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New Developments in Developmental Research on Social Information Processing and Antisocial Behavior

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Abtract:

The Special Section on developmental research on social information processing (SIP) and antisocial behavior is here introduced. Following a brief history of SIP theory, comments on several themes—measurement and assessment, attributional and interpretational style, response evaluation and decision, and the relation between emotion and SIP—that tie together four new empirical investigations are provided. Notable contributions of these studies are highlighted.

New Developments in Developmental Research on

Social Information Processing and Antisocial Behavior

In the past quarter century, social-developmental research in psychology has made considerable gains. Among the most productive movements has been that of social cognitive development, marked distinctly by inquiry in social information processing (SIP) and antisocial behavior in childhood and adolescence. The articles in this Special Section emerged from this tradition and represent a range of original empirical papers that were part of a Symposium on SIP and antisocial behavior presented at the 20th biennial meeting of the International Society for the Study of Behavioural Development (Fontaine, 2008b).

A Brief History of Social-Information Processing Theory

In the 1980s, a number of formulations of children's SIP and behavioral competence were introduced, borrowing from linear models of information processing that were traditional to cognitive psychology and computer science (Dodge, 1986; Huesmann, 1988; McFall, 1982). These models inspired considerable scholarly thought and investigation—so much so that substantial reformulations of initial SIP models were prompted and duly provided by Crick and Dodge (1994) and Huesmann (1998). These reformulated models represented significant theoretical advances over their predecessors. Although the models were consistent with each other with respect to some developments (e.g., greater emphasis on non-linear processing), they also differed in some critical ways, such as whether social cognitive processing is more "on-line" and conceptual (Crick and Dodge, 1994) or schema-based and automatic (Huesmann, 1998).

It seems plausible that while much human processing is guided by schemata, and,

likewise, behavior by scripts, that such latent structures develop out of and are continually informed by more conceptual processing of events and contexts that present new or otherwise different information about our social worlds. Although acceptance of this idea may provide understanding as to the unique contributions of these SIP theorists' models (Crick & Dodge, 1994; Huesmann, 1998), it does not, of course, begin to approximate finality as to the complicated workings of social cognitive processing in humans or how this individual system (see Fontaine, 2006) develops across childhood and adolescence. Numerous outstanding issues remain unresolved. As such, SIP theorists have since offered additional theoretical comments about important topics, such as the relation between emotion and SIP (Lemerise & Arsenio, 2000), the role of evaluative behavioral decision-making in SIP (Fontaine, 2008a; Fontaine & Dodge, 2006), SIP's place in moral development (Arsenio & Lemerise, 2004; cf. Dodge & Rabiner, 2004), the importance of considering SIP in the context of transactional development (Fontaine & Dodge, 2009) and translation of SIP research to practice, policy and law (Dodge, 2006; Fontaine, 2007a, 2008c; Lochman, 1991).

SIP is designed such that it serves as a heuristic by which social behavior may be understood as the product of distinct patterns of social cognitive operations. Developmental research has been especially successful in demonstrating the predictive utility of SIP with respect to antisocial conduct (aggression, violence, delinquency) in youth. In their reformulated model of SIP, Crick and Dodge (1994) posited that, upon being presented with a social stimulus, one may determine how to respond based on the activation of five social-cognitive steps. First, the responding individual attends to and organizes features of the stimulus (*encoding of cues*). Second, judgments of intent,

causality and emotion, are attributed to the stimulus in order to make personal meaning of it (*interpretation of cues*). Third, the responder identifies and prioritizes his or her objectives (clarification of goals). Fourth, alternative behavioral responses are either constructed anew or drawn from memory (*response access or construction*). Fifth and finally, the responder evaluates response options across multiple domains in order to select one for behavioral enactment (*response decision*). This reformulation has provided the theoretical grounding for an impressive body of research on the development of social information processing and antisocial behavior and empirical support has been demonstrated at each step of the model (see Dodge, in press).

New Developments in Research on SIP and Antisocial Behavior

The empirical articles in this Special Section all make unique, original contributions to the developmental literature on SIP and antisocial behavior in youth. Although they were not designed with any single concentration in mind, they collectively address a number of current themes in SIP research that are worth identifying. These themes have all been emphasized in recent theoretical statements of important future directions for the field (see Fontaine & Dodge, 2006; Mize & Pettit, 2008; Orobio de Castro, 2004).

Measurement and assessment. Research on SIP and aggression has historically been assessed using paper-and-pencil measures in which hypothetical stories are presented to participants or with a protocol of video-recorded vignettes that represent day-to-day social interactions in which the intent of the stimulus is left open to interpretation (e.g., Fontaine et al., 2010/In press, this issue). These methods have proven quite useful and have been utilized repeatedly by numerous social developmental

laboratories. They are not without their limitations, though, and the importance of developing new measurement techniques has been stressed in recent theoretical papers (e.g., Fontaine, 2007b; Mize & Pettit, 2008; Orobio de Castro, 2004).

Two papers in this Special Section have responded in kind to this call. The empirical investigation by Horsley and his colleagues employed an eye tracking methodology to assess the relation between encoding (SIP step 1) and aggressive behavior in youth (Horsley, Orobio de Castro, & Van der Schoot, 2010/In press, this issue). Participants' eye movements were recorded in a true on-line (or "in the moment") sense as they responded to hypothetical social scenarios representing ambiguous provocations. Via this methodology, Horsley et al. were able to track participants as they directed their attention to different features of presented stimuli. Whereas past studies have depended on particpants' recall of attention and encoding following the presentation of a story or video segment, this methodology allowed the authors to tracked encoding by following participants' eye movements in real time, thus removing the potential confound of memory recall.

Alternatively, Schultz and his colleagues identified the need for developing and testing an assessment of SIP in early childhood, a maturational period that has received less empirical attention than later stages of youth development (Schultz et al., 2010/In press, this issue). They administered the Schultz Test of Emotion Processing—Preliminary Version (STEP-P) to preschool children in order to (a) determine the reliability and predictive validity of STEP-P, and (b) assess relations between preschool children's emotion processing and style of social behavior (socially competent versus disruptive). Results of the study were comparable with those of other protocols that were

designed for and have been used to assess SIP and interpersonal behavior in older children and adolescents, suggesting that STEP-P may be a useful measurement tool in the identification of links between processing and behavior as they emerge in young children.

Attributional and interpretational style. Perhaps the most studied step of SIP is interpretation of cues (step 2). In particular, the tendency of aggressive individuals to quickly and definitively interpret ambiguous provocations as hostile and intentionally harmful has been well-documented. This phenomenon, called *hostile attributional style* (e.g., see Dodge 2006) or *provocation interpretational bias* (e.g., see Fontaine, 2009), has been the focus of numerous independent social-development laboratories and has received considerable empirical support, most notably in studies of severely antisocial individuals (e.g., see Lochman & Dodge, 1994; also, for a meta-analytic review, see Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Despite the large body of scientific study, though, there remain critical questions about hostile attribution and what its role is in aggressive and violent behavior.

In the Horsley et al. study, the encoding step of SIP was the focus. Encoding and interpretation of cues (steps 1 and 2) have been characterized as working so closely together that a discussion of one necessitates the recognition of the other (see Crick and Dodge, 1994, in which the two steps are discussed together). Horsley and his colleagues had, as a primary interest, the goal of better understanding SIP, and, more specifically, appraisals of hostile cues, from a "top down" approach. Contrary to what one might expect, aggressive youths actually spent significantly more time attending to non-hostile than hostile cues. However, these youths recalled *less* information about the non-hostile

cues. Encoding is posited to consist of rapid processing, which is consistent with the idea that this level of social cognitive operating is schematically driven. It would follow that because hostile cues neatly fit with aggressive youths' schema of interpersonal relations that they require less attention and are more easily and fully recalled. This is an important discovery for a number of reasons, not least of which is it provides insight as to how aggressive youths may learn to quickly and definitively interpret ambiguous provocations as hostile and intentionally harmful.

Fontaine and his colleagues focused on *how* hostile attributional style is related to antisocial conduct in adolescents (Fontaine et al., 2010/In press, this issue). The relation between attributing hostile intent to an ambiguous provocation and responding with aggressive retaliation is sometimes discussed as if it is direct (see Fontaine, 2007a). This characterization was challenged and a test of the hypothesis that this relation is mediated by evaluative behavioral judgments that favor aggressive responsivity was conducted. These researchers found that the effect of hostile attribution on antisocial conduct is fully statistically mediated by adolescents' appraisals of aggressive response options. These findings have the important implication that, at least by adolescence when executive function is more fully developed, there is more to the story than the traditional cause-and-effect (hostile attribution-to-aggressive response) relation suggests.

Response evaluation and decision. The Fontaine et al. study (2010/In press, this issue) is the most recent of a series of new SIP studies that has focused on the role of the fifth and final social-cognitive step of the model, *response evaluation and decision* (RED), in the development of social cognition and antisocial behavior (see also Fontaine, Burks, & Dodge, 2002; Fontaine, Yang, Dodge, Pettit, & Bates, 2009; Fontaine, Yang,

Dodge, Bates, & Pettit, 2008). For example, response efficacy represents an individual's confidence in successfully carrying out a considered behavior. Response valuation is an assessment of the sociomoral qualities of the behavioral option and reflects the degrees to which the behavior matches the responder's identity as a social actor and moral agent. Outcome expectancy can guide response selection and decision in a variety of ways. For example, whereas social outcome expectancy may concern the degree to which others will look upon a certain behavior favorably, emotional outcome expectancy attends to the likelihood that enacting the considered behavior will lead to experiencing a particular emotional state (e.g., happiness, fear, shame). These evaluative processes are hypothesized to combine at a stage of behavioral decision making that is proximate to the conduct enacted. Thus, they may hold the key to understanding the relation between lower-level social cognitive operations, such as interpretation of cues, and interpersonal behavior.

The recent body of empirical research on RED by Fontaine and his colleagues (in particular, 2008, 2009, 2010/In press, this issue) was prompted by a detailed theoretical formulation of the response decision step, which discerned multiple qualitatively distinct sets of operations that are potentially active when an individual is determining how to respond to a stimulus. Collectively, these studies have demonstrated that, by adolescence, RED is a powerful multi-componential construct in aggressive behavioral development and accounts for a considerable portion of behavioral variability. As discussed above, this set of processes fully mediated the effect of hostile attributional style on antisocial behavior, and may well provide a key to developing more effective interventions with aggressive adolescents.

Harper and her colleagues also had RED as a focus in their empirical investigation, along with another step of SIP that, relative to some other steps, has received less empirical scrutiny, clarification of goals (step 3) (Harper, Lemerise, & Caverly, 2010/In press, this issue). There is a strong theoretical link between clarification of goals and RED. Indeed, RED assumes the identification of certain personal goals. For example, how would one be able to place a value on an expected outcome (*outcome valuation* and *outcome expectancy*; see Fontaine & Dodge, 2006) if he or she is unable to identify and value a goal to which it corresponds? If it is expected that punching a bully in the face will lead to respect from your peers, this has little personal meaning if peer respect has not be identified or valued as a goal. The Harper et al. study was guided by this understanding in its investigation of the effect of mood on SIP, an important venture given the widely accepted need to pursue scientific inquiry in the relation between emotion and social cognition.

SIP and emotion. In 2000, Lemerise and Arsenio published a theoretical statement that outlined how emotion may be more prominently featured in SIP theory. The argument, of course, was that emotional processes (e.g., emotion regulation) need be more central to a model of SIP that attempts to comprehensively account for individual differences in the development of youths' social competence. The importance of understanding emotion's role in the development of social cognition and antisocial behavior has been emphasized elsewhere, as well (e.g., Fontaine, 2008a; Pettit & Mize, 2007).

The Lemerise and Arsenio paper (2000) has provided the grounding for numerous developmental studies that have examined cognition-emotion relations in the interest in

explaining social competence over the last decade. The Harper et al. study (2010/In press, this issue) is the most recent evidence of this observation. The authors investigated the effect of induced mood on SIP—namely, clarification of goals and RED. Results showed that feeling angry increases the likelihood that a child will focus on and select instrumental goals (goals guided by an interest in personal gain) over social and relational goals. This is an interesting finding in that anger is typically associated with reactive aggression, a subtype of aggression that is associated with relational motives such as harming a perceived provocateur in order to serve retribution or exact revenge. Also notable among the findings is that anger was not found to have any effect on RED. This is contrary to several hypotheses that frame RED processing as a stage of SIP that is likely highly susceptible to emotional experiences (e.g., Fontaine, 2008a; Fontaine & Dodge, 2006; Lemerise & Dodge, 1993).

Schultz et al. (2010/In press, this issue) also focused on the role of emotion in the development of SIP. In this study, the question of how young children process and understand *others'* emotions was explored. Schultz and his colleagues found some support for their hypothesis that emotion attributions may play a more prominent role in young children's interpretation of cues than do intent attributions. In early childhood, youths may not be sufficiently cognitively developed such that they fully comprehend the social meaning of intent, whereas the social meaning of emotion may be more accessible. This distinction is critical to understanding the emergence and early development of attributional and interpretational processing in children.

Conclusion

The four empirical investigations that follow provide important scientific

contributions to the scholarly literature on social information processing and antisocial behavior in child and adolescent development. In this introduction to the Special Section, four themes that tie these articles together—measurement and assessment, attributional and interpretational style, response evaluation and decision, and the relation between emotion and SIP—are identified and discussed. Certainly, these papers contribute to the scientific body in numerous ways that are not here recognized, as well. Whereas they contribute to answering theoretical and empirical questions that have remained open in social development, they also prompt new questions as to the development of children's social cognitive processing and how it is related to individual differences in their social and antisocial behavior.

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