

THEORY OF FEAR AS A MOTIVATION (1972)

Sunnie D. Kidd
James W. Kidd

Modern science has two inseparable components, the empirical and theoretical. The empirical component is concerned primarily with observation; the theoretical component is concerned with the interpretation and explanation of observation.

If a deduction is in genuine disagreement with the observation, the postulate must either be abandoned or so modified that it implies no such conflicting statement. If, however, the deductions and the observations agree, the postulate gains in dependability. By successive agreements under a very wide variety of conditions, it may attain a high degree of justified credibility but never absolute certainty.

A theory is pragmatic only in terms of prediction. Therefore, it shall be shown that fear is a motivation in itself, whether it be negative or positive incentive or habit, it can turn an organism on, guide behavior and turn the organism off. Therefore, fear as motivation and fear reduction as a reinforcer, coupled with a direction provided for the organism once away from the reinforcer of drive reduction of fear itself is a paradigm of behavior leading to a new learned response.

It is a matter of common observation that situations which are associated with drives themselves become conditioned drive stimuli. For example, the case involving tissue injury. The response leading to escape from the injury gets connected to the stimuli and to the traces of those stimuli which are associated (with the drive stimulus discharge). These antecedent stimuli when later encountered will therefore give rise to more or less realistic reproductions of these movements. These antecedent stimuli are the new conditioned drives and the proprioceptive stimuli activated by the associated internal or "fear" reactions become the drive state of the secondary drive or motivation (Hull, 1951). Finally, the intensity of this combination of stimuli, especially of the proprioceptive internal or "fear" stimuli, through the principle of stimulus-intensity dynamism gives them their distinctive motivational potentiality. Such acquired associative connections not only have motivational powers but their diminution or cessation will now possess the power of reinforcement.

Fear is the result of numerous different types of activators. It has been observed that various stimuli, events or procedures strengthen the behavior of living organisms, whether they produce a particular form of behavior or not. At one time the word "drive" was used as a collective name for these activating factors. Probably because the simplest and most effective ways of

activating an organism have obvious biological accompaniments, drive has come to be linked exclusively with procedures like food deprivation, water deprivation and noxious stimulation. It is therefore suggested that the term “activator” be used as a name for anything that affects the general energy level at which an organism operates. It means that drives are species of activator but allows for other sources of activation as well.

Activation may be formally defined as an observed or an observable relation between a known activator, as an independent variable and some measure of performance, as a dependent variable. It has been already noted that a noxious stimulus is activating and that its offset is reinforcing. Any strong stimulus is noxious in the sense that it is actually or potentially harmful to the organism.

A good example of noxious stimulus working into this theory, along with the learning aspect, would be stating to children: “You may get a spanking and go to bed or just go to bed.”

The distinction between drives and other activators largely reflects degree of knowledge about the physiological processes involved and probably has little psychological significance. One of the most important of these other activators is frustration, defined as the procedure in which a reward or attractive reinforcer is withheld after it has been given a number of times under constant conditions or a physical barrier is used to prevent a response from occurring under its usual conditions. It will be noted that the term “frustration” is not being used here as a name for any feeling an animal or person may have nor for any particular form of behavior. It simply refers to the directly observable process of thwarting.

Wagner (1965) trained rats in a runway on a partial reinforcement schedule. On non-reinforced (frustration) trials a combined light-noise stimulus was presented as *Ss* in the experimental group approached the empty goal box. Control subjects received the same training except that the light-noise stimuli were presented while they were in a cage away from the runway. Later tests showed that, compared with the control group, the experimental group gave a larger startle response in the presence of the light-noise and gave superior performance in a hurdle-jumping situation with offset of light-noise as reinforcement. The light-noise appeared to have taken on activating and reinforcing properties for the experimental rats, effects which persisted in the absence the primary activator that gave rise to them (frustration).

Another known source of general activation is conflict, which means the simultaneous presentation of stimuli known to elicit incompatible responses. Because one of the two incompatible responses block the other, conflict may be regarded as a more complex form of frustration. As with

frustration, conflict is a name for a procedure and not a state of mind or form of behavior.

An experiment was conducted (Innes, 1969) to investigate postulated drive and cue properties of the state of conflict. First grade school children were tested for responses of escape from or avoidance of conflict in a new and different approach-approach conflict after initial training of these responses under an approach-avoidance conflict. Results supported the conclusion that either responses of escape from or avoidance of conflict acquired in an initial approach-avoidance conflict generalized to a new and different approach-approach conflict due to mediation by conflict produced drive cues. Appropriate control *Ss* ruled out simple stimulus or response generalization interpretations or mere transfer of information on the availability of these responses.

Egger and Miller (1960) have reported that a response, specifically an escape response, is engaged in when made available in approach-avoidance conflict. The strategy of this study was to further test behavioral predictions to support a theory of conflict-produced drive. The positive results obtained clearly support the predictions and demonstrate that conflict-produced drive cues can mediate the generalization of escape from conflict and avoidance of conflict acquired in an initial conflict to a new and different conflict.

Since removal or prevention of the conflict inducing stimulus reinforced original learning and the generalized responses accomplished the same purpose, it can be inferred that the state of conflict itself had aversive properties which motivated *Ss* to make the responses learned to the earlier but different conflict. Even children are likely to have sufficient past learning of conflict to affect behavior in conflict situations.

Just as with forcing and reinforcing stimuli, so there are primary and secondary activators. Deprivation, noxious stimulation, frustration and conflict all raise the energy level of behavior without the need for any intervening process; they therefore qualify as primary activators. If a neutral stimulus with no general activating properties is consistently paired with one of these primary activators in action, then it takes on activating properties and becomes a secondary activator for the organism concerned.

It has been emphasized that activation is a matter of general energy level of behavior, no matter what form the behavior may take. It is a fact, however, that a given form of activation not only makes the organism give stronger responses but also tends to make it act in a way that reduces the activation. This would be in agreement with Hull's statement quoted earlier regarding the reinforcement involved in the cessation or diminution of fear. Because of the nature of the response mechanism alone, a noxious stimulus

elicits the response of withdrawal. Less obviously, an organism can learn to avoid stimuli associated with noxious stimulation or to approach stimuli that reduce deprivation. Fear in proper activation levels can produce and intensify learning in numerous situations as shall be discussed later. In all these cases some external stimulus clearly directs the behavior, whether it be innate or acquired and the strength of the directed behavior varies with the organism's level of activation.

Fear can interfere with, compete with and intensify any other activity taking place at the time. There is experimental evidence for the proposition that a true activator affects all responses in a given organism's repertoire, after an allowance is made for the directing properties of drive stimuli. Miller (1948a) trained rats in a T-maze while they were hungry, with food as reinforcement for the correct response; even when satiated with food, the rats maintained a high level of performance if given electric shock at the start of the maze. Amsel and Maltzman (1963) found that rats drank more when placed in the drinking situation immediately after an electric shock given outside it. There are no innate or learned direct connections between the after-effects of shock and the response of turning in a T maze and of drinking water and none between the startle response and food deprivation. The most likely explanation of a great deal of data of this kind seems to be that activators, like shock and food deprivation, energize any response that happens to be occurring at the time.

Learning can be increased by fear through increased activation of the organism. The psychological phenomena of activation and learning are closely related in at least four ways. First, some stimuli take on activating properties through learning, becoming what have been described as secondary activators. Second, it is likely that activational effects are intimately bound up with reinforcement, a key process in learning. Third, it is possible that learning performance is a function of level of activation, e.g., that the amount of or nature of learning on a given occasion partly depends on the learner's level of activation at the time. Fourth, since learning and activation represent two of the most important ways in which performance or behavior can be modified, they usually operate together.

Miller's experiments involving fear as activation supports the above statements and supplies a basic branching off point for further investigation. The basic experimental evidence on secondary activation lies in the fact that a neutral stimulus consistently associated with a primary activator itself takes on activating properties. The first experiment to show clearly that secondary activation could be produced and studied in the laboratory used noxious stimulation as a primary activator (Miller 1948b). The apparatus was a double-compartment box for rats. One compartment had white internal walls and a grid floor, while the other had black walls and a smooth floor. In the first stage of the experiment each rat was placed in the white box and

given a shock through the feet once every five seconds for one minute. Then a door between the two compartments was opened and the shock was given continuously, gradually increasing in strength. This whole sequence was used ten times with each rat. Sooner or later the rat ran into the black box where there was no grid floor and no shock. By the end of the tenth session in the first stage of the experiment, all 25 rats were running quickly into the black box as soon as they were placed in the white box.

From this point onwards there were no further shocks. On five more test trials, however, each rat continued to run quickly into black as soon as it was placed in white. It therefore appeared that the visual and tactual stimuli of the white box had taken on some of the activating properties of the shock, the shock itself being no longer present, as well as eliciting the response of running to black. By the second stage, then, there was evidence for secondary or acquired activation. The rats were not deprived of food or water and were not activated in any other primary ways known to the experimenter and yet they were almost as energetic as when actually getting shocks.

As a further check on this interpretation, the experiment was continued into a third stage. The apparatus was modified so that the door could only be opened by the rat turning a small wheel mounted above it. The aim now was to discover if the offset of the secondary activator, the white box, had the same reinforcing effect as the offset of the shock. Thirteen of the 25 rats learned the new response, still without any shocks at all. As a final check, the apparatus was changed again so that the door mechanism could be operated only by pressure on a small rod at its left side, instead of turning the wheel. All 13 rats learned this new response, still without any shocks. The experiment as a whole therefore showed: a) the activating properties of a noxious stimulus could come to be elicited by a neutral stimulus in the course of a learning process and that b) the cessation of the stimuli eliciting the secondary activation had reinforcing properties similar to those of the offset of the primary activator.

In conditioning a new behavior it is sometimes necessary to use noxious stimuli such as punishment or fear of punishment. This is much more effective in the beginning with no escape or direction for an organism to go to avoid the punishment. In punishment training a selected response produces an aversive stimulus and the experimenter is concerned with the subsequent decline in response frequency. The punishment paradigm may contain an escape contingency, i.e., a second response distinguishable in kind from the one that initially provoked punishment is required to terminate the punishing stimulus. The organism must understand what is expected and know the consequences if it does not respond correctly. Fear also makes a strong response, leading to a much higher level of resistance to extinction. Such statements are supported by several experimental endeavors.

A study by Leitenberg (1967) used rats as *Ss* and bright light as aversive stimulus, demonstrating that the effectiveness of punishment varies as a function of the presence or absence of such an escape contingency. It was found that: a) punishment had greater suppressive effects in the no-escape condition than in the escape condition; b) response frequency was more resistant to recovery following removal of punishment in the no-escape condition than in the escape condition.

The results indicate that punishment of a response is most effective when escape is prevented. This corresponds with the effect of an escape contingency in the avoidance situation; and it confirms the notion that results in the punishment paradigm can be predicted on the basis of results in the avoidance situation.

Marx and Helwig (1964) speculated that the aversive stimulus has greater motivational (fear) properties (as demonstrated by defecation, etc.) when escape is prevented; and that this greater motivation accounts for the greater resistance to extinction in the avoidance without escape condition. Similarly, it may account for the greater resistance to recovery and more complete suppression in the punishment without escape condition of the present experiments.

There are two independent sources of support for this motivation hypothesis. In a CER study, Mowerer and Viek (1948) found that a CS preceding inescapable shock caused greater suppression of eating than a CS preceding escapable shock. Mowerer and Viek conclude that a greater degree of fear is conditioned to stimuli preceding shock whose duration cannot be self-controlled than to stimuli preceding shock whose duration can be self-controlled. When threat of fear is present without escape, the organism pays more attention and is more open to learning (at a moderate level of activation).

Some of the work on pain perception in humans also supports this motivation hypothesis. Melzak (1961) mentions a study by Hill which demonstrated that *Ss* perceive stimuli as less painful when they are told they can control the stimulus.

The intensity of fear induced is an important variable. It should not be too strong unless it is to prevent the organism from emitting a behavior. For learning it should be a moderate level of activation and is dependent upon the amount of conflict involved in the prior learning history of the organism involved. Spence has done experimental studies on such a conceptual approach.

Conditioning studies involving some form of noxious stimulation have revealed that level of performance is a function of the intensity of the

unconditioned stimulus. One interpretation that has been given of this finding is that the more noxious the stimulus the higher is the level of the emotional response (state of emotionality) of *S*. Level of emotionality, in turn, is one of the factors assumed to determine the effective drive level of the organism. This concept of drive level or *D* is one of the important intervening variables in determining response strength in S-R theory.

Spence, Farber and McFann (1956) conducted an experiment on the basis of the assumption that an anxiety scale measures degree of emotionality and hence, level of *D* and the further assumption that the effect of variations in the level of *D* upon performance in learning depends upon the position in the response hierarchy of the responses to be learned. Different predictions were made concerning the relative performance of high and low anxious *Ss* in two different verbal learning situations. In the case of a list of paired associate words having a minimum of generalization among the S-R pairs and therefore, little competition among responses, it was predicted that highly anxious *Ss* would perform better than nonanxious *Ss*. In the case of a list in which competing, incorrect responses could be expected to be stronger than correct responses, it was predicted that highly anxious *Ss* would perform more poorly than nonanxious *Ss*.

In an experiment using a noncompetitive list, the anxious *Ss* made significantly fewer errors and required significantly fewer trials to reach the learning criterion than did the nonanxious *Ss*. In a second experiment using a list mainly of competitive items, anxious *Ss* required significantly more trials to reach the criterion.

The necessity of minimizing the possible confounding effects of responses elicited by the drive stimuli resulting from emotionality when one studies the effects of drive level upon learning is strongly emphasized.

Fear can interfere with, compete with and overtake any ongoing activity, it can be the strongest motivational state known. It will lead to the greatest persistence in behavior with only occasional re-occurrences for maintenance of a given behavior.

Greater drive should lead to greater persistence of an activity since the tendency is stronger, making it more difficult for an alternative to compete successfully. For example, the persistence of an activity in the face of no reward would be expected to correspond to the level of drive supporting the activity; in general, laboratory findings tend to indicate that such is the case.

Conditioned frustration has the properties of a permanent habit. During initial training with partial reinforcement, conditioned frustration develops as a result of non-reinforcement. During subsequent training with continuous reinforcement, the motivation associated with conditioned

frustration extinguishes to some extent. Thus, for example, while a rat runs a maze in the presence of cues that have acquired the ability to elicit conditioned frustration, the reinforcer for conditioned frustration (primary frustration from nonreinforcement) has been removed. What does not extinguish, however, is the tendency for the rat to make compatible as opposed to incompatible responses to frustration cues when they do appear. This stays with the rat through the period of continuous reinforcement and when extinction finally does begin, the rat with a history of partial reinforcement has a greater tendency to run to frustration cues than the rat without such a history.

In the normal course of events, anxiety (activation) can serve as a cue for danger and can almost be dealt with by drive consequences, such as adaptive striving or defenses which reduce the drive or eliminate the cue of danger so that the emotion itself is evanescent and of little importance, its importance is not as a substantive state but as a motivation; it is just a fleeting source of adaptive activity.

After pairing with fear, avoidance stands alone not because fear is not present but because it is just underlying the surface. After this occurs the organism has an opportunity to approach new learning situations. Perhaps the best empirical evidence that avoidance can be dissociated from fear comes from a widely cited experiment by Solomon, Kamin and Wynne (1953), who showed, among other things, that once dogs had learned consistently to avoid a painful shock by jumping a barrier to another compartment of the cage, all evidence of fear seemed to disappear; nevertheless, the avoidance response failed to extinguish completely.

It is because an organism feels in complete control of the situation, that is, because there is no appraised threat, that avoidance behavior is not associated with the activation of fear. This does not imply that the threat or its bases must be in full awareness, since it is evident that objects which the person consciously regards as benign can stimulate fear. The fact that the reaction seems to contradict, however, what the person seems to believe is irrelevant to the argument that threat is always implicated in negatively toned emotions, such as anger, fear, grief, depression, disgust, guilt, shame, etc. The point is that only when and if the organism actually appraises danger does one experience a negatively toned activation. When the adaptive response is automatized and performed without appraisal of danger, as many are, the avoidance is not associated with fear. The organism may go its entire lifetime, adaptively avoiding many dangers, precisely because one may not consider harm as a very likely prospect. If one should lose this confidence or seem to lose control of the situation, the other components of activation will then accompany the avoidance behavior, a change or shift in behavior occurs. Thus, the configuration of fear includes not only the behavioral impulse of avoidance as a necessary condition to give the impulse its special

urgency and vigor but it also includes the appraisal of threat and the physiological arousal pattern which such a vigorous impulse requires.

In conclusion then it may be said that fear (activator) is a motivational factor involved in behavior and that its offset is reinforcing. Organisms are not always active, they must be motivated and their activity directed. Motivational properties of fear possess this quality and in given situations activate the organism, direct the activity experienced and is capable of turning the organism off in regards to that activity. It should be made clear at this point that this theory is dealt with within the microtheory approach and not a general behavior theory of motivation. The properties of fear will be effective in given situations with the proper contingencies of reinforcement and motivation.

Notes

- 1) Amsel, A. and Maltzman, I., "The effect upon generalized strength of emotionality as inferred from the level of consummatory response", *Journal of Experimental Psychology*, 66, 1963, pp. 142-148.
- 2) Bindra, D., "The interrelated mechanism of reinforcement and motivation and the nature of their influence on response", *Nebraska Symposium on Motivation* (Lincoln: University of Nebraska Press, 1968).
- 3) Egger, M. and Miller, N. E., "Will rats work to escape from conflict", *American Psychologist*, 15, 1960, p. 474.
- 4) Gloye, E., "Learning as a function of contexts differentiated through antecedent value experience", *Journal of Experimental Psychology*, 50, 1955, pp. 261-265.
- 5) Guilford, J. P., "Motivation and informational psychology", *Nebraska Symposium on Motivation* (Lincoln: University of Nebraska Press, 1965).
- 6) Hull, C. L., *A Behavior System* (New Haven: Yale University Press, 1952).
- 7) Hull, C. L., *Principles of Behavior* (New York: Appleton-Century-Crofts, 1943).
- 8) Hull, C. L., *Essentials of Behavior* (New Haven: Yale University Press, 1951).

- 9) Innes, R. J., "Escape and avoidance as responses learned to a specific conflict-produced drive", *Journal of Experimental Psychology*, 80, 1969, pp. 78-85.
- 10) Lazarus, R. S., "Emotion and adaption: conceptual and empirical relations", *Nebraska Symposium on Motivation* (Lincoln: University of Nebraska Press, 1968), pp. 175-271.
- 11) Leitenberg, H., "Punishment training with and without an escape contingency", *Journal of Experimental Psychology*, 75, 1967, pp. 393-399.
- 12) Marx, M. H. and Hellwig, L. R., "Acquisition and extinction of avoidance conditioning without escape responses", *Journal of Comparative Physiological Psychology*, 58, 1964, pp. 451-452.
- 13) Melzak, R., "The perception of pain", *Scientific American*, 204, 1961, pp. 41-49.
- 14) Miller N. E., "Studies of fear as an acquirable drive: fear as motivation and fear reduction as reinforcement in the learning of new responses", *Journal of Experimental Psychology*, 38, 1948b, pp. 89-101.
- 15) Miller, N. E., "Theory and experiment relating psychoanalytic displacement to stimulus-response generalization", *Journal of Abnormal and Social Psychology*, 43, 1948a, pp. 155-178.
- 16) Mowerer, O. H. and Viek, P., "An experimental analogue of fear from a sense of helplessness", *Journal of Abnormal and Social Psychology*, 43, 1948, pp. 193-200.
- 17) Solomon, R. L., Kamin L. J. and Wynne, L. C., "Traumatic avoidance learning: the outcomes of several extinction procedures with dogs", *Journal of Abnormal and Social Psychology*, 48, 1953, pp. 291-302.
- 18) Spence, K. W., Taylor, J. and Ketchel, R., "Anxiety (drive) level and degree of competition in paired-associate learning", *Journal of Experimental Psychology*, 52, 1956, pp. 306-311.
- 19) Spence, K. W., Farber, I. E. and Mcfann, H. H., "The relation of anxiety (drive) level to performance in competition and non-competition paired-associates learning", *Journal of Experimental Psychology*, 52, 1956, pp. 296-306.

- 20) Wagner, A. R., "Conditioned frustration as a learned drive", *Journal of Experimental Psychology*, 66, 1963, pp. 142-148.
- 21) Wike, E. L., "Secondary reinforcement: some research and theoretical issues", *Nebraska Symposium on Motivation* (Lincoln: University of Nebraska Press, 1969).

Reprinted from the *Stanislaus Journal of Psychology*, 2, no. 2, 1972.