. In an experimental room. There was 100 percent resumption of the interrupted task. When the interruption appeared to be intentional, there was still 82 percent resumption.

Adler and Kounin (1939) and Henle and Aull (1953) reported similar findings from experiments employing more sophisticated procedures.

Since the construct of tension refers to the state of one system in its relation to the state of surrounding systems, it presupposes a geometric representation of the person and a distinction between functional subparts or systems within the person. Lewin (1935b), in conceiving of the person as a series of differentiated subsystems, had rejected the catch phrase “everything is related to everything else” as misleading, since there is a great range of interdependencies between the subsystems of the person. Much of the research of Lewin and his students is concerned with the question of what factors determine the interdependence of tension systems and with the “fate” of tension with varying conditions of action.

Lewin postulated that the change in the tension difference between any two tension systems would depend on the time interval and the degree of interdependence of the two systems. With increased time, one would expect the tension differences between interdependent systems to decrease. Zeigarnik, in her experiments on the recall of interrupted activities, and Ossikovska, in her experiments on the resumption of interrupted activities, both found that as time elapses the tendency to recall or resume the interrupted activities decreases.

The degree of interdependence of two tension systems is conceived to be a function of the degree of fluidity or rigidity of the person and of the structural relations or connections between the two systems. The fluidity of the person is affected by general states of the person. For example, a person is considered to be more fluid when tired, when he is undergoing a wave of emotional tension, when he is young, when he is in a “make-believe” or irrele situation, when he is intelligent, etc. Experiments by Zeigarnik have indicated that in more fluid states, the tension differences between systems tend to dissipate more rapidly.

Experimental studies of rigidity by Kounin (1941a, 1941b), in which he compared three groups of subjects of equal mental age (an old feebleminded group, a young feebleminded group, and a normal group) led him to conclude that any performance which requires a certain degree of communication between neighboring regions is to such extent made difficult for the older and/or more feebleminded individual. The task may be predominant of a cognitive nature... or a motor nature... or of a volitional nature. If a task is facilitated by a lack of communication between neighboring regions, such a task will be more efficiently and accurately performed by an older and/or more feebleminded individual.

Investigation of the structural relations between systems occasions such questions as whether two particular systems are subparts of a larger system, whether two particular systems have a relationship of simple dependence, interdependence, or organizational dependence, and what the proximity of or distance between regions may be. Although the problem of characterizing structural arrangements in logically strict terms has received only scant attention (Bavelas, 1948; Lewin, 1951b, Appendix: Zajone, 1954), a number of interesting experiments have been conducted which deal with structural relations. Among these are the experimental studies of substitution.

Some experimenters have used a technique of recall to study the value that a substitute activity has for reducing a tension originally connected with another activity. Lissner, who initiated investigation of this point (1933), used a technique of resumption. The substitute value is measured by the amount of decrease in resumption or recall of the interrupted original activity after a substitute activity has been completed. The results of the experiments on substitute value can be summarized briefly:

1. Substitute value increases with the perceived degree of similarity between the original and the substitute activity and with the degree of difficulty of the substitute activity (Lissner, 1933).
2. Substitute value increases with increasing temporal contiguity between the original and the substitute activity (Hendle, 1942).

3. The substitute value of an activity (thinking, talking, doing, and so forth) depends on the nature of the goal of the original task. A task whose goal is to demonstrate something to another person, and in particular to the experimenter, must involve activity that the other person can observe; merely thinking without social communication would not be satisfactory to the case. Realization tasks, whose goals are to build material objects, require “doing” it, and not merely “telling how” it can be done. On the other hand, an intellectual task may find a substitute of high value in “telling how” the intellectual job is to be done (Mahler, 1933).

4. “Magic solutions,” “make-believe solutions,” or solutions which obviously violate the requirements of the task have little substitute value for tasks at the reality level. However, if the situation is a make-believe or play situation, make-believe situations will have substitute value (Dember, 1931; Strube, 1934).

5. A substitute activity which is identical with the original activity will have little substitute value if it does not serve the same goal. Thus, building a clay house for John will have little substitute value for building a clay house for Mary. If the emphasis is on “building a clay house and not on ‘for . . .’” then substitution can of course occur (Adler and Kounin, 1939).

6. Having someone else complete a task in which the subject has been interrupted tends to have little substitute value, particularly if completion of the task by himself is related to the subject’s self-esteem. However, when pairs of individuals work cooperatively on a task, the completion of the task by one’s partner has considerable substitute value (Lewis, 1944; Lewis and Franklin, 1944).

The research findings concerning substitute value have implications for a wide range of problems in psychology, from the relative gratification value of individual versus socially shared productive or fantasy systems to the development of specialized roles within a group. Let us illustrate this briefly with the very important finding that the actions of another person can be a substitute for one’s own if a cooperative relationship exists. Substituteability enables individuals who are working cooperatively on a common task to subdivide the task and to perform specialized activities, since none of the individuals in a cooperative situation has the need to perform all the activities by himself. In contrast, the individual in a competitive situation is less likely to view the actions of others as substitutable for similarly intended actions of his own. Thus, when a competitive situation exists in a group, there is less likely to be development of specialization in activities (Deutsch, 1949a, 1949b).

The concept of tension systems has also been successfully applied in experimental studies of satiation. For most needs, one can distinguish states of hunger, of satiation, and of over-satiation. These states correspond to a positive, a neutral, and a negative valence of the activity regions which are related to a particular need or tension system. Karsten (1928) has studied the effect of repeating over and over again such activities as reading a poem, writing letters, drawing, and turning a wheel. The main symptoms of oversatiation appear to be (1) the appearance of subunits in the activity, which leads to the disintegration of the total activity and loss of its meaning; (2) increasingly poor quality and greater frequency of errors in performance of the task; (3) an increasing tendency to vary the nature of the task, accompanied by a tendency for each variation to be quickly satiated; (4) a tendency to attempt to make the satiated activity a peripheral activity by concentrating on something else while doing the task (this attempt is usually not completely successful and the mind wanders); (5) increasing dislike of the activity and of similar activities, accompanied by an increased valence for different tasks; (6) emotional outbursts; (7) development of “fatigue” and similar bodily symptoms, which are quickly overcome when the individual is shifted to another activity.

Satiation occurs only if the activity has, psychologically, the character of marking time or of getting nowhere. If the activity can be viewed as making progress toward a goal, symptoms of satiation usually will not appear. Embedding an activity in a different psychological whole so that its meaning is changed has practically the same effect on satiation as shifting to a different activity. The rapidity with which satiation occurs depends on (1) the nature of the activity—satiation occurs more slowly as the size of the units of action and the complexity of the action increase; (2) the degree of centrality of the activity—other things being equal, activities which are of greater significance to the person are more quickly satiated than peripheral activities; (3) the state of the person—the more fluid the state of the person, the more quickly he is satiated. The rate of satiation and co-satiation of similar activities, that is, the rate of spread of satiation effects from one activity to similar activities, decreases with age and with lack of intelligence (Kounin, 1941a, 1941b).

Most of the phenomena of satiation can be explained by assuming that continued performance of a task leads to a lowering of the tension level in the system corresponding to the task; with increasing repetition the system corresponding to the task may be represented as reaching a lower level of tension than the surrounding systems. This should lead the person to turn away from the repeated task to other activities. With time, the person will also turn away from activities related to tension systems that are interdependent with the satiated system, and turn toward activities not connected with the satiated activity. Thus, his tendency is to turn away from similar activities and to turn toward dissimilar activities. The breakdown of the satiated activity into disorganized units fits in very well with Lewin’s analysis of the “differentiation and unity of a whole based on simpledependence” (Lewin, 1941, 1951b, pp. 305–335).

The concept of tension system has also been employed to give insight into some of the effects of frustration. Barker, Dembo, and Lewin (1941) in their study of frustration and regression have indicated that psychological development can be characterized as resulting in two structural changes: (1) an increased differentiation of the person into subsystems, which is reflected in a wider variety of behavior, emotions, skills, knowledge, etc.; (2) a change of organization of the person such that subsystems of the person are related to another hierarchically, rather than by simple interdependence. Thus, as the individual grows older some systems become more dominant and other systems serve as their “tools”; this older individual may be contrasted with the infant, in whom interdependence of systems is characterized by the simple diffusion of influence. Barker, Dembo, and Lewin believed that the structural changes brought about by psychological development could be reversed at least for the moment, by creating a high level of tension in a subsystem of the person and by not permitting this tension to be reduced through activity toward a relevant goal. Presenting a frustrating situation, that is, one in which an individual is prevented from reaching a desired goal, is one way of creating such tension.
To study the effects of frustration, Barker, Dembo, and Lewin created an experimental situation in which, in the first stage, children aged three to five were allowed to play with some extremely desirable toys. In the second stage, the children were taken to another part of the room separated from these toys by a wire partition. Here they were allowed to play with less desirable toys. Their behaviors, including the constructiveness of their play activities, were observed and compared during the period when they could play with the desirable toys (free-play period), during the period when they could not play with the toys (frustration period), and during a later period when they were again allowed to play with the desirable toys (post-frustration period). The results of the experiment indicated that frustration produces a change in the constructiveness of play activities, that is, of the degree of organization and differentiation in the play activities, equivalent to an average regression of 17.3 months of mental age.

The deindividuation which was produced by the experiment is explained in terms of two related notions, which are developed at some length by Lewin (1941; 1951b, Appendix): (1) The degree of differentiation of a whole (for example, the person) is inversely related to the strength of tension when this passes beyond certain limits. These limits are determined by the strengths of boundaries of the subsystems comprising the whole. (2) A decrease in the variety of behavior must also occur if a part of the whole is kept in a fixed state. The amount of decrease depends on the extent of the fixed areas, their degree of centrality, and their divergence from the normal level. Frustration keeps a certain portion of the person in a state of more or less permanent tension and the variety of behavior therefore decreases. The change in degree of organization of play activities results from a tendency toward diffusion of tension when tension is high, and hence from a passing or disruption of organizational relations; and, in addition, from the conflict for control over the perceptual-motor regions between the "frustrated" tension system and the tension system related to playing with the less desirable toys.

Let us conclude our discussion of tension systems by pointing out that the concept of tension system and the various experimental studies on the recall and resumption of interrupted activities, substitution, satiation, and frustration have direct relevance to many problems of social psychology (although, as yet, this relevance has not been fully exploited). The concept of tension system is applicable to socially derived needs and intentions, to motives which develop from belonging to a group and from participating in group activities, to interpersonal influences, etc. The various effects of tension on psychological processes provide criteria for developing insights into the social and group factors which produce individual motivation and facilitate the reduction of individual tensions.

Dynamic properties of the psychological environment

The construct force characterizes, for a given point of the life space, the direction and strength of the tendency to change. The combination of a number of forces acting at the same point at a given time is called the resultant force. Whenever a resultant force (different from zero) exists, there is either a locomotion of the behaving self in the direction of that force or a change in cognitive structure equivalent to this locomotion.

Lewin distinguished between driving and restraining forces. Driving forces correspond to a relation between at least two regions of the life space: the region of present activity and the region of a goal. Driving forces tend to lead to locomotion, and hence the statements in the preceding paragraph, strictly speaking, refer only to driving forces. Restraining forces, as such, do not lead to locomotion, but they do influence the effect of driving forces. Any region which offers resistance to locomotion, that is, any barrier to locomotion, is characterized by restraining forces at its boundary. The strength of the restraining forces reflects the relation between the perceived nature of the barrier region and the perceived ability of the individual. The same social or physical obstacle corresponds, therefore, to different restraining forces for different individuals. It is an important characteristic of the force field, which corresponds to a barrier, that it does not extend, or at least does not extend to any important degree, outside the region of the barrier. In other words, at the barrier there are only forces away from the barrier and there are no forces in any other region which are directed away from the barrier.

We have employed the term "valence" in our discussion of tension systems and of driving forces; the three constructs are intimately interrelated. A region within the life space of an individual which attracts or repels is considered to have valence: a region of positive valence attracts, a region of negative valence repels. Technically, a positive valence corresponds to a force field with all forces directed toward the same region, the region of positive valence. A negative valence corresponds to a force field with all forces directed away from the same region, the region of negative valence.

The relations among tension, valence, and force may be clarified by comparing two types of theory. The first type attempts to explain behavior as a result of the inner state of the person, including the inner stimuli (which in turn may be due to stimuli from outside). This view is characteristic of many of the so-called physiological theories. It involves a derivation of behavior, including directed locomotions, from the state of inner personal regions. Lewin, advancing the second type of theory, wrote (1938, pp. 106–108):

... such an explanation of behavior is not possible ...

(1) Forces for locomotions cannot be derived logically from tension in the person.
(2) There exists a relation between certain tensions of the inner personal regions of the person and certain valences in the environment: as the tension increases, the strength of the valence tends to increase. However, the existence and the strength of the valence does not depend only upon the tension of the person but also upon certain nonpsychological "alien" factors. More specifically, the valence $V_a(G)$ which an object or activity $G$ possesses for a person at a given time depends upon the character and state of the person $P$ and upon the perceived nature of the object or activity $G$.

(3) In the same indirect way tension and forces for locomotion are related... the force is a function of the strength of the valence $(G)$ and of the relative position of $P$ and $G$. ... the strength of the force increases as the strength of the valence increases and as the distance between the person and the valent region decreases. ... In other words, the force for a locomotion depends on the need...
or the tension of the person, on those non-psychological factors which affect the existence of a valence, and on the relative position of the person and the valence.

Instead of linking the need directly to the motoric, the need is linked with certain properties of the [psychological] environment. The [psychological] environment then determines the motoric.

The dynamic concepts which Lewin has utilized to characterize the psychological environment have been brilliantly employed, in conjunction with his topological concepts, to give insight into the nature of different types of conflict situations. Lewin's article, "The Psychological Situations of Reward and Punishment" (Lewin, 1935b, Chapter IV), ought to be read in its entirety to obtain the full richness of his important discussion. Here we can give only the essential points of his distinctions.

Lewin first distinguished between the interest and the punishment situations. He pointed out that one can represent the fact that a person is interested in a task by a positive valence or by a field of forces all directed toward the goal. If difficulties force the person out of his original direction toward the goal, a new vector in the direction of the goal comes into play and initiates behavior toward the goal. The behavior thus makes a pronounced goal-seeking impression. In the punishment situation, the person finds himself between two negative valences arising from the unpleasant task and the threat of punishment for failure to do the task. If the threat of punishment is to be effective, the forces emanating from it must not only be strong enough to overcome the forces in the direction away from the unpleasant task, but they must be so distributed as to hold the person continuously within the field of the task. If the forces emanating from the threat are not so distributed or are not continuously active, and the individual encounters a difficulty in the pursuit of this unpleasant task, then he is pushed in the direction opposite to that of the task. This result may be contrasted with the interest situation, in which a difficulty standing between the individual and a task that is attractive to him tends to sharpen his interest and to draw him toward this task. The interest situation thus possesses an educationally important property that the punishment situation lacks. In the interest situation, if the child is thrust away by difficulties, he tends of himself to resume the direction of the task; in the punishment situation, this is not the case.

From the context of this comparison of situations, it is easy to understand what is meant by a "conflict." A conflict is characterized as a situation in which oppositely directed forces of about equal strength play upon the person simultaneously. In a general way, Lewin distinguished three fundamental types of conflict situation, the punishment situation just described being an example of one of the three. We shall briefly enumerate and describe them.

1. The individual stands midway between two positive valences of approximately equal strength. A classical instance of this sort of conflict is Buridan's ass starving between two stacks of hay. That the ass actually starved, however, is highly unlikely, because this sort of conflict is a labile or unstable condition rather than a true equilibrium. It is a fact of the field-theory analogy that the strength of force toward a goal region increases as the individual approaches the region. From this it follows that if the individual, because of the play of chance factors, moves from a point of apparent equilibrium toward a particular goal region, he is likely to continue to move toward it and away from the point of equilibrium, because the increase of force resulting from the increase of his proximity to the goal region tends to provide him with, as it were, a natural acceleration. It is the influence of this particular which distinguishes the real conflict situation from the classical instance described above.

Most instances of apparent conflict between two positive valences, for example, between going to the theater and going to the opera, are actually conflicts between regions each of which is simultaneously positive and negative in valence. One wants to go to the opera but does not want to miss going to the theater, or one wants to go to the theater but does not want to miss the opera; and yet doing one precludes doing the other.

2. The individual stands between two negative valences of approximately equal strength. This is the type of conflict of which the punishment situation is an example. The type is very much influenced by the structure of the situation. Let us enumerate and illustrate three subtypes of situations involving conflict between equal negative valences: (a) The individual is between two negative valences but there are no restraints keeping him in the situation. For example, a girl must marry an unpleasant suitor or become an impoverished spinster if she remains in her village; yet there is nothing to prevent her from leaving her village. (b) The individual is between two negative valences but he cannot leave the field. For example, a group member must perform an unpleasant task or face the prospect of losing social status; yet his situation is such that it is impossible for him to leave the group. (c) The individual is in a region of negative valence and can leave it only by going through another region of negative valence. For example, a man is cited for contempt of Congress for not testifying as to whether or not some of his acquaintances were members of the Communist party; yet to purge himself of contempt he must engage in the unpleasant activity of being an "informant."

It is evident that the situation depicted in (a) leads to a going "out of the field." Escape behavior follows from the fact that the resultant of the forces away from the two regions of negative valence tends to push the person in a direction perpendicular to the path connecting them. Only if restraints prevent the individual from leaving the field will such a situation result in more than momentary conflict. Restraints as in (b) introduce a conflict between the driving forces related to the negative valences and the restraining forces related to the restraining barrier. There is a tendency for a barrier to acquire a negative valence which increases with the number of unsuccessful attempts to cross it, a negative valence which, finally, is sufficiently strong to prevent the individual from approaching it (Fajans, 1933a, 1933b). Thus the conflict between driving and restraining forces is replaced by a conflict between driving forces as in (c) above. This fact is particularly important for social psychology since, in many situations of this sort, the barriers are social. When a person turns against the barrier, he is in effect directing himself against the will and power of the person(s) or social group to whom the erection of the barrier is due. That is, when there is no way to escape the conflict between negative valences except by overcoming social barriers, the barriers and the people from whom the individual perceives that they derive will take on negative valence as he realizes that he is unable to escape. One of the effects of the threat of punishment is to create a situation in which the individual and the creator of the barrier stand against each other as enemies.

3. The individual is exposed to opposing forces deriving from a positive and negative valence. We can distinguish at least three different forms of this conflict: (a) The individual finds himself in a region that has both positive and negative valences (the Freudian concept of ambivalence is subsumable under this variety of conflict). For example,
a person wishes to join a social group but he fears that being a member will be too expensive. (b) The individual is encircled by, but is not actually in, a negative or a barrier region and is attracted to a goal which is outside the negative or barrier region. For example, a person must go through the unpleasant ordeal of leaving his home or his group in order to pursue some desired activity. The nature of this situation is such that the region of the person's present activity tends to acquire negative valence so long as the region which encircles the person hinders locomotion toward a desired outer goal. Thus, being a member of a minority group or being in a ghetto or in a prison often takes on negative valence, apart from the inherent characteristics of the region, because one cannot get to desired goals from the region except by passing through an encircling region of negative valence. (c) The individual perceives a region of positive valence which is encircled by or is accessible only through a region of negative valence. This type of situation differs from (b) in that the region of positive valence, rather than the region in which the person is to be found, is encircled by the negative valence. The reward situation, in which the individual is granted a reward only if he performs an unpleasant task, is an example of this type of conflict. Similarly, the initiation rites of many social groups, the hazing procedures of college fraternities, for example, may be viewed as exemplifying this kind of conflict.

Both Lewin (1946a; 1951b, p. 259) and Miller (1944) have pointed out that the forces corresponding to a negative valence tend to decrease more rapidly as a function of the psychological distance than do the forces corresponding to a positive valence. The amount of decrease depends also on the nature of the region which has a positive or negative valence. It is different, for example, in the case of a dangerous animal which can move about, than it is in the case of an immovable unpleasant object. The difference in the gradients of decrease for forces deriving from positive and negative valences accounts for the fact that a strong fear or a strong tendency to withdraw may be taken as evidence of a strong desire for the goal despite the apparent paradox. Only with a highly positive goal will the equilibrium point between approach and avoidance tendencies be close enough to the negatively valent region to produce a strong force away from the goal. On the other hand, strengthening the negative valence of a region may very well have the effect of weakening the forces in conflict, since the equilibrium point (that is, the point where the force away from the negative valence and the force toward the positive valence are of equal strength and opposite direction) may be pushed a considerable distance from the valent regions.

We have pointed out that one can analyze conflict in terms of overlapping situations. The usefulness of characterizing conflict in these terms becomes evident when one considers more broadly choice situations or decision-making situations, of which the conflict situation might be considered a subtype. It becomes apparent that the relative potencies of the overlapping situations constitute an important factor in determining choice, as do the strengths of the conflicting valences and the relative position of the person in relation to the valent regions. Potency may, in fact, be viewed as a factor influencing the effective strengths of valences or forces; even if a goal is highly attractive, it will not elicit behavior if the potency of the situation to which the goal is linked is very low. (The combined potency of all the situations in which an individual is simultaneously involved is considered to be equal to 1; the potency of any given situation varies between 0 and 1.) Escalona (1940) has indicated that one may consider the potency of a situation to vary as a function of the perceived probability of success in obtaining the goal. Although it is clear that factors other than the subjective probability of success may influence potency, these have never been adequately discussed in the writings of Lewin and his students.

Reaching a decision, where there are equally attractive and opposing goals, may be thought of as a process which raises one of the alternative paths to a stable and dominant potency. Experimental results indicate that, other things being equal, decision time is greater for choice between two negative than between two positive valences (Barker, 1942). It has also been found that decision time increases as the potencies of the opposing situations approach equality (Escalona, 1940), (2) as the strengths of the opposing forces approach equality (Cartwright, 1941), and (3) as the opposing forces increase in strength (Barker, 1942). Decision time also varies as a function of certain personality characteristics.

Cartwright and Festinger (1943) have developed a rather neat quantitative theory of decision from which many of the results of classical psychological studies of choice can be derived. The essential ideas in this theory are as follows:

1. Conflict between incompatible forces is represented as overlapping situations.
2. The strength of the effective force in each of the overlapping situations is a function of the potency of the overlapping situation. Potency refers to the subjective probability of success of a given course of action. The sum of the potencies is assumed to be 1.00.
3. The potencies, and therefore the effective forces, are assumed to vary according to the normal distribution from moment to moment.
4. A certain minimal difference between effective forces must be exceeded before a decision is reached.
5. The more nearly equal the effective forces are to begin with, the more time it will take before their random fluctuations will produce a difference which exceeds the minimum necessary for a decision.

More recently, Festinger (1957, 1964) has developed a theory of cognitive dissonance which elaborates Lewin's view that the situation prior to decision differs from the postdecision situation (1951b, p. 76):

For example, if food is expensive, two forces of opposite direction act on the housewife. She is in a conflict. The force away from spending too much money keeps the food from going into that channel. A second force, corresponding to the attractiveness of the food, tends to bring it into the channel. Let us assume that the housewife decides to buy an expensive piece of meat: the food passes the gate. Now the housewife will be very eager not to waste it. The forces formerly opposing one another will now both point in the same direction: the high price that tended to keep the expensive food out is now the reason why the housewife makes sure that through all the difficulties the meat gets safely to the table and it is eaten.

Festinger's theory generalizes the idea that the situation after decision may differ from the situation before decision. He makes the unique and original assumption that making a decision per se arouses dissonance and pressures to reduce the dissonance.

Dissonance after decision results, according to Festinger, from the fact that the decision in favor of the chosen alternative is counter to the beliefs that favor the unchosen alternative or alternatives. To stabilize or freeze the decision after it has
been made, a person attempts to reduce dissonance by changing his cognitions in such a way that the relative attractiveness of the chosen as compared to the unchosen alternative is increased, or by developing cognitions that permit the alternatives to be possible substitutes for one another, or by revoking the decision psychologically. In Festinger's (1964) view, the crucial difference between the states before and after decision is that the conflict before decision is more "impartial" and "objective," since it does not lead to any spreading apart of the attractiveness in favor of the alternative presently to be chosen. Festinger wrote (1964, pp. 8-9): "Once the decision is made, however, and dissonance-reduction processes begin, one should be able to observe that the differences in attractiveness between the alternatives change, increasing in favor of the chosen alternative." According to this view, after a student has decided to go to one college rather than another, the college he has chosen will seem to him to have increased in attractiveness compared to the college that he did not choose.

A variety of interesting and ingenious experiments have been stimulated by Festinger's view of the postdecision process. These experiments have often involved "nonobvious" predictions that appear to defy common sense. Many of these derive from the notion that if a decision produces insufficient rewards, the person will change his beliefs so as to make the decision seem more rewarding. Festinger (1961) wrote: "Rats and people come to love the things for which they have suffered." Presumably they do so in order to reduce the dissonance induced by the suffering and their method of dissonance reduction is to enhance the attractiveness of the choice which led to their suffering. (For a sympathetic summary of dissonance theory and of many experiments stimulated by it, see Breib and Cohen, 1962; for critical reviews see Chapais and Chapais, 1964, and Jordan, 1963; also see Chapter 5 of this volume for a discussion of dissonance theory and other related theories.)

Let us sum up our discussion of the dynamic features of the psychological environment by pointing out that Lewin employed three main concepts—valence, driving force, and restraining force—supplemented by the concept of potency. These concepts are dealt with most fully in his monograph, "The Conceptual Representation and Measurement of Psychological Forces" (1938). In this monograph, he also considered, as its title suggests, the problem of the measurement of psychological forces. He pointed out that the strength of a force can be measured by (1) the strength of opposed driving or restraining forces, (2) the relative persistence of directed activity, or (3) the velocity of locomotion or of restructured. Lewin's monograph should be consulted for a detailed discussion of these various methods of ascertaining the strength of a force.

**PSYCHOLOGICAL ECOLOGY**

The field-theoretical approach highlights the relation between psychological and non-psychological factors in the explanation of behavior in such basic concepts as life space and psychological environment. It is not surprising that Lewin, in his 1944 paper "Psychological Ecology" (reprinted in Lewin, 1951b, p. 170), pointed out that

... the first analysis of the field is done from the point of view of "psychological ecology": the psychologist studies "nopsycho logical data" to find out what these data mean for determining the boundary conditions of the life of the individual or the group. Only after these data are known can the psychological study itself be begun to investigate the factors which determine the actions of the group or individual.

It is, however, surprising that Lewin's theoretical contributions in this area were so limited. They are confined to a channel theory (Lewin, 1943c) which attempts to characterize how the flow of events in social and economic channels may be influenced by those who control the gates in the channel ("the gatekeepers"), and to an indication (Lewin, 1947a, 1947b) that the analysis of social interaction must follow a three-step procedure, moving from a separate analysis of the life space of each individual at time 1 to the resulting "objective" interaction at time 2, and from there back to the effect on each individual's life space at time 3.

Although Lewin did not devote much attention to psychological ecology, a notable group of his students have. Barker and Wright and some of their colleagues and students at the University of Kansas have attempted to characterize systematically the settings in which behavior occurs (Barker, 1960, 1963, 1965; Barker and Gump, 1964; Barker and Wright, 1949, 1955; Wright and Barker, 1950). The essence of their approach may be captured in an explanation of their definition of ecology. Barker (1960, p. 12) stated that "ecology" is concerned with the naturally occurring environment of entities, i.e., with the environment as it occurs without the intervention of the investigator, and with the distribution over the earth of the entity and its environmental variables. The key terms are "naturally occurring," "environment," and "entities." Let us consider these terms as Barker and his coworkers employed them in relation to psychology.

They distinguished between naturally occurring behavior units, which occur without intervention by the investigator, and investigator-selected or investigator-created fragments of behavior, which they called "behavior tesserae" after the pieces of glass in mosaic work (Barker, 1963, 1965). Behavior tesserae are consequences of research methods which divide the behavior continuum at predetermined points; they are produced by tests, experiments, questionnaires, and interviews, that is, by all methods in which an investigator requires a subject to engage in actions to suit the investigator's scientific purposes. Barker (1963) pointed out that even though all sciences segment, compound, synthesise, and rearrange their substances for analytic purposes, most sciences also devise techniques for exploiting the natural units of their phenomena. The identification and description of the natural entities or events of psychology and of their relevant contexts or environments and the incorporation of these into a unified system of concepts constitute the ecological side of psychological science. But as Barker (1963, p. 7) stated, "... ecological studies of the behavior stream while not entirely absent are meagre indeed. Psychology is surely one of the few sciences that has little more knowledge than laymen about the occurrence in nature of many of its phenomena; of talk, of fear, of problem-solving efforts (and their successes and failures), of laughter, of frustration, of being disciplined, of anger, of achievement, of cooperation, of play, of being eased..."

The terms environment and entity are intertwined. The environment of an entity is composed of those parts of the regions outside the entity with which the entity is coupled by laws on a different level from those which govern the entity itself (Barker, 1960). Every entity stands between phenomena on its outside and its inside, and these belong to different orders of events from the entity itself and from each other. Every entity forms the outside of the phenomena which are within it and, along with other entities, it forms the inside of superordinate entities.

To illustrate these ideas, let us consider a person driving a car. The physico-chemical processes going on within the person are coupled with, but are not at the same explanatory level as, his goal-directed behavior; similarly, although the molar
behavior of the car’s driver is coupled with the car’s movements, the physical movement of the car is of an order of events different from that of his psychological activity. In this illustration, the person has been considered as the relevant entity, his physicochemical processes as “inside,” and the car as part of the “outside” environment. For other purposes, one might consider the person and his car as part of the “inside” of a traffic jam.

Barker and Wright (1955) have described a concept useful for characterizing those parts of the environment which tend to elicit a discriminable pattern of behavior that is independent of the particular individuals involved. They use the term “behavior setting” to include both the milieu within which the behavior occurs and the synonymic behavior pattern which typically occurs within it. Some examples of behavior settings are a doctor’s office, a social party, a classroom, a school lunchroom, a fishing trip, a movie, a church supper, and a cemetery. For reasons which are not clear, Barker and Wright unnecessarily limit the term “behavior setting” to those parts of the environment which have a specific physical-temporal locus. In other words, behavior settings are not defined to include positions located in the social structure (e.g., father, policeman, husband) that are not necessarily confined to a given physical locale.

Specific behavior settings tend to elicit standard patterns of behavior because of direct physical or social forces acting on behavior (narrow passageways make people walk in file; soldiers on a drill field are required to walk in step with one another). These forces, in turn, may reflect native or learned ways of perceiving the milieu (people do not have to be taught to avoid cliffs; taboos are taught). Or the social forces may operate through the selection of persons with appropriate behavior characteristics (boys younger than a certain age cannot join the Boy Scouts) or by creating milieus which permit or encourage certain kinds of behavior (constructing a tennis court to be able to play tennis). Barker (1963, p. 29) remarked that behavior settings not only elicit particular patterns of behavior, they are also “strongly self-regulated systems which regulate the behavior episodes within them as molecules regulate atoms, as organs regulate cells, and as structures regulate the beams of which they are constructed.” In other words, behavior settings are conceived by Barker to be homeostatic systems which normally persist at a characteristic functional level.

Barker and Wright (1955) developed an extensive category system which they employed to characterize behavior settings. In their survey of behavior settings in Midwest (a fictitious name for a small town in Kansas), they used six major category dimensions: occupancy time, penetration, action patterns, mechanisms, richness, and centrality.

Occupancy time refers to the total number of hours people of Midwest spend in the behavior setting during the year. The total occupancy time for the behavior setting “father-son banquet,” for example, was 260 hours; the Negro population of Midwest spent zero hours in this behavior setting. If one examines the proportion of time spent in the different varieties of community behavior settings, one notes the interesting fact that the four most frequently occupied behavior settings are, in descending order: school classes; trafficways (traveling between behavior settings); settings concerned with buying and selling food; settings dealing with buying and selling of clothing, household accessories, and medicines. Of the different age groups in Midwest, infants and elderly people spend the most time in family settings while adolescents spend the least time.

Penetration of behavior settings refers to the degree to which its occupants have involvement and responsibility in the setting. It is rated on a six-point scale from “loomer” (zone 1) to “active functionary” (zone 4) to “single leader” (zone 6). Depth of penetration increases progressively with age until adulthood and then falls off for the aged. It is higher for whites than Negroes, and higher for the middle class than the upper or lower class in Midwest.

Action patterns refer to the typical behavior patterns associated with particular behavior settings. Thirteen categories are distinguished: esthetics, business, earning a living, education, government, nutrition, orientation, personal appearance, philanthropy, physical health, recreation, religion, and social contact. For each of the thirteen categories, ratings are made to indicate (1) what proportion of the occupancy time of the behavior setting is spent in the specified action pattern; (2) what proportion of time is spent supplying materials for carrying out the specific action pattern in another behavior setting (for example, buying food—nutrition—in a grocery to eat at home); (3) what proportion of the time is spent evaluating or appreciating the specific action pattern; and (4) what proportion of the time is spent on explicit teaching or learning of the specific action pattern. In Midwest, social interaction and recreation are the most prominent behavior patterns in the community behavior settings, with work and education next in prominence. Business, earning a living, and government increase with age, while nutrition, religion, and personal appearance decrease.

Behavior mechanisms refer to the molecular features of behavior: affective behavior, gross motor activity, listening, looking, manipulating, talking, and thinking. Each mechanism is rated in terms of frequency of occurrence, tempo or speed, and intensity or energy.

Richness of a behavior setting refers to the variety of behavior possibilities within it as indicated by the population richness, that is, by the variety of population categories participating in it, and by the variety of action patterns and behavior mechanisms that occur in the behavior setting. The overall measure employed is labeled the “General Richness Index.” This measure is, unfortunately, subject to many artifacts and therefore has no clear meaning. It is, like the measure of centrality (the average degree of interdependence of a setting with the other behavior settings of the town), was employed very little in the study of Midwest.

In addition to characterizing behavior settings in detail, Barker and Wright (1955) have investigated the behavior objects around which behavior occurs. Behavior objects include animal as well as inanimate objects: people, dogs, trees, toys, etc. Behavior, in a sense, surrounds a behavior object, while it is surrounded by a behavior setting. Three children of Midwest who were studied intensively interacted with the following objects for which they most frequently (in descending order): women, boys, girls, men, books, dogs, trees, desks, papers, cap guns and caps, cookies, bicycles.

Barker and Wright have also been interested in characterizing the stream of behavior. In their characterization of it, they have been concerned with recording both the molar behavior ("saluting the flag" as opposed to "elbow bending and extensor adjustments of the fingers") and the environment as experienced by the person who is engaging in the behavior. A behavior setting that is experienced is called a psychological habitat; a behavior object that is experienced is called a habitat object. Their descriptions of behavior and of its psychological environment seek to preserve the
continuity, the qualitative refinements, and the observable conditions of everyday human action. Their method is naturalistic observation of what a person does and of the situation within which his behavior occurs, combined with a detailed narration and setting down in common language of what has been observed. Observers are trained to follow systematic procedures and rules in observing and describing their observations (see Barker and Wright, 1955, Chapter VI). An inspection of their recordings of behavior, which they termed “behavior specimens,” makes it apparent that the recorded behavior specimens are unusually interesting and supply detailed descriptions of behavior which provide rich material for analysis.

Analysis consists of dividing the recorded stream of behavior into “behavior episodes,” meaningful units of action and situation. Barker and Wright (1955) and Barker (1963) discussed at some length the methodological and theoretical issues of dividing and classifying the behavior stream, but it seems fair to say that their method of identifying behavior episodes is a commonsense one. However, as Barker (1963, pp. 20–21) indicated:

In the ordinary course of life, the beginning and the end of actions are of utmost importance, for awareness of the arrangement of a person’s own and his associates’ behavior streams is the basis of effective social behavior . . . . Just as one does not step on another person’s toes, eat another person’s food or wreck another person’s toys, one does not destroy another person’s behavior-in-progress, and laymen are able to identify such units with considerable precision.

Thus, considerable reliance is placed on the intuitive judgments of the behavior analyst.

Here, for example, are the names of the identified behavior episodes of eight-year-old Mary Ennis on May 12, 1949 between 7:58 and 8:12 a.m. (Barker, 1963, p. 18):

- looked for sweater;
- talked to mother about beads;
- brushed hair;
- played with baby brother;
- showed off skirt;
- talked to mother about some money;
- searched for a new half dollar;
- joked with mother about a key;
- helped mother fold diapers;
- talked baby talk to mother;
- talked to mother about baby brother’s bath.

Even the names of the identified behavior units give considerable insight into this eight-year-old girl’s behavior in her home before she goes off to school.

Behavior episodes are more than labeled; they are described in terms of such structural characteristics as length, type of overlap with other episodes, manner of initiation and termination, and type of outcome. Behavior episodes involving social action or interaction are, in addition, categorized in terms of a complex category system (see Barker and Wright, 1955, Chapter X) which does not seem to possess any advantage over some of the more commonly employed schemata for classifying social interaction (see Chapter 13 in Vol. 2 of this Handbook).

The above methods of describing behavior settings and behavior episodes have been employed in a number of different investigations by Barker and his colleagues (Barker, 1963; Barker and Gump, 1964; Barker and Wright, 1955). These studies have investigated the distribution of behavior settings and behavior episodes in a small town in Kansas, compared the social actions in the behavior streams of American and English children, examined and compared the behavior of the same child during a day at camp and a day at home, contrasted mothers and fathers as sources of environmental pressures on children, investigated the disturbances experienced by children in their natural habitats, and examined the effects of high school size on student behavior.

Let us turn to the study of the effects of high school size on student behavior (Barker and Gump, 1964). It is based on several theoretical assumptions about behavior settings. First, it is assumed that a setting (such as a school) is a homeostatic system with controls which keep the setting intact and operating at a stable functional level under widely varying conditions. Some of the controls reside within the setting itself; in a school class, there are “rules,” a time schedule, a physical arrangement of the room. Some controls reside in the setting’s relationship to exterior conditions: the curricula within the school, the qualifications of the teachers, and the extensiveness of the school’s facilities may be much influenced by local and state agencies. Other controls involve feedback loops linking the setting with its inhabitants and other interior components: boys’ school differs from a girls’ school.

A second assumption is that a behavior setting and the behavior episodes occurring in it stand in the relationship of thing to medium. According to Heider (1927, 1959), a thing is internally constrained in the sense that its components are not readily rearranged without altering or destroying it; a medium, on the other hand, is constrained by the external forces which play on it, but its internal components are free to rearrange themselves in response to external forces. A medium is docile, a thing is not. Molecules of air (a medium) can transmit the wave pattern imposed on them by a vibrating fork (a thing) because the air molecules are free to be rearranged by the external pressures of the vibrating fork.

A good medium is composed of many independent elements. The efficiency of a medium can be reduced either by a reduction in the independence or flexibility of its parts or by a reduction in the number of elements composing it. Barker assumed that for every homeostatic level of a behavior setting, there is an optimal number of people (people or behavior episodes are conceived to be the media of behavior settings). The homeostatic mechanisms of a behavior setting will operate, within limits, to maintain the setting at its functional level if the number of people within a setting falls below an optimal level. If the number of people is smaller than optimal, two compensations may be expected: (1) the strength of the forces acting on each person in the setting will increase; (2) the range in the direction of the forces acting on each person will increase. Of course, under certain conditions the compensatory processes do not work and the homeostatic level is not maintained; as a consequence, the behavior setting may be modified.

In sum, Barker stated that a behavior setting provides opportunities for its inhabitants to satisfy their diverse individual motives; and, further, that if these motives are to be satisfied, the setting itself must be maintained so that it functions appropriately. If the inhabitants of the setting find that it is functioning unsatisfactorily, they are obligated to respond with compensatory behavior that will enable the setting to provide the opportunities for the satisfaction of their motives. The homeostatic
mechanisms of the setting ensure that a reduction in personnel, within certain ranges, does not change the absolute number of opportunities and obligations the setting contains. The opportunities and obligations are shared by fewer people rather than reduced.

Barker's theoretical analysis led him to suggest that an underpopulated setting, as compared with a fully populated one, calls for greater effort and responsibility, provides more difficult and more important tasks, and offers a wider variety of activities and a sense of greater importance, but results in lower levels of maximal performances (due to lack of specialization), less sensitivity to differences between people, lower standards and qualifications for admission, more frequent occurrences of success and failure, and greater insecurity.

To test these suggestions, a study was made of high schools in Kansas, ranging in size from a small school of 35 students to a large one of 2287 students. We shall state some of the findings, which, in general, agree with Barker's predictions.

1. The schools differed more in the number of students than in the number of behavior settings included within each school, and more in the number of settings than in the number of setting varieties. The largest school contained 55 times as many students as the smallest, and 8 times as many settings, but only 1.5 times as many varieties. All schools had the following settings: athletic contests (indoors and outdoors), educational groups (academic courses, home economics, physical education, shop, and agriculture), fire and tornado drills, government and school offices, hallways and corridors, libraries, meetings, open spaces, outings, plays and concerts, recognition programs, school lunch rooms, restrooms, and school coach rooms. Only three varieties of behavior settings were missing in the small schools: swimming classes, medical examinations and services, and art classes. However, there were more different types of settings of any given variety in the larger schools than in the smaller (for example, wrestling, tennis, golf, and bowling did not occur in schools with fewer than 151 students; nor did such academic courses as probability and statistics, economics, sociology, psychology, geography, Spanish, French, German, and retail selling occur in the smaller schools).

2. The proportion of students who participated in district music festivals and dramatic, journalistic, and student government competitions was three to twenty times as great in the small school as in the largest school. The average number of extracurricular activities and kinds of activities in which students engaged during their four-year high school careers was twice as great in the small as in the large schools. A larger proportion of students in small schools held positions of importance and responsibility, and they did so in a wider variety of activities than students in the large schools.

3. Students in small schools reported greater day-by-day attraction, obligation, and external pressure to take part in school activities. They also reported more satisfaction relating to the development of competence, to being challenged, to engaging in important actions, to being involved in group activities, while students in large schools had more satisfaction from being identified with their school, from learning about their school's affairs and persons.

4. Part-time and summer employment in business and professional behavior settings and participation in church and community social organizations were more common among students from small schools (and therefore small communities).

Barker and Gump (1964, p. 202) drew the conclusion that "a school should be sufficiently small that all of its students are needed for its enterprises. A school should be small enough that students are not redundant." This conclusion is buttressed by its concordance with a host of other findings which compare small and large groups, organizations, and other ecological units. In a summary of these findings, Barker and Gump (1964, pp. 35-36) reported that persons in smaller units are absent less often, are more punctual, volunteer more, are more important to their groups, are more productive, are more interested, communicate and interact more frequently per person, are more satisfied with their experiences, and are more cohesive. These data are not only consistent with Barker's theoretical analysis, but they also support his preference for rural rather than urban living. It should be noted, however, that the data are subject to other interpretations which would place more stress on rural conformity and dissonance reduction than on rural bliss.

CONCEPTS DEALING WITH CHANGE IN THE PSYCHOLOGICAL ENVIRONMENT

Although little of Lewin's work deals with the traditional conceptions of learning, a good deal of the research by Lewin and his students has relevance to learning more broadly conceived as any change in the person which produces a change in his psychological environment. Lewin (1942; 1951b, p. 67) wrote:

Within what is called learning, we have to distinguish at least the following types of changes: (1) learning as a change in cognitive structure, (2) learning as a change in motivation (learning to like or dislike), (3) learning as a change in group belongingness or ideology (this is an important aspect of growing into a culture), (4) learning in the meaning of voluntary control of the body musculature.

It is beyond the purpose of this chapter to discuss in any detail the various types of changes which might be called "learning." Lewin's writings on learning were largely confined to a study of learning as a change in valences and values, and we shall focus our attention on this area. However, insofar as Lewin concerned himself with problems of change in cognitive structure, his viewpoint was sympathetic to Tolman's approach to learning (White, 1943). He emphasized that both differentiation and restructuring, in the sense of separating certain regions which have been connected and connecting regions which have been separated, are key processes in cognitive change. Furthermore, he emphasized that change in the cognitive structure may occur in any part of the individual's life space, including the psychological present, the psychological past; it may occur on the reality level or on the irreality level of each of these sections of the life space.

In preceding sections of this chapter, we have discussed many studies bearing on factors affecting change in needs and valences, for example, the studies on satiation and substitution. Here we shall confine our discussion to three topics: level of aspiration, socially induced changes, and social perception.

LEVEL OF ASPIRATION

Perhaps no other area of research that Lewin and his students have opened to experimental investigation has been the subject of so many studies as that of level of aspiration. The level of aspiration may be defined as the degree of difficulty of attainment.
of the goal toward which the person is striving. The concept of level of aspiration is relevant only if there is a perceived range of difficulty in the attainment of possible goals and if there is variation in valence among the goals along the range of difficulty.

In discussing the level of aspiration, it may be helpful to consider a sequence of events typical of many of the experimental studies in this area:

1. A subject plays a game, or performs a task, in which he can obtain a score (for example, throwing darts at a target).
2. After playing the game and obtaining a given score, he is asked to tell what score he will undertake to make the next time he plays.
3. He then plays the game again and achieves another score.
4. He reacts to his second performance with feelings of success or failure, with a continuing or new level of aspiration, etc.

In the foregoing sequence, point 2 (setting of the level of aspiration) and point 4 (reaction to achievement) are particularly significant for the dynamics of the level of aspiration.

In outline, the theory of the level of aspiration is rather simple (Lewin et al., 1944). It states that the resultant valence of any level of difficulty is equal to the valence of achieving success times the subjective probability of success minus the valence of failure times the subjective probability of failure. The level of aspiration, that is, the goal an individual will undertake to achieve, is the level of difficulty that has the highest positive resultant valence. The subjective experience of success or failure is determined by the relation of the individual's performance to his level of aspiration (provided, of course, that the performance is seen to be self-accomplished) and not simply by his absolute accomplishments.

Experimental work on the level of aspiration has brought out the variety of influences which affect the positive and negative valences of different levels of difficulty. It has indicated that cultural and group factors establish scales of reference which help to determine the relative attractiveness of different points along a difficulty continuum. Some of these influences are rather stable and permanent in their effects. It has been found, for example, that most people of Western culture, under the pervasive pressures toward "self-improvement," when first exposed to a level-of-aspiration situation give an initial level of aspiration which is above the previous performance score, and that under most conditions they tend to keep their level of aspiration higher than their previous performance. In addition to broad cultural factors, the individual's level of aspiration in a task is likely to be very much influenced by the standards of the groups to which he belongs (Anderson and Brandt, 1939; Hilgard, Satt, and Magaret, 1940). The nature of the scales of reference set up by different group standards may vary (Lewin et al., 1944, p. 308):

In some cases, for instance, in the case of the ideology underlying the college term "Gentleman C," the group standard is equivalent to the maximum valence on the scale of success: to be either above or below this standard is considered less desirable than the standard. The fashion, particularly in democratic countries, frequently follows a similar pattern of an optimum rather than a maximum of elegance as the most desirable level. In other cases, the group standard merely indicates a level at which the valence gradient is particularly steep: there is little success valence and much negative valence of failure immediately below the group standard, and much success and little failure valence directly above group standard.

Reference scales do not come only from membership in a definitely structured social group, for they also may reflect the influence of one's self-image, other individuals, in groups that either establish certain standards for performance or that serve as models for evaluating self-performance. Thus, the level of aspiration of a college student with respect to an intellectual task varies depending on whether he is told that a given score was obtained by the average high school student, the average college student, or the average graduate student (Festingher, 1942a, 1942b).

Research has given some insight into the factors determining the valences on the scale of subjective probability. A major factor which determines the subjective probability of future success and failure is the past experience of the individual with respect to his ability to reach certain objectives (Jackson, 1937). If the individual has had considerable experience with a given activity he will know pretty well what level he can expect to reach or not to reach, and the gradient of valences on the subjective-probability scale will be steep. However, it is not only the average of past performances which determines an individual's subjective-probability scale, but also the trend: whether he is improving, getting worse, or remaining the same. Furthermore, there is experimental evidence to indicate that the last or most recent success or failure has a particularly great influence on the individual's expectation of his future achievement level. In addition, there is evidence that the subjective-probability scales as well as the performance of others can influence the subject's own probability scale. Personality factors, self-confidence, for example, may also influence subjective probability.

Atkinson (1956, 1964) and Atkinson and Feather (1966) have developed a theory of achievement motivation that is an extension and elaboration of ideas advanced in the theory of level of aspiration. The theory of achievement motivation was stimulated by the desire to take more explicitly into account certain relatively enduring personal attributes, namely, those attributes that can be assessed beforehand to afford prior knowledge, for example, of whether the potency of failure might be particularly strong for an individual or whether he would attach a greater valence to success than to failure.

In this theory, achievement-oriented activity is conceived to be the resultant of two opposed tendencies, the tendency to achieve success (T_s) and the tendency to avoid failure (T_f). The tendency to achieve success is assumed to be a multiplicative function of the motive to achieve success (M_s) which the individual carries about with him from situation to situation, of the subjective probability of success (P_s), and of the incentive values of success at a particular activity (I_s):

\[ T_s = M_s \times P_s \times I_s \]

Similarly, the tendency to avoid failure is assumed to be a multiplicative function of the motive to avoid failure (M_f), the subjective probability of failure (P_f), and the negative incentive value of failure (I_f):

\[ T_f = M_f \times P_f \times I_f \]
So far, Atkinson's analysis parallels the level of aspiration theory, if one assumes (quite properly) that the Lewinian concept of valence is equivalent to Atkinson's motive times incentive, that is, that the valence of success is equal to \( M_s \times L_s \) and that the valence of failure is equal to \( M_f \times L_f \). However, Atkinson introduces the additional assumptions that \( L_s = 1 - P \), and that \( L_f = -P \). In other words, his theory details more unequivocally the relationship between the perceived level of difficulty and the incentive values of success and failure. (Note that in Atkinson's theory \( P \times L_s \) must equal \(-P \times L_f \) and, hence, that whatever difference in strength there is between \( T_s \) and \( T_f \) is due solely to the difference between \( M_s \) and \( M_f \).

One of the central implications of the Atkinson formulation is that both the tendency to achieve success and the tendency to avoid failure reach their maximums when the task is perceived to be of medium difficulty; that is, when \( P_s = P_f = 0.50 \), the expressions \( P \times L_s \) and \( P \times L_f \) are of maximal magnitude. It follows that "persons in whom \( M_s > M_f \)" therefore have negative resultant achievement-oriented tendencies, will avoid intermediate risk when constrained to undertake an achievement-oriented activity by some extrinsic tendency" (Atkinson and Feather, 1966, p. 555).

In other words, an individual is more motivated to avoid failure than to achieve success seeks to avoid achievement-oriented situations, but, if forced into one, is more likely to choose tasks that provide extreme (high or low) rather than moderate chances of success. Doing so minimizes his anxiety about failure. One would expect just the opposite for an individual in whom \( M_s > M_f \); that is, that he will seek out tasks of intermediate risk. Atkinson and Feather (1966) reported much research in support of these predictions.

Another central implication of the Atkinson formulation is that \( L_s = 1 - P \), (that is, the incentive value of success at a given level of achievement decreases as the expectancy of success increases) is that behavior will be altered rather than repeated after the experience of success. In other words, contrary to the Law of Effect, success should lead an individual to increase \( P \) and thus to decrease \( L_s \). This should, in turn, lead him to choose a more difficult task rather than to continue what he has just done successfully. An abundance of evidence supports Atkinson's view that the Law of Effect is inadequate in the domain of achievement-oriented activity.

One of the more interesting social implications of the theory of achievement motivation arises from the possibility that the basic assumption \( L_s = 1 - P \) holds in reference to the occupational hierarchy that defines success in life. Atkinson (Atkinson, 1966) reported that estimates by both college and high school students of the percentages of people having sufficient general ability to succeed in various occupations are nearly a perfect, linear, inverse function of the prestige standing of the occupation. As can be expected from the theory, a significantly greater number of failure-oriented men \((M_s > M_f)\) are classified as unrealistic in their vocational aspirations than are achievement-oriented men \((M_s > M_f)\).

The level-of-aspiration theory and the related theory of achievement motivation have widespread implications for many social phenomena. They give insight into the reasons for social apathy in the face of pressing political and international problems; people are not likely to attempt to achieve even highly valued objectives when they see no way of attaining them. Similarly, they shed some light on why social revolution tends to occur only after there has been a slight improvement in the situation of the oppressed groups; the improvement raises their level of aspiration, causing goals once viewed as unattainable to be perceived as realistic possibilities.

The level-of-aspiration technique suggests itself as an instrument by which to compare different cultures and to characterize their aspirations in a systematic way. Cantril (1965) has made such a study of the concerns and aspirations of adult populations in 14 countries which vary considerably in their political, economic, and social characteristics. The countries were Brazil, Cuba, the Dominican Republic, Egypt, India, Israel, Japan, Nigeria, Panama, the Philippines, Poland, the United States, West Germany, and Yugoslavia. Each individual surveyed was asked to define on the basis of his own values the two extremes or anchoring points of a scale of measurement: for example, "top" and "bottom," "best" and "worst," "good" and "bad." This self-defined continuum was then used to scale the individual's responses to questions that elicited information on such points as how he perceived his present condition in terms of what he hoped to get out of life, how he perceived the condition of the country in terms of what he hoped it would be in the future, and how he expected things to be 10 years later. From the many interesting findings reported by Cantril (1965), only a few summary results can be cited:

1. Both in terms of their economic and social development, as measured by "objective" indices and in terms of their aspirations as expressed by their people, nations may be roughly differentiated into those that are in a stage of premodernization, such as India and Brazil, a stage of mobilization, such as Yugoslavia and Israel, or a stage of relative maturity, such as the United States and West Germany.

2. Psychologically, mobilization of a nation implies an expansion of what its people learn to want out of life, because as the mobilization goes forward they perceive new potentialities for increasing both the range and the quality of their satisfactions. What a people in a mature society may regard as a primary requirement for a decent standard of living, such as good health, may be regarded by people in a premodernized nation as a luxury item. Once the people of such a nation awaken to the potentialities available to them, their very backwardness may serve as an incentive to their strivings, as appears to be the case with the Nigerians and the Egyptians. The existence of this special incentive is implied by the relatively high ladder ratings that people in a premodernization country assign themselves and their nation for the future, by which they provide themselves with high targets.

3. More emphasis is placed on increasing the range of satisfactions in the mobilization stage than in the premodernization stage; whereas in the stage of maturity more emphasis is placed on the quality of satisfactions (as "quality" is defined in the culture) than in the mobilization stage.

4. It is clear that the developed nations of the West, with their relative abundance of material goods and their use of technology to ease the burdens of life, serve as models by which people in less developed nations learn to define and expand their wants. It is relatively rare that a people does not sooner or later learn to define its goals in terms of Western standards: the people of the Kibbutzim, perhaps a passing micronorm in the present stage of world history, are the prime example.

Socially Induced Changes

Lewin distinguished between changes due to forces which are "imposed" on the individual and changes which reflect directly the individual's own needs. Relevant to this distinction is the concept of power field, which, although not well defined, has been employed in many social-psychological investigations (Armenian, 1943; Carti-
A power field is an inducing field; it can induce changes in the life space within its area of influence. The induced changes may be in the valence of regions in the life space, or they may be cognitive in nature.

The source of a power field is usually but not necessarily a person. It is possible to speak of the area of a person's direct social influence as his power field and to speak of the changes which it can or does induce in the life spaces of other people. For example, in a situation in which workers have no intrinsic interest in their work and do not view it as a means to some important goal, they are inclined to loaf, and so to when no supervisor is present who can induce forces in the direction of performing work. When the supervisor is not psychologically present and when, therefore, his power field is absent, the workers resume their loafing.

The distinction between own and induced forces has been found useful in explaining some of the differences in behavior under autocratic and democratic leadership (Lippitt and White, 1943). Children in a club led by authoritarian leaders who determined policy, dictated activities, and evaluated activities in arbitrary and personal ways tended to develop little of their own motivation with respect to club activities. Although the children worked productively when the leader was present, that is, when his power field was psychologically effective, the lack of personal motivation toward group goals was clearly shown by (1) change of behavior when the leader left the club, (2) absence of motivation when the leader arrived late, (3) lack of carefulness in the work, (4) lack of spontaneous suggestions about club projects, and (5) lack of pride in the products of club effort.

The distinction between own and induced forces has also been used to help explain why workers are usually happier and more productive if they are allowed to participate in the decisions which affect their work. Apart from other considerations, participation in goal setting is more likely to create own forces toward the goal, and thus there will be less necessity to exert continuous social influence in the direction of the work goal or to induce restraining forces to prevent the individual from leaving the work region (Coch and French, 1948; McGregor, 1944). Liker (1961) has developed a theory of organization, and cited much research in support of it, based on the notion that work which is self- and group-motivated is likely to be more productive than work whose motivation is induced by the coercive power of authority.

A power field can be characterized not only in terms of its perceived source (for example, a given person, a group, a personal value, or a law) but in other terms as well:

1. The regions that the power field can affect in the individual's life space. For example, a mathematician may influence one's views about the soundness of a mathematical proof but not about the soundness of a political viewpoint.

2. Its strength or power as indicated by the magnitude of the changes it can induce.

3. The conditions under which a power field is effective. For example, a child is unlikely to obey his father if his mother is telling him to do the opposite.

4. The nature of the changes induced by the power field. For example, either barriers or valences may be affected and the induced forces may act either on the behaving self or on regions of the psychological environment.

5. Whether or not being in the power field of another person is positively or negatively valent. For example, does an individual like to have decisions made for him or does he like to make them himself?

6. The perceived qualities of the source of the power field. These may be friendly or hostile, personal or impersonal.

7. The degree of correspondence or conflict between induced and own forces.

8. The attributes of the source of the power field which give rise to its power: physical strength, social role, personal attractiveness, etc.

Social influence and socially induced change have been the focus of a series of investigations conducted under the direction of Ronald Lippitt and Fritz Redl (Grosser, Polansky, and Lippitt, 1951; Lippitt, Polansky, and Rosen, 1952, Polansky et al., 1949). These studies were conducted in three children's camps: a camp for emotionally disturbed boys, a camp for emotionally disturbed girls, and a camp for middle-class, nondisturbed boys. Two different types of social-influence processes were investigated: behavioral contagion, which is defined as "the spontaneous pickup or imitation by other children of a behavior imitated by one member of the group where the initiator does not display any intention of getting the others to do what he did"; and direct influence, which is indicated by behavior which has "the manifest objective of affecting the behavior of another member of the group." Various kinds of data were collected through sociometric questionnaires and through direct observation of the children in their activities. The data included measures of (1) the power attributed by other children to each child, (2) self-perception of power, (3) frequency of initiation of behavioral contagion and of direct influence, and (4) frequency of pickup of contagion and of reciprocity of direct influence.

Some of the major results of these investigations may be summarized as follows:

1. A child is most likely to "catch" from the behavior of another group member, the higher the attributed power of this other group member.

2. A child is more likely to accept direct attempts to influence him, the higher the attributed power of the group member trying to influence him.

3. The average child tends to initiate more deferential, approval-seeking behavior toward group members with high attributed power than toward those with low attributed power.

4. The more attributed power a child perceives himself to have, the more likely he is to initiate direct influence attempts.

5. The children with high attributed power make more attempts to influence others and are more successful in these attempts than the children with low power.

6. While neither "height" nor "weight" has an unequivocal relationship to attributed power, children who have the highest attributed power are also perceived to have the best fighting ability and to have superiority in "camp-craft skills."

7. Children who have high attributed power are liked better and identified with to a greater extent than are other group members.

More recently, Cartwright, French, and Raven and their colleagues at the Research Center for Group Dynamics (Cartwright, 1959) have presented a field-theoret-
The conception of power and a series of empirical papers relating to power. However, it cannot be said that either the theory or the research has given rise to the other. Cartwright (1959, p. 193), in an elaboration of some ideas advanced by French and Raven, stated that "the power of O over P with respect to a given change at a specified time equals the maximum strength of the resultant force which O can set up in that direction at that time. The strength of the resultant force on P is determined by the relative magnitudes of the forces activated by O to 'compel' and to 'resist.'" It is assumed that for O to set up forces in P, O must possess a repertoire of acts which enable him to "tap" one or more motives in P which could activate these forces.

It is evident from Cartwright's definition that power is not an attribute of a single person but rather a relationship between two persons—a leader cannot be a leader without a follower. It is also evident that a power relationship is non-symmetric and non-transitive. It is possible for O to have power to influence P and for P to have less power, equal power, or greater power to influence O, no matter what the relationship between P and Q and between O and Q may be. Power is not inherently general and diffuse; its locus and focus must be specified if predictions are to be made.

French and Raven (1959) and Raven (1965), examining the bases of social power, described five varieties: reward power, whose basis is the ability to reward; coercive power, whose basis is the ability to punish; legitimate power, which stems from institutionalized values in P that dictate that he has an obligation to accept O's attempts to influence him; referent power, which is based on the identification of P with O; and expert power, which is based on the attribution of greater information or expertise to the influencing agent by the person being influenced. Certain correlates can be expected with the different bases of power. Thus, power based on either reward or coercion requires the person administering the influence to monitor the responses of the person whom he is trying to influence. This was the case for the "autocratic" leaders in the Lippitt and White studies. On the other hand, influence based on identification, legitimacy, or expertise does not require the continuous supervision of the influencing agent. Referent power seems to be most diffuse and more likely than any of the other bases of power to enable the power wielder to affect a wide range of activities of the person being influenced.

SOCIAL PERCEPTION

Heider (1958) applied the term heteronomous event to the phenomena referred to by the concept of power field, and more broadly to all changes whose source does not lie in the person but in the environment. He pointed out that the psychological significance of a heteronomous event is very much influenced by its perceived source. Thus, an individual is more likely to be angry when someone steps on his toes if he sees this event as having a source in the intentions of the other person, than if he saw it as one of those things which happen in a crowded bus. The focus in the study of social perception, as Heider defined it, is not so much the study of social influences on the perception of the physical world, but rather the study of the conditions which influence one's perception of other people (groups, for example) and which determine the characteristics and relations that one attributes to them (Heider, 1944, 1946, 1958; Heider and Simmel, 1944).

Heider indicated that the attribution of responsibility to people as sources of events serves the function of providing a cognitive stability for our psychological environment. The motives and other personality characteristics of other individuals provide the underlying causes which give coherence and meaning to the diverse "surface facts" with which we are confronted. The life-structure would be in a state of confusion if cognitive awareness and meaning were determined by molecular events or proximal facts (for example, the physical movements of parts of the body) without regard for the more distal, underlying causes which give rise to and determine the direction and significance of these movements. In effect, Heider is asserting that people develop their own "naive" psychology as a means of giving meaning and cognitive organization to the surface actions of others. In this naive or everyday psychology, there are concepts which deal with perception, action, wanting, trying, being able to, experiencing (or suffering), ought and may, attitudes, and belonging. Much of the task of the study of social perception is to determine the conditions which govern the development and application of these concepts in our perception of other people.

Two major, interrelated, dynamic themes run through Heider's analysis of naive psychology, attribution and balance. In his early paper, "Thing and Medium" (1927), Heider developed the theme that people tend to attribute happenings in their environment to central unitary "cores" which are internally conditioned and are in some way centers of the causal texture of the world. They do not attribute such happenings to the mediating processes which are molded by these cores. We see a stone, not the light rays which intervene between the stone and our eyes. The mediating processes which meet our sense organs are spurious units, for they are built up of many parts that are independent of one another. The light rays reflected from one edge of the stone, for example, are independent of the light rays reflected from another edge. The order that is imposed on the mediating processes remains unintelligible unless it is attributed to their unitary cause. Thus, in our perception of the physical world, perception focuses on the distal object (for example, the stone) that makes intelligible the order in the mediating processes as they impinge on our organs of sense.

Similarly, in perceiving the happenings of our social environment, we try to make sense out of the manifold proximal stimuli by focusing on the central unitary causal cores to which the surface events can be attributed. Such concepts of naive psychology as intention ("want") and ability ("can") are closely associated with the causal cores of our social perceptions. In social perception, as compared with physical perception, there is more likely to be distortion of the underlying causal core, for two reasons. First, the relevant social context (the surrounding field) of a given event is less likely to be represented in the proximal stimuli which reflect a social event; and, second, the social mediating processes through which social events are often perceived are more likely to have idiosyncratic, distorting properties.

Heider pointed out that it is particularly important in the interpretation of social events whether we attribute an event to causal factors located in the person or to causal factors in his environment. For example, a person's enjoyment of a play may be attributed either to the play itself or to his own personal idiosyncrasies; a person's success or failure in a task may be attributed to the ease or difficulty of the task or to his ability, or lack of it; a teacher's reprimand to a student may be attributed to the personal intentions of the teacher toward the particular student or to the objective requirements of the teacher's role.

Heider (1958, p. 62) suggested that a naive version of J. S. Mill's method of difference (more precisely, in Mill's terms, the "joint method of agreement and difference")
provides the commonsense model for such causal attribution. The effect is attributed to that condition which is present when the effect is present and which is absent when the effect is absent. Thus, failure at a task is attributed to the difficulty of the task rather than to the incompetence of the person, if other people who are considered to be able also fail at it and if the person who fails at it is able to perform other tasks that are thought to require some ability.

It is evident that attribution of behavior to one or another causal source (oneself or the environment, personal idiosyncrasies or the objective requirements of the situation, and the like) often requires social comparisons. To be able to tell whether one's judgments, beliefs, or opinions are objectively right or are merely personal idiosyncrasies, it may be necessary to compare one's beliefs with the beliefs of others. To decide whether the difficulty experienced in a task lies in oneself or in the task, one needs information about how well others do. To judge whether one's emotional response to a situation is appropriate or not, social comparisons may be useful.

Heider, in effect, indicated how these specific processes are outcomes of the more general human attempt to find an underlying causal network that makes sense of the multiplicity of surface events impinging on us. Festinger's theory of social comparison (see the next section of this chapter) is a more precise and more experimentally oriented formulation of the process of social comparison.

Heider pointed out in his important discussion of "the naive analysis of action" that the attribution of personal responsibility involves a decision as to which of the several conditions of action—the intentions of the person, personal power, or environmental factors—is to be given primary responsibility for the actual outcome. In general, the more the environmental factors are thought to influence the action, the less the person is held responsible for an action with which he is connected.

Heider also suggested that the connection between a person and an action may take a number of forms, each of which represents a different stage of conceptual development. At the most primitive level, the connection is a global one; the person is held responsible for each effect connected with him in any way. For example, a person may be accused of the wrongdoings of his ancestors. At the next level, an event is connected with the person only if he has a necessary condition for its occurrence, independently of his intentions or his ability to foresee or to alter the event's outcome; a person is judged in terms of the results of what he does. For example, a man who makes money on the stock market is enhanced in his valuation as a person. Piaget (1948) refers to this level as that of "objective responsibility." At the third level, a person is considered responsible for an effect he might have foreseen or presented, even though it was not his intention to produce it. A person's car may run out of gas because he forgot to check his gauge. Next, only what the person intended is perceived as being caused by him; in Piaget's terms, this is "subjective responsibility." Finally, even actions that are intended and produced by a person are not entirely ascribed to him if his intentions are seen as having been produced by the environment, that is, if his intention is regarded as having been provoked, coerced, or seductively induced by the environment.

The nature of attribution that occurs in any particular instance is determined by the stage of cognitive development, by the naive application of the joint method of agreement and difference, by the person's expectations, and by personal style; but it is also determined by the need to prevent cognitive imbalance. The striving for cognitive balance is the second major theme in Heider's analysis of naive psychology.

He pointed out that cognitive stability requires a congruence among causal expectations with respect to related objects. For a state of complete cognitive harmony to exist, the various implications of a person's expectations or judgments of any one aspect of the cognized environment may not contradict the implications of his expectations or judgments of any other aspect of the cognized environment. Thus, if a person judges X to be of potential benefit to his welfare, he cannot at the same time judge that Y (which is judged to be of benefit to his welfare) and X are antagonistic and still maintain a stable or balanced cognitive structure (X and Y may be things, people, products of people, or characteristics of people). When the cognitive structure is in a state of imbalance or is threatened by imbalance, forces arise to produce a tendency toward locomotion so as to change the psychological environment or to produce a tendency toward change in the cognition of the environment. Under conditions that do not permit locomotion, the tendency for cognitive change is enhanced.

In the preceding example of X and Y, cognitive change could occur by changing one's judgment of X or of Y, or of the relationship between X and Y, or by differentiating X or Y into independent or segregated subparts. Thus, instead of continuing to like both X and Y (two persons who hate each other), one may come to dislike either X or Y, or to feel that they do not hate each other; or one may come to feel that one likes X because she is beautiful and that Y hates X because she is wealthy, and there is no interaction directly or indirectly between these two characteristics (beauty and wealth) of X. In general, the tendency of the cognitive changes resulting from imbalance is to produce the most congruence and fewest changes in the perceptual-cognitive field.

From assumptions similar to those just outlined, and using three hypotheses about the conditions of cognitive imbalance, Heider has been able to develop a keen insight into some of the conditions that determine perceptions in interpersonal situations. For example:

1. In respect of attitudes directed toward the same entity, a balanced state exists if positive (or negative) attitudes go together; a tendency exists to see a person as being positive or negative in all respects.

2. In respect of attitudes toward an entity combined with belongingness, a balanced state exists if a person is united with the entities he likes and if he likes the entities he is united with; the converse is true for negative attitudes.

3. If two entities are seen as parts of a unit, a balanced state exists if the parts are seen to have the same dynamic character, positive or negative; but if the two entities have different dynamic characters, then a balanced state can exist only if they are seen to be segregated (by breaking up the unit).

One may consider these hypotheses true for various types of positive attitude (to like, to love, to esteem, to value) and also for various types of negative attitude. Similarly, the statements about belonging to or being part of a unit refer to diverse types of units (membership, belonging, causality, possession, similarity, and proximity). However, we must not forget that the unbalanced cognitive situation produces only a tendency to change. Whether or not locomotion or cognitive change actually occurs depends on the strength of the other forces operative in the situation.

Heider's theory of cognitive balance and its relationship to other similar theories is discussed in more detail elsewhere in this volume (see, for example, Chapter 5).
Here let me note that it has been generalized in two ways. Newcomb (1953) has extrapolated from Heider's theory to formulate a set of propositions concerning interpersonal communication. He concluded that the tendency for balance is characteristic of interpersonal as well as intrapersonal relations.

In effect, he stated that if two people perceive themselves as (positively) interdependent and each is oriented toward some third entity, they tend to develop similar orientations toward this entity. Interpersonal communication thus increases the likelihood that similar orientations will develop. On the other hand, dissimilar orientations in an interdependent pair or group tend to increase the frequency of communicative acts so as to reduce the dissimilarity of the orientations. The strength of these "strains toward symmetry of orientation" are partly determined by the strength of the bond between the two people and the strengths of their attitudes toward the third entity.

Cartwright and Harary (1956) have formalized and generalized Heider's theory of cognitive balance by using concepts taken from the mathematical theory of linear graphs. They pointed out that Heider's formulation has certain ambiguities and limitations. First, Heider did not distinguish between the complement and the opposite of the belonging relation. The complement of belonging is not belonging; its opposite is unspecified, but is probably equivalent to disunity or to bring competitively linked. Second, Heider's formulation is limited to the perceived interactions among three units (for example, three people, or two people and an object). Third, the formulation makes it possible to distinguish between balanced and unbalanced states, but does not make it possible to identify different degrees of imbalance. The mathematical formulations of Cartwright and Harary overcome some of the ambiguities and limitations of Heider's formulation.

We do not have the space to elaborate on the many insights which Heider's approach gives to social and self perception and to the psychology of interpersonal relations. However, let us point out that the nature of "moral" or "ought" forces and of various sociopsychological emotions, such as envy, jealousy, revenge, altruism, benefiting, and harming, are clarified by Heider's formulations. His book, *The Psychology of Interpersonal Relations* (1958), should be read in full to appreciate the richness of his ideas.

**ACTION RESEARCH AND GROUP DYNAMICS**

From the first, Lewin's work on the study of motivation heightened his awareness of the importance of social factors for practically all aspects of psychological life. Experimental studies in such topics as goal setting, conflict, level of aspiration, play, and recall and resumption of activities clearly revealed the effects of social influences. In his first explorations of social psychology, Lewin focused his attention on the individual in his social environment. He analyzed the social influences playing upon the child (Lewin, 1931), the differences in national character between Americans and Germans (Lewin, 1936b, 1948), the sociopsychological problems of being a member of a minority group (Lewin, 1935a, 1948), and the situation of the adolescent (Lewin, 1938a, 1951b). These diverse studies stimulated an interest in the study of the conditions which affect group life. This interest hedged in the group atmosphere studies conducted at the University of Iowa and began to flower with the establishment of the Research Center for Group Dynamics at the Massachusetts Institute of Technology in 1945.

Lewin's work on social psychology reflected two basic personal orientations which Lippitt (1947) was summed up in the term "scientific citizen." *Action research* and *group dynamics*, two terms which are closely associated with the work of Kurt Lewin in social psychology, in a sense reflect each of Lewin's personal orientations.

**ACTION RESEARCH**

As a citizen deeply sensitive to the world in which he lived, aware of the personal tragedies caused by oppression and prejudice, Lewin devoted much of his scientific work to furthering the understanding of the practical day-by-day problems of modern society. His book, *Resolving Social Conflicts* (1948), presents many of his sociopsychological analyses which deal with such important social problems as the effects of prejudice, methods of facing oppression, conflict in industry, conflict in marriage, morale in time of war, and methods of changing prejudiced groups. Lewin felt that the social scientist could not only contribute to the solution of social problems but also that the study of attempts to produce change in social conditions would make possible scientific insight into social processes which might not otherwise be attainable. These feelings led Lewin to help stimulate an interest in action research among various social agencies concerned with reducing prejudice.

*Action research* is a term with many meanings (Chen, Cook, and Harding, 1948), but let us here elaborate only the two major complementary values which Lewin felt might be advanced by action research. First of all, Lewin (1946a, p. 34) pointed out that many social agencies and civic groups concerned with eliminating and preventing community problems are ineffective, despite their efforts and good will; "They feel in a fog on three counts: 1. What is the present situation? 2. What are the dangers? 3. And most important of all, what shall we do?" One of the consequences of this uncertainty is the lack of standards by which to measure progress. As Lewin (1946a, p. 35) pointed out:

This lack of objective standards of achievement has two severe effects:
1. It deprives the workers in intergroup relations of their legitimate desire for satisfaction on a realistic basis. Under these circumstances, satisfaction or dissatisfaction with his own achievement becomes mainly a question of temperament.
2. In a field that lacks objective standards of achievement, no learning can take place. If we cannot judge whether an action has led forward or backward, if we have no criteria for evaluating the relation between effort and achievement, there is nothing to prevent us from making the wrong conclusions and to encourage the wrong work habits. Realistic fact-finding and evaluation is a prerequisite for any learning.

In addition to the value that action research might have for social agencies, Lewin felt that linking research to social action might give the social scientist access to basic social processes which he would otherwise be unable to study. Furthermore, Lewin's orientation to dynamics in individual and group psychology led him to the conclusion that change-studies are necessary to reveal underlying processes. Since the social scientist is rarely in the position to create social change on his own initiative, he has much to gain through cooperation with social agencies that attempt to produce...
social and community change. Through such cooperation, the social scientist is able to do research in the community and to escape the limitations of social-psychological research on the much abused "college sophomore." Considerable experience with action research, however, has indicated that the goals of action and the goals of research may often be incompatible. The danger that confronts the research worker in such situations is the possibility that his research design or methodology will be sacrificed to the achievement of the social-action objective.

By working closely with various social agencies, educational institutions, and industries, Lewin was able to dramatize a number of field experiments on such important topics as leadership training (Bavelas, 1942), intergroup relations (Lippitt, 1949), and group productivity (Locke and French, 1948). Not the least of Lewin's contributions to this field are his emphasis on field experiments in diversified settings and his stimulation of social psychologists to leave the sheltered comfort of the college campus and to carry their experimental procedures into settlement houses, workshops, offices, and factories.

**GROUP DYNAMICS**

While Lewin stressed the importance of relating action and research, he was perhaps even more deeply concerned with the relationship between research and theory. Developments began in the 1930's and were stimulated by World War II, in each of the fields of social psychology, sociology, and cultural anthropology. These apparently separate disciplines more closely. Lewin (1947a, 1947b) felt that a fruitful integration of the social sciences could come about, however, only if the focus were to move from description of social and group life to theoretical analysis and experimental study of the dynamic problems of changing group life. This theoretical analysis and experimental study he referred to by the title group dynamics.

It is well to realize that Lewin first wrote about group dynamics (Lewin, 1939a, 1939b) at a time when psychologists commonly denied the existence or reality of "groups." Only "individuals" were real, and to refer to such characteristics as "group atmosphere" and "group goals" was considered "nonsense" or "mystical." One of Lewin's major contributions was to help make the concept of group acceptable to psychologists; that is, to lead psychologists to accept the notion that groups per se have characteristics and that the behavior of an individual is greatly influenced by the various groups to which he belongs.

Among psychologists, the taboo against believing in the reality of the group was shattered mainly by demonstrating that "something could be done with groups"; that is, by handling groups experimentally (Lewin, 1948). "The concept of the group is, of course, not new; it has been the key concept in sociological writings for decades. Nevertheless, by performing experiments with groups, Lewin did psychologists the service of moving this concept from the plane of irreality to the plane of reality. For sociologists, the introduction of experimental studies of groups also served a radical function by opening up many of the theoretical writings of sociologists to experimental testing. Lewin and his students have helped to demonstrate that experimental studies of small groups can shed light on large-scale social processes. The early experiments of Lewin, Lippitt, and White (1939), Lippitt (1940), French (1944), and Festinger (1947) were instrumental in initiating and giving momentum to the experimental investigations of group life which are now accepted as commonplace in psychology and sociology.

**Concepts of group dynamics**

Apart from papers dealing with group decision and social change (Lewin, 1947a, 1947b, 1947c, 1948), Lewin actually wrote very little on the theory of group dynamics. However, from the research investigations of his colleagues and students at the Research Center for Group Dynamics a formidable array of concepts has emerged. These concepts have been largely developed in isolation from the body of sociological literature dealing with related topics; nevertheless, the sociologically oriented reader will be able to detect many parallels between the concepts of group dynamics and the concepts of sociology. Whether or not the isolation from prior sociological theorizing has been sensible is hard to judge. The group dynamics might argue that the isolation has produced concepts which have stimulated experimental research studies, studies which did not flow from the more general sociological concepts. The sociologist might argue that the studies of group dynamics might have been more sophisticated if they had been acquainted with the prior, relevant writings of sociologists.

Let us begin our discussion of the concepts of group dynamics by briefly considering the concept of group. Lewin (1943d; 1948, p. 84) wrote:

> The essence of a group is not the similarity or dissimilarity of its members, but their interdependence. A group can be characterized as a "dynamical whole": this means that a change in the state of any subpart changes the state of any other subpart. The degree of interdependence of the subparts of members of the group varies all the way from a "loose" mass to a compact unit.

French (1944) pointed out that in addition to interdependence, membership in a group presupposes identification with the group. Deutsch (1949a, 1962) indicated that the interdependence is that of, promotor or cooperative interdependence rather than, for example, competitive interdependence. Thus any group may be defined as being composed of a set of members who mutually perceive themselves to be cooperatively or promutorly interdependent in some respects and to some degree. Our discussion of groups will throughout refer to psychological groups rather than to collections of individuals who may be objectively interdependent without, at the same time, being subjectively or psychologically interdependent.

A group may be conceived in terms of its relationship to its external environment in a manner analogous to that in which the behavior of a group perceived in the psychological environment, or a may be considered in terms of the relations among the members composing it in a manner analogous to the person is considered in terms of the tensions systems composed of. In group dynamics, there has been very little discussion of the external relations of groups, of "group spaces." This is, of course, a profound neglect, comparable to the earlier tendency in psychology to consider the individual without relation to his environment. Most of the conceptualizations and research in group dynamics have been on the internal characteristics of groups, that is, on their internal structural and dynamic properties.

One of the key concepts which has been the subject of much experimental investigation is that of cohesiveness. It is intuitively clear that cohesiveness refers to the forces which bind the parts of a group together and which thus resist disruptive influences. Hence the study of conditions affecting group cohesiveness and of the effects that variations in group cohesiveness have on group functioning is at the heart of the study of group life.
Festinger, Schachter, and Back (1950) have defined cohesiveness, in terms of the group member, as "the total field of forces which act on members to remain in the group." The nature and strength of the forces acting on a member to remain in the group may vary from member to member. These investigators suggested that group cohesiveness be related to the average magnitude of this force in all parts of the group. Deutsch (1949a), in a definition which has essentially the same implications as that of Festinger, Schachter, and Back, related group cohesiveness to the degree of perceived cooperative interdependence among members and to the strength of goals about which the members are cooperatively interdependent. "Membership motive" in the individual is defined so as to be the counterpart of cohesiveness in the group.

In the foregoing definitions, the relationship between the group attribute of cohesiveness and the individual attribute of membership motive (or cohesiveness) is not adequately handled. It is obvious, however, that the average of the various individuals' membership motives is an inadequate measure of group cohesiveness. It is intuitively obvious that group cohesiveness is affected by the distribution of membership motives in a group; that is, whether there is much or little variation in membership motive among the members and whether "important" or "unimportant" members have high or low membership motives. It should be noted parenthetically that in the definitions of cohesiveness the "forces to remain in the group" are a residue of all the forces to remain in the group and the forces to leave the group. For simplicity of presentation, we shall neglect the forces to leave the group in our discussion of cohesiveness.

The forces acting on an individual to remain in the group may derive from the attractiveness or positive valence of the group, the negative valence of not being in the group, the barriers or restraints against leaving the group, or some combination of these. The forces acting on the individual may be induced or own forces. Little research has been done to determine the consequences that these different types of membership motivation have for the group. However, Back (1951) has shown that with certain aspects of group functioning it makes no difference whether attraction to a group is based on (1) liking the other group members, (2) liking the group because belonging to it confers prestige, or (3) liking the group because it is a means of obtaining personal goals.

In Back's experiment, subjects worked cooperatively in pairs in interpreting a set of pictures. Each pair was formed so as to be more or less attractive to its members. In making up his pairs, Back used the three different bases of attraction mentioned in the preceding paragraph. He found that in the more cohesive groups the members made more effort to reach agreement and were more influenced by the discussion than in the less cohesive groups, no matter which basis of attractiveness he had used in choosing the members. Discussion, however, was influenced by the source of attraction to the group. The people in the groups composed of people attracted to the group by a liking for the other group member were more chatty than those in the other groups; where cohesiveness was based on the prestige of the group, members were more cautious and less related to one another; and where cohesiveness was based on the group as a means to a goal, members were more impersonal and task-oriented.

A number of experimental investigations bear on the factors determining group cohesiveness. Thus Back (1951) found that he could produce high cohesiveness by stressing to the subjects how much they would like each other, how important it was for the group to do well on the task since the task was a test of ability, or how prestigious the group was. Festen (1941) found that groups composed of students who belonged to the same athletic teams were more cohesive than groups composed of students not previously acquainted. Deutsch (1949b) and Levy (1953) found that members rewarded on a cooperative basis were more cohesive than members rewarded on a competitive basis. Lippitt and White (1943), in a study of the effects of aocratic, democratic, and laissez-faire group leadership in boys' clubs, found that democratically led groups were most cohesive.

Schachter (1951) produced clubs with high cohesiveness by grouping students who expressed moderate or high interest in these activities; he created clubs with low cohesiveness by grouping students who expressed little or no interest in their activities. Thibaut (1950), in the most direct study of factors affecting cohesiveness, found that being in a persistently high-status group increases cohesiveness; and that, on the other hand, being in a persistently low-status group tends to decrease the attractiveness of one's own group but also increases hostility toward the high-status group. These members of the low-status group whose hostility toward the high-status group is most aroused, the most central members, may as a consequence of their rejection of the other group become more cohesive. Deutsch (1959) reported research indicating that "membership motivation" (as indicated by such measures as desire to continue working with the group, feeling of obligation to the group, and evaluation of the group and its performance) is strongly affected by the experience of group success or failure and by the perceived attitudes of other group members toward participating in the group, and weakly affected by the objective probability of goal attainment by the group.

Summarizing the enormous amount of research bearing upon group cohesiveness (see Collins and Gueckow, 1964; Hare, 1962; McGrath and Altman, 1966), we can state that cohesiveness, as measured by interpersonal congeniality, the desire to remain a member of the group, the attitude toward the group's functioning, or other similar measures, is consistently associated with communication among group members, readiness of group members to be influenced by the group, consensus among members on attitudes and beliefs that relate to group functioning, a sense of responsibility toward other group members, a feeling of personal ease and security within the group on the part of the group members, and so forth. Also, task effectiveness is in general positively correlated with cohesiveness if high accomplishment on the task is valued by the group (some groups restrict performance to achieve objectives) and if the task is such that its performance is likely to be enhanced by increased group effort. It should be noted that the causal arrow is bidirectional: group cohesiveness not only increases intragroup communication and group success, but group success and intragroup communication increase group cohesiveness.

Various measures of cohesiveness have been employed in the foregoing experimental investigations: desire to remain in the group, the ratio of "we" remarks to "I" remarks during group discussion, ratings of friendliness, evaluations of the group and its product, acceptance of each other's ideas, intragroup sociometric choice versus outgroup sociometric choice, etc. Deutsch, in a theoretical paper (1949a), provided a rationale for the use of a wide variety of measures of membership motive by developing the following hypotheses about members of more cohesive (cooperative) groups as compared with members of less cohesive (competitive) groups. Under conditions of successful innovation, he stated, members of groups of the former type are (1) more ready to accept the actions of other group members as substitutable
for similarly intended actions of their own (and therefore do not see a necessity for them to perform these actions also); (2) more ready to accept inductions, that is, be influenced, by other members; and (3) more likely to positively rather the actions of other group members. From these core hypotheses, with the addition of more specific assumptions, it is possible to deduce the nature and amount of the influence that coherence has on many aspects of group functioning. Thus, from the substitutability hypothesis (1), it is possible to predict that more specialization of function, more subdivision of activity, and more diversity of membership behavior will occur in the more cohesive groups. The inducibility hypothesis (2) leads to the prediction that members of more cohesive groups will be more attentive to one another, be more understood by one another, be more influenced by one another, be more likely to change, and will have more internalization of group norms than members of less cohesive groups. The cathexis hypothesis (3) leads to predictions of greater friendliness, higher ratio of ingroup sociometric choices, etc., in the more cohesive groups. Data in a variety of experiments (Back, 1951; Deutsch, 1949; Gerard, 1954; Levy, 1953; Schachter, 1951) support the foregoing predictions.

In a well-integrated program of research, Festinger and his coworkers developed a series of fertile hypotheses (Festinger, 1950) and conducted some ingenious experiments on the compliance process within groups. In brief, these investigators were concerned with communications arising from three sources of pressures to communicate within groups: (1) communications arising from pressures toward uniformity in a group (Back, 1951; Festinger and Thibaut, 1951; Schachter, 1951); (2) communications arising from forces to locomote in a social structure (Kelley, 1951; Thibaut, 1950); (3) communications arising from the existence of emotional states (Thibaut, 1950; Thibaut and Coulter, 1952). Most of the theoretical writings and experimental work of Festinger and his associates have been concerned with the first of these categories.

Festinger (1950) has indicated two major sources of pressures toward uniformity in a group: social reality and group locomotion. He indicated that when an individual has no simple objective basis for determining the validity of his beliefs, he is dependent on social reality, that is, on the consensus of judgment among people whose judgments he respects, to establish confidence in his beliefs. For example, the belief that "Negroes adversely affect property values when they move into a white neighborhood" is difficult for any white property owner to test in a simple, objective way; thus he must rely on the judgment of others as a test of its validity. Lack of agreement among members of a group provides an unstable basis for beliefs which depend on social consensus for their support, and hence (in line with Heider's discussion of the tendency toward cognitive balance) forces arise to produce uniformity. Pressures toward uniformity among members of a group may also arise because such judgments are desirable or necessary in order that the group may locomote toward some goal. Greater uniformity in opinion within a group can be achieved either (1) by actions (communications) directed at changing the positions the members occupy relative to one another (for example, by attempting to influence others to change their opinions or by changing one's own views) or (2) by actions that make others incomparable, in the sense that their opinions become inexecutable as a comparison for one's own (for example, by rejecting or excluding people with deviating opinions from the group).

Experiments have shown that as the attractiveness of the group increases, and thus as the importance of the group as a comparison object increases, the members' attempts to exercise influence also increase. Furthermore, if there is discrepancy of opinion within a group, the frequency of opinion change also increases as the attractiveness and importance of the group increase (Back, 1951). It has also been demonstrated that the pressure toward uniformity in a group increases with the relevance and importance of the opinion to the functioning of the group (Festinger and Thibaut, 1951; Schachter, 1951). As might be expected from theoretical considerations, evidence shows that when pressures toward uniformity exist, a member's concern is mainly with those members of the group whose opinions are most divergent from his own, and thus a member exerts influence mainly on those whose opinions are most divergent from his own (Berkowitz and Howard, 1950; Emerson, 1954; Festinger and Thibaut, 1951; Schachter, 1951). Although there has as yet been little research to indicate what conditions lead the pressure toward uniformity to manifest itself in a rejection of deviates rather than in an attempt to influence them to change, experiments by Gerard (1951) and by Festinger and Thibaut (1951) suggest that as the heterogeneity of a group increases, rejection also increases.

Underlying Festinger's theory of social communication is the assumption that people are driven to find out whether their opinions are correct. His theory of social comparison (Festinger, 1954) assumes that the same drive makes people behave so as to obtain accurate appraisals of their own abilities. It also assumes that when "objective, nonsocial" means are not available people evaluate their opinions and abilities by comparison with the opinions and abilities of others. (Festinger assumed that "objective, nonsocial" means are preferred to social comparison presumably because they are more accurate and less easily influenced.) Furthermore, the theory postulates that, since people want an accurate evaluation of their opinions or abilities, they are more likely to compare themselves with people whose opinions or abilities are similar to their own, rather than widely discrepant. The assumption is that greater accuracy of evaluation is possible when differences are small rather than gross. For example, a person who is just beginning to learn the game of chess is likely to compare himself with other novices rather than with recognized masters of the game.

Next, Festinger drew the interesting conclusion that the drive to evaluate one's own opinions or abilities accurately may, paradoxically, lead one to change them so as to bring them closer to the opinions or abilities of others who are available for comparison. He assumed here, without making his assumption explicit, that one way of reducing dissimilarity is to change and become more similar to the others. Another way is to take action to reduce the dissimilarity by changing the others. Still another way is to be attracted less to situations in which the others are dissimilar. In the case of extreme discrepancy, one would reject the situation and cease comparing oneself with others who are markedly dissimilar. A person's tendency to change or to attempt to change others is determined largely by how similar his position is to the modal position within a group; the more at variance his own position is, the more likely he is to change it.

Any factors which increase the strength of the drive to evaluate some particular ability or opinion (for example, by increasing the "importance" of the opinion or ability) presumably increase the negative evaluation of dissimilarity between oneself and the others who are used for comparison purposes and thus increase the pressure toward uniformity. Similarly, increasing the importance of the comparison group by increasing its attractiveness or by increasing the relevance of the opinion or ability to the group increases the pressure toward uniformity. If others are considered to be dissimilar from oneself in certain respects, however, there is less pressure toward uniformity in other related characteristics.
Festinger pointed out that, although the same basic processes of comparison are involved for opinions and abilities, there are critical differences. In the case of abilities, there is a value set on doing better and better ("a unidirectional drive upward") which is absent in opinions; also, there are nonsocial restraints that make it difficult to change one's ability. The drive to do better and better presumably conflicts with the need for precise evaluation of one's abilities (by comparison with the performance of others who are similar in ability). Consequently, one is led to do only slightly better than the others. It is obvious, however, that not everyone in a group can be slightly better than everyone else. Thus, with respect to the evaluation of abilities, a state of social equilibrium is never reached; competitive behavior is a manifestation of this lack of equilibrium.

Festinger pointed out that the theory of social comparison has clear implications for group formation and group structure. In effect, the drive for self-evaluation can lead people to associate with one another and to join groups; it is one of the factors that make peoplegregarious. The theory suggests, however, that the selective tendencies to associate with others of similar opinion and ability, together with the influence which is evoked by dissimilarity, guarantee relative homogeneity of opinions and abilities within groups.

The theory of social comparison has been extended by Schachter (1959) to apply to the evaluation of emotions as well as to the evaluation of opinions and abilities. In a series of experiments, he demonstrated that the tendency to affiliate with others undergoing a similar experience increases when subjects are made anxious. His explanation for this finding is that his subjects were unclear about the appropriateness of their anxiety to the situation; hence they desired to be with others undergoing a similar experience in order to compare their reactions. Schachter proposed that the emotions experienced by an individual are often very much influenced by the process of social comparison. He theorized that a state of physiological arousal, such as that induced by an injection of adrenalin, may be experienced as either euphoria or anger, depending on how it is interpreted, and how it is interpreted may in turn depend on social cues derived from the behavior of others. This notion led Schachter to a series of experiments which indicated that subjects may, in fact, interpret a given physiological arousal as to make it compatible with the emotions being expressed by others in the same situation (Schachter and Singer, 1962).

Deutsch and Kraus (1965), in a critique of social comparison theory (also see Singer, in press), pointed out that its central notions seem plausible. People want to have an accurate appraisal of their own opinions, abilities, and emotional reactions and to appraise these attributes they often have to compare themselves (and, thus, associate) with other people who are similar. However, Deutsch and Kraus were skeptical about the general validity of three notions implicit in the theory which give the theory its interesting, nonobvious character. First is the notion that the accuracy of appraisal requires that comparison be confined to people with rather similar attributes; it is, after all, useful to know how one's competence as a statistician compares with that of statisticians as well as with other psychologists. Second is the notion that the necessity for comparison with similar others becomes a motive in its own right such that it can lead the individual to change his opinion from the correct one or to lower his performance so as to be more comparable with others. People seek out not only similarity but also variety, novelty, and differences in their social encounters; moreover, behavior that seeks variety is just as much part of the process of getting to know oneself as is social comparison with others who are similar. A man learns much about himself as a man by interacting with women; social comparison with other men is not the only or best route to such knowledge. Third, it is by no means self-evident that processes of social comparison derive from the need to have an objective picture of one's abilities or opinions. The causal arrow may point equally well in the opposite direction. Thus it may be because opinions and abilities are compared socially within a group that a person needs to evaluate his opinions or abilities.

A good deal of research has been stimulated by the theory of social comparison. The older research is reviewed and a number of more recent studies are presented in a recent issue of the Journal of Experimental Social Psychology (see Latané, in press). The existing research is, unfortunately, mostly ambiguous with respect to the theory, nevertheless, it may be supporting it unobtrusively.

Festinger's theory of cognitive dissonance (Festinger, 1957, 1964) is in some respects an amplification of the theory of social comparison. The earlier theory assumed that the processes of social comparison develop out of the "need to know": dissonance theory goes on to indicate that the need is to have seemingly consistent knowledge, to have cognitions that are not dissonant with one another. In its emphasis on the need for cognitive consistency, Festinger's theory is similar to Heider's theory of cognitive balance. It differs from balance theory and the other theories of cognitive consistency in two respects: it places unique emphasis on the consequences of decisions, and it has stimulated abundant research. It makes the unique and original assumption that making a decision per se arouses dissonance and the pressures to reduce dissonance (see pp. 445-446 and Chapter 5 for a more detailed discussion of dissonance theory).

The experiments of Festinger and his colleagues, revealing the tendency to direct communication toward deviates in the group and to exert social pressure upon them through communication, provide support for Lewin's theory of group decision and social change. Lewin (1947) began his analysis of change by pointing out that the status quo in social life is not a static affair but a dynamic process that flows on but still keeps a recognizable form. He borrowed the term "quasi-stationary equilibria" from physics to apply to such ongoing processes, which are kept at their present level by fields of forces that prevent rise or fall. By definition, if a field of forces is in the neighborhood of the level of equilibrium, then the forces acting against going higher than the equilibrium level increase with the amount of raising, and the forces against lowering increase (or remain constant) with the amount of lowering. Thus, if we assume that a group standard is operating to determine the level of worker productivity in a factory, we can conclude that any attempt on the part of a worker to deviate from the standard by higher productivity will only result in stronger forces being induced on him by his coworkers to push him back into line. That is, as the Festinger experiments have demonstrated, the deviate is exposed to stronger pressures toward uniformity the more he deviates. However, as Lewin pointed out, the gradient of forces may change at a certain distance from the equilibrium level so that an individual who has gone that distance from it, the forces may push him away rather than pull him back toward the group standard.

Lewin's analysis of the status quo as a quasi-stationary equilibrium has two major implications. First of all, it points out that change from the status quo can be produced either by adding forces in the desired direction or by diminishing opposing forces. However, the two methods of producing change have different consequences. If forces are added, the process of the new level will be accompanied by a state of relatively high tension, since the strength of forces in opposition will be greater; if the opposing forces are decreased, the new level will be accompanied by lower tension.
Second. Lewin's analysis highlights the difficulties of attempting to change individual conduct and attitudes that are rooted in groups by efforts which are directed at the individual and not the group. If one endeavors to change the prejudices of an individual without changing the prejudices of the group to which he belongs, the individual will either be estranged from his group or will be under pressure from his group to revert to his initial attitude. Isolated individuals may perhaps change their attitudes because of their individual experiences, but the person who is deeply enmeshed in the social life of his community and who wishes to maintain his good standing is unlikely to be able to resist the pressures to conform on matters of community importance.

Considerations such as the foregoing have led to a series of experiments in various settings—in the school, in neighborhood groups, in industry, in an interracial workshop—on the relative efficacy of changing behavior by efforts directed at individuals and at a group (Lewin, 1948). A typical procedure has been to compare the results of a lecture or individual instruction in changing behavior with respect to the use of certain foods, with the results of a group discussion on the merits of the food combined with a group decision favoring the use. Results have clearly indicated that the group decision method produces more change. However, most of the experiments on group decision were unfortunately not designed in such a way as to rule out the possibility that such factors as interest or decision peer to peer were not the factors producing the greater change. A more carefully controlled experiment by Bennett (1955) suggests that the apparent advantages of the group-discussion method result primarily from the fact that group discussion facilitates decision and perception of consensus. Bennett concluded that group discussion, other things being equal, is not more effective than lecturing, nor does public identification of individuals' decisions contribute appreciably to obtained differences. In Bennett's experiment, the subjects were college students in introductory psychology classes. The content of their lecture or group discussion was consistent with a request to volunteer as experimental subjects for an unspecified psychological experiment. The "groups" (introductory psychology sections) were not very cohesive and the issue of volunteering was not group-rooted in the sense of being clearly relevant to group norms. Bennett's conclusion that group discussion is no more effective than the lecture method is challenged by a study by Pennington, Harary, and Bats (1958). They found that opinion change was greater when discussion was allowed than when no discussion took place. Decision making was effective in causing opinion change but not in imparting a factor as group discussion. The cumulative evidence (see Hare, 1952, Chapter 2; Collins and Guetzkow, 1964), as well as everyday experience, supports Lewin's basic conviction that to change group-rooted individual attitudes one must, in many instances, change the group to which the individual belongs.

Horwitz (1954) performed an experiment which demonstrates some of the psychological consequences of group decision. He designed an experimental setting in which it was possible for members to set up goals for the group and to perceive where the group stood in regard to the attainment of the goals. In the course of working toward the attainment of some of the group-agreed-upon goals the group was allowed to complete the task. After working on a number of different tasks, a Ziegarnik-type test for memory of completed and of interrupted tasks was given to all members of the group. The expectations were conducted in such a way that each individual indicated by vote whether or not he wanted to complete each task. The results of a secret ballot for each task were also announced to the group. (The experimenter actually announced a falsified group vote in order to be able to study its effects under equated conditions.) The results clearly indicated the motivational effect of the group-agreed-upon goals: in general, more interrupted than completed tasks were recalled. In addition, there was clear evidence that the announced group vote (that is, group decision), whether to complete or not to complete the task, affected recall: when the announced group vote was to abandon the task recall was smaller than when the announced group vote was to complete the task.

Much of our discussion of group dynamics so far has considered the group as made up of homogeneous parts. In reality, of course, groups are differentiated structures, and the behavior of any group member is largely determined by his position in the group structure. Although the concepts of group structure and of position within the group have not been well defined in the writings of group dynamics (see Flament, 1963, and Harary, Norman, and Cartwright, 1965, for mathematical treatments of group structures employing graph theory), a good deal of research related to these concepts has taken place. Lewin, Lippitt, and White's (1939) pioneering study on the effects of different types of leadership behavior has demonstrated how crucial the position of leadership is in determining the atmosphere of the group. Bavelas (1951) and Leavitt (1951) have demonstrated the significance of position in a communication network in determining member behavior and have indicated how the structure of a communication network may affect group productivity and individual satisfactions. (For a review and critique of the extensive research stimulated by the work of Bavelas and Leavitt on communication networks, see Glanzer and Glaser, 1959, 1961.) Kelley (1951) has experimentally shown the significance of position in a status hierarchy in determining the nature and direction of communication. Cohen (1958) has revealed the effects of anticipated change in status on communication behavior. Polansky, Lippitt, and Redi (1950), in a study of behavioral contagion in groups, have explored the relationship between status, as defined by various criteria in sociometric choice, and the ability to influence others in the group. Studies such as the foregoing provide the rationale for use of the communication process (who communicates with whom, about what, with what frequency, in what manner, in what circumstances, and with what effects) as a key instrument for characterizing group structure and for locating the occupants of various positions within this structure.

The very diversity of these studies indicates some of the varied meanings that the term position may have; it has been employed to refer to the functions a member performs in a group, to an individual's locus in a communication network, to a person's ability to induce forces, to a person's prestige in the group, etc. Gerard and others (unpublished memorandum) provide insight into the reason for this diversity of meanings. They have found it useful to conceptualize the position of a person in a group as "a locus which describes his relationship to other group members with respect to a single dimension. At any given time each member may have one and only one position on a specified dimension." A dimension refers to any group-psychological aspect which may be useful in describing the relations of one group member to another. Examples of dimensions are (1) being able to communicate with, (2) having power over, (3) having prestige for, and (4) having more skill than. In some social settings one dimension may become more salient than others and thus one's locus on that dimension becomes most important for the individual. This saliency is called dimension dominance; the dominant dimension is the one most powerful in determining
a given range of behaviors. Thus, to characterize adequately any group member’s relations to others in the group over a period of time and in different social settings, one must locate him along a number of dimensions, that is, in a number of different positions.

As we indicated in our earlier discussion of psychological ecology, a position in the group may be thought of as a behavior setting, a part of the spatio-organizational milieu which induces forces having certain magnitudes and directions on an individual who is located in it. A behavior setting derives its coercive and restraining powers from a social norm or group standard that defines the behavior setting as a locus appropriate for particular kinds of behavior. It follows that the ability of a behavior setting or a position in the group to induce behavior depends in part on the strength of membership motive in the individual.

Let us conclude this discussion of research in group dynamics by reminding the reader that the experimental study of small-group functioning began in earnest with Lippitt’s (1940) pioneering study of group atmospheres and did not gather momentum until after World War II. There has been an extremely rapid proliferation of studies and of theory since then. While Lewin and his students did much to develop “group dynamics,” it is no longer their exclusive domain; it has become an integral part of social psychology.

Lewin’s work in social psychology not only stimulated theoretical and experimental research in group dynamics; it also gave rise to an applied group dynamics. The National Training Laboratories, which has become one of the key institutions concerned with the application of behavioral science to social practice, was initiated in 1947 with the cosponsorship of Lewin’s Research Center for Group Dynamics and has been very much influenced by Lewin’s ideas. His article “Conduct, Knowledge, and Acceptance of New Values” (reprinted in Lewin, 1948) and his articles on “Frontiers in Group Dynamics” (reprinted in Lewin, 1951b), combined with the research on group leadership and group decisions, represent the intellectual base for the development of the conception of laboratory training groups. These articles emphasize the importance of the group in the process of individual reeducation and change. The research on group leadership and group decisions also highlights the advantages of allowing people to define and solve problems collaboratively as compared with the more authoritarian and less participative educational procedures.

The assumptions underlying the “laboratory method of human relations training” have never been systematically stated. However, various articles in Bradford, Gibb, and Bennett (1964) and also Schein and Bennett (1965) provide descriptions of the ways in which training groups function and develop. Schein and Bennett, in a fashion similar to Miles’ (1959), described a number of forces present in training laboratories that facilitate the three-stage process of change described by Lewin (1947a, 1947b): unfreezing a given attitude or performance level, changing it, and refreezing the newly developed attitude or behavior pattern. They indicated (Schein and Bennett, 1965, p. 291) that

...the unfreezing forces which are generated in a laboratory setting can be roughly classified into the following categories: (1) isolation from accustomed sources of support—colleagues, family, and regular routines; (2) removal of self-defining equipment, status, title, etc.; (3) loss of certain areas of privacy; (4) lack of confirmation or actual disconfirmation of roles which are appropriate in the back-home setting; (5) breakdown of hierarchial authority and status structures in favor of a kind of peer culture and informal status based on laboratory norms; (6) a set of laboratory norms about the value of the learning process and the method of learning; and (7) deliberately created lack of structure to heighten consciousness of self and to create unavoidable dilemmas.

Presumably, as trainees get unfrozen and learn new attitudes about “openness and authenticity of communication” with regard to personal reactions and feelings and also become able to listen attentively to the reactions of others, they achieve the ultimate objectives of laboratory training: increased understanding, sensitivity, and competence in regard to oneself, others, and groups. “Openness and authenticity of communication” are encouraged by the reduction of threat, that is, by the creation of norms which make such behavior not only permissible but positively valued. Attentive listening is also encouraged by the same processes and by discussion of the theory and specific problems of giving and receiving feedback.

There has been little good research on the effectiveness of laboratory training. Among the investigations of individual change, Miles’ (1965) study of 34 school principals is notable. Using two control groups (one a matched sample and one a random sample), Miles attempted to demonstrate the effect of personality factors, organizational pressures, and involvement in laboratory training on the outcomes of that training as measured by perceptions of the participants, the trainers, and work associates. (The latter group were tested eight months after the laboratory training.) A replication of this study by Bunker (1965) confirmed the results that participants at a training laboratory showed more change than controls.

Other studies of individual change have been concerned with changes in self-perception (Burke and Bennis, 1961; Stock, 1958), changes in cogntion style (Oshry and Harrison, 1966), and the effects of feedback on behavior (Gibb, 1960; Miles, 1958). Finally, Minton (1965), who used laboratory methods in a psychiatric hospital, obtained data which suggest that the training had beneficial effects for the patients who participated.

In the area of organizational change (see the review by Buchanan, 1962) data are even more scarce. Moreover, recent organizational-change work by Benedict et al. (1966), Kuriloff and Atkins (1966), and Manc (1964) is unconvincing. These studies generally fail to employ adequate controls, and the techniques employed to produce change are both amorphous and many-faceted. Thus one is hard pressed to determine what, if anything, is causing the change.

Laboratory training, although initially stimulated and guided by the ideas of Lewin and of his students (most notably, Lippitt), has been influenced increasingly in recent years by concepts and techniques from all the applied behavioral sciences. It has borrowed from individual and group psychotherapy, from role and organizational theory, from psychodrama, and from applied anthropology as it has tried to stimulate its trainees to develop an open and inquiring mind about their personal and group functioning. It has shown a healthy eclecticism, as belies a new area. However, it has not yet developed a self-inquiring research attitude which has sufficient vigor to counteract the evangelistic tone of some of its enthusiastic supporters.
CONCLUDING COMMENT

In this chapter we have attempted to present a survey of the theoretical approach to psychology which is commonly called fiel theory. While many theorists in psychology might have been discussed under the title "Field Theory in Social Psychology," we have limited our discussion to the work of Kurt Lewin and the people who have been closely associated with him. We discussed Lewin's approach to theorizing in some detail because of our belief that his extraordinary creativity as theorist and as experimenter reflected a "way of thinking." We also surveyed the basic concepts of Lewin's topological vector psychology and some of the research studies which grew out of these concepts. Finally, we discussed action research and group dynamics.

It cannot be said that field theory as a specific psychological theory has much current vitality. None of the grand theories in psychology is any longer much in vogue. No can it be said that Lewin's specific theoretical constructs, his structural and dynamic concepts, are central to research now being carried on in social psychology. His impact is reflected instead in his general orientation to psychology, which has left its impress on his colleagues and students. He believed that psychological events must be explained in psychological terms; that central processes in the life space (distal perception, cognition, motivation, goal-directed behavior) rather than the peripheral processes of sensory input and muscle action are the proper focus of investigation; that psychological events must be studied in their interrelations with one another; that the individual must be studied in his interrelations with the group to which he belongs; that the attempt to bring about change in a process is the most fruitful way to investigate it; that important social-psychological phenomena cannot be studied experimentally; that the scientist should have a social conscience and should be active in making the world a better place to live in; and that a good theory is valuable for social action as well as for science.

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