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# Recent advances in the study of development, social and personal experience, and psychopathology

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**Abstract:** The field of developmental psychopathology has been challenged by various issues in understanding the link between social experiences and psychopathology. These challenges involve conceptual, methodological and statistical concerns that are often interrelated. This article examines four advances in resolving these concerns. First, co-rumination and deviancy training are discussed as specific interpersonal processes that are examples of important social experiences for predicting psychopathology. Second, dynamic properties of dyadic interaction are discussed as one of the recent advances in methodology for this area. Third, the Actor-Partner Interdependence Model is outlined as one of the recent statistical advances in the study of individuals within a dyad. Fourth, changes in the study of culture are presented as informing the understanding link between social experiences and developmental psychopathology.

Like birds, bees, elephants, and many other types of animals, human beings belong to a social species. We live together, work together, think about each other, and have strong emotions that propel us to move toward, against and away from others. It is believed that our greatest pleasures and advantages, as well as our biggest problems and anxieties, come from our experiences with other people. This essential social basis of human nature lies at the core of the several theories about human development and in turn developmental psychopathology. The ideas of Bowlby, Sullivan, Erikson, Bronfenbrenner and others have all emphasized in one way or another that the study of development and the study of social and personal relationships are highly overlapping, if not synonymous, activities. Accordingly, an enduring challenge for the field of developmental psychopathology has been to study the experiences that children have in their social and personal experiences with peers, parents, and siblings. This challenge involves conceptual, measurement, methodological and statistical concerns that are often interrelated. In other words, researchers have struggled with the challenge of (a) knowing what aspects of social experiences should be studied, (b) how these phenomena should be measured, and (c) how the effects of these experiences should be assessed. None of these tasks is easy, and progress often appears to be slow. Nevertheless, there have been significant advances in each of these three areas in the past 10 years. In this essay we highlight four of these advances. First, social experiences involving interpersonal process in peer relations are often important in understanding internalizing and externalizing problems. Recent advances concerning two interpersonal processes, co-rumination and deviancy training, are presented as examples of social experiences indicative of the power of interpersonal process on developmental psychopathology. Second, the measurement of the dynamic properties of dyadic interaction is discussed as one of the most recent advances in how social processes can be measured and analyzed. Third, the Actor-Partner Interdependence Model will be outlined as one of the most recent statistical advances in the study of individuals within a dyad. Fourth, significant changes in the study of culture and developmental psychopathology will be discussed as examples of what aspects of social experience should be studied and recent advances in methodology.

## Interpersonal processes

Certainly the first question that persons who study the links between social experience and developmental psychopathology need to answer is which social experiences/processes should be examined. Two sets of creative researchers have given new answers to this question, one regarding social relations and internalizing disorders, and the other directed at understanding how social experience affects externalizing problems. Specifically Amanda Rose and her colleagues have identified a process they refer to as “co-rumination”; Thomas Dishion and his colleagues have drawn attention to processes known as “deviancy training”. Amanda Rose’s research on co-rumination has focused on a process that is found more often in female friendships. Co-rumination through self-disclosure involves sharing thoughts and feelings that in turn leads to closeness, but because co-rumination involves repeatedly focusing on problems and dwelling on negative affect it is believed that this type of disclosure process is linked to depression (Rose, 2002). Rose has suggested that since girls’ relationships are in general closer than boys, girls are at more risk of engaging in co-rumination and, in turn, at risk for experiencing the negative effects of co-rumination. In fact, she believes that co-rumination is one of the causes of gender differences in depression among adolescents. To date, the data seem to support her ideas. Survey and observational studies of preadolescents and adolescents have found that the process of co-rumination is more prevalent within female relationships than male relationships, particularly during adolescence (Rose, 2002; Rose, Schwartz, & Carlson, 2005). Moreover, co-rumination was shown to partially mediate the gender effects on friendship quality and internalizing symptoms. This would seem to suggest that co-rumination partially explains gender differences in relationship quality and internalizing symptoms. Recently, Rose has replicated many of these findings with observations of friends’ conversations about their problems (Rose et al., 2005). In addition to replicating previous findings, this observational research has also shown that the level of co-rumination within the conversations was related to how participants respond to their friends’ statements about problems. Relationships high in co-rumination responded to problems with more support and acknowledgement than those low in co-rumination. This suggests that to the casual observer co-rumination might appear to be a pleasant supportive process, which would make it a process that could be easily overlooked as a contributor to negative outcomes like depression.

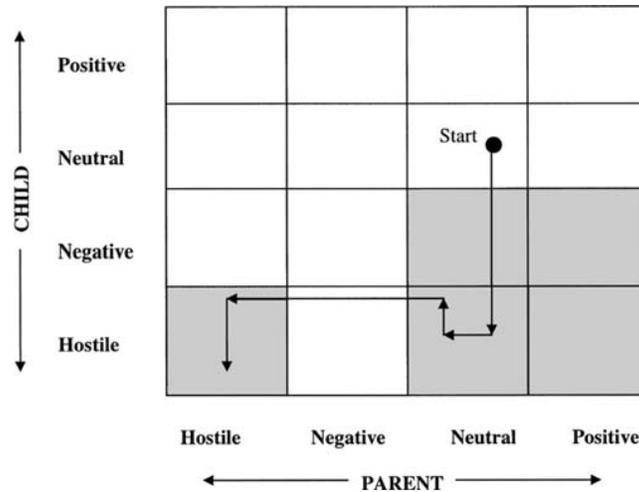
While co-rumination is a process that is typically seen among females, deviancy training, as outlined in papers by Dishion (Dishion, McCord, & Poulin, 1999; Dishion, Spracklen, Andrews, & Patterson, 1996), is a good example of a dyadic process that is often seen among males. Dishion’s papers report findings based on a sample of at-risk boys and focus on the reinforcing process of deviant behaviors by friends. In an observational study of the boys from the Oregon Youth Study (Capaldi & Patterson, 1987; Patterson, Reid, & Dishion, 1992), participants and their friends were observed during a problem-solving conversation. During the conversation, the rate of positive affect, such as laughing, was recorded when the topic of discussion was about rule breaking. The rate of positive affect was viewed as a measure of the rate of reinforcement of delinquency within the relationship or, in other words, the rate of deviancy training in the relationship. So, the more friends laugh at delinquent behaviors the more those behaviors are reinforced. Longitudinal data from these boys supports this claim. Deviancy training predicted use of tobacco, alcohol, and marijuana in these same boys 2 years later, even in boys who were abstinent 2 years earlier. Increases were also found in self-reported delinquency and in self- and police-reported violent behavior. In fact, the effects of early involvement with deviant peers in predicting growth from 4th to 12th grade in new forms of antisocial behavior in the same boys is completely mediated by deviancy training during the 8th grade (Patterson, Dishion, & Yoerger, 2000). In other words, the effects of childhood deviant friends on increases in antisocial behavior from childhood to late adolescence are through the mechanism of deviancy training. Thus early deviant friends seem to reinforce antisocial behavior in children who are already antisocial and this, in turn, leads to new and increased levels of antisocial behavior over time. Recently, dyadic interactions between these boys and their friends were examined utilizing a dynamic systems framework by focusing on information from each individual in the dyad (Dishion, Nelson, Winter, & Bullock, 2004). By simultaneously plotting each individual’s behaviors

over the course of the conversation, an overall pattern for the conversation could be plotted. In addition to deviant peer processes, entropy within the pattern of the conversation was used to predict antisocial behavior in young adulthood. Entropy refers to the level of lability or the amount of change that occurs in the interaction between peers. In this respect high entropy indicated an unstable, disorganized interaction pattern and low entropy indicated an organized interaction pattern. The highest levels of antisocial behavior at age 24 were found in those boys whose conversations were low in entropy and high in deviant friendship process, while those boys whose conversations were low in entropy and low in deviant friendship process were lowest in antisocial behavior. Boys whose conversations were high in entropy, regardless of the level of deviant friendship process, had levels of antisocial behavior that were somewhere in between these two groups.

### **Dynamic properties of dyadic interaction**

Clearly one of the strengths of Dishion's research is the emphasis on the role of deviancy training in the changes in the interaction between partners. To this end, Dishion relies on an important conceptual and methodological advance of the past 10 years, namely dynamic systems models (DS). DS refers to a set of principles that can be used to specify how a system changes over time (Granic & Hollenstein, 2003). For example DS can be used for understanding the evolution of the interaction between two partners in a dyad. The goal of DS is to describe how a pattern of interaction changes and stabilizes through processes of self-organization such as the recognition of the effect of one's actions on others (Lewis & Granic, 2000). Among the key properties of dynamic self-organizing systems are "state space", attractors, and dynamic stability. The state space refers to the possible conditions that the interaction of a dyad could show. For example, as shown in Figure 1, the interaction between a parent and a child could be defined at any particular moment according to the degree to which the child was hostile or positive and the degree to which the parent was hostile or positive. That is, the state space is like a dance floor that is defined by the characteristics of the members of the dyad. As the behavior of each member of the dancing couple changes, the state needs to be redefined. Figure 1 shows that the couple moves from a state of child neutral/parent neutral to child hostile/parent neutral, and then eventually to a state of child hostile/parent hostile. The essential features of the state space are its dynamism and its stability. In regard to dynamism, the pattern of interaction is assumed to unfold over time and eventually interactions will become stable in a particular state. That is, eventually the dancers will end up in just one part of the dance floor.

The DS properties that account for the emergent stability are known as attractors. Attractors are states that pull the systems away from other potential states. For example, as shown in Figure 1, the interaction was drawn to a hostile/hostile state where it eventually reached a dynamic stability. In this case, the hostile/hostile state functioned as an attractor. A goal of the DS approach to the study of social interaction is to first define the potential states that would define the "space" in which the interaction would occur. Then it seeks to describe the evolution of the interaction in this space. Next, it seeks to identify the attractors, or stable spaces where the dyad's interaction stabilizes. Finally, the goal is to identify when the dyad changes states and to understand what conditions or control parameters would account for these transitions. Although the emphasis of a DS approach is to understand the system as a system, part of such an analysis could be an assessment of which member typically takes the lead or accounts for the shifts in state. In regard to the study of development and psychopathology, the DS approach would be interested in knowing which partner (e.g., parent or child) would account for shifts in state.



**Figure 1.** An example of a state space grid with a hypothetical trajectory representing the following series of events: child neutral/ parent neutral, child hostile/parent neutral, and then child hostile/ parent hostile.

### Advances in the study of individuals and the dyad

A concern with disentangling the effects that are due to the actions of the partners in a dyad is seen in another advance of the past 10 years. New techniques have allowed researchers concerned with development and psychopathology to overcome methodological and statistical challenges in research that examined the individual within a dyad. Specifically, procedures have been developed to study dyads in a way that disentangles the effects linked to an individual from those that are due to the individual's experiences in dyads or groups (Cook & Kenny, 2005; Laursen, 2005; Little & Card, 2005). Much of these advances has been focused on studying the effects of dyadic interaction. Although the importance of examining dyadic processes for developmental psychopathology seems to be apparent, how to analyze dyadic data in the most appropriate manner is not always clear. This is because the dyad of interest in developmental research is often a close relationship, such as a parent–child relationship, friendship, or sibling relationship, and one of the most distinguishing features of close relationships is interdependence (Kelly et al., 1983). In other words, individuals in the dyad mutually influence one another such that each person's characteristics or behaviors influence the other person's behaviors or outcomes. Interdependence between individuals makes this type of data interesting, but also makes it difficult to analyze since the data for each person in the dyad are not independent. It is the lack of independence of the data between members of the dyad that violates many assumptions of the statistics so often utilized to examine this type of data and the violation of these assumptions can lead to biased significance tests (Kenny, 1995; Kenny & Judd, 1986). Instead of performing separate analyses based on some grouping variable (i.e., gender) or to randomly select one of the members of the dyad for analysis, the better solution to this problem is to separately account for effects of each of the individuals in the dyad and the effects unique to the dyad. In a series of papers and book chapters, David Kenny (Kashy & Kenny, 2000; Kenny, 1988, 1990, 1996; Kenny & Cook, 1999) has outlined a model that focuses on the dyad as the unit of analysis. The Actor-Partner Interdependence Model (APIM), which sometimes is known as the Social Relations Model, accounts for the effects of an individual on their own outcome score (i.e., the actor effects), the effects of the individual's partner on their outcome score (i.e., the partner effects), and the effects of a unique combination of the actor and the partner's scores on their outcome score (i.e., the effect of the dyad).

There are several ways to examine APIM effects. One is to use a pooled regression technique as delineated by Kashy and Kenny (2000). This approach combines the results from two regressions to estimate the various effects. Other methods utilize structural equation models (Gonzales & Griffin, 1999)

and PROC MIXED in SAS (Campbell and Kashy, 2002; Kenny and Cook, 1999), but here we would like to focus on hierarchical linear modeling (HLM) as a method for estimating APIM effects. It should be mentioned that the brief explanation of these effects presented here is influenced by the clear and user-friendly guide presented by Lorne Campbell and Deborah Kashy (2002), and one should reference this guide for more detailed information about the procedures briefly described below.

One of our recent studies of the factors related to the stability of aggression provides an example of estimating APIM effect with HLM (Adams, Bukowski, & Bagwell, 2005). This study found that the participants' initial level of aggression (i.e., actor effect), their friends' level of aggression (i.e., partner effect), and the reciprocated status of the friendship (i.e., dyad descriptor effect) predicted stability over a 6-month period during the 6th grade. Even more importantly, the interaction between all three of these effects was significant, suggesting that the unique effect of the dyad was most important in understanding stability. In the Level 1 HLM model for each child, the T2 aggression score was used as the dependent variable and the child's T1 aggression score (i.e., the actor effect) and the peer's T1 aggression score (i.e., the partner effect) were used as predictors. In the Level 2 model, three variables were used as predictors of variability in the Level 1 outcome scores. They were: type of friendship (i.e., reciprocated or non-reciprocated), the two-way interaction between the child's aggression and their friend's aggression (i.e., dyad effects), and the three-way interaction between type of friendship and child aggression and friend aggression. As mentioned previously, the significant three-way interaction indicated that it was not just the individual's or their friend's level of aggression that was most important for understanding the stability of aggression but the unique dyadic combinations of the characteristics of each person in the dyad and the type of dyad. For children with high initial levels of aggression, those with unreciprocated aggressive friends were the most stable in their aggression. For children with low initial levels of aggression, most children remained stably low in aggression with type of friendship and friend aggression having little effect on stability. Adolescents who were high in aggression at time 1 and had an aggressive friend (reciprocated or not) remained aggressive at time 2, but those who were aggressive at time 1 and had non-aggressive friends actually displayed much lower levels of aggression at time 2. The opposite did not occur for those adolescents low in aggression at time 1. Those low in aggression with aggressive friends at time 1 did not increase in aggression. In sum, these findings are a good example of how the APIM not only helps to solve methodological and statistical challenges but also provides novel and important findings that might have been missed with less sophisticated approaches.

### **A possible future direction: Culture**

Considered most broadly, the study of the social has been somewhat narrow. Certainly, as we have tried to show, research on the family and the peer group is always changing. Nevertheless, broader contexts are often overlooked. Perhaps the next frontier, almost literally, for research on psychopathology and social context will be the study of culture and the development of psychopathology. Two advances have been seen recently in the study of culture as a social context for the study of developmental psychopathology. One advance is methodological, the other is conceptual. The methodological advance has been discussed here already. Specifically, multilevel modeling provides opportunities for advances in research at higher levels of analysis than the dyad. Typically, research on culture has relied on comparisons of mean level differences between cultural contexts on variables of interest. Although this strategy is useful, it does not help to understand differences in developmental processes between cultures and it often provides a one-dimensional view of culture and development. Multilevel modeling is ideally suited to the study of culture and development in the sense that children are "nested" within particular cultural contexts. Specifically, the association between particular variables (e.g., friendship and aggression) related to development can be assessed as Level 1 variables while indices of cultural contexts can be used as Level 2 variables. This sort of analysis will reveal whether the predictors of developmental psychopathology will vary across cultures (e.g., whether friendship is as closely linked to aggression in one place as in

another). More importantly, instead of using ethnicity or nationality as an index of “culture” (e.g., Canada versus Brazil) as a Level 2 variable, one could use actual indices of the characteristics (e.g., individualism or collectivism) that one sees as the critical dimensions of cultural experience for distinguishing one place from another.

Another advance in the study of culture concerns the variables that one might use as the critical distinctions between cultures. Traditionally, researchers have tried to capture differences between cultures by using the dimensions of individualism and collectivism (Hofstede, 1980; Oyserman, Coon, & Kimmelmeier, 2002; Schneider, 1993; Triandis & Brislin, 1984). The use of these two dimensions has dominated research on cultural differences and developmental psychopathology. Recent evidence, however, points to the limitations with these constructs (Oyserman et al., 2002; French, Lee, & Pridada, in press). Oyserman et al. show that trying to reach conclusions about any particular culture according to these dimensions is likely to lead to very gross generalizations. For instance, two cultures might have a collectivistic orientation but might differ from each other in how collectivism is manifested. In Chinese culture collectivism might mean that individuals are well controlled and reserved. In Colombia collectivism is seen in the belief that one should be happy and buoyant all the time. More importantly, French et al. argue that even when one can use these dimensions to distinguish one culture from another, their effects on social relations often vary as a function of other characteristics within the culture and, as a result, their immediate impact is often weakened. For example, the strength of kinship bonds might have a more powerful impact on the significance ascribed to friendship than does collectivism per se. French et al. showed instead that researchers might want to focus on cultural beliefs about whether one should have extensive or intensive social relations.

## **Summary**

The social domain can be as small as the dyad and as large as culture. It is the context where development happens. The association between the “individual” and the “social” is complex and multifaceted. As a result our continued understanding of how social relations and social contexts affect development requires advances in ideas, measures, and methods. All of these can be seen in the developmental literature in the past decade.

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