

An Integrated Model of Emotion Processes and Cognition in Social Information Processing

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Literature on the contributions of social cognitive and emotion processes to children's social competence is reviewed and interpreted in the context of an integrated model of emotion processes and cognition in social information processing. Neurophysiological and functional evidence for the centrality of emotion processes in personal–social decision making is reviewed. Crick and Dodge's model is presented as a cognitive model of social decision making, and a revised model is proposed into which emotion processes are integrated. Hypotheses derived from the proposed model are described.

INTRODUCTION

The last two decades have witnessed rapid progress in research and theory regarding the contributions of social information processing (e.g., Crick & Dodge, 1994; Dodge, 1986) and emotionality and regulation (e.g., Eisenberg & Fabes, 1992; Eisenberg et al., 1997; Hubbard & Coie, 1994; Saarni, 1999) to children's social competence. Although both research traditions share a focus on social competence, integration across the domains of social information processing and emotionality and regulation has been minimal. We argue here that (1) it is vitally important for developmental psychologists to take a broader view of children's social and cognitive development, and (2) an essential aspect of this broader view involves considering, both theoretically and empirically, how emotional and cognitive processes can be integrated in models of social competence.

HISTORICAL BACKGROUND AND OVERVIEW

There is a long-standing theoretical interest in understanding the multiple ways affect and cognition interact. Cognitive psychologists have been interested in the critical role of emotions in prioritizing and weighting multiple goals and objectives in real-time human information processing (e.g., Simon, 1967). Attachment and emotion researchers have been interested in working models (e.g., Bowlby, 1988; Bretherton, Ridgeway, & Cassidy, 1990) and emotion–event representations (e.g., Arsenio & Lover, 1995) of affectively charged relationships and events. Despite this interest, and a journal devoted to the topic (*Cognition and Emotion*), progress has been slower than expected.

An early reflection of the interest and difficulties in integrating emotion and cognition was Piaget's (1981) *Intelligence and Affectivity*. Piaget described affect and cognition as being indissociably linked ("two sides of

the same coin," Cowan, 1981, p. xiv), where affect plays a role ". . . like gasoline, which activates the motor of an automobile but does not modify its structure" (Piaget, 1981, p. 5). Although this book sparked considerable interest (Bearison & Zimiles, 1986; Brown, 1996; Cowan, 1981), the analogy of affect as gasoline and intelligence as the motor of human functioning reflects a key limitation found in various attempts to include emotion within cognitive models of development. For example, both Piaget (1981) and Crick and Dodge (1994) acknowledge the central importance of emotion, but provide a detailed and elaborated description of cognition without providing a comparably differentiated account of emotions.

In this paper, we define the domain of emotion broadly to include processes that vary in duration from briefly experienced feelings resulting from conscious or unconscious appraisal to more enduring affective styles (see, e.g., Ekman & Davidson, 1994; Oatley & Jenkins, 1996). Therefore, we deliberately use the term *emotion processes*. Delineating the difference between emotion and cognition is a difficult task for which there is little consensus. To some extent, whether one sees emotion and cognition as separate or as one process depends on how broadly cognition is defined (Dodge, 1991; Ekman & Davidson, 1994). Moreover, both emotion and cognitive processes develop, and the nature of their relations changes (e.g., Denham, 1998; Saarni, 1999).

At a very general level, both emotion and cognition are types of information processing, but the functions they serve are distinct. Izard (1994, p. 204) stated "Emotion is about motivation, cognition about knowledge." This view is shared by functionalist theorists, neurophysiologists, and some cognitive theorists who see the function of emotion as alerting individuals to

important features of the environment and providing direction for cognitive processes and behavior in ways that are mostly adaptive (e.g., Campos, Mumme, Kermoian, & Campos, 1994; Damasio, 1994; Oatley & Jenkins, 1996). Recent neurophysiological evidence (e.g., LeDoux, 1995) suggests that emotion processes and cognitive processes influence one another, making it difficult to isolate cases of pure emotion or pure cognition, *except* where brain damage has severed this connection (e.g., Damasio, 1994, and see below). We argue that emotion processes serve motivational, communicative, and regulatory functions within and between individuals that are distinct from the contributions of cognitive processes (attention, learning, memory, logic) to social competence. Regardless of how broadly or narrowly cognition is defined, in our view the inclusion of emotion processes in models of personal–social decision making will expand their explanatory power.

Our primary goal is to offer a model of social information processing that (1) brings together affective and cognitive contributions without distorting or minimizing the literatures from which these contributions are drawn, and (2) is theoretically coherent enough to spur empirical examination of many of these proposed connections. To accomplish this goal, three basic topics will be covered. First, a brief overview is presented of Crick and Dodge's (1994) information processing model of social competence. The model was chosen both because it is well articulated and has received considerable empirical support, and because Crick and Dodge themselves acknowledge the need to consider emotion-related processes more fully. Next, there is a brief summary of the types of emotion processes that are relevant to social competence and are likely to be influential in social information processing. The final section illustrates the specific ways emotion processes can be integrated into a social information processing model.

SOCIAL INFORMATION PROCESSING

A basic premise of social information processing (and of other social cognitive models, e.g., Piaget 1932/1965; Turiel, 1998) is that children's understanding and interpretation of situations influences their related behaviors. Social information processing theory offers a detailed model of how children process and interpret cues in a social situation and arrive at a decision that is more or less competent (Crick & Dodge, 1994; Dodge, 1986). Crick and Dodge assume children enter a social situation with past experiences and biologically determined capabilities which they may access during the encounter. The processing steps they describe are

hypothesized to occur relatively rapidly and in parallel, with numerous feedback loops (see Figure 1), but for clarity, we describe them sequentially (see Crick & Dodge, 1994; Dodge, 1986, 1991, for more details).

Briefly, social information processing begins when the child attends to, encodes, and interprets social cues (steps one and two in the model). Imagine a child who gets hit by a ball while walking across the playground. The child must figure out what happened (attention, encoding) and why it happened (interpretation: an accident or on purpose?). In the third step of the model, the child's goals for the situation are clarified. Possible goals might be to maintain friendly relations with classmates, or to show others you won't tolerate this intrusion of your personal space. In steps four and five of the model, possible responses to the situation are generated and evaluated in terms of anticipated outcomes, relations to goal(s), and self-efficacy for performing the response. The child may consider retaliating in kind, but rejects that alternative because of a fear the conflict will escalate or a recognition that he/she can't throw the ball hard enough. Finally, the most positively evaluated response with respect to goals, anticipated outcomes, and self-efficacy is selected and behaviorally enacted (Crick & Dodge, 1994).

Although Crick and Dodge explicitly assert that emotion is an important component of social information processing, they also acknowledge that emotion's role is not well articulated in their model. In what follows, we describe the kinds of emotion processes that need to be integrated into cognitive models of behavior. Finally, we illustrate how emotion processes can be integrated into Crick and Dodge's (1994) model.

EMOTION PROCESSES

Some aspects of emotional functioning apply more generally, whereas others vary across individuals. Accordingly, we begin by describing normative emotion processes and then consider individual variations.

Normative Aspects of Emotions

Functionalist theories. Functionalist theories of emotion emphasize the biologically adaptive role of emotions in person/environment transactions (Lazarus, 1991; Malatesta, 1990). Although there are important differences in various versions of these theories (Saarni, Mumme, & Campos, 1998), many emphasize both the innate communicative and motivational aspects of emotion. Some theories (Ekman 1984, 1993;

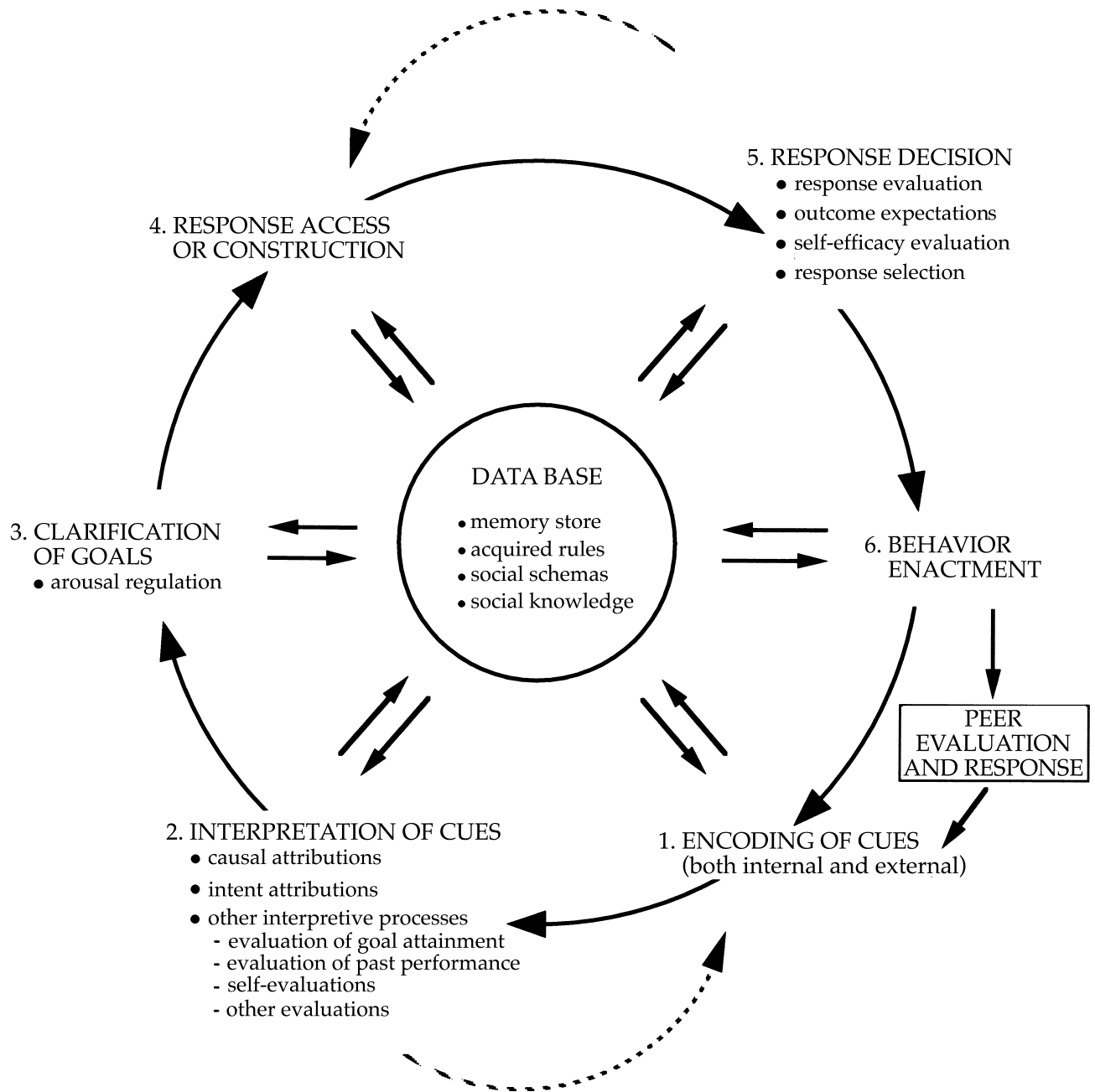


Figure 1 Crick and Dodge's social information processing model of children's social adjustment. *Note:* From "A review and reformulation of social-information-processing mechanisms of children's social adjustment," by N. R. Crick & K. A. Dodge (1994), *Psychological Bulletin*, 115, p. 74. Copyright 1994 by the American Psychological Association. Reprinted with permission.

Izard, 1977, 1991; Plutchik, 1980) propose a limited number of discrete emotions that are associated with more or less universal emotion expressions and related recognition abilities. These emotions are seen as serving a vital interpsychological function by providing information about intended or likely behaviors and underlying mental states of others, although the

emergence of emotion display rules (Saarni, 1999) makes these links less transparent.

Emotions also are seen as having an intrapsychological function of organizing and motivating behaviors and cognition to facilitate adaptive goal-directed behaviors. Given the numerous reviews available on such theories (e.g., Magai & McFadden, 1995; Mala-

testa, 1990; Saarni et al., 1998), little more will be said other than although there is a biologically based substrate of adaptive emotional functioning, learning, experience, and the active socialization of emotions (Denham, 1998) all significantly influence this biological substrate (Malatesta, 1990). Similarly, emotions may be adaptive in general, but biological and social stressors can distort emotional functioning, resulting in psychopathology and the disruptive picture of emotions typically emphasized in clinical psychology (Malatesta & Wilson, 1988; Plutchik, 1993).

Neurophysiology and functionalist theories. The functionalist focus on the adaptive role of emotions is receiving increasing attention and support from neurophysiologists. Work by LeDoux (1993, 1995) and others (e.g., Kandel & Kupferman, 1995) has documented the complex interconnections between parts of the brain that address emotional responsiveness and a variety of cognitive functions. The Damasios, in particular, have documented how disruptions in the connections between emotional and rational substrates of the brain can disrupt competent human functioning (Damasio, 1994; Damasio, Grabowski, Frank, Galaburda, & Damasio, 1994). They acknowledge that emotions can sometimes disrupt reason but also note that "Reduction in emotion may constitute an equally important source of irrational behavior" (Damasio, 1994, p. 53).

The Damasios have examined the consequences for decision making of damage to ventromedial prefrontal cortex that leaves patients with motor and cognitive functions intact but with impaired emotional functioning. Unlike participants with no brain damage and those with other kinds of brain damage, when patients with prefrontal lesions were shown disturbing images, they showed no skin conductance response. These patients could report the content of the slides and were aware of the emotional significance of the images, but they did not *feel* the emotions they *knew* they should (Damasio, 1994; Damasio, Tranel, & Damasio, 1991). The practical effects of this deficit are seen most clearly for decision making where outcomes are uncertain or for which there is no clear correct answer (Bechara, Damasio, Damasio, & Anderson, 1994; Bechara, Tranel, Damasio, & Damasio, 1993). In one telling example, a patient who was asked to choose between two dates for his next appointment spent over thirty minutes calmly listing pros and cons for each date until it was suggested that he come on the second date (Damasio, 1994).

Emotional prioritizing and somatic markers. A critical issue in the interaction of affect and cognition involves how the nearly unlimited considerations that enter into any choice are reduced to a manageable number. Extrapolating from Simon's (1967) discus-

sion, Damasio (1994), Brown (1996), Oatley and Jenkins (1996), and others have argued that emotions not only help to prioritize among different plans and options; they also help to narrow the search space during "on-line" information processing. In a summary of Pugh's (1977) influential book, Brown (1996, p. 154) noted that "rigorously logical decisions are impossible in most of the situations adapting organisms face. . . . affectivity provides a method for inventing provisional or 'good enough' knowledge structures."

A mechanism for emotional prioritizing is the formation of somatic markers (Damasio, 1994). Briefly, when a negative outcome becomes linked with a specific behavior or cognition, a negative somatic or gut feeling is experienced which ". . . protects you against future losses, . . . and then allows you to *choose from fewer alternatives*" (Damasio, 1994, p. 173). Once the field of alternatives has been narrowed, the individual can still use higher-level cognitive processes, but with greater efficiency. Damasio acknowledges that somatic markers are a form of bias that can contribute to maladaptive behavior (see below), but for the most part, somatic markers support adaptive behavior.

Secondary emotions/affect-event links. Damasio (1994) made an important distinction between primary and secondary emotions. Primary emotions are innate, preorganized, and relatively inflexible responses to certain combinations of stimuli. They are the sorts of emotions described by functionalists where certain classes of events (e.g., loss of a loved one, being attacked by a wild animal) are likely to be linked with specific emotions and their associated motivational tendencies. Although these primary emotions provide a quick and efficient set of responses, "the next step is the *feeling of emotion* in connection to the object that excited it" (i.e., secondary emotion, Damasio, 1994, p. 132; see also Piaget, 1981).

Awareness of the connections between object X and certain emotions serves several adaptive purposes (Damasio, 1994). For example, knowing about the connection between seeing a large animal running nearby and fear allows one to plan ahead ("Where and when did I see it?"), and to make more fine-tuned discriminations ("Does it run toward me or away?"). Thus, the more automatic event-emotion connections can be loosened somewhat, and conscious understanding of event-emotion links provides adaptive behavioral flexibility. Damasio sees experience as important in fine-tuning secondary emotions, with adaptive functioning the product of a normal brain and a normal set of experiences. Brain damage and/or experience that influences secondary emotions, however, can produce maladaptive functioning.

Individual Variations in Emotional Functioning

Although functionalists stress the normative, adaptive role emotions serve, there is a growing interest in individual variations in affective systems (Thompson, 1994). Just as psychologists have realized that basic similarities and constraints on human cognition do not preclude meaningful individual differences in cognitive functioning, emotion theorists have begun to expand their understanding of emotions to include individual differences. Two somewhat separable lines of research focus on temperament/emotionality and the regulation of emotions.

Temperament/emotionality. Rothbart and Bates (1998, p. 109) define temperament as “constitutionally based individual differences in emotional, motor, and attentional reactivity and self-regulation. . . . Reactive parameters of temperament can be measured in terms of the onset, duration, and intensity of expression of affective reaction. . . . variability in arousability, and distress to overstimulation, activity and attention.” Although temperament includes more than emotions, variations in emotionality, which are at least partially biologically based, are central to modern conceptualizations of temperament.

Eisenberg and colleagues have conducted a systematic program of research focusing on the contributions of emotionality and emotion regulation to social competence. They define emotionality as “stable individual differences in the typical intensity with which individuals experience their emotions . . . and in threshold to relatively intense levels of emotional responding” (Eisenberg & Fabes, 1992, p. 122) and include both positive and negative emotionality in this temperament-based definition. Eisenberg and colleagues developed methods to measure emotionality and found individual differences to be reasonably stable from preschool to elementary school (Eisenberg et al., 1997). Emotionality’s impact on social functioning, however, depends on skill at regulating emotion.

Emotion regulation. Along with the focus on temperamental aspects of emotionality, there has been much interest in children’s abilities to regulate emotions, that is, to control, modify, and manage aspects of their emotional reactivity and expressivity (e.g., Eisenberg & Fabes, 1992; Thompson, 1990, 1994). It should be noted that children who vary in temperament face quite different tasks in regulating their emotions (Thompson, 1990, 1994). A child with a positive, even-tempered disposition has a very different set of regulatory tasks than one prone to intense, long-lasting negative emotions.

Although the more innate aspects of emotionality clearly interact with socialization patterns in ways

that may even alter the underlying physiology of emotional reactivity (Gottman, Katz, & Hooven, 1997), it seems important to distinguish between the more innate aspects of emotionality and attempts to manage/regulate whatever those biological substrates provide. For example, in their extensive, ongoing research on children’s social and emotional competence, Eisenberg and colleagues include separate assessments of emotionality and emotion regulation. Emotions may be regulated with attentional mechanisms, through approach or avoidance, or by cognitive or behavioral coping (Eisenberg & Fabes, 1992). Eisenberg and colleagues found that a combination of regulatory abilities and low emotionality predicted social competence concurrently and longitudinally (e.g., Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994; Eisenberg et al., 1997). High emotionality combined with poor regulation skills predicted poorer social functioning and problem behaviors, whereas children with high emotionality and good regulation skills were *not* at risk for behavior problems (Eisenberg et al., 1996).

Mood state/background emotions. Mood states (Clark & Isen, 1981) or background emotions (Damasio, 1994) also are likely to influence social information processing. There is an extensive social psychology literature on how experimentally induced moods influence a wide variety of behaviors and cognitions (e.g., Berkowitz, 1990; Isen, Shalke, Clark, & Karp, 1978; Moore, Underwood, & Rosenhan, 1984). More recently, Lemerise, Harper, Caverly, and Hobgood (1998) found that induced moods influence children’s goals for hypothetical provocation situations.

Little is known about how or whether ongoing emotions or moods serve an adaptive role or whether they are “unintended” consequences of the larger functional organization of human emotions. Another unresolved issue is whether ongoing emotions act as short-term influences or in more long-term, trait-like ways (e.g., Arsenio, Cooperman, & Lover, in press; Arsenio & Lover, 1997; Denham, 1986; Denham, McKinley, Couchoud, & Holt, 1990). Regardless of their presumed functions or duration, it is clear that more empirical attention should be directed to the influence of ongoing emotions on social information processing.

INTEGRATING EMOTION PROCESSES AND SOCIAL INFORMATION PROCESSING

An important way in which thinking about people is different from thinking about things is that social interaction is likely to be associated with a variety of strong emotions (Hoffman, 1981). The peer entry and provocation situations examined by social informa-

tion processing theory (e.g., being excluded from play or teased in front of others) are especially likely to be emotionally arousing for children. Moreover, in these situations, children are unlikely to know all relevant information which would assist problem solving, and the outcomes of these situations are uncertain. Despite these limitations, the child still needs to do something.

Emotion theorists have argued that conditions of uncertainty and incomplete knowledge are the very contexts in which emotion processes can play an adaptive (or maladaptive) role by reducing information processing demands so the individual can arrive at some course of action (e.g., Damasio, 1994; Oatley & Jenkins, 1996). Crick and Dodge (1994) also acknowledge that emotion processes play important roles in social information processing, but suggest that the cognitive nature of their model may prevent a full examination of the contribution of emotion. We argue that it is possible to integrate emotion processes into Crick and Dodge's model (see Figure 2), and the integration of emotion and social information processing expands the model's explanatory power.

We agree that the child enters a given social situation with a combination of "biologically limited capabilities and a database of memories of past experiences" (Crick & Dodge, 1994, p. 76), and that selective attention, perception, memory, and processing speed set limits on what children notice and process about a situation. In addition, we suggest that emotion processes are part of these givens. An important component of the child's biological predispositions is his/her emotion style or emotionality (Eisenberg & Fabes, 1992; Rothbart & Derryberry, 1981). Children vary in the intensity with which they experience and express emotions and in their skills for regulating emotions. These individual differences in emotionality and regulatory abilities are related to social competence (e.g., Eisenberg et al., 1997). We hypothesize that emotionality and regulatory ability will affect both processing of social (and emotional) information and decision making in challenging social situations (see Figure 2).

In Crick and Dodge's (1994) model of social information processing, children's database includes a memory store of acquired rules, social knowledge, and social schemas. Based on current models of the neurophysiology of emotion and cognition (Damasio, 1994; LeDoux, 1995), we argue that the child's representations of past experience include affective as well as cognitive components, similar to what Arsenio and Lover (1995, p. 90) termed "affect-event links" (see Figure 2). Thus, children's social knowledge can be cued by events and/or by emotion cues, and events may cue emotions.

Finally, children enter a social situation with a general level of physiological arousal and/or mood (see

Figure 2) which may not necessarily be related to that situation. For example, feelings of anxiety in a peer entry situation may be related to the terrible fight your parents had this morning *or* to past experiences of rebuff by peers. Children also differ in their skill at regulating arousal or mood (Eisenberg et al., 1997). Because children who are poor regulators have a higher risk for maladjustment (Eisenberg et al., 1996), we hypothesize that poor regulators also will show social information processing deficits.

Encoding and Interpreting Cues

The first two steps of the Crick and Dodge (1994) model involve encoding and interpreting social cues. Crick and Dodge point out that one's own internal emotion cues must be encoded and interpreted along with other situational cues. They also suggest that the process of encoding and interpreting cues can result in a change in the discrete emotion experienced or in the intensity of a pre-existing emotion (see Crick & Ladd, 1993).

We would add that others' affective cues are an important source of information and must be encoded and interpreted (Saarni, 1999). For example, provocateurs' anger cues in the context of ambiguous provocation facilitate hostile attributions (Lemerise, Gregory, Leitner, & Hobgood, 1999; see also Dodge & Somberg, 1987). Functionalist theories of emotion stress the mutual regulatory function of affective signals (Magai & McFadden, 1995). One's own and others' affective signals provide ongoing information about how the encounter is proceeding, allowing for sensitive adjustments to behavior. The mutual regulatory function of affective signals may work especially well with familiar, well-liked interaction partners (at first parents, and later friends) whose signals may be easier to read and interpret and with whom the child is more likely to feel empathy (Hoffman, 1981; Parker & Gottman, 1989). The nature of emotional ties with an interaction partner also may influence encoding and interpretation. Being teased by a friend is quite different from being teased by the class bully. Children with conduct disorder have difficulty reading their own and others' affective signals and have deficits in their expressive behavior (Casey, 1996; Casey & Schlosser, 1994) and in empathy (Cohen & Strayer, 1996). These deficits are thought to contribute to behavior problems.

Finally, encoding and interpretation can be influenced by mood, level of arousal, or by discrete emotions (whether pre-existing or the result of appraisal). Mood, emotions, and/or arousal can affect what is noticed about a social encounter and make the recol-

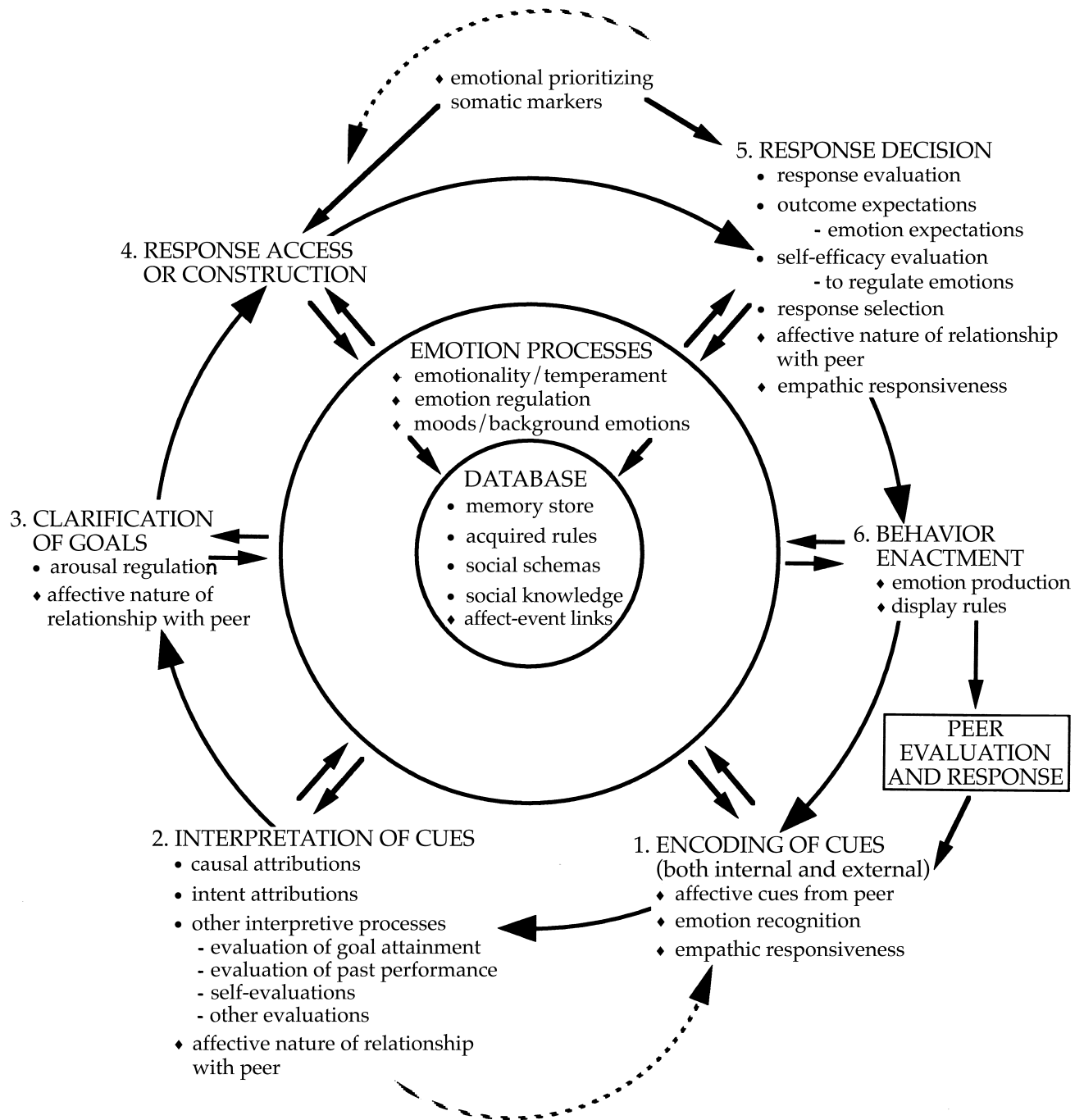


Figure 2 An integrated model of emotion processes and cognition in social information processing. Items marked with filled circles are from Crick and Dodge's model; those marked with filled diamonds represent emotion processes added to the model. Note: From "A review and reformulation of social-information-processing mechanisms of children's social adjustment," N. R. Crick & K. A. Dodge, *Psychological Bulletin*, 115, p. 74. Copyright 1994 by the American Psychological Association. Adapted with permission.

lection of mood-congruent information more likely, thus influencing interpretation of social cues. Moreover, the effects of a happy mood may be quite distinct from those of a sad or angry mood (Oatley &

Jenkins, 1996). The intensity with which children experience emotions and their skill at regulating emotion also will influence what is noticed and the meaning attributed to the situation.

Clarification of Goals

Crick and Dodge (1994) consider the role of emotion processes in a more explicit fashion for step 3 of their model, clarification of goals. They define goals as "focused arousal states that function toward producing (or wanting to produce) particular outcomes" (p. 87). Goals are conceptualized as either internal (maintaining or regulating emotion) or external (e.g., instrumental goals, such as getting the swing, or social relational goals, like getting another to play with you). According to Crick and Dodge, emotions can act to energize particular goals. For example, being in an angry mood makes it more likely that a child will focus on instrumental goals (Lemerise et al., 1998), whereas children in positive moods may choose goals that maintain their pleasant moods. Finally, Crick and Dodge assert that goal selection and/or attainment may modify mood or emotion.

We suggest that peers' affective cues also can influence children's goals. Positive affective signals may promote affiliative goals, whereas negative cues may discourage affiliation (Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984). Moreover, the intensity with which children experience emotions and their efficacy for regulating emotions will influence the types of goals pursued in social encounters (Eisenberg & Fabes, 1992; Eisenberg et al., 1994; Saarni, 1999). Children who are overwhelmed by their own and/or others' emotions may choose avoidant or hostile goals to reduce their own arousal. Children with deficits in affective cue detection and empathy may find it easier to pursue goals that are destructive to relationships because they literally do not "feel other children's pain" (Cohen & Strayer, 1996). Poor regulatory abilities may interfere with assessing the situation from different cognitive and affective perspectives and prevent a flexible approach to goal selection which takes into account contextual factors (Saarni, 1999). Instead, children's goals may be rigid because they result from "preemptive processing" (Costanzo & Dix, 1983; Crick & Dodge, 1994).

Finally, the nature of the emotional ties between a child and others involved in an encounter may bias goal selection. Social relational goals may be facilitated by friendship ties, whereas less positive relationships elicit quite different goals (e.g., avoidance, revenge). Social relational goals are both cognitively and emotionally more complex because they require consideration and coordination of multiple cognitive and affective perspectives. Friendship ties may motivate children to engage in this more effortful processing, partly because of the negative emotional consequences associated with hurting a friend and

partly because of the desire to maintain enjoyable play activities (Arsenio & Lover, 1995; Parker & Gottman, 1989).

Response Generation, Evaluation, and Decision

In steps 4 and 5 of the Crick and Dodge model, children access possible responses to the situation and evaluate these in terms of likely outcomes, goals, and self-efficacy for performing the response; the most positively evaluated response with respect to the child's goals is selected. They also suggest that children's accessing of responses could be influenced by an emotion they are experiencing, and that accessing particular responses may modify an emotion. Both of these possibilities are consistent with the idea that representations of past experiences include an affective component (e.g., Damasio, 1994). Thus, feeling angry, frightened, or happy may cue different response types. Given that representations of these responses include an affective component, retrieval of particular strategies should cue certain emotions. For example, if experiences of avoidance are associated with a reduction in anxiety, accessing avoidant responses may moderate feelings of fear.

Other emotion processes that can influence accessing and evaluation of responses are the intensity with which emotions are experienced and the capacity to regulate emotion. Children who experience strong emotions may be too overwhelmed and self-focused to generate a variety of responses and evaluate them from all parties' perspectives. Such children may be likely to engage in "preemptive processing" (Crick & Dodge, 1994) which can result in a response that is unlikely to further social interaction (e.g., running away, angrily retaliating, or venting; see Eisenberg et al., 1994). Skill at regulating emotions in challenging situations makes possible the more effortful processing involved in accessing and evaluating several responses. Good regulators may be more likely to consider the situation from multiple cognitive and affective perspectives which should facilitate selecting a more competent response (Saarni, 1999).

We agree with Crick and Dodge (1994) that children's expectations about the emotional consequences of various responses constitute an important component of the response evaluation process, and have argued elsewhere that emotion expectations contribute importantly to socio-moral reasoning and behavior (Arsenio, 1988; Arsenio & Lover, 1995). Finally, we add that children's emotional ties (or lack thereof) to others involved in the encounter and/or the reputations of the other children (Perry, Willard, & Perry, 1990) may motivate the child to engage in the

effortful processing involved in considering various perspectives and response options. In other words, a child may be more likely to consider another's reaction if he/she cares about and wants that person to like him/her.

Response Enactment

In the final step of Crick and Dodge's (1994) model, the child enacts the chosen response. Several emotion-related processes can influence response enactment. The intensity with which emotions are experienced and the child's regulatory capacities can influence response enactment. For example, under calm conditions, even maladjusted children are well aware of display rules for challenging situations (Underwood, 1997), but under highly arousing conditions, this knowledge may not be put into practice (Parker & Hubbard, 1998). The ability to flexibly display emotions appropriate to the situation requires both control over one's expressivity and sensitivity to the situation from multiple perspectives (Saarni, 1999). Moreover, the child's and others' emotion cues provide an ongoing source of information concerning how the encounter is proceeding, allowing the child to make adjustments to his/her response enactment. Children with deficits in reading and sending emotion cues may resort to relatively rigid approaches to situations (Casey, 1996; Casey & Schlosser, 1994; Saarni, 1999). Emotion cues also can inform the child about the ultimate success or failure of his/her response enactment. Finally, emotion cues are part of the representation of the encounter stored in the child's database of social knowledge. Consider a situation in which a child wants to play with a peer's toy. An affectively positive offer to trade toys may be successful in that the child not only gets the desired toy but both children feel positive about the encounter and may even play together. An angry demand that the peer hand over the toy, however, may elicit anger and resistance, with the result that the child has neither the toy nor a playmate. In these examples, the affective cues that were part of the child's enactment influenced the peer's reaction and ultimately the outcome of the encounter, including associated emotions.

FUTURE DIRECTIONS FOR RESEARCH

A number of hypotheses can be derived from the proposed model. At a general level, we hypothesize that individual differences in emotionality and emotion regulation can influence each step of social information processing. Specifically, children who are high in emotionality and poor at regulating emotion will show

deficits in social information processing (e.g., Murphy & Eisenberg, 1997). Also, because emotions within the person and in others function to mutually regulate encounters, we hypothesize that manipulating these cues can affect each social information processing step and that the effects of different discrete emotions may be distinct. Specifically, manipulation of emotion or mood in the child via mood induction or situational manipulations (see Lemerise & Dodge, 2000, for a review) will influence social information processing. Also, manipulation of emotion cues or the nature of emotional ties to targets (peers about whom judgments are made) will influence social information processing. Research on target effects on social information processing has been especially rare (Crick & Dodge, 1994). Given our hypothesis that emotionality and emotion regulation skills influence social information processing, we hypothesize that the above described emotion manipulations will have a greater effect on children who are high in emotionality and poor in regulatory abilities. In addition, we suggest that there is a need to explore the emotion content of children's database of knowledge about social situations (e.g., Arsenio, 1988). Recent research has shown that children's knowledge structures predict aggressive behavior (Burks, Laird, Dodge, Pettit, & Bates, 1999), but the emotion content of children's knowledge structures has received little empirical attention.

Beyond these specific hypotheses, we hope the present model will encourage other systematic attempts to integrate affect and cognition. These efforts should prove fruitful for a fuller understanding not only of children's social competence, but also of other areas in which motivation and reasoning combine in essential ways, including socio-moral development, academic achievement, and developmental psychopathology.

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