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J Interpers Violence 2002 17: 824

DOI: 10.1177/0886260502017008002

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During the past two decades, there has been a tremendous growth in research related to interpersonal violence. From this research, researchers have acquired a greater understanding of the risk factors associated with abusive and violent events, the consequences of being victimized, and the characteristics of victims and perpetrators. One area yet to be fully explored involves the interactional processes between a victim and a perpetrator. This article provides a brief description of the advantages of examining the contextual aspects of interpersonal violence, describes a promising observational analysis technique that may prove enlightening to current interpersonal violence research, and describes some limitations of the application of social interaction research to violent relationships. The article "Antecedents of Coercive Interactions in Physically Abusive Mother-Child Dyads" (from this issue) is presented as an example of the value of behavioral observational methods in interpersonal violence research.

Patterns of Interaction Within Violent Families Use of Social Interaction Research Methodology

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Existing research in the area of interpersonal violence has provided valuable insight into many characteristics of victims, perpetrators, and the environment in which violence occurs. From this research, we have acquired a greater understanding of the risk factors associated with abusive and violent events (Fleming, Mullen, & Bammer, 1997; Riggs, Caulfield, & Street, 2000; Weisz, Tolman, & Saunders, 2000), the consequences of victimization (Cahill, Kaminer, Ruth, & Johnson, 1999; Sharps & Campbell, 1999; Widom, 2000), and characteristics of the victim (Arriaga & Oskamp, 1999; McCloskey & Bailey, 2000) and perpetrator (Porter et al., 2000; Proulx, Perreault, & Ouimet, 1999). As valuable as this research has been, it has been limited to examining one or more aspects of the violent or abusive relation-

Authors' Note: Support for this article was provided by funding from the Sierra Health Foundation and the National Institute of Mental Health (Grant MH54221 R21). Correspondence regarding this article should be addressed to Anthony J. Urquiza, CAARE Center, Department of Pediatrics, University of California, Davis Medical Center, 3300 Stockton Blvd., Sacramento, CA 95820. E-mail may be sent to ajurquiza@ucdavis.edu.

JOURNAL OF INTERPERSONAL VIOLENCE, Vol. 17 No. 8, August 2002 824-835
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ship, without examining dynamic qualities of the relationship itself. One important area yet to be fully explored involves the interactional processes between a victim and a perpetrator.

SOCIAL INTERACTION AS THE CONTEXT OF INTERPERSONAL VIOLENCE

One avenue for the future study of interpersonal violence involves the examination of the context of abusive relationships. Interpersonal violence is an inherent characteristic of an abusive relationship. It possesses dynamics that involve both the victim and the perpetrator and provides a relational context in which violence takes place (Milner, 2000; Reid, Patterson, & Loeber, 1982). This context may offer more information about the nature of violence than understanding the mind of the perpetrator or knowing its sociodemographic predictors. Furthermore, developing a better understanding of both the relational context of violent relationships, combined with other types of data (e.g., sociodemographic variables, victim and perpetrator traits), may yield an understanding of interpersonal violence not achievable through only one strategy or approach.

In situations where the victim and the perpetrator have an ongoing relationship, as happens when a parent physically abuses a child, relationship dynamics can play an important part in the formation and maintenance of the abusive or violent relationship (Urquiza & McNeil, 1996). For instance, research has documented the tendency for abusive parents to consistently attend to the negative behavior of their children and to inconsistently attend to their children's positive behavior (Cerezo & D'Ocon, 1999; Wahler, Williams, & Cerezo, 1990). In addition, research by Borrego (1999) suggests that abused children may not respond to the positive behavior directed toward them by their parents but will respond immediately and negatively to their criticisms and negative behavior. From these findings, we can see that the abusive parent's and child's behaviors mesh together to perpetuate an essentially negative and coercive relational context. This is one example on a micro level of analysis that shows how an abusive relationship is sustained. However, negative interactions may continue for other reasons contained in the dynamics of the relationship. For example, a wife may fear harm to herself or her children if she attempts to leave a violent husband, or she may perceive that violence in a relationship is a common or acceptable way of expressing anger in an intimate relationship. Either way, violence perpetrated by one spouse may be legitimized either through the other's fear, as a symbol of power and control, or as an acceptable method of conflict resolution.

The body of research investigating interpersonal violence spans across different disciplines and different theoretical perspectives. It has established a firm foundation for understanding how abusers and victims differ from non-violent populations. However, it has not similarly advanced our knowledge of the dynamic aspects of interactions that help maintain and perpetuate abusive relationships. Because these dynamic processes are a central aspect of many types of interpersonal violence, they should be examined as closely as those participating in interpersonal violence (i.e., victims and perpetrators). Thus, we argue that in addition to the behavior, the relational context, that is, the behaviors, cognitions, emotions, and interactions surrounding the violence, are also essential elements of the abusive relationship.

Dynamic qualities of interactions are by nature changeable, and the way they change is contingent on what has just occurred. It is difficult to capture these dynamic aspects of interactions with paper-and-pencil measures, clinical interviews, or any other method that either only uses one person's point of view or turns a dynamic sequence of events into a static representation of the event. In this article, we present an argument for using systematic observational research methods and preserving the sequential nature of interactions in violence research by coding either types of behavior sequences or chronological sequences of events. We describe three studies that used observational methods but used different approaches to describing interactions in parent-child dyads and different analytic techniques. Through these illustrations, we describe the advantages and disadvantages of collecting different types of data for research in interpersonal violence.

BEHAVIORAL OBSERVATION AND SOCIAL INTERACTION RESEARCH METHODS

The use of observational research methods is no guarantee that the researchers will preserve the sequential nature of the interaction, even if the researcher examines behavioral sequences. To illustrate, we describe Kochanska and Aksan's (1995) study of the effect of the mothers' control styles and children's compliance styles on the children's internalization of mothers' instructions not to play with certain desirable toys. The researchers observed 103 children 2 and 3 years of age together with their mothers for 2 hours, videotaping the dyads at play in their homes and in a laboratory setting several weeks later. The mother-child dyads played freely part of the time and then cleaned up in the home and laboratory. During free play in the laboratory, mothers were asked not to allow their children to play with certain attractive and colorful toys researchers had set on a shelf. They used an event-

triggered coding system such that when the child looked at or mentioned the forbidden toys, observers coded the behaviors that occurred within an "episode" chronologically for as long as the mother or child spoke of or attended to the toys. This type of data, which describes and records each interactive event involving the child chronologically, but without noting the time the events occur, is known as event sequential data (see Bakeman & Gottman, 1997, for a detailed description). During the episode, children's predominant compliance style, mothers' control style, and mothers' and children's affect was coded every 20 seconds. These behaviors were also coded during the clean up time. However, instead of an event sequence style of coding, observers coded predominant mother and child affective and behavioral styles in intervals of 60 seconds (i.e., interval-sequential data). At the end of the laboratory session, children were left alone in the playroom and were reminded not to play with the forbidden toys. Every 5 seconds during this time, observers noted the degree to which children complied with this instruction. Both event-sequential and interval-sequential data are amenable to sequential analysis. In this study, however, researchers did not take advantage of the behavioral sequences but instead used the data to construct measures reflecting the amount of time the mothers and children spent behaving in a certain way relative to the total amount of time available (or total number of sequences coded).

Kochanska and Aksan (1995) found that greater amounts of mother-child mutually positive affect correlated positively with immediate compliance and negatively with noncompliance. They also reported that non-power-assertive maternal control styles correlated positively with children's compliance and negatively with noncompliance, while more power-assertive methods of maternal control (negative control and coercion) showed just the opposite relationship with children's compliance and noncompliance. Furthermore, they found that the more dyads showed high levels of mutual positive affect and child compliance, the more likely the child was to show subsequent internalization of maternal rules. These findings have obvious implications for clinicians treating families with a history of physical abuse of children because much of the abusive behavior is believed to emerge in the context of discipline resulting from children's noncompliance (Urquiza & McNeil, 1996). We might make the assumption that to reduce children's noncompliant behaviors, we could change the parent's control style. However, because of the correlative nature of the findings, we cannot and should not make that assumption. It is just as likely that the children's compliance styles elicited certain types of parental control styles. Alternately, we might speculate that high levels of mutual, positive parent-child affect elicits both compliance in children and non-power-assertive parental control styles. To

discover the true relationship between affect, control, and compliance styles, one must perform analyses that examine the sequences of parent and child behaviors (i.e., sequential analyses).

One advantage of global assessments that are averaged across time is that they are easy to use statistically. They are linear measures, usually with a fair amount of variance, normally distributed, and can be used easily in analyses with standardized measures of children's or parents' psychological adjustment and demographic measures such as gender, age, or ethnicity. It is tempting, therefore, to use global measures, even when they are not entirely suitable. Kochanska and Aksan (1995) found that their global measures of mutually, positive affect were powerful indicators of their outcome measures, and global measures of discreet behavior tended to show strongest relationships within contexts (i.e., in-home control style related most strongly to in-home compliance style). These findings suggest that measures of mood and affect may be more reflective of a global style, whereas discreet behaviors may be more dependent on variations of context, time of day, and so forth. Hence, if the researcher wants to make hypotheses about processes in relationships involving discreet behaviors, such as the impact of command style on the likelihood of compliance, the researcher should perform sequential analyses.

Cerezo and D'Ocon (1999) showed the potential of sequential analysis of observational data in their examination of the interaction patterns of 25 abused and 25 nonabused children and their parents. Observers coded the duration, frequency, valence (i.e., positive vs. negative behaviors), and sequence of 18 different types of behaviors (e.g., social, instructional, corrective, etc.) of a target child with up to five different family members. At the end of each 1-hour visit, the observer had coded one long sequence of the child's behaviors and his or her interactions with family members (i.e., event sequential data).

Previous research suggested that abusive parents responded consistently and negatively to their children's aversive behavior but responded inconsistently and indiscriminately to their children's positive behaviors. In this study, Cerezo and D'Ocon (1999) tested the hypothesis that when parents responded inconsistently to their children's positive behaviors (e.g., compliance), then their children would be more likely to respond aversively to their parents (e.g., noncompliance) to increase the predictability of their parent's behavior. They further hypothesized that the parent would reinforce the aversive behavior by attending to the child's negative behavior, without following through with the original command. Cerezo and D'Ocon thus examined two different interaction sequences. One sequence was identified as *indiscriminate reactions* and consisted of a mother either inconsistently

responding to a sequence of two similar child behaviors or responding similarly to two different child behaviors. These were interactions in which the mother's behavior was likely to be unpredictable to the child. The other type of interaction sequence, labeled *compliance sequence*, consisted of the mother giving a command, the child opposing it, and the mother failing to ensure compliance. In this way, they identified sequences of behavior that might occur before or after a target event: children's aversive behavior. Cerezo and D'Ocon then compared the probabilities that maternal compliance and indiscriminate behavior would occur up to three events preceding versus three events following children's aversive behavior. For both abusive and nonabusive dyads, they found that mothers' indiscriminate responses were significantly more likely to precede than follow an aversive behavior, and maternal compliance sequences were significantly more likely to follow than precede the child's aversive behavior. However, they found that abusive mothers were likely to show a significant connection between children's aversive behaviors and mothers' indiscriminate behavior when it occurred three events preceding children's aversive behavior and still showed a significant relationship between children's aversive behavior and maternal compliance when the compliance occurred three events after the aversive behavior. Furthermore, when they examined the relationship between the likelihood of maternal indiscriminate behavior preceding versus following a maternal compliance episode, they found that although indiscriminate responses were unlikely to precede compliance episodes among either abusive or nonabusive mothers, among abusive mothers only, there was a significant likelihood that indiscriminate responses would occur three events following a compliance episode. Cerezo and D'Ocon's findings support their hypothesis that all children seek predictability and that if mothers respond indiscriminately to their children's behavior, their children will be more likely to behave aversively. However, abusive mothers showed the same numbers of indiscriminate responses and compliance episodes. The researchers believed that the most significant difference between the two groups lay in abusive mothers' greater likelihood of responding indiscriminately after a compliance episode. Because indiscriminate behavior only further provokes aversive behavior in children, we might assume that the connection between maternal compliance and indiscriminate responsiveness is a key element in a coercive cycle specific to abusive dyads. These data further suggest to the clinical reader that abusive parents may have a great need to be taught how to manage their children's aversive behavior, thereby breaking a coercive cycle that may lead to abuse. These findings show some of the flexibility of sequential: the ability to identify patterns of interactions and, with some certainty, obtain an estimate of the contingent relationship between a pattern of behavior and a particular

response. Because research suggests that a child's aversive response to a parent's commands are key elements in a coercive and abusive cycle (Patterson, 1982; Urquiza & McNeil, 1996), these findings suggest that one way to reduce the likelihood of abuse in a high-risk family would be to increase the consistency with which abusive parents respond to their children's good behavior. They provide researchers and theorists with solid information about the importance of the predictability of parents' behavior to children and the kinds of parent-child interactions that may maintain children's aversive behavior. These data provide therapists working with parents the knowledge that in addition to teaching parents to recognize children's signals and respond appropriately to their children's signals, they must also teach them to respond consistently.

Timmer, Borrego, and Urquiza (2002 [this issue]) also provide an example of observational research that uses sequential analysis to describe interactional processes in abusive and nonabusive parent-child dyads. In this study, 30 mother-child dyads were videotaped in a laboratory setting as they engaged in structured play and clean up. Times were attached to each of the mother's and child's physical and verbal behaviors and were subsequently coded into larger categories of behavior. This type of data, in which times are attached to behaviors and arranged in chronological sequence, is known as timed event data (Bakeman & Gottman, 1997; Bakeman & Quera, 1995).

Basing their study on research suggesting that abusive parents and their children were vigilant to coercive overtures and that parents' questions can be intrusive and controlling, Timmer et al. (2002) examined the function of questions in parent-child interactions to try to determine when in an interaction abused children would interpret their parents' behaviors as coercive. If abused children were highly sensitive to their parents' attempts to control them, they might be less willing to answer questions or otherwise begin to respond aversively. Timmer et al. found that abusive and nonabusive parents asked similar numbers of questions and that both groups of children answered the large majority of questions their parents asked. However, they also found that when abused children did not answer their parents, abusive parents were more likely than nonabusive parents to respond with a command and that abused children were twice as likely as nonabused children to respond negatively to commands.

As with Cerezo and D'Ocon's (1999) research, the research by Timmer et al. (2002) also provides an example of the level of analysis that sequential methods offer. In each study, it is possible to go beyond making cautious statements about the processes of relationships and the direction of causation. By identifying sequences of behaviors characteristic of the abusive/

coercive cycle, Cerezo and D'Ocon are able to confirm a "new predictability hypothesis" (Wahler et al., 1990) that children's aversive behavior may stem from a desire for predictability and an inability to obtain it by behaving well. Similarly, the Timmer et al. study focused on micro processes in abusive relationships, but the findings begin to define the outer limits of abusive dyads' hypervigilance to issues of control. Sequential analysis would have allowed Kochanska and Aksan (1995) to determine whether children's behavior shapes maternal control style or whether control style elicits certain types of compliance or noncompliance in the children.

ADVANTAGES AND LIMITATIONS OF SEQUENTIAL ANALYTIC METHODS

We have argued that observational methods and sequential analysis procedures are underused in interpersonal violence research and that further development of these methods may advance the field. However, these methods are not always recommended for use. It would be difficult, for instance, to observe interactions and use sequential data analytic strategies if there were no stable relationship between the victim and perpetrator (e.g., assaults by a stranger) or if contact between the victim and perpetrator would further traumatize the victim (e.g., research involving an adult perpetrator and a victimized child, where the child may respond with an increase in traumatic symptoms). In such situations, arranging for contact between the victim and perpetrator would be insensitive and unethical, regardless of the potential for researching dyadic processes of violence in relationships. Neither would it be particularly helpful if the hypotheses or research questions involved global aspects of the relationship and did not involve more discrete relationships processes. For instance, if a researcher were interested in the relationship of levels of maternal depressive symptomatology to levels of conflict and violence in the household, there would be no need to use sequential analysis. However, if the researcher wanted to know how maternal depressive symptomatology affected children's responsiveness to parents' cues, it would be very helpful to use sequential methods. In addition to resolving questions of appropriateness, there is also the issue of resources. Observational methodology is labor intensive. It requires a monumental number of person hours to acquire observational data, transcribe videotapes, train research personnel to acquire reliable interrater reliability in selected codes, and eventually code videotapes (see Bakeman & Gottman, 1997, for a full description of observational methods, and Bakeman & Quera, 1995, for a description of sequential

analysis procedures). It can also require the use of sophisticated recording equipment and computer support, in addition to the skills and training to coordinate the human and mechanical resources.

One of the limitations of behavioral research (and consequently, of sequential analytic procedures) is that it relies primarily on behavior as the unit of measure, which may not reflect internal processes (e.g., cognitions, affect). Although one strength of behavioral research is the benefit of recording the actual behaviors exhibited by an individual (or within a dyad), it is also possible to measure (i.e., code) latent variables or constructs (for an excellent example, see Easterbrooks, Biesecker, & Lyons-Ruth, 2000, and Easterbrooks & Biringen, 2000, on parental emotional availability with parent-child dyads). Finally, behavioral research has been criticized as being susceptible to bias introduced from conducting research in a clinic or laboratory setting (Roberts, 2001). Regardless of the efforts of the researcher, there may be substantive differences between behaviors exhibited in natural settings and behaviors exhibited within a structured observational paradigm, which occurs within a university research laboratory. Although this criticism may be accurate, behavioral research can nonetheless acquire data in more naturalistic settings (e.g., school, home) and can use paradigms that are commonly found in multiple settings (e.g., parent-child observations of child clean up). Furthermore, there have been many instances of behavioral observation methods being successfully employed in other fields (e.g., attachment, parent-child interactions/parenting, communication in marital dyads).

With these caveats in mind, we still believe that observational research methods can provide valuable information about the dynamics of interactions between the victim and the perpetrator (e.g., child physical abuse, domestic violence) when there is an ongoing relationship. The continuity of these types of violent relationships would suggest that the social interaction characteristics may be most salient and, hence, in greatest need of dyadic investigation. We would suggest many types of interpersonal violence could incorporate behavioral methods that employed some type of sequential analysis. Some possible examples could include the following:

- Examination of communication strategies (i.e., patterns of conflict and problem-solving efforts) with domestic violence couples. Are there patterns of interaction between husband and wife that lead to an escalation or de-escalation of conflict?
- Mother-child dyadic/parenting strategies with women who have been victims of domestic violence and children with behavioral disturbance. Do children exposed to domestic violence attempt to exhibit aggression/defiance toward their mother in a manner that is similar to that of their father?

- Use of a stable pattern of interaction as a measure of treatment outcome. Do physically abusive parent-child dyads demonstrate a pretreatment to post-treatment change in sequences of parent-child behaviors (e.g., greater frequency of parent command, child comply, parent praise)?
- The impact of parental mental health and/or substance abuse on relationships with children. For example, are parents with a mental health (e.g., depression) or substance abuse problem less responsive to the positive behaviors of their children or hyper-responsive to the negative behaviors of their children?

Sequential data analytic strategies also provide opportunities for examining interpersonal violence within and between multiple levels of analysis. Although we advocate the use of an interpersonal research methodology, using an intrapersonal-interpersonal research methodology may yield a greater understanding than either method alone. For example, understanding the impact of maternal depression on patterns of interaction with abusive husbands and defiant, oppositional children may be valuable in developing effective family intervention programs. We can test to see whether behaviorally disruptive children exposed to domestic violence display social interaction patterns that mimic those of their fathers toward their mothers and/or whether they display this same pattern of behavioral disturbance toward their violent fathers.

Furthermore, in some types of violence, the victim may have long-standing negative sequelae that impair their ability to develop and/or maintain positive relationships. This might involve misinterpreting social cues, distorted cognitions, erroneous preexisting beliefs, and/or other maladaptive behaviors. In such situations, it may be valuable to observe and investigate relationship characteristics that impede positive adjustment to the victimization or that compound the initial problems (e.g., domestic problems, aggressiveness, defiant behavior, and exhibiting sexually inappropriate behavior).

In sum, although there are limitations to these research methods, we advocate the use of observational methods and sequential analysis for more accurate modeling of the dynamics of violence. Defining relationship dynamics that characterize violent relationships may provide a means of further determining how sequences of interactions lead to a violent end, how we might be able to prevent violence interchanges, and how we could most effectively intervene.

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