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Returning to Roots: On Social Information Processing and Moral Development

Kenneth A. Dodge and **David L. Rabiner**

Center for Child and Family Policy, Duke University.

Abstract

Social information processing theory has been posited as a description of how mental operations affect behavioral responding in social situations. Arsenio and Lemerise (this issue) proposed that consideration of concepts and methods from moral domain models could enhance this description. This paper agrees with their proposition, although it suggests that numerous additional concepts about the nature of latent mental structures (e.g., working models, schemas, scripts, object relations, classical conditioning) provide equally compelling refinements to processing theory. Furthermore, theoretical and methodological challenges in integrating latent mental structures into processing theory remain.

Integration across theoretical traditions is a daunting but important task for scholars who wish to understand human development. Traditions operate with different assumptions, methods of data collection and analysis, publishing outlets, and even rules of evidence. With these challenges facing them, Arsenio and Lemrise (this issue) are to be commended for attempting to bring together two perspectives on children's aggressive behavior: what they termed social information processing and moral domain models. In so doing, they have made an important contribution by highlighting how the methods of data interpretation developed within the moral domain tradition and the consideration of mixed-domain situations could help clarify several aspects of processing theory that have remained elusive. Furthermore, they have contributed to the moral domain tradition by pushing scholars to use processing theory to consider more seriously how moral understanding leads to behavioral responses in actual social interactions. However, we believe that their reach at integration exceeds their grasp in several crucial ways.

Goals and Roots of Each Theory

Most important, the goals of each theory differ in ways that render them asymmetric. The goal of moral domain models has been to describe how children develop knowledge and understanding about social events. It is a theory of social cognitive development in the tradition of Piaget (1965). It has rarely been concerned with a child's social behavior and should not be criticized for failing to address behavioral responses such as aggression adequately. The mental operations that are assessed and considered in this tradition are thinking and reasoning and the outputs are knowledge and understanding, rather than overt social behavior.

In contrast, social information processing theory (Crick & Dodge, 1994; Dodge, 1986; Dodge & Pettit, 2003; Gifford-Smith & Rabiner, 2004) is more broadly concerned with all of the mental operations that are deployed to generate a behavioral response during one's own social interaction. The mental operations that are considered include, but go well beyond, the social

understanding that is the topic of moral domain inquiry. These operations include selective attention to social cues, attribution of intent, generation of goals, accessing of behavioral scripts from memory, decision making, and behavioral enactment. Given the different scope of these two traditions, more narrow moral domain models might well be an essential component of broader processing models, rather than a competitor in the marketplace of theories.

It may surprise some that processing theory has its roots (partially) in Piagetian moral judgment theory. Dodge's first empirical study of children's hostile attributional biases (1980) and theoretical synthesis of a processing model (1986) followed explicitly from the structural cognitive development literature. Both Dodge and Rabiner were trained by a student (John Coie) of a student (Phil Cowan) of Piaget. The first line of Dodge's 1980 paper began: "The application of concepts from the literature on the development of social cognition to the problem of inappropriate and persistent aggression among certain children provides the basis for two connected studies constituting this investigation" (p. 162).

Dodge's (1980) initial line of empirical investigation grew out of Chandler's (1973) attempt to apply Piaget's (1965) theory of the development of spatial perspective taking (e.g., a child's ability to represent a visual picture of three mountains as observed by someone sitting opposite) to social domains and to the creation of interventions to help aggressive children learn how to take the perspective of others. Chandler's hypothesis was that aggressive children lack the developmentally acquired understanding of how to consider the emotions and thoughts (i.e., take the perspective) of peers, leading them to make egocentric errors when interpreting peers' intentions. He further hypothesized that training in this skill could improve their social competence. After trying, unsuccessfully, to replicate Chandler's positive intervention effects, Dodge realized that the slippage in this application grew from the fact that perspective-taking theory was a model of cognition, not behavior. No matter how well aggressive children could be taught (trained? educated?) to take the perspective of peers on academic-like tasks such as Piaget's three-mountain problem, during actual social interactions these children emotionally burst forth with aggressive responses that indicated numerous cognitive and emotional disruptions, including, but going beyond, inaccurate interpretations of peers' intentions.

Dodge (1986) hypothesized that the theoretical gap was in how children translate structural knowledge to behavioral responses. Behavioral responses grow out of a host of emotionally laden personalized experiences, in addition to objective social knowledge, and they occur as a function of numerous sequential mental operations, not just moral judgments. During online social events, aggressive children seemed to engage in what Murray (1933) long ago had termed a "complementary apperceptive projection." That is, aggressive children did not make all kinds of errors in interpreting peers' intentions. They were able to recognize when a peer was acting with altruistic intention toward them. The problem was that when they suffered a provocation, they interpreted the peer as intentionally causing them harm and impulsively exploded. Although this kind of hostile attributional bias was an important discovery, it alone did not adequately explain why some children who make hostile attributions refrain from aggressive retaliation, nor did it address other kinds of aggressive behavior such as bullying. A more comprehensive model of online processing of information in social interactions was needed.

The theoretical integration at that time was to bring to bear the perspective of cognitive science and models of problem solving (e.g., Newell & Simon, 1972). These models emphasized mental operations that are denoted by active verbs (e.g., attend, interpret, access, decide, enact) rather than passive states (e.g., knowledge, understanding). What grew was a model of social information processing as it occurs in real time. This model was applied to a series of empirical studies of how various mental operations relate to aggressive behavior (e.g., Rabiner, Lenhart, & Lochman, 1990), and the concepts became a basis for numerous interventions to address

specific aspects of processing (e.g., Bierman, Miller, & Stabb, 1987; Conduct Problems Prevention Research Group, 1999; Lochman, Coie, Underwood, & Terry, 1993).

Role of Moral Development in Social Information Processing

Although the emphasis on active mental operations during social interactions was the hallmark of processing theory, several theoretical issues remained. One issue concerned emotion, to which we return later. The second issue concerned the experiential antecedents of individual differences in processing patterns and the mechanisms through which these antecedent events get stored in memory and used to guide processing in future situations. In Crick and Dodge (1994), “it is proposed that a mental representation of past events is stored in long-term memory. Later, this memory is integrated with other memories into a general mental structure that guides the processing of future social cues” (p. 78). They speculated about the nature of these mental structures, and they drew on Piaget (1965) and Flavell (Flavell, Botvin, Fry, Wright, & Jarvis, 1968) to propose that role taking and moral knowledge might be one kind of latent mental structure.

The moral domain did not dominate the realm of latent mental structures, however. Crick and Dodge (1994) proposed that numerous other theoretical traditions should be invoked, as well, to build a comprehensive understanding of children’s social knowledge. In addition to moral knowledge, they proposed inclusion of: schemata (Winfrey & Goldfried, 1986), scripts (Shank & Abelson, 1977), working models (Bowlby, 1969), and cognitive heuristics (Kahneman, Slovic, & Tversky, 1982). Rather than specifying how these constructs can be integrated into a coherent whole, Crick and Dodge concluded that “further research is needed that explores children’s social memory abilities” (p. 83).

Arsenio and Lemerise (this issue) have now ironically suggested that the processing model as currently articulated could be enhanced by integration of the moral domain model. Indeed, perhaps Crick and Dodge’s (1994) articulation and the bulk of subsequent empirical studies have strayed too far from their roots in moral understanding. Arsenio and Lemerise proposed several important ways findings from the moral domain model might enrich processing theory, and these assertions are crucial contributions.

An important feature of Arsenio and Lemerise (this issue) is the discussion they offered on the integration of children’s latent mental structures with their online social information processing. As the authors noted, the revised social information processing model developed by Crick and Dodge (1994) distinguishes “between the rapid, real-time processing of social information and the representations of earlier social events stored in long-term memory” (p. 987 – 1002). They argued that integrating social information processing and moral domain models benefits both approaches: The social information processing model enhances domain theory by providing a compelling account for how children reason about domain-relevant events, particularly those that are not prototypic but instead contain elements of multiple domains (i.e., mixed-domain events). Moreover, the social information processing model benefits because the latent knowledge structures postulated in domain theory represent an important way that children’s social knowledge is organized and may thus influence online processing at several social information processing steps. We fully agree that social information processing theory enhances domain theory explanations for how children reason about moral, conventional, and mixed-domain events. The contribution that moral domain theory makes to the revised social information processing model of Crick and Dodge, however, requires greater scrutiny.

How might the latent knowledge structures described in moral domain theory influence children’s online processing of social experience? Arsenio and Lemerise (this issue) speculated that at the interpretation step of social information processing, domain knowledge is critical

because a child's judgment about whether an experienced event falls within the moral domain is likely to influence his or her interpretation and attribution of the other child's actions. For example, deciding that a peer's behavior represents a moral transgression would increase the likelihood that a hostile intent attribution would be made. At the response-generation and response-selection steps of social information processing, Arsenio and Lemerise suggested that children's underlying moral knowledge structures "will exert strong selective pressure for some choices over others," presumably because children will be reluctant to behave in ways they may regard as a violation of moral standards (p. 987 – 1002).

Although this is a compelling account for how the latent knowledge structures described in domain theory influence children's online information processing, it is important to note that alternative latent mental structures have been described in several other influential developmental theories. For example, within attachment theory (Bowlby, 1969), children's early relationship experiences are suggested to become internalized in the form of working models that reflect beliefs about what other people are like and what one's experience in relationship is likely to be. Internal representations of others are also an important component of object relations theory (Greenberg & Mitchell, 1983), where the quality and complexity of object representations are hypothesized to provide a basic foundation for the understanding and encoding of interpersonal experiences (Lenhart & Rabiner, 1995). Crick and Dodge (1994) suggested that structures such as these are likely to influence how a child encodes, interprets, and responds in a variety of social situations, and subsequent research has supported this assertion. For example, children's working model of peers (i.e., their beliefs about what peers are generally like) has been shown to predict changes in their social acceptance and aggression (MacKinnon-Lewis, Rabiner, & Starnes, 1999) and adolescents' object representation level (i.e., the complexity of their description of parents) is related to an important aspect of online information processing, that is, the quality of their social problem-solving responses (Lenhart & Rabiner, 1995).

Given that several latent knowledge structures are potential influences on children's social information processing, we think it is important to consider which structures are likely to be most influential on different social information processing steps and whether this varies in relation to social context. Arsenio and Lemerise (this issue) suggested that for situations that include elements involving harm and victimization, knowledge structures described in domain theory are especially relevant. Although this is ultimately an empirical question, our hunch is that knowledge structures posited in attachment theory and object relations theory (e.g., internal working models of others and of relationships) may turn out to be more relevant.

For example, the Arsenio and Lemerise (this issue) suggested that in situations in which a child is harmed by a peer, the victim's intent attribution will be influenced by whether he or she judges this to be a moral event. We argue, however, that rather than activating knowledge structures related to moral domain theory (i.e., did the other child behave morally?), situations in which a child experiences harm—particularly when the intent cues are ambiguous—are more likely to activate children's internal working model of what peers are generally like. This working model, in turn, will guide the child's subsequent information processing. In other words, we hypothesize that the critical factor influencing a child's intent attribution when subject to an ambiguous provocation is whether the child tends to view others in generally benign versus hostile ways, and whether the child's conceptions of others is sufficiently rich to provide an awareness of the multiple and conflicting motivations that can underlie behavior.

At the goal-clarification stage, the Arsenio and Lemerise (this issue) hypothesized that the child's relative emphasis on relational versus instrumental goals will cue different moral knowledge structures that influence subsequent social information processing steps of response generation, evaluation, and decision. We suggest, however, that a child's tendency to

emphasize relational versus instrumental goals is more powerfully influenced by the child's working model of peers. Children whose experience with peers has promoted representations of others as caring and dependable, and of relationships as a source of pleasure, comfort, and gratification will be more likely to emphasize relational goals. In contrast, children with less positive representations of peers and relationships would be expected to view instrumental goals more favorably.

At the time a child decides among potentially multiple ways of responding to a provocative peer, Arsenio and Lemerise (this issue) stated that "most children's underlying moral structures will exert strong selective pressure for some choices over others" (p. 987 – 1002). We agree, and it is easy to imagine how a child's own beliefs about what constitutes moral versus immoral behavior will lead certain responses to be discarded, even in situations where the child is otherwise motivated to enact them. Thus, at this social information processing stage, we expect the integration with moral domain theory to be most fruitful. On the other hand, we can also imagine how decisions to engage in certain behaviors will depend on how a child expects a particular response will affect future relations with a peer, and this judgment will be influenced by the child's working model of relationships.

Role of Emotion

A secondary aspect of the essay by Arsenio and Lemerise (this issue) concerns the role of emotion in processing. This question was raised as early as 1986 by Gottman (1986) and was addressed explicitly by Dodge (1991). Nonetheless, Arsenio and Lemerise followed their previous essay (Lemerise & Arsenio, 2000) by chastising processing theory for neglecting emotion. In both essays, they have made excellent suggestions for the integration of emotional processes with processing theory.

It is ironical that processing theory is meant to be entirely emotional, and it owes this emphasis to Piaget. Dodge (1991) wrote, "Borrowing from Piaget (1962, 1973) and Cowan (1978, 1982), I propose that all information processing is emotional, in that emotion is the energy level that drives, organizes, amplifies, and attenuates cognitive activity and in turn is the experience and expression of this activity. There is no such act that is nonemotional" (p. 159). Thus, emotion is posited as an adjectival descriptor of mental operations. This feature of emotion could be added to Arsenio and Lemerise's (this issue) excellent list of how emotion is relevant to processing.

Problem of Measurement

In their attempt to integrate latent mental structures with processing operations, Arsenio and Lemerise (this issue) have yet to solve one important issue concerning the empirical testing of hypotheses about how mental structures affect processing. At the theoretical level, the distinction between mental structures (e.g., moral knowledge) and processing (e.g., attribution of intent) is clear. At the measurement level, however, the distinction gets blurred, and the researcher runs the risk of "proving" hypotheses that are operationalized in tautological ways. For example, Arsenio and Lemerise cited (p. 987 – 1002) as a positive instantiation the relation between moral domain judgments and response-evaluation processes. However, a close look at the empirical measurement of each construct reveals confounding: Moral domain judgments are measured by responses to the question, "Is it alright to hit?" and response evaluation is measured by responses to the question, "In this instance, is it legitimate to respond with physical aggression?" The former is merely the generalized version of the latter. A major challenge for scholars who wish to integrate these two traditions is to generate empirical methods of measuring different constructs in truly distinct ways.

Directions for Future Research

Arsenio and Lemerise's (this issue) recommendations that future research should include the core methodologies of moral domain theory and social information processing theory within a single research design, and that efforts to understand better how online processing is influenced by existing mental structures, are important. As implied by the preceding discussion, we add the suggestion that such studies will be strengthened by efforts to include and measure latent mental structures that have been proposed in numerous developmental traditions. Thus, a study in which constructs from moral domain theory and attachment or object relations theory are simultaneously examined in relation to children's social information processing—concurrently and over time—could greatly enhance our understanding of the mental structures that are most influential on different information-processing steps. Latent structures that are not necessarily part of developmental theories but that are also relevant to children's social information processing (e.g., beliefs about the acceptability of aggressive behavior, which have been learned by observation and conditioning; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999) would also be important to incorporate in such research. Although we have argued that working models of others and of relationships are likely to be particularly important at several social information processing steps, this is an open question that remains to be addressed in carefully conducted longitudinal research.

What should be included about social contexts in examination of these issues? Clearly, situations characterized by ambiguous provocation have proven to be fruitful for researchers, and examining the influence of different latent mental structures in this context seems important to pursue. Children operate in a wide variety of social contexts, however (e.g., peer entry, accepting criticism, providing support), and their competence may vary considerably from one context to the next. This assertion implies that the latent mental structures and aspects of online information processing that influence behavior are also likely to vary across contexts. Thus, future studies in which the goal is to understand how online processing is influenced by existing mental structures would benefit from including contexts that reflect the diverse situations and circumstances in which children's lives evolve.

Conclusion

Arsenio and Lemerise (this issue) have provided a thought-provoking account of how the integration of moral domain theory and social information processing theory may enhance our understanding of children's aggressive behavior and acts of overt victimization. We see their proposed theoretical integration as falling within a still small, but growing, effort to develop a more complete understanding of how children's history of experience in the world becomes translated into knowledge structures that influence their subsequent experience and processing of that experience. Certainly, the knowledge structures described in moral domain theory represent an important construct to examine in these efforts. As we note, however, other theoretical constructs (i.e., working models, object representations, scripts, and attitudes toward aggression) seem especially important to include as well. As we also note, researchers interested in pursuing these interesting and important issues will need to be especially vigilant to developing measures of latent knowledge constructs in ways that are truly distinct from those used to assess more online aspects of social information processing, and we encourage them to consider a wide range of social contexts that are important in children's development. This will be challenging work, but we anticipate the payoff will be substantial. We commend Arsenio and Lemerise for their effort to move the field in this important direction.

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