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8 Thinking about Feelings: The Development and Organization of Emotional Knowledge

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This paper presents a framework for describing the development and organization of emotional knowledge. Our primary aim is the construction of a theory that explains how people represent, understand, and use knowledge about emotion. This theory includes a description of the knowledge acquired about the conditions that elicit emotional responses, the way in which emotion organizes and regulates cognitive planning and overt action, and the decision making and problem solving processes that occur during and subsequent to emotion experiences.

Three issues play a central role. First, we are interested in understanding the structure and organization of the knowledge related to emotion. Emotion is an integral part of personal and social experience, and serves both as an organizer and as a regulator of cognition and action. In this regard, a description of the characteristics of knowledge about emotion becomes a primary task, with an emphasis on delineating the relationship between emotion, cognition, and behavior.

Our second concern is developmental in nature. We are interested in explaining the age related changes that occur in: (1) the events that trigger emotional responses, (2) the language used to label and differentiate emotional experiences, (3) the reasons given for the occurrence of an emotional response, (4) the plans and actions formulated in response to an emotion, and (5) the perceived consequences of the actions that follow an emotional response.

Our third concern is with the relationship between talking about emotion and the actual experience of emotion. In most of our studies, knowledge about emotion is elicited through the verbal responses of children and adults to simple narratives. Thus, our conclusions about the organization and structure of emo-

tional knowledge are primarily descriptive of the language of emotion. We believe, however, that when emotions are elicited in response to life situations, many of the same types of knowledge are accessed. Whenever possible, we use evidence relating to the nonverbal and natural occurring emotional experiences to substantiate our claims about the development of emotional knowledge.

Although the study of emotional development has a long, elaborate history (Bowlby, 1969; Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983; Emde, 1980, 1984; Freud, 1948; Izard, 1971, 1977, 1984; Piaget, 1981; Sroufe, 1979, 1984), the role of cognition in producing emotion is still debated. Several investigators have attempted to trace the effects of developments in the cognitive domain on emotional development. Some investigators such as Piaget (1981), Sroufe (1979), and Emde (1980), believe that during the very early periods of infancy, affective responses are produced primarily in reaction to direct sensory and perceptual stimulation. Although the distinctions between sensation, perception, and higher cognitive processes are not delineated by these investigators, it is clear that the types of affective responses produced in the first 2 or 3 months of life are qualitatively different from those observed during later periods. For example, in the earliest part of infancy, smiling occurs primarily during REM sleep and is endogenously controlled (Emde, 1980, 1984). It is not until 6- to 8-weeks-of-age that the infant smiles with any consistency in response to external stimulation. The appearance of exogenously controlled smiling at this time (Emde, 1980, 1984) is correlated with a number of other changes in cognitive activity. Systematic scanning of faces emerges in this period, as do expressions of interest and joy.

From the ages of approximately 2½ months to 7 or 8 months, emotional responses undergo further changes contingent upon further developments in the cognitive domain. Stable cognitive structures begin to emerge at this time, enabling the infant to anticipate and form expectations about future events (Piaget, 1981; Sroufe, 1979). The infant also becomes capable of voluntary intentional action and is able to form the beginnings of a value system that influences the infant's choice of actions (Piaget, 1981). According to Piaget, as a function of carrying out inentional actions, the infant comes to associate the completion of an action with the arousal that follows the act. When the infant succeeds in attaining a desired endstate, then *joy* (arousal) occurs and is associated with successful goal attainment. If the infant fails to attain a goal, then *sadness* or *distress* (arousal) occurs and is associated with failure. Piaget argues that these associations are the primitive basis upon which emotional development and awareness begin.

When the infant becomes able to represent and understand that objects have permanence, emotional awareness is thought to undergo another qualitative change (Emde, 1980, 1984; Sroufe, 1979). Fear and anger responses begin to emerge in a more consistent fashion. Both Emde (1980, 1984) and Sroufe (1979) have argued that the emergence of these two emotions are contingent upon a well

developed object concept. Until this concept is acquired, Sroufe holds that only wariness and rage are experienced by the infant. We would interpret these assertions to mean that wariness and rage are more primitive emotional responses in that they do not require an awareness of the object as the *cause* of an emotion. The registration of novelty, discrepancy, and/or blocking of a desired end state are sufficient in themselves to produce wariness or rage.

The emergence of fear and anger, then, signals a qualitative change in emotional responding. The infant can now relate failure or success at obtaining desired end states to external objects. Attention is focused on the *relationship* between an external object, person, or event, and the obstruction of goal attainment. The infant is now capable of expressing fear at seeing and interacting with a stranger. This response resembles that of an adult (Emde, 1980, 1984) in that an appraisal process precedes the fear response. From our perspective, it is the recognition of an object as the *cause* of *possible* goal obstruction that determines the emergence of fear.

As development proceeds, emotional experience is thought to become increasingly more complex and intimately related to thinking and representational processes. The emergence of stable cognitive structures, the development of voluntary intentional action, the emergence of evaluation behavior, and the development of an object concept all play a significant role in predicting the emergence of more varied emotional responses. For many investigators, the study of emotion does not begin until the infant is capable of these more complex cognitive behaviors (Arnold, 1970; Lazarus, 1984; Mandler, 1975, 1984). Thus, the study of emotional development is intimately connected to the study of cognitive development. Complex emotional behavior does not occur without parallel developments in the cognitive system.

Changes in the nature of children's emotional development, unfortunately, do not resolve the debate about the causal relationship between emotion and cognition. There are some who believe that affect remains independent of cognition, even into adulthood (Zajonc, 1980, 1984; Zajonc, Pietromonoco, & Bargh, 1982) and that cognitive input is not necessary for many types of affective arousal. Zajonc et al. (1982), Zajonc (1984) and Izard (1984) are particularly strong advocates of this hypothesis. Zajonc (1980, 1984), in particular, argues that there are many instances of animal and human behavior where physiological arousal occurs in response to *raw* sensory input with no higher order cognitive processing necessary. Zajonc further argues that affect and cognition originate and are controlled by distinctly separate anatomical structures.

Although we have no doubt that physiological and autonomic nervous system arousal can occur without much *higher order* cognitive processing, we have difficulty with Zajonc's position for two reasons. First, Zajonc has not taken into account the parallel relationship between the respective changes that occur in the cognitive and affective systems. Complex emotional behavior does not occur immediately at birth. Research (see Emde, 1980, 1984; Sroufe, 1979) suggests

that complex emotional behavior is intimately linked to specific developments occurring in the cognitive system. There is no evidence that complex emotional behavior precedes independently of cognition or that certain emotional expressions and behavior precede or cause developments in the cognitive system of the infant. How the two systems, if they are separate, interact and influence one another is not addressed in Zajonc's writings. Second, arguments about the primacy of affect over cognition do not inform us about the many situations where cognition appears to both regulate and organize emotional behavior or about the types of knowledge that humans acquire about the emotion system. The most serious problem with this type of approach is that a description of how information is processed and represented is never included in a model of emotion and cognition. A detailed definition of *organization* and *regulation* is also never presented.

The present paper is a beginning attempt at conceptualizing the knowledge used to understand emotional experience. Rather than debate the relationship between emotion and cognition, we have chosen to study those situations where the evaluation of an external or internal event clearly precedes an emotional reaction. As a result of this focus, the discussion may not bear on topics such as extended mood states or emotional dispositions. Our aim is more specific. We attempt to describe the eliciting conditions and the cognitive processes that lead people to the conclusion that a particular emotional reaction has been experienced. We explore the types of thoughts, plans, and actions that occur concurrently with or subsequent to emotional reactions.

TALKING AND THINKING ABOUT EMOTION

A growing body of literature on the language and knowledge of emotional experience is emerging. Although there are those who view the relationship between everyday language and emotion as problematic (Mandler, 1975; Ortony & Clore, 1981), there are others (Averill, 1978; Lakoff, in preparation; Miller, 1984; Stein, & Jewett, 1986) who view the study of language as a useful tool for describing the nature of the evaluative processes that occur during emotional experience.

These recent approaches view emotion and language as playing a central role in personal and social problem solving within and across cultures. Rather than limit investigation to the language used to label emotional states and facial expressions, the focus is on the language and thinking associated with the eliciting conditions of emotions (Miller, 1984; Stein & Jewett, 1986; Trabasso, Stein & Johnson, 1981) as well as the language associated with the wishes, actions, and outcomes of an emotional experience. By integrating the study of emotion into a problem solving framework, a more detailed and elaborated model of emotional knowledge can be developed.

Because we are interested in the organization and development of emotional knowledge, it is important that we attempt a working definition of emotional experience. Two individuals have provided guidance in the construction of such a definition: Mandler (1975) and Piaget (1981). Both consider emotion in the larger context of cognitive development and/or information processing, and both discuss the interaction of cognition and emotion. Of the two, Mandler's (1975, 1984) framework is the more detailed, especially in reference to the description of the cognitive processes necessary for the occurrence of an emotional experience.

Mandler focuses on two primary dimensions in his discussion of emotional experience: physiological arousal and a cognitive meaning analysis. Physiological arousal is produced by an interruption of ongoing mental activity and/or an interruption of ongoing organized action. Arousal is characterized by increased activity of the autonomic nervous system and can be measured in terms of specific events that are independent of and external to the mental system (e.g., increased heart rate, increased GSR activity, etc.). Almost any type of interruption, either externally or internally induced, can cause arousal. The concept of interruption, however, needs more explanation, as does the relationship between interruption, meaning analysis, and behavior. Some clarifying comments can be made about these concepts.
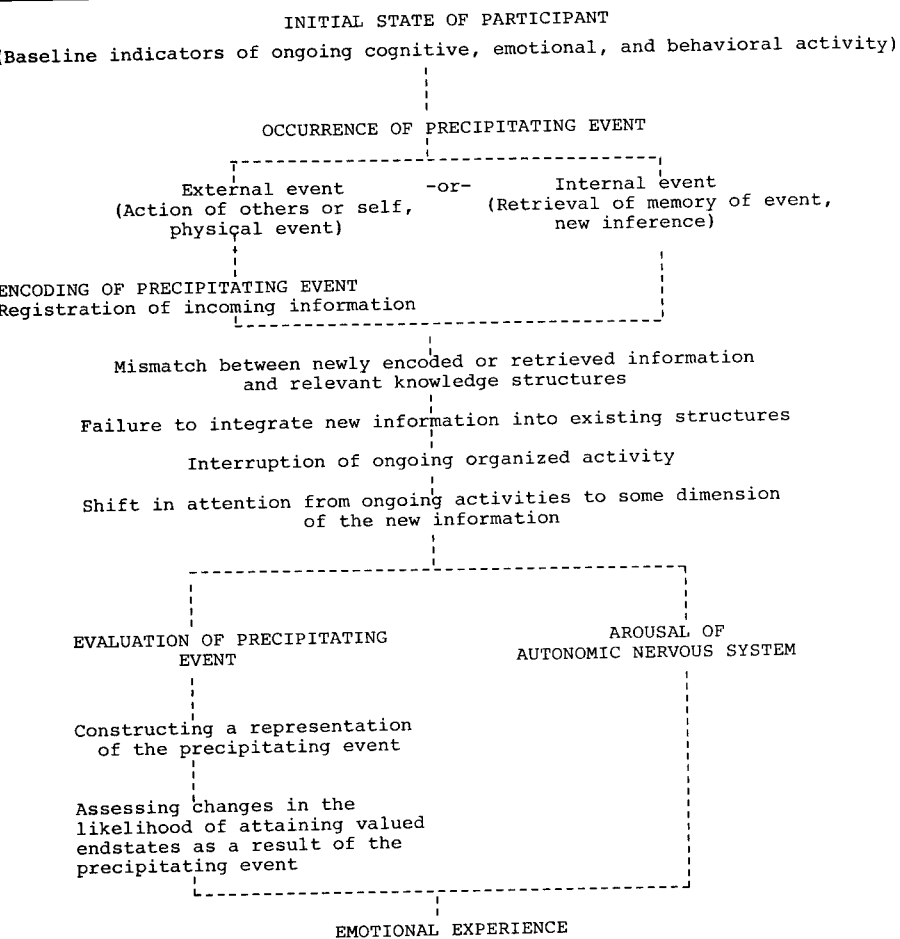
In discussing the importance of cognitive processes in determining emotional experiences, Mandler (1975, 1984) like Piaget (1981), assumes that schemata are the basic units of the cognitive interpretive system. Schemata refer to cognitive structures composed of systems of organized knowledge, where organization is defined as the existence of stable relationships among the elements of a given structure. Some schemata are innate, but many are formed as a result of the interaction that a person has with the environment.

The definition and description of schemata are necessary for theories of cognition and emotion because these cognitive structures are thought to guide the interpretation and organization of all types of incoming information, independent of the source of information (e.g., information can come from the external environment, from the actions of an individual, or from the individual's own thought processes). Existing schemata give rise to a meaning analysis of incoming information by relating incoming information to what is already known.

In many situations, the meaning analysis of incoming information proceeds smoothly. Information is assimilated into existing structures without difficulty. In these situations, the individual is often unaware of the ongoing processes associated with encoding and understanding. There are other instances, however, where incoming information cannot be readily integrated into existing structures. The presence of novel information almost always ensures some type of failure to immediately integrate incoming information into existing structures.

When Mandler talks about the encoding of novel information, he uses the terms discrepancy, incongruity, and violation. He argues that, in the process of

TABLE 8.1
Hypothesized Sequence of Events that Result in an Emotional Experience

```
                    INITIAL STATE OF PARTICIPANT
 (Baseline indicators of ongoing cognitive, emotional, and behavioral activity)
                                 |
                                 |
                    OCCURRENCE OF PRECIPITATING EVENT
           r---------------------|--------------------1
           |                                          |
     External event       -or-          Internal event
 (Action of others or self,        (Retrieval of memory of event,
      physical event)                      new inference)
           |                                          |
           |                                          |
 ENCODING OF PRECIPITATING EVENT                      |
 Registration of incoming information                 |
           L------------------------------------------J
                                 |
         Mismatch between newly encoded or retrieved information
                    and relevant knowledge structures
                                 |
       Failure to integrate new information into existing structures
                                 |
              Interruption of ongoing organized activity
                                 |
      Shift in attention from ongoing activities to some dimension
                          of the new information
                                 |
          r----------------------|----------------------1
          |                                             |
          |                                             |
    EVALUATION OF PRECIPITATING            AROUSAL OF
            EVENT                   AUTONOMIC NERVOUS SYSTEM
          |                                             |
          |                                             |
  Constructing a representation                         |
    of the precipitating event                          |
          |                                             |
          |                                             |
  Assessing changes in the                              |
  likelihood of attaining valued                        |
  endstates as a result of the                          |
  precipitating event                                   |
          L----------------------|----------------------J
                                 |
                    EMOTIONAL EXPERIENCE
```

making sense out of incoming information, novel information will be registered as discrepant or incongruous. That is, in an attempt to integrate incoming information into existing structures, some type of pattern matching procedure will be invoked. A mismatch will cause an interruption in ongoing organized thinking, and the interruption will then cause arousal of the autonomic nervous system. Interruption should also cause a shift in the focus of attention so that the new discrepant information can be processed at some level. Thus, there should be a shift from ongoing organized thinking activities to processing novel incoming information.

According to Mandler, physiological arousal of the autonomic nervous system is necessary for an emotional response but not sufficient to induce the experience. Evaluation of the novel information must also occur. In his use of the term *evaluation,* Mandler (1982, 1984) refers to those processes whereby a person assesses incoming information with respect to the person's values and desires.

Piaget's description of emotional experience resembles Mandler's in many respects. Piaget (1981) also argues that the existence of a value system is critical for an emotional experience. The emergence of stable cognitive structures allows the infant to abstract regularities from incoming information and then to form expectations about the environment. In turn the infant develops preferences for certain endstates. The development of these preferences then affects the quality of the voluntary actions initiated by the infant.

In order to provide some insight into how all of these processes are integrated during an emotional experience, we have sketched a tree diagram of a sequence of events that should lead to the experience of an emotion. Although some of the features in the tree diagram are those used by Mandler and Piaget, the diagram represents our interpretation of the processes preceding an emotional experience and adds dimensions that neither Mandler nor Piaget would necessarily include in their discussion of thought and emotion.

In Table 8.1, the tree diagram begins with a reference to the activities that are ongoing before a precipitating event occurs. The beginning of the sequence is designated by the type of activity occurring prior to a specific precipitating event. Four properties are of interest:

1. the type of ongoing cognitive activity
2. the level of physiological arousal
3. the emotional state of the participant
4. the type of ongoing overt activity

These variables are important because our model describes the changes that occur in these four aspects of behavior. Unless these changes are assessed, it becomes difficult to say that an emotional response has occurred. Thus, our model is a *state change model* where all four properties change in some specific way when a precipitating event occurs.

Precipitating events emerge from several possible sources: the external environment (e.g., physical events or actions of others), one's own actions, or the memory retrieval of past events. In order for an emotional response to occur, the precipitating event must be encoded and registered by the participant. In the case of memory retrieval for an event, the initial encoding has already taken place. Subsequent to the initial encoding or retrieval, a meaning analysis has to be performed on the incoming or self-generated information.

A description of the meaning analysis necessitates reference to different processes. Of primary importance are the processes which integrate incoming information into existing knowledge structures. Assuming that there are different pattern matching procedures which are carried out on incoming information, it is important to discriminate between those procedures where a match results and those where a discrepancy occurs. If incoming information is congruent with information represented in existing knowledge structures, then the incoming information is readily assimilated. If any discrepancies arise during the pattern matching process, then the information is not readily assimilated. Failure to assimilate incoming information gives rise to interruption, to the subsequent process of evaluation, and to changes in arousal states. Note that both evaluation and changes in arousal are consequences of interruption, occurring as parallel processes.

For much of experience, the processing of information occurs automatically so that the person is unaware of the contents and procedural information being used during a meaning analysis. Events that are discrepant and do not fit into existing structures, however, require conscious or effortful processing. Thus, evaluation behavior will involve conscious awareness of certain dimensions of the precipitating event.

Both evaluation and physiological arousal are necessary for a person to undergo an emotional experience. During the initial part of evaluation, the participant may have to assess whether or not an adequate representation of the precipitating event exists. For example, when highly novel events occur, the participant must first be able to retain a meaningful representation of the event before an assessment can be made as to whether the event will lead to a desired endstate. Therefore, a distinction has to be made between an initial evaluation that occurs in the service of understanding and representing novel information and a subsequent evaluation that includes an assessment of whether valued endstates have resulted as a function of a precipitating event.

Separating these two types of evaluations is problematic because they often occur in close temporal proximity. However, different emotional states often result as a function of different types of evaluation. Surprise and interest are evidenced when highly novel events occur. These emotions are representative of those processes initiated in understanding and encoding the event. Emotions such as anger, sadness, fear, and happiness are more likely to result from evaluation processes focused on assessing the relationship between the precipitating event and the attainment of desired endstates.

The fact that surprise and interest are reported to frequently cooccur with emotions such as happiness, fear, and anger (Tomkins, 1984) suggests that evaluation does have two separate components: understanding the precipitating event and assessing how the event will affect the attainment of valued endstates. Both of these components are represented in our tree diagram in Table 8.1. When

both occur in close temporal proximity, understanding and representing the precipitating event should precede an assessment of the consequences of the precipitating event. Thus, surprise and/or interest may precede other emotional responses.

As an example, consider the following situation. Every day when Ruth goes to her kindergarten classroom, her teacher brings out paints and other art materials for the children to use. The children are then allowed to paint whatever they wish. If this activity occurred daily, a child would quickly construct a *script* of the sequence of events important to painting and may also have a particular affective state associated with the activity.

Now suppose we interview Ruth and ask her how she feels about being able to paint on a daily basis. She tells us that she likes (values) it, and that painting makes her happy (an emotional state which occurs when she is allowed to engage in a valued activity). Now suppose we tell Ruth that today, when she gets through painting, her teacher is going to give her all of the paints to take home. Then Ruth will be able to paint at home as well as in school.

If we were to watch Ruth's facial expressions as she begins to talk about her feelings and thoughts about the precipitating event, the first thing we would notice is a look of surprise on her face. She then begins to talk by saying:

Do you really mean that she (the teacher) is going to let me take all the paints home? Am I the only one who gets to do this? Is this a present for me? Does she want me to paint at home every day?

Here, Ruth is attempting to understand the conditions that are associated with the precipitating event, especially in reference to the endstates she values. In the initial part of the sequence, she has not yet figured out the consequences of the event. When her questions are answered, then the child expresses, both verbally and facially, that she feels really happy.

In the example above, surprise precedes happiness. Reactions such as surprise or interest, however, need not occur in the chain of events leading to an emotional experience. The degree of understanding of the precipitating event, in terms of its relationship to the attainment of valued endstates, will predict whether surprise and/or interest occur first. If the precipitating event is not fully understood, then surprise and/or interest should occur. If the precipitating event is easily understood in terms of its role in producing desired endstates, then surprise and interest should not precede the experience of other emotions.

In this sense, surprise and interest are different than the other emotions because they can lead to either positive or negative consequences for the participant. These emotions may serve to facilitate the continuation of attention necessary for constructing representations of novel information. Once a representation has been constructed, the participant can evaluate the impact of the

precipitating event on the likelihood of attaining valued endstates. The evaluation of resulting endstates then leads to the evocation of emotions such as happiness, fear, anger, and sadness.

ANALYSIS OF HAPPINESS, FEAR, ANGER, AND SADNESS

Earlier, we discussed a sequence of events that leads to the experience of an emotion. We now turn to the meaning analyses that serve to differentiate emotional reactions. In constructing these analyses, we assume that an *ideal* person makes these inferences during an emotional episode. We then consider how development may affect the acquisition and the use of emotional knowledge.

The four emotions—happiness, fear, anger, and sadness— were chosen for an initial analysis because they have distinct patterns of facial expression and accompanying body movements (Ekman & Friesen, 1975; Ekman, Friesen, & Ellsworth, 1972; Izard, 1979, 1982; Plutchik & Kellerman, 1978, 1983; Sroufe, 1979). These four emotions are also thought to be basic. They emerge early in development and they are primarily descriptive of how the child is affected by the world. In contrast, the more complex emotions such as guilt or shame, require an additional awareness of how the child affects other people. Thus, the concept of self is thought to be more complex and differentiated when guilt and shame emerge than when the more basic emotions emerge.

Only one positive emotion, happiness, was chosen. Our previous research (Trabasso, Stein, & Johnson, 1981) has shown that the positive emotions tend to overlap and co-occur more frequently than negative ones. Thus, different emotion words, like happy, joy, glad, etc. may not reflect differences in the underlying meaning structure. It is important to include a positive emotion, however, because theoretical disagreements arise rimarily in discussion of this class of emotions. Many investigators (Isen, 1984; Scherer, 1984; Sroufe, 1979) believe that interruption and discrepancy in Mandler's conception of emotion may be more characteristic of negative emotions than the positive emotions. Sroufe (1979) for example, has asserted that positive affect can occur in the normal flow of action without interfering with or disrupting behavior. Scherer (1984) also views positive affect as facilitative rather than disruptive.

In the present analysis, happiness, as well as the negative emotions, is assumed to result from the processing of discrepant or incongruous information. Mandler (1983, 1984) provides evidence that incongruity, violation, and interruption are as central to positive emotions as they are to negative ones. The difficulties expressed by Sroufe and Scherer may be related to their equating concept of interruption with that of disruption, or to not differentiating between a positive emotional response and a positive mood state. The interruption of ongoing cognitive activity does not necessarily imply that subsequent behavior will be

disorganized or completely disrupted. Facilitation of ongoing behavior can also be a consequence of interruption, depending upon the degree of incongruity perceived and whether or not there are subsequent events which must be given attention. We discuss this issue further in our analysis of happiness.

In developing our conceptual system, we were aware that others have attempted an analysis of these four emotions (Ekman, 1977; Plutchik, 1980; Roseman, 1979). We discovered, however, that these analyses were incomplete or were discrepant when compared with our analysis. Thus, we have attempted to construct a more systematic and integrative analysis of emotion. Our scheme describes both the causal antecedents and the plans associated with each emotion.

Our analysis is discussed within a framework of personal and social problem solving behavior. We assume that an emotional experience arises from an attempt to interpret and respond to ongoing events with respect to the attainment of valued goals and states (Stein & Jewett, 1986). Thus, a central assumption underlying our model is that individuals first evaluate an event in terms of whether it leads to the attainment of desired states. The type of state attained is important because individuals have strong preferences for being in certain states and seek to avoid others. This assumption is closely related to Freud's (1948) pleasure/pain principle, stating that most human activity occurs in the service of attaining desirable endstates and avoiding undesirable ones.

In our model, then, two types of desires are said to exist: those where an individual wants something and those where an individual does not want something (i.e., where an individual seeks to avoid an end state). A second component in our model concerns the attainment of these states. Again, two possibilities exist: the desired state is attained or the desired state is not attained. If these two dimensions are paired to generate all possible combinations of want and have (attained) states, four possibilities exist:

1. a person wants to attain something and does not attain it
2. a person wants to attain something and attains it
3. a person does not want to attain something and does not attain it
4. a person does not want to attain something but attains it.

Awareness of want/have states is critical to the experience of an emotion. This awareness can be induced as a result of completing an action sequence, as a function of being interrupted during an action sequence, or as a result of planning or thinking about different courses of action. In discussing the development of emotional knowledge, Piaget (1981) suggests that the infant first becomes aware of success or failure in the attainment of desired end states when an action sequence has been completed. For adults and children capable of representational thought, however, awareness of goal states can occur when thinking about plans and actions as well as at the end of an organized action sequence. Further, for

older children and adults, valued states that are not under immediate considera-
tion can be brought quickly into awareness by the occurrence of an appropriate
precipitating event. The event causes the participant to interrupt his thinking
about one set of goal states and to shift attention to a second set of goal states.
The value attached to the goals underlying an event sequence will determine how
the situation is understood and evaluated.

In a related analysis of several emotions, Roseman (1979) also discusses the
importance of evaluating want/have states. According to Roseman, specific
combinations of want/have states are sufficient to differentiate positive from
negative emotions. Happiness occurs when a person wants something and gets it
or when a person does not want something and does not get it. The negative
emotions, such as fear, anger, and sadness occur when a person wants something
and does not get it or when a person does not want something and gets it. In our
meaning analysis, however, *the want/have states are NOT identical for the class
of all positive or all negative emotions*. Fear requires a different combination of
want/have states than anger and sadness. Fear concerns the *anticipation* of a state
change whereas anger and sadness are evoked as a result of state changes that
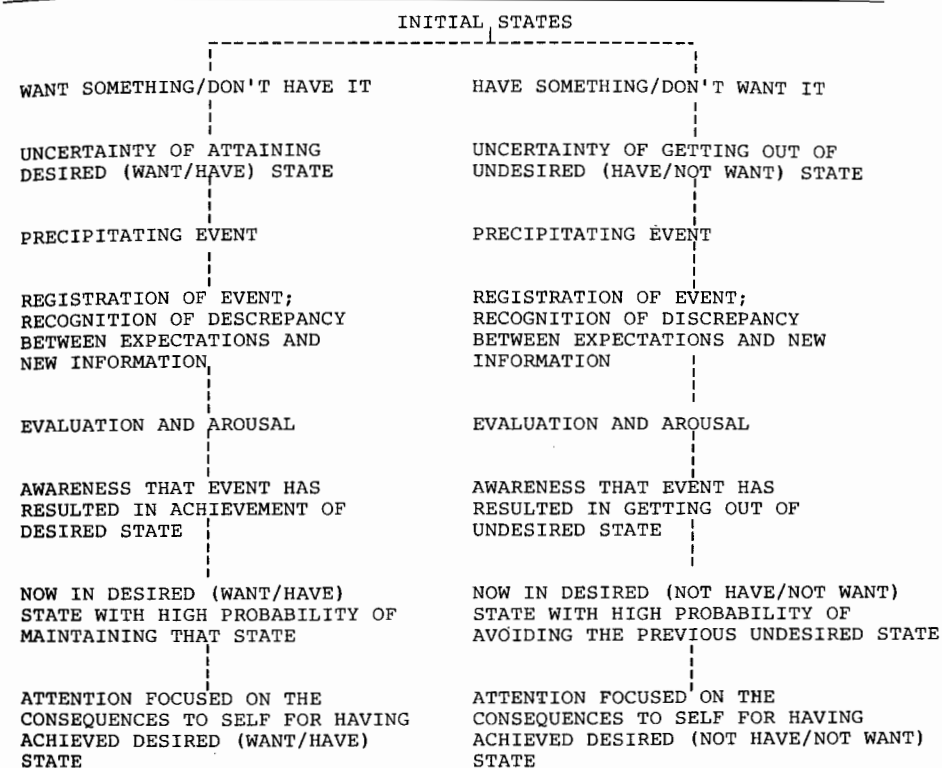have already occurred.

In order to differentiate fear from anger and sadness, the dimension of certain-
ty must be added. Certainty refers to the probability that a state change will
occur. In situations where a precipitating event has taken place, anger and/or
sadness occur when a person has perceived that the precipitating event has
already caused a change of state with respect to the attainment of a desired state.
When fear is expressed, a precipitating event has occurred that resulted in a
situation where the *possibility* of a state change is perceived. However, the
change has not yet occurred. By combining the dimension of certainty with the
dimensions of want/have states, we can differentiate among the emotional states
fear, anger/sadness, and happiness.

HAPPINESS

We begin our analysis by considering the emotion of happiness. Happiness
entails the recognition that desired states have been attained or that unwanted
states have been eliminated. A tree diagram in Table 8.2 describes the sequence
of events associated with happiness.

Prior to the experience of happiness, a person enters a situation with expecta-
tions about attaining a valued state at either a low level or an uncertain level. A
precipitating event occurs that causes or enables the valued state to be achieved.
A comparison is then made between prior expectations and the new information
in regard to attaining desired endstates. The discrepancy arising from the com-
parison process leads to interruption and subsequently to evaluation and arousal.
Happiness is experienced when a person recognizes the discrepancy between

TABLE 8.2
Event Sequence That Leads to Experience of Happiness

INITIAL STATES	
WANT SOMETHING/DON'T HAVE IT	HAVE SOMETHING/DON'T WANT IT
UNCERTAINTY OF ATTAINING DESIRED (WANT/HAVE) STATE	UNCERTAINTY OF GETTING OUT OF UNDESIRED (HAVE/NOT WANT) STATE
PRECIPITATING EVENT	PRECIPITATING EVENT
REGISTRATION OF EVENT; RECOGNITION OF DESCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION	REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION
EVALUATION AND AROUSAL	EVALUATION AND AROUSAL
AWARENESS THAT EVENT HAS RESULTED IN ACHIEVEMENT OF DESIRED STATE	AWARENESS THAT EVENT HAS RESULTED IN GETTING OUT OF UNDESIRED STATE
NOW IN DESIRED (WANT/HAVE) STATE WITH HIGH PROBABILITY OF MAINTAINING THAT STATE	NOW IN DESIRED (NOT HAVE/NOT WANT) STATE WITH HIGH PROBABILITY OF AVOIDING THE PREVIOUS UNDESIRED STATE
ATTENTION FOCUSED ON THE CONSEQUENCES TO SELF FOR HAVING ACHIEVED DESIRED (WANT/HAVE) STATE	ATTENTION FOCUSED ON THE CONSEQUENCES TO SELF FOR HAVING ACHIEVED DESIRED (NOT HAVE/NOT WANT) STATE

expected and real outcomes and evaluates the consequences of attaining desired
states. Here, the concept of consequence refers either to thoughts about the
enjoyment of goal attainment or to thoughts about how goal attainment affects
other valued states.

At the beginning of an episode resulting in happiness, attention can be
focused on different aspects of a situation. Happiness sometimes results from
fortuitous circumstances, where events occur without a person being actively
engaged in an attempt to attain desired states. In these instances, a person's
attention is initially focused on ongoing activities and thoughts not associated
with the desired state. The occurrence of a fortuitous event, however, aids in the
reinstatement of information related to the valued state and expectations associ-
ated with the probability of attaining that state. The discrepancy between pre-
vious expectations and the actual achievement of a desired state causes an
interruption in processing and an attentional shift to the fact that desired states

have been achieved. Attention is also directed toward an evaluation of the consequences of goal attainment.

Similar attentional processes occur in those situations where happiness results from a direct attempt to attain a valued state. The major difference between fortuitous event situations and those where active attempts are made in the service of goal attainment is that in the latter instance attention is initially focused on the plans or thoughts directly related to attaining the desired outcome. However, like fortuitous situations, the probability associated with attaining a desired state is low or uncertain.

An example of a situation where happiness is experienced is the following: Suppose Johnny really wants a puppy. He does not have enough money to buy one, however, and he knows that it will take him 6 months to save enough money. Johnny is thus in a state of wanting something but not being able to attain it. If Johnny were asked to estimate the chances of being able to buy a puppy in the near future, his estimate would be low. He may even feel sad about not being able to get what he wants.

Now suppose that Johnny's grandmother discovers that Johnny wants a puppy, and buys him one. When Johnny gets the puppy, he is very happy. He did not expect to get a puppy so soon, and now he has one. He is also happy because he thought he would have to work hard to earn money to buy a dog, which he did not want to do. Now he doesn't have to work, and he can do other things with his time.

In this example, the precipitating event has changed both the probability of Johnny attaining a valued goal (getting the puppy) and the probability of Johnny being in a state that he did not want to be in (having to work hard to earn money to buy a puppy). If Johnny had been asked to estimate the probability that he would have to work in order to get his dog, his estimate would have been very high. The precipitating event set up an incongruity between Johnny's expectations about the amount of work he would have to do and what actually occurred.

In the sequence of events described in the tree diagram in Table 8.2, a discrepancy or incongruity arises out of the uncertainty associated with being able to attain a particular state or the uncertainty associated with being able to eliminate an undesired existing state. The degree of initial uncertainty has been left flexible intentionally, simply because the initial uncertainty can vary widely.

Though our previous example described a boy changing from a negative emotional state to a positive one, happiness need not result as a function of being sad beforehand. There are many situations where a person is already in a state of happiness when an unexpected event occurs. The event enables the person to attain even more desired states. In this situation, the emotion of happiness does not change but intensifies. Possibilities that the person never thought of are suddenly introduced and related to important ongoing goals and values. Thus, although the prototypic happy situation may be thought of as one emerging from a negative emotional state, the presence of a negative state is *not* a prerequisite

for experiencing happiness (see also Mandler, 1984, for a discussion of this possibility). The important point is that a precipitating event sets up a *discrepancy* between expected and real outcomes and that desired states are achieved as a result of such an event.

Experiencing a positive (or negative) emotion does not necessarily entail the occurrence of disruptive or disorganized behavior. If a person is engaged in an action sequence, where he has to achieve a series of goals in order to attain a desired end state, arousal may occur after each goal is attained. The attainment of individual subordinate goals, however, does not lead to disorganized or disruptive behavior. The person is aware that there are other goals to be attained. Upon attaining a subordinate goal, the person proceeds to try to attain other subsequent goals. Thus, the problem-solving behavior continues in a smooth sequence even though arousal has occurred at the end of each episode of goal attainment.
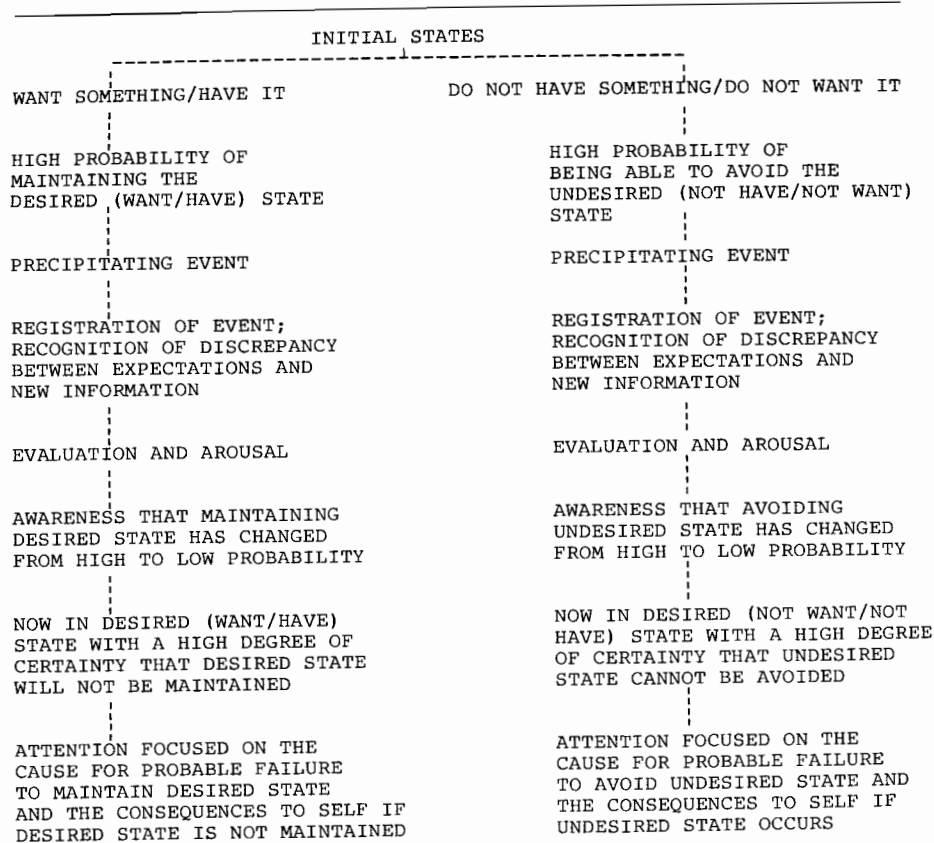
In this situation, since the person cannot be completely certain of the outcomes, attainment of each subordinate goal leads to incongruity and interruption. But the interruption also leads to the realization that other goals can now be accomplished. This realization then leads to a further plan of action rather than to goal abandonment and disruption. If we knew a person's thoughts at the time of interruption, they might consist of first expressing how happy she was that the goal had been attained and then generating the next super-ordinate goal in the problem-solving sequence. She might think about how good she felt at achieving part of her plan, but the awareness that there is a need to continue the problem-solving process enables her to shift attention to the next subordinate goal.

In some cases, however, a positive emotional experience may disrupt ongoing plans and behavior. The degree of incongruity experienced in integrating information into existing structures should predict the degree of interruption. If a person wins a lottery prize involving forty million dollars, the amount of incongruity experienced should be very high. The attainment of this goal would alter how the winner thinks about many other goals, such as earning a living. Winning may change the participant's value system so that the hierarchy of major life goals has to be altered. Winning may also change the ease of attaining goals which had been unattainable until the lottery was won. Thus, the degree of incongruity experienced reflects the number and type of changes that occur in the value system as a function of attaining a goal. Goal attainment, like goal failure, has consequences, and if these are substantial, disruption of behavior can ensue.

FEAR

Fear differs from the two other negative emotions in that its want/have states do not change as the result of a precipitating event. A distinctive feature of fear is a large shift in the subjective probability of being able to maintain an achieved desired state or being able to avoid an undesired state. Table 8.3 describes the sequence of goal states and events that lead to an experience of fear.

TABLE 8.3
Event Sequence That Leads to the Experience of Fear

INITIAL STATES

WANT SOMETHING/HAVE IT	DO NOT HAVE SOMETHING/DO NOT WANT IT
HIGH PROBABILITY OF MAINTAINING THE DESIRED (WANT/HAVE) STATE	HIGH PROBABILITY OF BEING ABLE TO AVOID THE UNDESIRED (NOT HAVE/NOT WANT) STATE
PRECIPITATING EVENT	PRECIPITATING EVENT
REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION	REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION
EVALUATION AND AROUSAL	EVALUATION AND AROUSAL
AWARENESS THAT MAINTAINING DESIRED STATE HAS CHANGED FROM HIGH TO LOW PROBABILITY	AWARENESS THAT AVOIDING UNDESIRED STATE HAS CHANGED FROM HIGH TO LOW PROBABILITY
NOW IN DESIRED (WANT/HAVE) STATE WITH A HIGH DEGREE OF CERTAINTY THAT DESIRED STATE WILL NOT BE MAINTAINED	NOW IN DESIRED (NOT WANT/NOT HAVE) STATE WITH A HIGH DEGREE OF CERTAINTY THAT UNDESIRED STATE CANNOT BE AVOIDED
ATTENTION FOCUSED ON THE CAUSE FOR PROBABLE FAILURE TO MAINTAIN DESIRED STATE AND THE CONSEQUENCES TO SELF IF DESIRED STATE IS NOT MAINTAINED	ATTENTION FOCUSED ON THE CAUSE FOR PROBABLE FAILURE TO AVOID UNDESIRED STATE AND THE CONSEQUENCES TO SELF IF UNDESIRED STATE OCCURS

At the beginning of a fear sequence, a person is in one of two states: either wanting something and having it or not wanting something and not having it. In other words, a desired attained endstate is being maintained. For example, one of the strongest needs individuals have is physical security. People seek environments and conditions where the certainty is high that they can move about in relative comfort without having to continually think about protecting themselves from harm. Any change in the certainty of being protected may bring about a fear response.

To illustrate, suppose Jenny is on her way home from school. She expects to see her mom when she gets there. Upon her arrival at home, however, she finds no one there. The house is silent and the door has been left open. Finding herself at home alone, she feels fear. The state of being alone, however, is not the object of Jenny's fear. Although Jenny has not yet been harmed, she perceives that she

might not be able to maintain her state of well being. The shift in Jenny's expectations that she would be in a protected environment in conjunction with the possible harm that could be inflicted on her are the factors that contribute to a fear response.

Our example illustrates that fear is aroused when the maintenance of valued states is threatened, especially those states connected with physical survival or safety. Fear can occur when people least expect these survival goals to be threatened. On her way home from school, Jenny probably never considered that her mother would not be home. The precipitating event of finding an empty house causes a discrepancy between expected and real outcomes. When Jenny experiences this discrepancy, she then shifts her attention to the consequences of being left alone. When the possibility of physical harm is considered, Jenny experiences a fear reaction.
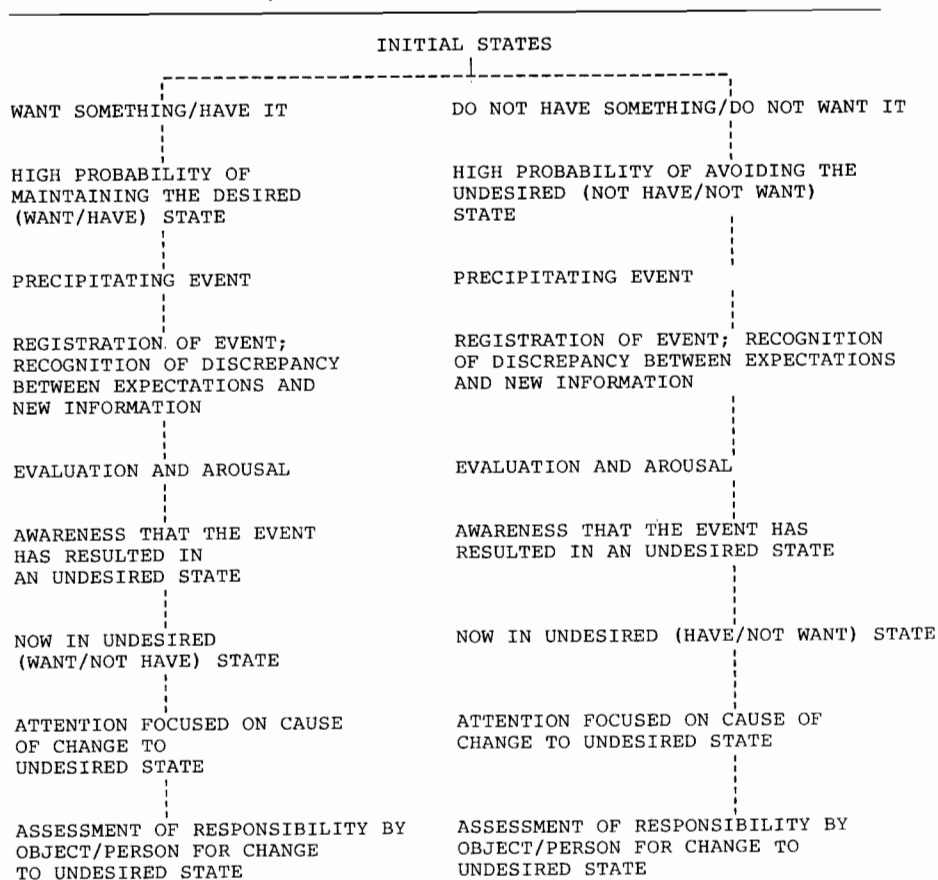
Our example of a fear situation focused on the desire to maintain a valued state. There are also times, however, when a fear experience begins with a person being in a state of not wanting something to occur and not having had it occur. For example, most people attempt to avoid sickness, pain, and punishment. Even though these states could be conceptualized in terms of positive goals (e.g., the desire to maintain well being, the desire to seek pleasureful stimulation, the desire to seek rewards), adults and children often talk about fear reactions in terms of their desires to avoid certain endstates. For example, upon discovering that a friend is sick with the flu, many children would react with fear at having contact with their sick friend. In this case, fear is caused by a shift in the subjective probability that a particular state (sickness) can be avoided. Thus, the use of the term fear encompasses shifts in the probability of avoiding undesired endstates as well as shifts in the probability of maintaining desired endstates.

ANGER

At the beginning of both a fear and an anger experience, a person can be in a state of maintaining a desired state or in a state of avoiding an undesired one. During the fear episode, the probability of maintaining the initial state shifts. The state, however, does not shift. In contrast, in anger experiences, there are distinct changes in the ability to maintain or avoid desired endstates. Table 8.4 contains the sequence of events that result when anger is experienced.

In the beginning of an anger episode, the person is either in a state of having something that is valued or in a state of not having something that he wants to avoid. For example, Johnny has just finished a picture for his teacher. He is happy because his teacher has chosen his picture as the one to be displayed on the bulletin board for the week. As Johnny is hanging up his picture, one of his classmates scribbles all over the picture with a red magic marker. Anger is

TABLE 8.4
Event Sequence That Leads to the Experience of Anger

INITIAL STATES

WANT SOMETHING/HAVE IT	DO NOT HAVE SOMETHING/DO NOT WANT IT
HIGH PROBABILITY OF MAINTAINING THE DESIRED (WANT/HAVE) STATE	HIGH PROBABILITY OF AVOIDING THE UNDESIRED (NOT HAVE/NOT WANT) STATE
PRECIPITATING EVENT	PRECIPITATING EVENT
REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION	REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION
EVALUATION AND AROUSAL	EVALUATION AND AROUSAL
AWARENESS THAT THE EVENT HAS RESULTED IN AN UNDESIRED STATE	AWARENESS THAT THE EVENT HAS RESULTED IN AN UNDESIRED STATE
NOW IN UNDESIRED (WANT/NOT HAVE) STATE	NOW IN UNDESIRED (HAVE/NOT WANT) STATE
ATTENTION FOCUSED ON CAUSE OF CHANGE TO UNDESIRED STATE	ATTENTION FOCUSED ON CAUSE OF CHANGE TO UNDESIRED STATE
ASSESSMENT OF RESPONSIBILITY BY OBJECT/PERSON FOR CHANGE TO UNDESIRED STATE	ASSESSMENT OF RESPONSIBILITY BY OBJECT/PERSON FOR CHANGE TO UNDESIRED STATE

aroused here because a desired endstate has not been maintained: Johnny's picture has been ruined. There was also a discrepancy between the real and expected outcomes (i.e., a ruined picture instead of a displayed picture). To arouse anger, in addition to perceiving the discrepancy between real and expected outcomes, the cause of the goal failure must be noticed.

An additional dimension typically associated with adults' concept of anger is an assessment of whether the person causing the obstruction acted intentionally or not (negligence is often considered synonymous with intention in the case of anger). If intentional harm can be attributed to a person's obstructive behavior, then anger is very likely to occur.

Anger is not only descriptive of failure to maintain desired states, but it also describes failure to avoid undesired states. Children and adults frequently ex-

press their anger by noting that they are in a state that they do not wish to be in. For example, young children who are angry at being forced to eat food they dislike will often clearly indicate that they don't want to eat the food and that they would do anything to get out of the situation (Stein & Levine, in preparation). Thus again, the language of emotion vacillates between being *forced* into undesirable endstates and being denied pleasurable endstates.

SADNESS VERSUS ANGER

Many of the dimensions of an anger situation are similar to those of a sad situation. More often than not, the same event can cause sadness, anger, or both, depending upon what dimensions are most salient. The initial states and the endstates that give rise to sadness are the same as those that give rise to anger. Sadness, like anger, occurs when a person's state changes from being able to maintain a valued endstate to not being able to maintain the endstate. Thus, dimensions other than the want/have states distinguish between the two emotions. Tables 8.4 and 8.5 describe the dimensions that differentiate sadness from anger.
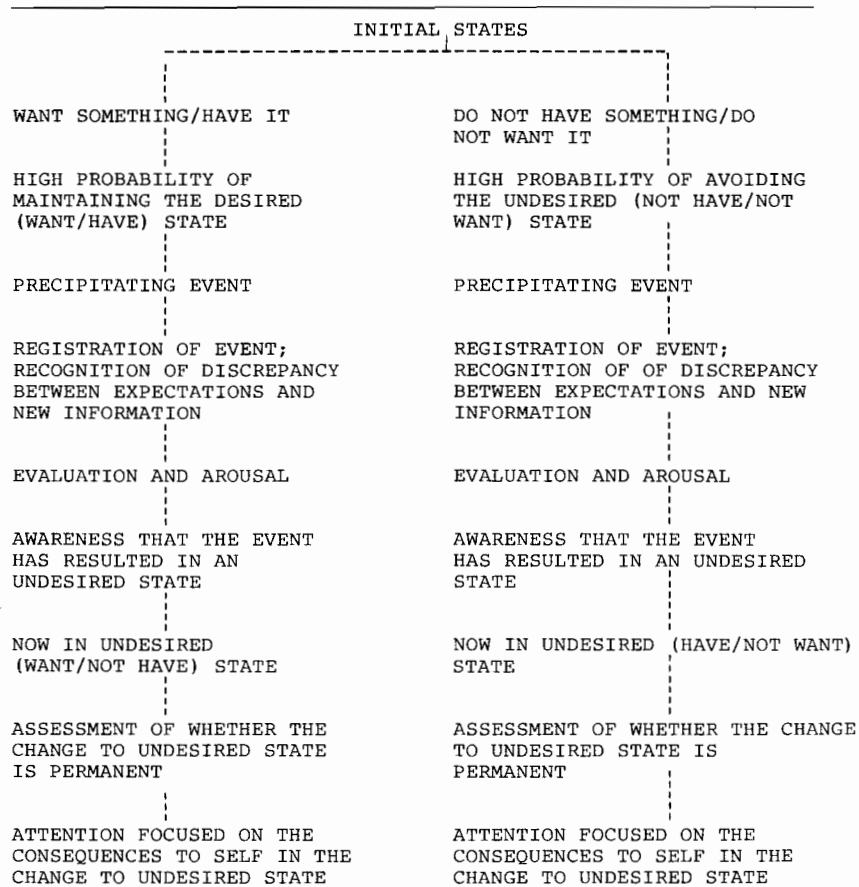
The distinction that anger is characterized by obstruction and sadness is characterized by loss (see Ekman, 1977, and Plutchik & Kellerman, 1978) is not sufficient since goal obstruction and loss occur in both anger and sadness situations. The feature distinguishing the two emotions is that anger results from the participant focusing on the *cause* of the obstruction, whereas sadness results from the participant focusing on the *consequences* of the obstruction—that is, whether the obstruction is permanent and the failure to attain one goal will affect the attainment of other valued goals.

The example of Johnny and his picture, used to illustrate anger, can also be used to illustrate sadness. Recall that Johnny's picture has been destroyed by a classmate just before Johnny can hang up the picture. The change in state for sadness is identical to the one for anger: A valued state has been changed. If we were to take this situation, and ask children why they felt either angry or sad, the responses for each emotion should be the following:

Anger.   (Child responding to having her picture destroyed) "Because she ruined the picture, and now I don't have no picture to give to the teacher. She should be punished, because it's her fault. She's not allowed to do that. She shouldn't be allowed to get treats or anything, and she should never do that again."

Sadness.   (Child responding to her picture being destroyed) "Cause now I don't have no picture. I worked real hard on that. It's wrecked and now I won't have anything to give to the teacher. I just couldn't do it over again, so I won't get a chance to have my picture up there."

TABLE 8.5
Event Sequence That Leads to the Experience of Sadness

INITIAL STATES

WANT SOMETHING/HAVE IT	DO NOT HAVE SOMETHING/DO NOT WANT IT
HIGH PROBABILITY OF MAINTAINING THE DESIRED (WANT/HAVE) STATE	HIGH PROBABILITY OF AVOIDING THE UNDESIRED (NOT HAVE/NOT WANT) STATE
PRECIPITATING EVENT	PRECIPITATING EVENT
REGISTRATION OF EVENT; RECOGNITION OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION	REGISTRATION OF EVENT; RECOGNITION OF OF DISCREPANCY BETWEEN EXPECTATIONS AND NEW INFORMATION
EVALUATION AND AROUSAL	EVALUATION AND AROUSAL
AWARENESS THAT THE EVENT HAS RESULTED IN AN UNDESIRED STATE	AWARENESS THAT THE EVENT HAS RESULTED IN AN UNDESIRED STATE
NOW IN UNDESIRED (WANT/NOT HAVE) STATE	NOW IN UNDESIRED (HAVE/NOT WANT) STATE
ASSESSMENT OF WHETHER THE CHANGE TO UNDESIRED STATE IS PERMANENT	ASSESSMENT OF WHETHER THE CHANGE TO UNDESIRED STATE IS PERMANENT
ATTENTION FOCUSED ON THE CONSEQUENCES TO SELF IN THE CHANGE TO UNDESIRED STATE	ATTENTION FOCUSED ON THE CONSEQUENCES TO SELF IN THE CHANGE TO UNDESIRED STATE

In comparing the angry and sad responses, both similarities and differences exist. Both children verbalized the fact that their picture had been destroyed, and both children stated that they would have no picture to give to the teacher. Thus, each child was explicitly aware of the change in state with respect to achieving a particular goal. The child who was angry, however, focused on the cause of the obstruction, her classmate, and indicated that the classmate was responsible for the picture being ruined. The child who was sad focused on the consequences of having the picture destroyed (e.g., thinking about doing the picture over again, concluding that she could not do it the same way again, and stating that now she would have no picture to give to the teacher).

One factor that influences whether an individual focuses on the cause of an obstruction or on its consequences may be the perception of intentional harm on the part of the person causing goal obstruction. If the recipient of harm perceives that another person intentionally interrupted or blocked a sought after goal, then anger may be easily invoked. On the other hand, if the recipient perceives that another person's actions were not intentional or that the other person was not responsible for his actions, sadness may be evoked because the recipient then shifts his focus to the consequences of the obstruction.

There are many situations of anger that do not conform to the prototypic case where intentional harm can be inferred. Our data (Stein & Levine, in preparation) suggest that anger can occur in response to any type of goal obstruction, whether the cause of the obstruction is a person, an object, or an external event. Many times, children and adults express anger at people who have not intentionally sought to harm them. The mere fact that the person caused an obstruction seems to be enough to trigger anger. Thus anger may occur simply because of an inferred causal relationship between a person or event and the change in endstate.

SUMMARY OF FEATURES DIFFERENTIATING EMOTIONS

Table 8.6 contains a summary of six dimensions that have been used to distinguish among the four emotions: the initial state at the beginning of the emotion episode, the end state, the probability of a change occurring in the initial state, the focus of attention after the precipitating event, the reason normally given for the experience of each emotion, and the plans typically associated with each emotion.

We have shown that the first three dimensions can be used to distinguish the *positive* from the *negative* emotions. These dimensions can also be used to distinguish fear from anger and sadness. The fourth dimension, the focus of attention after registration of the precipitating event, is necessary to distinguish between anger and sadness. Both emotions can occur when precipitating events cause a definite shift from a desired to an undesired state. The dimension that distinguishes between them is the focus of attention on the cause or consequences of the precipitating event.

For anger to be evoked, the cause of the shift to an undesired state must be considered, as well as the circumstances that permitted the cause to occur. Attention is focused on a person's knowledge about the appropriateness of the cause. For sadness, the consequences to the self must be considered. Sadness entails an awareness of the permanence of the undesired state, and also an awareness of how the undesired state will affect the attainment of other desired states.

TABLE 8.6
Dimensions Differentiating Happiness, Fear, Anger, and Sadness

	STATE TRANSITION		PROBABILITY OF CHANGE IN INITIAL STATE	FOCUS OF ATTENTION AFTER PRECIPITATING EVENT	VERBAL REASON FOR EMOTION	PLAN
	INITIAL STATE	END STATE				
HAPPINESS	want/not have OR not want/have	want/have OR not want/ not have	change in initial state certain	consequences to self because of change to desired state	attainment of desired state; avoidance of undesired state	goal enjoyment; maintenance of desired state; avoidance of undesired state
FEAR	want/have OR not want/ not have	want/have OR not want/ not have	change in initial state uncertain but highly probable	cause of proba-ble failure in not being able to maintain de-sired state and consequences to self from proba-ble change	anticipation of physical or psychological harm	prevention of state change
ANGER	want/have OR not want/ not have	want/ not have OR not want/ have	change in initial state certain	cause of change to undesired state	violation of personal wish or social code	removal of obstacle
SADNESS	want/have OR not want/ not have	want/ not have OR not want/ have	change in initial state certain	consequence to self because of change to unde-sired state	loss of valued object	goal abandonment; goal substitution

Happiness and fear also have characteristic attentional shifts that occur as a function of a precipitating event. Happiness results when attention is focused on the consequences of achieving a desired state. Fear results when attention is focused on both the *cause* of probable failure to maintain a desired state *and* the *consequences* to the self that would follow from the inability to maintain the desired state.

It is interesting to note that fear requires attention to both the cause and consequence of the intervention of a precipitating event, whereas anger and sadness require attention to one or the other. In most real world situations, an attempt to understand the effect of a precipitating event requires an understanding of both its causes and consequences. Further, the two types of inferences (cause and consequence) are readily made by very young children. Thus, it would seem that young children would often be aware of both the causes and consequences of a precipitating event that resulted in a desired state. The co-occurrence of anger and sadness should then be very high. In our empirical section, we discuss this possibility.

Just as the four emotions can be distinguished in terms of the dimensions apprehended before the emotional experience, so can each of the emotions be distinguished by the types of plans that follow. According to Dahl (1979), the plans occurring subsequent to an emotion can be characterized along an AC-TIVE/PASSIVE dimension. Anger is an active emotion and carries with it a specific consummatory act of getting rid of the object of anger. We would say that anger functions to organize subsequent action directed at removing the source of goal obstruction.

In contrast to anger, Dahl (1979) conceives of sadness as a passive emotion, with no consummatory act following its expression. The passivity experienced in sadness stems from the perception that the goal under consideration is not attainable and the probability of reinstating the goal is very low. The only plan appropriate to sadness is one of goal abandonment or goal substitution. In many situations, however, the ability to formulate a new goal may require too much restructuring and cognitive effort. Then, the only plan associated with sadness would be one of goal abandonment.

Associating passivity with the acts following sadness is problematic in at least one respect. Often the person experiencing sadness persists in attempting to reinstate a particular endstate despite an awareness that the endstate is probably unattainable. For example, when young children lose a valued object, they may know that the object is gone. When asked about their wishes and plans, however, they may indicate that they still hope to find the lost object and thus reinstate their original goal (Stein & Jewett, 1986; Stein & Levine, in preparation).

The question arises as to whether the emotional response of sadness organizes these wishful thoughts or whether a change from sadness to another emotional state enables the person to engage in wishful thinking. It is possible that sadness is first associated with goal abandonment, but that goal abandonment causes a

fear or anxiety reaction. The anxiety reaction could then cause the person to engage in wishful thought, in order to reduce the intensity of the reaction. If this were the case, we would have to discover the nature of an anxiety reaction to goal abandonment and how it initiates wishful thinking. Otherwise, we would have to conclude that sadness, like fear and anger, is an organizer of subsequent plans.

The same comment can be made about happiness. According to Dahl (1979), happiness is a passive emotion in that no consummatory act follows the emotion. In contrast, we would expect happiness to be followed by plans to enjoy the goal that has been attained. Other behaviors that often follow happiness are those where the person attempts to maintain the happy state. When maintenance activities occur, are we to conclude that a shift in emotional state has occurred in order to initiate these activities or do we conclude that happiness can be an organizer of subsequent activity?

Fear, according to Dahl, is clearly an active emotion and carries with it a consummatory act of avoiding the object of fear. In our terminology we would say that a person attempts to prevent an undesired endstate from occurring. For example, if a child perceives that another person might physically harm him, the child normally attempts to prevent the physical harm. To this end, the child may avoid the threatening person. Alternatively, however, the child may decide to aggress against the person. In this case, avoidance is not an adequate description of the plans generated by a fear response, whereas *prevention* of physical harm is. The flight or fight plans normally associated with fear and anger are too restrictive to encompass all plans associated with these emotions. Prevention of state changes and removal of obstructions better characterize the plans arising from these emotions.

EVIDENCE SUPPORTING THE CONCEPTUAL ANALYSIS

Our description of emotional knowledge is analogous to a discrimination network, where specific conditions are assumed to be necessary before the arousal of each type of emotion occurs. For example, anger occurs when valued end states are unexpectedly blocked and when attention turns to the cause of goal blockage. The critical components are a valued goal, an unexpected blockage, and attention to the cause of the goal blockage. Sadness also occurs when valued endstates are unexpectedly blocked. The blockage, however, is usually permanent and attention turns to the consequences of the goal blockage.

The question is whether a specific emotion will be elicited when the pattern of dimensions associated with it is inferred from a given event. For example, if an emotional episode were constructed which included all of the dimensions necessary for anger to be inferred, would all persons interpreting the episode express

anger? Similarly, when respondants give reasons for the expression of anger, will they include all of the dimensions of anger outlined in the conceptual model? The necessity argument reduces to the question of whether all dimensions associated with an emotion have to be inferred each time the emotion is aroused or whether some dimensions are more central to each emotion than others. If certain dimensions are found to be more central to the arousal of each emotion, must these dimensions be inferred each time a particular emotion is experienced?

These questions formed the basis for our initial set of investigations. In one study (Stein & Jewett, 1986) 6-year-old children generated emotional responses to a series of mini episodes. For example, children heard the following event:

> You've been working a long time on a picture you want to put up in your classroom. Just when you finish it, a (boy/girl) comes along and scribbles big red crayon marks all over the picture.

Children were than asked to tell how they would feel if that event happened to them. They were given a choice of one of three emotions: anger, sadness, or fear. They were then asked if they felt more than one emotion, and if they did, which other emotion they felt. A series of additional probe questions followed. Each question was constructed to elicit a critical dimension assumed to be associated with each emotional response.

The results were unambiguous. First, nearly all the angry and sad responses were expressed in terms of wanting to attain a valued state and not being able to achieve it *OR* not wanting to be in a particular state and being forced into it. The want/have states associated with positive emotions such as happiness (e.g., I want something and I have it), were never given for angry or sad feelings. For example, when asked why they were angry at a child who scribbled on their picture, almost all children said:

> Because now I don't have (not have) any picture to hang up and I wanted (want) to hang it up.
>
> or
>
> Because now it's ruined (have). I didn't want (not want) her to do that.

When children heard mini episodes in which desired states were achieved, they almost always gave happiness as their emotional response (Stein & Eulau, in preparation; Stein & Levine, in preparation). When giving reasons for their happiness, almost all children referred to having what they wanted or avoiding what they did not want. Children as young as three generated responses of these types, and their reasons for happiness rarely overlapped with their reasons for anger or sadness. Children clearly associated blocked goals with anger or sadness and accomplished goals with happiness. There were no developmental differences associated with the ability to communicate about the states that were

blocked or attained. Three-year-olds were as proficient at talking about internal goal states as were 5- and 6-year-old children (Stein & Levine, in preparation).

The fact that different want/have states were associated with positive and negative emotions corroborates previous findings with both children and adults (e.g. Scherer & Ekman, 1984). One of the most fundamental and consistent dimensions found to distinguish among emotions corresponds to the "positive-negative" factor. Our studies substantiate these findings and indicate that subjects focus on the dimension of goal failure and goal attainment.

Furthermore, our data strongly suggest that very young children are aware of internal states that refer to the attainment and denial of a valued state. Although several developmental studies have claimed that young children are not aware of their own or other people's internal states, this claim is not supported in our and other recent studies of very young children's knowledge of emotions and internal states (see Stein & Jewett, 1986, for a review of this literature; see also Stein & Levine, in preparation, for a more detailed analysis of 3-year-old children's knowledge of emotional states).

The conceptual understanding of emotions, however, involves more than an awareness of desired or valued states. In order to distinguish fear from anger and sadness children must infer that a valued state *might be* obstructed, although the obstruction has not yet occurred. Anticipation of a possible obstruction is a fairly sophisticated concept. Our data thus far indicate, however, that even 3-year-old children are capable of making such distinctions in differentiating fear from anger and sadness.

Three findings support this claim. When young children in our studies were asked to generate examples of events that cause fear, anger, and sadness, the events causing fear rarely overlapped with those causing anger or sadness (Trabasso, Stein & Johnson, 1981). When children were asked why something frightened them versus why something made them angry or sad, reasons for fear almost always contained the recognition that the child *could be harmed* by an event. The language used was always in the future tense. For example, many children gave a fear response to the following situation:

> One day you come in from playing outside when it turns dark. You look all over the house and cannot find anyone at home.

Of those children who gave fear responses, 94% of both 3- and 6-year-old children said they were afraid because something "bad" could happen to them without anyone home. The language used was one of *anticipated* harm. When asked if the harm had already occurred, all children said no. The children were aware that they did not want to be harmed, and that they were not harmed yet. They were fairly certain, however, that harm would occur if the situation did not change in some way (Stein & Jewett, 1985, 1986). Anger responses rarely, if ever, contained reference to anticipated events.

Fear, then, was distinguished from anger and sadness by different want/have states and a certainty dimension. The want/have states associated with fear are similar to those associated with positive emotions such as happiness. Fear, however, is distinguished from happiness in that the person perceives that there is a high probability that an existing and a desired state (e.g., safety) may undergo change.

Our data, thus, suggest that the want/have states and certainty dimension are necessary conditions for distinguishing between positive and negative emotions, as well as between certain negative emotions (i.e., fear as opposed to anger and sadness). The dimensions necessary to distinguish between anger and sadness, however, are more difficult to assess, since they share common contexts. Both emotions are elicited by events that block valued states or by events that put a person into an undesirable state.

Sroufe (1984) has argued that it is the inability to complete an action sequence that results in anger. Our results, however, do not support this hypothesis. Sadness as well as anger was inferred when emotional episodes contained incompleted actions. Associating obstructed plans or interrupted actions with only anger is not an adequate description as sadness may also be experienced. Puzzlement or curiosity can also be experienced for the same events. In order for anger to occur, dimensions, in addition to the inability to complete an action, must be present.

We hypothesized that the critical dimensions that differentiate anger and sadness are the focus of attention once an obstacle blocks goal attainment, and an assessment of the permanence of the obstacle. Sadness requires a shift in attention to the consequences of goal blockage whereas anger requires a shift in attention to the cause of goal blockage. The expression of sadness also presumes that goal blockage is permanent whereas anger can be aroused when goal blockage is either permanent or temporary.

Our data lend support to these claims. In an initial study completed on 6-year-old children (Stein & Jewett, 1986), we found that anger and sadness were similar in terms of the reasons given for each emotion's occurrence. Children reported that goal obstruction was the primary reason for both anger and/or sadness. In a subsequent study (Stein & Jewett, 1985), 3- and 6-year-old children were asked whether or not the obstacle blocking their goal path was permanent. Of those children who expressed sadness rather than anger, 62% said that the obstacle resulted in a permanent loss. Of those who expressed anger, only 24% said that obstruction resulted in a permanent loss. Thus, the irreversibility of the blockage is an important assessment in the expression of sadness.

Permanent blockage, however, does not result only in sadness. Some children expressed anger when permanent losses occurred. In addition to the permanence of the loss, the focus of attention on either the cause or the consequences of the obstruction is necessary to differentiate sadness and anger. All children who were angry referred to the cause of their goal failure. References to the cause,

however, were of a particular sort. Even when the cause of obstruction was an inanimate object, the children used language that was heavily marked with references to *fault, responsibility,* and the *unusual, unexpected* occurrence of such an event (Stein & Jewett, 1985).

These responses suggest that a further critical dimension for eliciting anger may be the violation of a set of expectations about how the world *should* operate. When a precipitating event disrupts a plan of action, if the event is perceived to be the cause of the disruption, and if the event is perceived to be unusual and violates the norm for the expected sequence of events, then anger will most likely occur. Physical actions and natural events that violate a set of beliefs about the world can arouse anger in children and adults as much as intentional actions performed by other people.

Thus, attention to the cause may occur because of the unusual nature of the circumstances surrounding the sequence of events. In attempting to understand and represent state changes which occur in social interaction, attention may shift to the event that initiated the series of unusual changes. Children may then make conscious, active comparisons between what actually occurred and what they expected to occur.

In the introduction, we proposed that all emotional reactions are a function of unexpected occurrences. The perception of unexpected events and violations is especially prevalent in our data on anger responses. The violations, however, need not be performed by an animate agent, as has been suggested by Roseman (1979) and Weiner (1982). Physical actions and natural events that obstruct goals and violate a set of assumptions about the world also produce anger in both children and adults (Stein & Levine, in preparation).

Sadness results from a focus on the consequences rather than the cause of not attaining a valued state. Although permanent loss is a dimension frequently associated with sadness, as proposed by Ekman (1977), permanent loss is not sufficient to induce sadness. A subject must perceive that having one goal blocked is going to affect the pursuit and attainment of other goals, some of which are more important than the initial goal that has been blocked.

This spread of attention to other affected goals can be seen in almost all episodes of sadness. In one study (Stein & Jewett, 1985), children were asked about their reasons for sadness in response to having their picture ruined by another child. Most of the children mentioned that they would not be able to produce a picture like that again (e.g., permanent loss). However, 92% of the children mentioned other goals that they could not attain as well. The children expressed concern about not receiving recognition from the teacher for painting such a *good* picture. Others were concerned about future instances of drawing pictures in the sense that their pictures would again be destroyed. Still others were concerned that the destruction of their picture would change their relationship with the perpetrator of the act and that they could no longer trust this child.

Up to now, the predictive validity of our conceptual model has been contingent upon children and adults first expressing an emotion and then explaining why the event in question elicited that emotion (Stein & Jewett, 1985, 1986; Stein & Eulau, in preparation). We have completed one study (Stein & Levine, in preparation) where the events to be associated with each emotion were constructed via combinations of the assumed critical dimensions outlined in the decision trees. This type of study seems to be most desirable as a test of the model because using this paradigm guarantees that most subjects are processing the same dimensions of each precipitating event. The results of this study support our analysis of the dimensions distinguishing positive (happy) from negative (anger and sadness) emotions and fear from anger and sadness.

More problematic have been the distinctions made between anger and sadness. Certain dimensions have been found to be highly associated with anger (e.g., focusing on the cause of disruption) or sadness (e.g., focusing on the consequences of disruption). Our data suggest, however, that it is necessary to probe for the dimensions used in eliciting these two emotions. Subjects who express anger do not always spontaneously state the unusual circumstances surrounding the cause of disruption or the inferences regarding fault, responsibility, or intentionality of the agent. Similar observations have been made in examining the data on the expression of sadness.

The fact that systematic probing almost always results in reference to the dimensions outlined in our model may support one of two hypotheses. The first hypothesis is that the expression of anger and/or sadness does involve the dimensions outlined in our analysis. Failure to verbalize the associated dimensions may be indicative of the rapidity with which these dimensions are recognized. The lack of verbalization may also be due to the fact that many children are not really experiencing anger, but just reporting how they would feel. In real world situations, where children actually experience and express anger, much of their verbalizations contain derogatory references to the agent who obstructed their goal (Miller, 1984).

Another issue associated with the expression of sadness and anger is that children and adults sometimes give both emotional responses to the same event (Stein & Eulau, in preparation; Stein & Levine, in preparation). Adults, however, are much more likely to give both emotions, with over half expressing both anger and sadness (Stein & Levine, in preparation). These subjects are apparently processing both the causes and the consequences of a precipitating event before *reporting* their emotions, illustrating that people can easily have more than one emotional response to a single event.

Our data are consistent with theories of social understanding based on how people represent and use personal and social information (Stein & Goldman, 1981; Stein & Trabasso, 1982, 1985; Trabasso, Stein & Johnson, 1981). In encoding and representing social information, the construction of a network of

associations which incorporates incoming information into previously acquired knowledge structures is central. The inferences about events are causal and include the effects that an event has on other events (Stein & Goldman, 1981; Stein & Jewett, 1986; Stein & Trabasso, 1982; Trabasso, Secco, & van den Broek, 1984; Trabasso, Stein, & Johnson, 1981).

Our studies have shown that young children are proficient at making inferences about the cause and consequences of events (see Stein & Trabasso, 1982; Stein & Jewett, 1986, and Trabasso, Stein, & Johnson, 1981, for a review of this literature). Furthermore, Stein and Eulau (in preparation) have found that 5-year-old children not only verbalize the endstates that change when a precipitating event occurs, but they can also report changes from a negative to positive emotional state as well as the reasons for this change. When goal conflict situations are presented, the incidence of expressing more than one emotion increases significantly.

Understanding social events may involve the experience and expression of more than one emotion. The experience of an emotion in our model is intimately bound to the desire to attain particular states. Normally, individuals have many goals that operate in a situation. When a precipitating event occurs to preclude goal attainment, more than one goal may be obstructed. Depending upon the recogniton of the multiple goals involved, more than one emotion can be expressed. Part of the problem solving process that occurs in emotional episodes involves the act of deciphering and representing the various goals at stake, comparing the importance of various goals in terms of a value system, and choosing the course of action most likely to result in a desired endstate.

Studying emotional knowledge in a framework of problem solving and social understanding is useful because it forces us to describe more accurately the types of knowledge people have acquired about personal and social events and the types of strategies used to access this knowledge in everyday social interaction.

Viewing emotional behavior within a problem solving framework might also provide more insight into the universal nature of emotional understanding and expression. As of now, it is believed by many that emotional behavior is a universal phenomenon and that distinct emotional expressions in one culture are also present in all other cultures. Ekman and Friesen's (1975) work, in particular, is used to support the validity of this hypothesis. Although we do not doubt that some aspects of emotional behavior are universal, it is not yet clear what the universal elements are. One source of the commonality across cultures may be the basic life values and desired states described in many moivation theories. While cultures may vary in terms of how they achieve basic sustenance goals, the pursuit of certain states appears to be invariant across cultures.

Rather than look for external events that are common across cultures, we propose that evaluating the important life goals and values of a culture may prove more fruitful in understanding the universal nature of emotional behavior. We

would not be surprised if a small set of events could be generated which would ensure similar responses across a number of cultures. The *interpretation* of those events, in terms of how the events are valued within a framework of desired states, is what makes the commonality. Thus, emphasis should be placed on discovering what commonalities are present in interpreting and understanding personal and social events as well as on attempting to discover commonalities in overt behavior and the events that cause particular emotional experiences.

And finally, we raise the issue that began this chapter: the relationship between cognition and emotion. The causal relationship between cognition and emotion needs to be understood better than at present. At the moment, there are many who believe that emotion acts as a fundamental organizer and regulator of cognition and behavior. The concept of organization and regulation, however, has not been clearly delineated by researchers working on the interaction of emotion and cognition. To say that emotion *organizes* cognition implies that emotion guides and fundamentally changes the nature of subsequent cognition.

In our model of emotional knowledge, it is the recognition of discrepant events in addition to the desire to attain or maintain certain states that leads to an emotional experience. The plans generated in response to emotional states are a function of the value imputed to a state, and the knowledge that has been acquired about how to reinstate or maintain a desired state. In our present state of knowledge, to simply claim that emotion is the organizer of cognition and behavior does not do justice to the complexity of the processes involved in responding to external events. In future studies, especially those concerning the development of emotion and thought, we hope researchers will be able to generate a clearer idea of the processes involved in representing information as well as a more delineated concept of the role emotion plays in the *organization* and *regulation* of cognition. At the moment, few, if any studies in the area of development have attempted this task.

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