Published in final edited form as:

Res Pract Persons Severe Disabl. 2004 June ; 29(2): 104–121. doi:10.2511/rpsd.29.2.104.

Validating the Construct of Coercion in Family Routines: Expanding the Unit of Analysis in Behavioral Assessment with Families of Children with Developmental Disabilities

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Abstract

We conducted an observational study of parent-child interaction in home activity settings (routines) of families raising young children with developmental disabilities and problem behavior. Our aim was to empirically investigate the construct validity of coercion in typical but unsuccessful family routines. The long-term goal was to develop an expanded ecological unit of analysis that may contribute to sustainable behavioral family intervention. Ten children with autism and/or mental retardation and their families participated. Videotaped observations were conducted in typical but unsuccessful home routines. Parent-child interaction in routines was coded in real time and sequential analyses were conducted to test hypotheses about coercive processes. Following observation, families were interviewed about the social validity of the construct. Results confirmed the presence of statistically significant, attention-driven coercive processes in routines in which parents were occupied with non-child centered tasks. Results partially confirmed the presence of escape-driven coercive processes in routines in which parent demands are common. Additional analysis revealed an alternative pattern with greater magnitude. Family perspectives suggested the social validity of the construct. Results are discussed in terms of preliminary, partial evidence for coercive processes in routines of families of children with developmental disabilities. Implications for behavioral assessment and intervention design are discussed.

Although there have been significant advances in our understanding of child problem behavior and parent-child interaction (Patterson, 1982; Stormshak, Bierman, McMahon, & Lengua, 2000), very little of this knowledge has been developed in the context of families raising children with developmental disabilities. The etiology of problem behavior in the context of parent-child interaction in the home has been studied in non-disabled populations almost exclusively (McMahon, 1994; Reid, Patterson, & Snyder, 2002). Despite significant social costs of problem behaviors for families of children with disabilities (Singer & Irvin, 1991), the scientific literature includes few studies that address processes of parent-child interaction that develop and maintain problem behaviors among these families (Floyd & Phillipe, 1993). Furthermore, there are no studies in the developmental disabilities literature that have examined the way in which typical family contexts may affect the development of child problem behavior. Such research is viewed as necessary if we are to develop behavioral family interventions that are acceptable, effective and sustainable when used by parents in natural family settings (Bristol et al., 1996). Although there is growing empirical evidence for the effectiveness of positive behavioral interventions for children with disabilities and problem behavior (Koegel, Koegel, & Dunlap, 1996), there is only modest evidence of their long-term sustainability in home and community settings (Lucyshyn, Horner, Dunlap, Albin, & Ben, 2002). Carr et al. (1999), in a recent meta-analysis of positive behavior support research from 1985 to 1996, found that only one-percent of studies documented the maintenance of behavior change beyond one-year post-intervention.

A critical factor in the empirical development of an acceptable, effective, and sustainable behavior support technology for children with developmental disabilities has been an expansion of the unit of analysis. Such an expansion brings to light additional factors that may influence the development and maintenance of problem behavior. A more complete understanding of such factors can lead to the development of intervention strategies that are more likely to be acceptable, effective, and sustainable. For example, over the past 20 years, the unit of analysis has been extended from a focus on the topography of problem behavior to the function or purpose of problem behavior (Carr, Robinson, & Palumbo, 1990). This has contributed to the development of a new technology of positive behavior support that emphasizes the use of antecedent and educative interventions (Carr et al., 2002; Derby et al., 1994). Preliminary efficacy studies show the approach to be acceptable and effective across a diversity of persons and settings (Carr et al., 1999; Feldman, Condillac, Tough, Hunt, & Griffiths, 2002; Vaughn, Clarke, & Dunlap, 1997).

Three promising developments offer direction for expansion of the unit of analysis in the behavioral assessment of children with developmental disabilities. The first, mentioned above, is empirical evidence that problem behaviors of children with disabilities serve specific functions (Carr & Durand, 1985). These functions include getting attention, obtaining a preferred object or activity, or escaping an aversive event (O'Neill et al., 1997). To date however, functional analysis research has focused almost exclusively on adult-mediated consequences that serve to reinforce child problem behavior. Little to no empirical attention has been given to child-mediated consequences that serve to reinforce ineffective parenting practices. Such "child effects" have been investigated in the interactions between teachers and children with disabilities, and have been shown, for instance, to diminish the frequency of adult demands on the child (Carr, Taylor, & Robinson, 1991).

The second promising development, coercion theory, addresses this limitation (Patterson, 1982). *Coercive family process* refers to moment-by-moment, aversive, microsocial interactions in which the parent and child reciprocally reinforce, respectively, child problem behavior and ineffective parenting practices. Across four decades of research, Patterson and colleagues have documented the presence of coercive processes in the interactions of young aggressive boys and their parents (Patterson, 1976; Reid et al., 2002). Two coercive processes were identified. In the first, the parent makes a demand on the child. The child responds by engaging in problem behavior until the parent terminates the demand, thus negatively reinforcing child problem behavior. The child then terminates problem behavior, thus negatively reinforcing parent withdrawal of the demand. In the second process, the parent is not attending to the child. The child engages in problem behavior until the parent attends to him or her, thus positively reinforcing problem behavior. The child then terminates problem behavior, thus negatively reinforcing the parent for attending to problem behavior (Patterson, 1982; Patterson, Reid, & Dishion, 1992). These results have been replicated by other researchers in investigations of parent-child interaction in families of antisocial children (Loeber, Green, Lahey, Christ, & Frick, 1992; Sansbury & Wahler, 1992). Most importantly, longitudinal research has shown that unless these coercive processes are addressed at an early age, these children are on a developmental trajectory toward antisocial behavior during later childhood and adolescence (Eddy, Leve, & Fagot, 2001).

A major contribution of coercion theory is the expansion of the unit of analysis for behavioral assessment beyond parent *or* child behavior to a bi-directional focus on parent-child interaction. Through the use of sequential analysis methods (Bakeman & Gottman, 1986), Patterson and colleagues defined the first steps in the developmental pathway to antisocial behavior in children (Patterson, 1982; Eddy et al., 2001). Patterson and colleagues also examined the relationship between coercive processes and the larger ecology surrounding the family. Through correlational studies, several contextual variables (e.g., daily hassles, financial problems, divorce) have been shown to disrupt parenting practices and thus contribute to the onset of coercive processes (Patterson & Bank, 1989). However, what is missing in the literature on coercion theory is a direct link between coercive processes and the immediate day-to-day family contexts that surround them. Such a link would expand the unit of analysis beyond social ecology to a broader view of the social, cultural, *and* physical ecology of parent-child interaction.

The third development, the ecological concept of the activity setting, addresses this issue directly (Gallimore, Goldenberg, & Weisner, 1993). Ecocultural theory (Gallimore, Weisner, Kaufman, & Bernheimer, 1989), supposes that the effects on child development of ecology (e.g., income, neighborhood, services available) and culture (e.g., goals and values; beliefs about child raising, disability, and family life) are mediated through child activity settings. Activity settings are defined as daily and weekly routines in the home and community in which children interact with family members as well as members of the community. Activity settings possess common structural elements such as time and place, people, tasks, resources, goals and values, and patterns or scripts of interaction. Examples include getting up and getting ready for school in the morning, dinner time with family, and

going shopping in the community with a parent. According to Ecocultural theory, families proactively strive to construct activity settings that are congruent with child characteristics, consistent with family goals and values, and sustainable over time.

The activity setting has clear implications for assessment and intervention with families of children with developmental disabilities and problem behaviors. First, because child behavior and microsocial family processes are embedded in activity settings, the functional analysis of problem behavior and the assessment of coercive processes are readily incorporated into an assessment of family routines (Lucyshyn et al., 2002). Second, the assessment of child activity settings -- their objective and subjective features -- can contribute to the design of interventions that are individualized to the child and culturally sensitive to the family. Third, embedding behavioral interventions into daily family routines may promote the long-term maintenance of intervention outcomes (O'Donnell & Tharp, 1990).

On this basis, we developed an ecological unit of analysis and intervention – coercive processes in family routines -- that incorporates child problem behavior, parent-child interaction, and the activity settings of daily and weekly routines in the home and community. In preliminary behavioral intervention research with families, we have used the construct to guide the design and implementation of positive behavioral interventions in natural family contexts. Single subject analyses with families of children with disabilities and severe problem behaviors indicated that the intervention approach was acceptable to families, effective at improving child behavior, and sustainable over time. (Lucyshyn, Albin, & Nixon, 1997; Lucyshyn et al., 2003). However, as discussed above, there remains little to no empirical evidence of the existence of the construct in the lives of families raising children with developmental disabilities who engage in serious problem behavior. Thus we sought to confirm the validity of the construct of coercive processes in family routines.

The primary aim of the study was to empirically investigate the construct validity of coercive processes in the daily routines of families raising young children with developmental disabilities who engage in problem behavior in the home. We did so in service to building an empirical foundation for an acceptable, effective, and sustainable ecological approach to behavioral assessment and intervention. To do so, we used a model of construct validity developed by Messick (1988). In this model, in addition to *evidence* of a construct's interpretation (discriminant validity; concurrent validity) and use (predictive validity; social validity), there also is concern with the *consequences* of a construct's interpretation (values implications) and use (social consequences). Accordingly, we posed a series of questions that sought evidence of the construct's discriminant validity, concurrent validity, and social validity. Three questions tested hypotheses about coercive processes in family routines and one question sought family perspectives about these processes:

1. In routines in which a parent is occupied in non-child centered tasks (e.g., preparing supper, cleaning up kitchen, talking with older sibling), do parents and children engage in attention-driven coercive processes comprised of the following four steps: (a) parent busy; (b) child problem behavior; (c) parent delivers negative or positive attention; and (d) child terminates or reduces problem behavior?

2. In routines in which parent demands are common (e.g., dinnertime, homework, structured play), do parents and children engage in escape-driven coercive processes comprised of the following four steps: (a) parent demand; (b) child problem behavior; (c) parent terminates and/or reduces demand; and (d) child terminates and/or reduces problem behavior?
3. Do families who experience coercive processes in two or more valued routines in the home also experience higher levels of parenting stress, social isolation, and child locus of control compared to normative levels for these global measures of family functioning?
4. How do parents view the social validity of the construct of coercive processes in family routines? That is, following a post-observation debriefing, how do families perceive the accuracy, importance, acceptability, and usefulness of the construct?

Methods

Participants

Ten families of children with developmental disabilities participated in the study. Families were recruited through referrals from non-profit organizations that provided family support and/or advocacy services to families, and from public agencies that provided special education services. Families were contacted by phone, informed of the study, and invited to provide informed consent for participation in an initial screening process. The screening process included a brief assessment interview about child problem behavior in home routines and pilot observations to verify problem behavior in routines. Children and families who met the following criteria were invited to participate in the study: (a) child with a developmental disability engaged in durable problem behaviors in two or more family routines in the home; (b) parents expressed willingness to be observed with their child in the home for a period of one-year; and (c) the parent(s) reported that the family was not experiencing a crisis due to the child's problem behaviors or other family issues (e.g., serious health problem).

All 10 families who met the criteria for participation agreed to participate in the study. The children with disabilities (focus children) ranged in age from 4- to 8-years old. Eight children had a diagnosis of autism and two children had the diagnosis of mild to moderate mental retardation. Four children were non-verbal, two children had delayed verbal language skills, and four children had near age level verbal language skills. All focus children lived at home with their families and attended a neighborhood preschool or public elementary school. Ten mothers were the primary parent participants in the observational research study. Two fathers and twelve siblings also participated in the study by their presence in observation sessions in the home. Nine families included both parents while one parent was a single mother.

Settings

For each of the 10 families, one or two home routines were collaboratively selected and defined for systematic observation and analysis. The routines represented typical contexts in

the home (e.g., free-time, dinner-time, homework) that were valued by the child's parent(s) but that were unsuccessful due to child problem behaviors. A valued routine was defined as one that the child's parent(s) ranked in the top four routines for change and that the parent(s) viewed as important to the child or family's quality of life. Guided by a structured interview protocol, the focus child's parents defined each routine in terms of the elements of a *successful* activity setting (Gallimore et al., 1993). The elements considered were time of day, place of routine, people present, resources used, parent and child tasks, and goals and values. Across the families, a total of 19 routines initially were identified for preliminary observation and assessment. A functional assessment interview (O'Neill et al., 1997) identified two categories of routines: (a) routines in which problem behaviors were positively reinforced by parent (e.g., parent delivered attention); and (b) routines in which problem behaviors were negatively reinforced by parent (e.g., parent terminated or reduced demands).

The functional assessment also identified behaviors of concern across the 10 focus children. These were physical aggression, verbal aggression, self-injurious behavior, destructive behavior, disruptive behavior, leaving assigned area/running away, inappropriate demands, physical resistance, and negative vocalizations. One to three functional assessment observations in identified routines confirmed the function of problem behavior in 17 of the 19 routines. There were a total of eight routines in which child problem behaviors were motivated by parent attention. These included three family dinnertime routines and five child free-time routines while mother was busy with non-child centered tasks. Mother busy included cleaning up after supper, working on computer, talking with older sibling, doing household chores, and preparing dinner. There were nine routines in which child problem behaviors were motivated by escape from demands. These included dinner time with family (two families/routines), after-school snack with mother, table games with mother and younger brother, evening homework routine with mother, structured play with mother (two families/routines), lunchtime with mother and younger brother, and reading time with mother. These 17 routines were included in subsequent experimental observations and analysis.

Parent and Child Coding System

To measure coercive patterns of parent-child interaction in family routines, we developed an observational coding system using guidelines described by Bakeman and Gottman (1997) for the sequential analysis of dyadic interaction in real time. The Parent and Child Coding System (PACCS) (Lucyshyn et al., 2000) is a "macro" coding system consisting of 17 parent and child coding categories and their constituent defining codes. There are eight parent behavior categories and nine child behavior categories. Categories are mutually exclusive and exhaustive. They are organized in hierarchical order for both members of the dyad. The hierarchy allows a coder to select one code when a parent or child is engaged in two behavior categories at the same time (e.g., washing dishes *and* making a demand, playing with a toy *and* screaming). Categories that are more functional or salient within the interaction, given the framework of coercion theory, are ranked higher in the hierarchy. For example, in the context of a parent washing dishes and making a demand, the demand is more salient and thus coded. The coding system is based on a turn-taking scheme for parent

and child interaction. It is designed to be sensitive to changes in behavior categories: (a) within one person's turn; and (b) across turns between parent and child. Parent behavior categories and their respective agent-action codes, in hierarchical order, are: 1) Parent Negative Attention (PNA); 2) Parent Request/Demand (PRD); 3) Parent Positive Attention (PPA); 4) Parent Physical Assistance (PPA); 5) Parent Noncomply (PNC); 6) Parent Comply (PCO); 7) Parent Other Behavior (POT); and 8) Parent Occupied (POC). Child behavior categories and their respective agent-action codes, in hierarchical order, are: 1) Child Problem Behavior (CPB); 2) Child Problem Behavior with Noncompliance (CPN); 3) Child Problem Behavior with Compliance (CPC); 4) Child Noncomply (CNC); 5) Child Comply (CCO); 6) Child Request/Demand (CRD); 7) Child Positive Attention (CPA); 8) Child Other Behavior (COT); and 9) Child Occupied (COC). The category 'Other Behavior' refers to parent or child verbal behavior that is neutral, nondirective, or unclear. The category 'Occupied' refers to parent or child engagement in a routine-related, action, task or activity or to engagement in an interaction with another family member.

Coder Training and Supervision

An undergraduate student in psychology served as the primary coder for the study. This coder was kept blind to the hypotheses of the study. A professional coder with eight years of experience coding dyadic interaction served as training coordinator and master coder. The coordinator's responsibilities included training the coder, conducting interobserver agreement sessions, and providing ongoing supervision. Training occurred across a period of 3 months and involved approximately 60 total hours of direct training. Training activities included reading and discussion of the coding manual, simulated coding exercises, and coding pilot observations of the 10 families. The criterion to begin coding experimental sessions was an average of 85% interobserver agreement for parent behavior categories and for child behavior categories across two consecutive agreement sessions with pilot videotaped observation data. Following initial training, the training coordinator met with the coder on a weekly basis to answer questions, review coding definitions and rules, correct errors in coding, and assign recoding of sessions in which common coding errors occurred.

Observation Sessions

Four trained observers conducted videotaped observations in the home. Guidelines for home-based observations described by Patterson (1982) were implemented (e.g., family members stay within view of observer, no guests or phone calls, no talking to observers during videotaping). Between 6 and 20 observation sessions were completed in each routine with each family (mean = 14 sessions per family). A total of 246 observation sessions were completed across 17 routines and 10 families over a period of 6 to 9 months. To ensure parent and child safety during observations, a criterion level of intolerable behavior was established with each family. During an observation, the observer asked the parent to read a brief description of the routine and then attempt to engage in the routine for between 5 and 15 minutes. The parent also was reminded to signal the observer to stop the observation if the child's behavior reached the criterion level of intolerable behavior, or if the parent no longer wanted to continue the observation. The observer then took a predetermined position in the home and began videotaping parent and child interaction during the routine. The routine continued until 15 minutes had passed, an intolerable level of problem behavior

occurred, or the parent signaled to terminate the session. After a routine was completed or terminated, the observer videotaped parent-child interaction for 10 additional seconds and then terminated the observation. The purpose was to briefly observe child behavior after the routine was terminated.

Coding Videotaped Observation Sessions

Preliminary analysis of individual family data indicated that 10 to 12 observation sessions per family were sufficient to meet the parametric assumptions of a normal distribution upon which the sequential analysis program was based (see Bakeman & Quera, 1997). For this reason, for families with more than 12 observation sessions, a random sample of 12 sessions was selected for experimental coding. For families with fewer than 12 sessions, all sessions were retained for coding. For all sessions that lasted more than 10 minutes, the final 10 minutes were coded. A total of 181 sessions were coded.

All coding took place in a data room that included an IBM compatible-computer, a computer monitor, a High-8 video-player, and head phones. The *Observer Video-Pro* software published by the Noldus Corporation (Noldus et. al., 2000) was used to code videotaped observations sessions. Videotaped observation sessions were converted to digital data and saved in the hard-drive of the computer. The digitized videotaped session was then displayed in a “video box” on the computer monitor. A videotape control panel also appeared on the monitor screen, and allowed the observer to control the movement of the observation session as it played in the video box on the monitor.

For all coding sessions, coders used a paper-and-pencil scoring format. The format was similar to that of the Marital Interaction Coding System (MICS) used by behavioral researchers in the field of marital interaction (Heyman, Weiss, & Eddy, 1995). An observation sheet is composed of 10, 30-second lines for both the parent and child. The coder marks, within a 30 second line, the agent-action codes (e.g., PRD for parent demand, CPB for child problem behavior) that define parent and child behavior during the interaction. This process is repeated for reach 30-second line until the interaction is completed or terminated.

Interobserver Agreement

Interobserver agreement sessions were held for 20 percent of observation sessions balanced across families and routines. During an interobserver agreement session, the coder and training coordinator independently observed and coded the videotaped session at different times. The training coordinator then computed interobserver agreement scores for parent behavior categories and for child behavior categories. The formula used was Total Agreement times 2 divided by Total Codes for Observer 1 plus Total Codes for Observer 2 times 100%. Average interobserver agreement across all parent and child behavior categories was 83%. For parent behavior categories, average interobserver agreement was 85%. For child behavior categories, average agreement was 79%. For individual parent behaviors, percentage agreement was as follows: 74% for negative attention, 93% for request/demand, 79% for positive attention, 86% for physical assistance, 77% for non-comply, 72% for comply, 82% for other behavior, and 84% for occupied. For individual

child behaviors, percentage agreement was 84% for problem behavior, 87% for problem behavior with non-compliance, 73% for problem behavior with compliance, 70% for non-comply, 84% for comply, 82% for request/demand, 50% for positive attention, 75% for other behavior, and 73% for occupied. In dyadic interaction research, such as studies of parent-child or husband-wife interaction, interobserver agreement scores of 70% or above are considered acceptable (see Aspland & Gardner, 2003; Kiecolt-Glaser et al., 1997; Reid, 1978). Codes which fell below a minimum agreement of 70% (i.e., child positive attention – CPA) were excluded from the subsequent sequential analysis.

Data Entry and Sequential Analysis

For the 17 routines, the master coder entered parent and child codes, in the sequence of their occurrence, into the data collection function of the *Observer Video-Pro* software program (Noldus et al., 2000). After data for one observation session was entered, an *Observer* data file was saved for that session. After all sessions for one routine were entered and saved, the OTS software program (Bakeman & Quera, 2000) was used to convert these *Observer* data files into a format compatible with a sequential analysis software program called the Sequential Data Interchange Standard and General Sequential Querier (SDIS/GSEQ) (Bakeman & Quera, 1995). These data were then merged into: (a) 17 *within* routine aggregate files composed of all observation sessions for one routine of one family; (b) one *across* attention-driven routines aggregate file composed of all within routine aggregate files for the eight attention-driven routines; and (c) one *across* escape-driven routines aggregate file composed of all within routine aggregate files for the nine escape-driven routines. Following this merging of files within routines, and across routines that shared the same function of child problem behavior, a second conversion of files was performed using a software program called “Cycles” (Bakeman, personal communication, October 14, 2000). Cycles is designed to control for irrelevant or trivial codes that are interspersed within patterns of coercive interaction (e.g., after a parent demand, parent engages in one or more different parent behavior categories *before* child complies or non-complies). These behaviors tend to obscure stable patterns of interaction when using traditional lag sequential analysis (M. Stoolmiller, personal communication, October 17, 2000). Cycles converts each file of parent and child interaction data into a series of parent-child behavior *cycles*. A cycle is comprised of one or more parent codes followed by one or more child codes. Thus, each cycle is represented by one line, or cycle, of parent-child interaction.

Following the creation of aggregate Cycles files within and across routines, we used the General Sequential Querier (GSEQ) for Windows (GSQ for Windows, Version 3.8) (Quera & Bakeman, 2000) to conduct sequential analyses of our hypotheses about coercive processes within individual family routines and across an aggregate of routines that shared the same hypothesized function. Specifically, we posed questions that statistically tested for the presence of the two, three, and four steps in the sequential pattern for an (a) attention-driven coercive process, and (b) escape-driven coercive process. For individual routine and aggregate analyses, we used the logic of the Cycles program to pose three generic questions:

1. Given the first step in the hypothesized process (e.g., parent demand), what is the conditional probability of the second step in the process (e.g., child problem behavior) occurring in the same cycle (lag 0)?

2. Given the first and second hypothesized steps in the process (e.g., parent demand followed by child problem behavior) occurring in one cycle, what is the conditional probability of the third step (e.g., parent withdraws or reduces demand) occurring in the next cycle (lag 1)?

3. Given the first and second steps in the process (e.g., parent demand followed by child problem behavior) occurring in one cycle, what is the conditional probability of the third and fourth steps in the process (e.g., parent withdraws or reduces demand, followed by child terminates or reduces problem behavior) occurring in the next cycle (lag 1)?

To pose these questions, using GSEQ for Windows (Bakeman & Quera, 2000), we developed a set of "supercodes" for each step in the hypothesized coercive sequence for attention-driven routines and escape-driven routines. The supercodes allowed us to combine two or more behavior categories together to represent a step in the coercive sequence (Bakeman & Quera, 1997). The supercodes represented conceptual categories composed of one or more descriptive codes. For example, supercodes for escape-driven routines were: (a) Parent Trigger (Demand) (PTR); (b) Child Problem Response (CPR); (c) Parent Withdraw Demand (PW); (d) Parent Reduce Demand (PR); (e) Parent Withdraw or Reduce Demand (PWR); (f) Child Appropriate/Acceptable Behavior (CAB); and (g) Child Appropriate/Acceptable Behavior or Reduce Problem Behavior (CAR).

We then used GSEQ for Windows (Quera & Bakeman, 2000) to answer our statistical questions. For each question posed, GSEQ generated the following sequential analysis results: (a) a 2 × 2 contingency table comprised of the lag frequency of target behaviors and residuals (i.e., all other codes); (b) the conditional probability of the target behavior given a criterion behavior; (c) adjusted residuals, which are equivalent to binomial z-scores; and (d) the probability value (p) of the adjusted residual for the predicted pattern of parent-child interaction. Two, three, and four step patterns of parent-child interaction that were statistically significant (i.e., $p \leq .05$) were viewed as stepwise confirmatory evidence for our hypotheses.

Concurrent Validity Assessment

To assess the concurrent validity of coercive processes in family routines, we also hypothesized that coercive processes operating in two or more valued family routines would covary with psychological measures of family functioning. Three family functioning measures, described below, were administered to the ten mothers participating in the study.

Parenting Stress Index (PSI)—The PSI (Lloyd & Abidin, 1984) is a 121-item self-report questionnaire designed to measure the relative magnitude of stress in the parent-child system. From a normative sample of 2,633 mothers, it has been standardized for use with parents of children one to twelve years of age. Parent responses generate a total stress score that is converted into a percentile score, which is derived from the frequency distribution of the normative sample.

Social Support Questionnaire (SSQ)—The SSQ (Sarason, Levine, Bashom, & Sarason, 1983) is a 27-item self-report questionnaire designed to quantify the availability of and satisfaction with the social support available to a person. The SSQ yields: (a) mean N-scores of how many people are available to provide support; and (b) mean S-scores for level of satisfaction with social supports. Mean scores for the SSQ are based on a sample group of 602 individuals.

Parent Locus of Control Scale (PLOC)—The PLOC (Campis, Lyman, & Prentice-Dunn, 1986) is a 47-item self-report questionnaire designed to measure parent locus of control (i.e., the parent's or child's power in a given child-rearing situation). Although actual norms are not reported, means for a group of 60 parents who did not report difficulties in the parenting role are distinguished from means of 45 parents who requested counseling services for parenting problems. The PLOC measures five factors: Parent efficacy, parent responsibility, child control of the parent's life, parent belief in fate or chance, and parental control of child's behavior.

All three measures have been shown to possess adequate to good discriminant and convergent validity for interpreting family functioning in clinical and nonclinical populations (Campis et al., 1986; McKinney & Peterson, 1984; Sarason et al., 1983). Each child's mother was provided with written instructions and completed the scales independently.

Social Validity Assessment

After observations were completed with individual families, the focus child's parent(s) participated in a social validity assessment, conducted by the principal investigator, comprised of a debriefing session about the study and a semi-structured interview. The purpose was to assess family perspectives on the accuracy, acceptability, and potential usefulness of the construct of coercive processes in family routines. First, the principal investigator debriefed the family about the study's hypotheses, of which they had remained blind throughout the study. The principal investigator described and illustrated the specific hypotheses about coercive parent-child interaction in the observed routine(s). Following this debriefing, parents responded to a series of semi-structured questions about family perspectives on: (a) the accuracy of the hypothesized attention and/or escape-driven coercive process operating in their family routine(s); (b) the acceptability of the interpretation of coercive family processes in routines; and (c) the potential usefulness of the construct. The interview was audio-taped and later transcribed. A simple, quantitative (i.e., number of parents who viewed construct as accurate) and qualitative analysis (i.e., emergent themes related to usefulness of construct) of family responses to questions in the social validity assessment protocol were then completed and summarized.

Results

Attention-Driven Coercive Processes

Results for hypothesis 1, about attention-driven coercive processes in family routines, are presented in Table 1. Within routine and across routine sequential analyses are shown for

five families and eight routines. Results show the lagged frequencies (JNTF), conditional probabilities (CONP), binominal z-score equivalents (ADJR), and levels of statistical significance (PVALUE) for the four-step, attention-driven coercive process in home routines. In these routines, parents were occupied in non-child centered tasks or activities such as preparing supper or doing a household chore. Overall, statistically significant (i.e., $p < .05$) relationships were evident for all eight routines during the first two steps in the attention-driven coercive process, for seven of eight routines through the third step in the process, and for six of eight routines for the full four steps. Aggregate results across families/routines indicated a strong (i.e., high lagged frequencies) and stable (i.e., high levels of statistical significance) relationship at each point in the dyadic interaction. Across individual routines, given that a parent was occupied or unresponsive (POC, PNC), the conditional probability that the child engaged in problem behavior within the same cycle (lag 0) ranged from .30 to .58. Significance levels ranged from .02 to < .001. Given these first two-steps in the coercive sequence within a cycle, the conditional probability that the parent delivered some form of attention (PNA, PPA, PAS, PRD, and/or POT) in the next cycle (lag 1) ranged from .48 to .94 ($p < .09$ to < .001). Finally, given that the first two steps in the coercive sequence occurred within a cycle, the probability that the parent delivered attention followed by the child terminating problem behavior (i.e., returning to appropriate or acceptable behavior; COC, COT, and/or CCO) in the next cycle (lag 1) ranged from .18 to .42 in four of eight routines ($p < .02$ to < .05). Alternatively (see data in bold-type), given the first two steps in the coercive process, the probability that the parent delivered attention followed by the child terminating (COC, COT, and/or CCO) or reducing (CPC) problem behavior was statistically significant for two routines and approached significance for a third routine. Conditional probabilities ranged from .19 to .49 with p values from < .09 to < .02. For one routine (F6B, Dinner), the full four steps in the coercive sequence were not statistically significant. When we combined 86 observation sessions across the eight routines, the first two steps, first three steps, and full four steps in the attention-driven coercive sequence all evidenced statistically significant relationships. In addition, high lagged frequencies suggested that the four-step coercive process was of reasonable magnitude (i.e., a stable pattern that was well represented in the data set). Given that parents were busy/unresponsive followed by children's problem behavior, the conditional probability that the parents delivered attention followed by the children terminating problem behavior was .28 ($p < .04$).

Escape-Driven Coercive Processes

Results for hypothesis 2, about escape-driven coercive processes in family routines, are presented in Tables 2 through 4 (see Tables 2 through 4). Within routine and across routine sequential analyses are presented for seven families and nine routines. Sequential analysis results for home routines in which parent demands are common showed a wider range of stable patterns of parent-child interaction compared to the sequential analysis of home routines in which the parent is busy and thus less responsive to the child. In Tables 2 and 3, we summarize results for two variations of the hypothesized four-step, escape-driven coercive sequence. In Table 4, we present results for one divergent pattern that more fully characterized the process of interaction for the seven families and nine routines. First we asked, given a parent demand followed by child problem behavior, did the parent withdraw

the demand followed by the child terminating problem behavior? This question represented one of the four-step processes defined by Patterson in coercion theory (Patterson, 1982). Individual routine and aggregate results, summarized in Table 2, show a stable relationship for the first two steps but not for the third and fourth steps in the hypothesized escape-driven process. Across individual routines, given a parent demand (PRD), the conditional probability that the child engaged in problem behavior (CPN or CPB) was statistically significant for eight of nine routines, with one routine approaching significance. Conditional probabilities ranged from .33 to .80 ($p < .06$ to $< .001$). However, given these first two steps in the interaction, the conditional probability that the parent withdrew the demand (POC or POT) was significant in the hypothesized direction for only one of the nine routines (F3A, Homework). Finally, given the first two steps in the process, the conditional probability that the parent withdrew the demand followed by the child terminating problem behavior (COC or COT) was not significant in the hypothesized direction for any of the nine routines. When we combined 95 observation sessions across the nine routines, the first two steps in the coercive sequence evidenced a strong and stable relationship (lagged frequency of 1318, with a conditional probability of .62 and $p < .001$). However, the first three and full four steps in the process did not evidence a stable relationship. Given a parent demand followed by child problem behavior, the conditional probability that parents withdrew the demand followed by children terminating problem behavior was not significant in the predicted direction.

Given these initial results, we posed a second question that examined an alternative, moderated pattern of escape-driven coercive interaction: Given a parent demand followed by child problem behavior, did parents *reduce* the demand followed by children terminating or *reducing* problem behavior? A reduction in parent demand was defined as the parent engaging in negative but non-directive attention (PNA), positive attention (PPA), or physical assistance in the form of help to the child (PAS). Child reduction of problem behavior was defined as problem behavior with compliance (CPC) or non-compliance without other problem behavior (CNC). These results are presented in Table 3.

Individual and aggregate results provided modest support for this alternative hypothesis. Given a parent demand followed by child problem behavior, the conditional probability that parents reduced the demand (PNA, PPA, or PAS) was statistically significant for six of nine routines and approached significance for one routine. Conditional probabilities ranged from .32 to .77 with p values of .12 to .001. Given the first two steps in the process, the conditional probability that parents reduced the demand followed by children terminating or reducing problem behavior (CPC, CNC, or CCO) was significant for one routine (F3A, homework; $p < .001$) and approached significance for another (F5A, dinner; $p = .06$). Aggregate results across routines and families evidenced an overall stable relationship: Given a parent demand followed by child problem behavior, the conditional probability that parents reduced the demand followed by children terminating or reducing problem behavior was .17, with a p value of $< .01$. However, because individual routine analyses revealed a stable, four-step, escape-driven coercive process in only two of nine routines, the process should be viewed as one of low magnitude.

To find a four-step process that was more representative of parent-child interaction, we posed a fourth question: Given a parent demand followed by child problem behavior, did parents withdraw or reduce the demand but children *continue to engage in problem behavior*? We chose this question because we noticed that during observations, focus children appeared to continue to engage in problem behavior even though parents had withdrawn or reduced task related demands. Thus, we tested an alternative hypothesis based on clinical observation rather than theory. Results for this divergent hypothesis are presented in Table 4.

Results showed a stable and more predominant pattern of parent-child interaction in routines in which parent demands are common. Given a parent demand followed by child problem behavior (CPN or CPB), the conditional probability that parents withdrew or reduced the demand (PNA, PPA, or PNC), but children continued to engage in problem behavior was statistically significant for six of the nine routines. Conditional probabilities for these routines ranged from .16 to .31 ($p < .05$ to $< .001$). The aggregate analysis confirmed the stability and magnitude of this relationship. Across seven families and nine routines, the four-step process occurred 287 times with a conditional probability of .21 and a significance level of $< .001$.

Concurrent Validity with Psychological Measures of Family Functioning

Global measures of family functioning indicated that mothers in the study evidenced higher levels of parental stress, less social support, and a somewhat stronger perception of child locus of control compared to normative or clinical comparison groups. For the Parenting Stress Inventory (Lloyd & Abidin, 1984), the normal range for scores is between the 15th and 80th percentile. High scores are considered to be those above the 85th percentile. The total stress scores for parents in the study ranged from 224 (55th percentile) to 339 (99th percentile). Only one parent's score fell within the normal range of relative stress. The overall mean stress score across the 10 parents was 291.2, well above the 90th percentile.

For the Social Support Questionnaire (Sarason et al., 1983), normative comparison group mean N-scores are 114.75, while mean S-scores are 4.25. The 10 mothers in this study reported an average N-score of 90.1 (range 53–141), indicating that the average number of persons available to provide support was significantly less than the average score of the comparison group. The parents reported an average S-score of 4.2, slightly below the average satisfaction score of the comparison group, indicating that mothers in the study were fairly satisfied with the social support available to them.

On the Parent Locus of Control Scale (Campis et al., 1986), parents reported scores in the areas of child control of parent behavior and belief in fate or chance within the range of the comparison group reporting parenting problems. However, parents also reported scores in the areas of parental efficacy, parental responsibility, and parent control well within the range of the comparison group reporting no parenting difficulties.

Overall, these results provide some concurrent validity for the third hypothesis about coercive processes in family routines; that is, lower levels of global family functioning (e.g., high levels of parenting stress, lower levels of social support, perception of child control of

parent behavior) were associated with the occurrence of coercive patterns of parent-child interaction in one or two valued routines in the home. However, this evidence of concurrent validity is moderated by the parents' relative satisfaction with the social support they received and their normative perceptions about their own efficacy, responsibility, and control.

Social Validity Assessment

Nine of the 10 families in the study participated in the social validity assessment interview. Results indicated that eight of nine families perceived the construct of attention-driven and/or escape-driven coercive processes to accurately reflect their interactions with their child in focus routines. The dissenting parent, who was involved with her 4-year-old son in two escape-driven routines, noted accurately that no matter what she did during the routines, the child persisted with problem behavior rather than terminate problem behavior. All nine parents viewed the construct to be acceptable and non-blaming, but with one caution. Several parents stated that professionals who assess the occurrence of coercive processes in the home should share the results descriptively rather than blame or judge the family. All parents viewed the construct as important and potentially helpful, but only a few parents were able to generate logically linked strategies to overcome coercive patterns of interaction. Some parents commented that the construct of coercion in family routines would most likely be useful if professional assistance and support were directly aimed at helping parents overcome these problematic patterns of parent-child interaction.

Parents also described their experiences and perspectives on the occurrence of coercive processes of interaction with their child with a disability. A few parents commented thoughtfully that until they received professional assistance focused on altering the coercive dance, they had little choice but to continue to submit to the child (e.g., serving the child only preferred foods during dinner, giving the child undivided attention when she demanded it). They perceived that doing so, at least in the short-term, had the benefit of preserving the family unit. For instance, three parents independently stated that attempting to enforce routine related demands on their child by not backing off in the face of problem behavior would only exasperate stress levels in the home and might lead to the break-up of the family (e.g., seeking out-of-home placement for the child). A second less-than-desirable option that parents reported was to avoid some problematic routines altogether (e.g., not reading to child, only talking to one's older daughter when the younger daughter with a disability was at school or asleep). From these parents' perspectives, until they received help in ameliorating these processes of interaction, the price of preserving relative peace and quiet in the home was fewer family routines that were valued or successful.

Discussion

Results provided preliminary, partial empirical support for the validity of the construct of coercion in family routines among parents of children with developmental disabilities. Individual and aggregate results documented the presence of stable, attention-driven coercive processes in typical home routines in which parents were occupied in non-child centered tasks. Sequential analyses revealed statistically significant, reciprocal processes of

positive and negative reinforcement between the parent and child for five families in seven of eight routines. That is, when the parent was busy with a non-child centered task such as preparing supper or washing dishes, the child engaged in problem behavior. The parent then delivered some form of attention, followed by the child terminating or reducing problem behavior.

Results were less definitive for the hypothesis of escape-driven coercive processes in routines in which parent demands are common. Results did not offer evidence of the four-step escape-driven pattern of coercion documented by Patterson and colleagues (Patterson, 1982) in which a parent demand followed by child problem behavior predicted the parent withdrawing the demand followed by the child terminating problem behavior. Instead, modest evidence for a moderated reciprocal process of negative reinforcement was shown. Parents, rather than withdraw a demand after problem behavior, tended to reduce the demand by delivering negative attention (e.g., making a negative but non-directive comment), positive attention (e.g., making a humorous comment), or physical assistance (e.g., helping child perform task). Similarly, the children with developmental disabilities tended not to terminate problem behavior after parents withdrew or reduced a demand. Instead, they tended to reduce problem behavior by complying while still engaged in problem behavior, by not complying without additional problem behavior, or by complying to (i.e., not resisting) physical assistance. An alternative four-step pattern of parent-child interaction proved to be more prevalent in the escape-driven routines. Given a parent demand followed by child problem behavior, even though parents withdrew or reduced the demand, children continued to engage in problem behavior.

Four factors may account for the low magnitude of children's reduction or termination of problem behaviors following the parents' reduction or termination of demands. First, children may not have reduced or terminated problem behavior in the fourth step of the hypothesized escape-driven coercive process because the routines may have acted as a pervasive setting event (Horner, Vaughn, Day, & Ard, 1996). That is, as long at the child was in the routine, there was a strong likelihood that parents would direct aversive task demands to the child. Thus, in addition to the value of escaping parent demands, there also was value in escaping the routine itself. Anecdotal evidence for this factor was the observation of children sometimes escaping the routine by walking or running away and going into another area of the house. When children were observed to be outside the physical boundaries of the routine (e.g., away from dining room table, away from homework), they typically decreased or terminated problem behavior. An examination of the final parent-child interaction in the last 10 seconds of observation sessions in escape-driven routines (i.e., after the parent terminated the routine) showed that children had returned to appropriate or acceptable behavior (e.g., COC, COT, CCO) in 73% of sessions.

A second factor relates to the children's arousal level. When children in escape-driven routines engaged in problem behavior, they often appeared to be in a heightened state of arousal. Their facial expressions and movements grew agitated and their speech or vocalizations became louder and/or distressed. When children with disabilities enter a heightened state of arousal, it may take longer for them to return to a previously calm state, even when the surrounding conditions no longer present triggers for escape-motivated

problem behavior (Boccia & Roberts, 2000; Freeman, Horner, & Reichle, 1999). Although parents may have reduced or withdrawn a demand, the children's high state of arousal may not have decreased quickly enough to allow the child to reciprocate by reducing or terminating problem behavior.

A third and related factor may involve the interval of time between requests/demands by parents. During parents' attempts to engage their child with a disability in valued routines in which demands were common (e.g., dinnertime, homework), parents engaged in an average rate of 2.8 requests/demands per minute. This rate may have represented reactivity by parents to the observation protocol in which they were asked to attempt the routine for 5 to 15 minutes. If the focus children more commonly experienced fewer demands during routines and a larger interval of time between demands, then it might have been difficult for focus children to discriminate that a demand had been terminated under the observation session conditions operating. Thus, the children may have been more likely to continue to engage in problem behavior even though parents momentarily terminated requests/demands.

A fourth factor is measurement error. An analysis of the PACCS coding system indicated that it was insensitive to the measurement of one form of decrease in child problem behavior. As mentioned above, when children escaped the routine by leaving the area of the routine, they were anecdotally observed to reduce or terminate problem behavior. However, the PACCS included the state of being "out of assigned area" as a defining code in the child problem behavior category. For this reason, when children were away from the routine, their behavior was coded as CPB or CPN, even though they may have terminated or reduced all forms of externalizing problem behavior (e.g., during a homework routine, the child walks away from his homework, goes into his bedroom, and plays appropriately with his toys).

Results also provided preliminary evidence for the concurrent validity of coercive processes in family routines. Global measures of family functioning showed that families experienced pronounced levels of parenting stress, less social support, and greater perceptions of child control of parent behavior compared to normative levels for parents. These results were consistent with other studies of the well being of families raising children with disabilities and problem behavior (Orr, Cameron, Dobson & May, 1993). They also reflected the findings of a recent qualitative study of family perspectives on problem behavior (Turnbull & Ruef, 1996). Parents of children and youth with autism or mental retardation reported that their son or daughter's problem behavior injected stress into family routines and that they needed more support to effectively manage routines in the home.

The study also suggests that the construct of coercive processes in family routines is socially valid in that most participating families viewed it to be accurate, acceptable, and potentially useful. However, the social validity of the construct is predicated on it being interpreted in a descriptive and normative manner rather than in a blaming fashion that suggests family dysfunction. Overall, results suggest that the social validity of the construct may be enhanced if professionals emphasize to families that coercive processes can develop naturally in routines in which demands are common or a parent is necessarily busy, and that the amelioration of such processes of interaction are difficult for most families to accomplish on their own without sustained professional assistance.

This study offers three contributions to behavioral family assessment. First, the study represents the first comprehensive empirical investigation of four-step coercive processes operating in the lives of families raising young children with developmental disabilities and problem behavior. The study extends Patterson's coercion theory beyond aggressive boys (Patterson et al., 1992) to include boys and girls with developmental disabilities such as autism and mental retardation. This study suggests that like the children with conduct disorders in Patterson's studies, young children with developmental disabilities also can play the role of architects of coercion in the home through their use of problem behavior to affect parent behavior. The study suggests that their mothers, if not unacknowledged victims (Patterson, 1980), are at least reluctant partners in this dance of coercion by submitting to the child in the form of either positive (e.g., parental attention) or negative (e.g., reduction or termination of demands) reinforcement. The children in turn negatively reinforce parental submission by reducing or terminating problem behavior, thus perpetuating the four-step dance in the social ecology of the family.

The study also indicated some differences with families of children with conduct disorders. Patterson reported that parents of aggressive boys tended to escalate into equally coercive behavior in response to the child's problem behavior (Patterson, 1976). He also reported that these parents tended to have inept parenting skills and to evidence symptoms of psychopathology (Patterson, 1980). A similar conclusion was presented by Loeber, Farrington, Stouthamer-Loeber, and Van Kammen (1998) in a study of approximately 1,500 young boys with externalizing behaviors. However, in the present study, mothers did not tend to escalate into intense aversive behaviors in response to their child's persistent problem behavior. Across all routines, for example, mothers delivered high rates of requests/demands (3.0 per min[1]), physical assistance (2.0 per min), and/or positive attention (1.0 per min). Although they also delivered negative attention, it occurred relatively less often (0.7 per min) and typically was limited to expressions of disapproval or exasperated comments in a negative tone of voice. Observations and global measures also did not indicate that mothers were generally inept at parenting or that they had symptoms of psychopathology. In the target routines, several mothers were observed effectively parenting siblings in the midst of difficulties with the focus child. In spite of the child's persistent problem behavior, mothers often displayed forbearance, affection, and even humor. Although parent self-report measures indicated high levels of stress, lower levels of social support, and a perception of child control of the parent, they also indicated that parents were satisfied with the social support they received and that they perceived themselves also to experience normative levels of parental efficacy, responsibility, and control in relation their son or daughter with a disability.

These observations and results are consistent with other studies of families of children with disabilities that revealed coping strengths in the midst of parenting stress (Summers, Behr, & Turnbull, 1989). This interpretation also is consistent with the findings of Floyd and Phillippe (1993) in a comparative study of two-step coercive exchanges in families of children with and without mental retardation. They found that, in relation to the comparison

[1]Base rate of parent behavior across all observation sessions

group, the parents of children with mental retardation issued higher rates of commands and attempts to gain compliance, but did not engage in higher rates of coercion and aversiveness. The present study suggests that although parents may experience coercive processes with their child with a disability, and these processes may be associated with diminished family functioning, coercion in these families may not be associated necessarily with a general lack of parenting skills or with psychopathology.

The study also adds to coercion theory by showing how typical family activity settings may lend themselves to different types of coercive exchanges. In home routines in which parents are commonly busy and not attending to the child, the study suggests that parents of children with disabilities are at risk of falling into attention-driven coercive processes. Because parents have many other responsibilities, and thus cannot be consistently responsive to their child, such attention-driven processes may be almost inevitable unless families possess knowledge and skills in special education and behavior management. Some level of expertise is typically necessary to teach and manage children with disabilities in school settings (Snell & Brown, 2000). This very likely applies to home settings as well. In home routines in which demands are common, the study suggests that parents may get caught in coercive exchanges involving reciprocal negative reinforcement in which children terminate or reduce problem behaviors only after parents wholly or partly submit to the child by terminating or reducing routine-related demands. However, the study also suggests that even if parents reduce or withdraw demands, the child may persist with problem behavior as long as the routine itself continues to be in place. Unless parents are empowered with strategies to promote child participation and cooperation in routines, the only way out of these negative exchanges may be to terminate the routine all together.

A third contribution is the way in which the concept of the activity setting broadens our understanding of the effects of coercive processes on the family system. The study suggests that the child with a disability, in addition to being an architect of the social ecology of family interaction, also may play a role in constructing the physical ecology of family life. First, if a typical routine in the home cannot be avoided because it is a necessary part of family life, parents may alter the routine in a manner that avoids coercive exchanges. This alteration may render the routine no longer typical or valued by the family, but it may be tolerated because it is better than rejoining the coercive dance. For example, one parent reported preparing two meals every evening for dinner, one for her son with a disability and one for the rest of the family. The food for the child with a disability consisted of only highly preferred foods that did not trigger problem behavior. Second, if a typical routine is not essential to family life, although it may be greatly valued, it may be omitted to avoid coercive exchanges. For example, another parent reported that she avoided reading books to her son with autism because of problem behavior. In each of these situations, the child has been the architect of a diminution of family life, but also a victim of this architecture. The child is engaged in fewer normative activities with his or her family, and the family may be involved in fewer valued activities in general. This analysis is consistent with qualitative studies in which parents of children with autism or other cognitive disabilities reported minimal involvement in or avoidance of community activities due to child problem behavior (Fox, Vaughn, Dunlap & Bucy, 1997; Turnbull & Ruef, 1996).

The study offers three implications for behavioral assessment and intervention with families of children with disabilities and problem behavior. First, during a behavioral assessment, practitioners should expand their focus to take into account coercive processes of interaction between the parent and child. Currently, best practice involves a functional assessment of child problem behavior (O'Neill et al., 1997; Repp & Horner, 1999). Such an assessment essentially defines the first three steps in a coercive process (e.g., parent demand → child problem behavior → parent withdraws or reduces demand). By extending the assessment one additional step (e.g., → child terminates or reduces problem behavior), practitioners will understand the reciprocal effect of the parent on the child and the child on the parent. This knowledge may place practitioners in a better position to help parents overcome negative child effects on new parenting practices. Practitioners can help parent's understand and anticipate these effects, teach parents to be wary of the short-term rewards of submission to the child, and empower families with specific interventions aimed at preventing or overcoming negative child effects. One simple way to measure coercive processes in family routines would be to include in a functional assessment, a question about what the child does *after* parental attention is delivered, or after escape occurs. Alternatively, a brief questionnaire could be created by which parents self-evaluate the presence of coercive processes. Questions would include, for example, "In routines in which you place demands on your child, does your child engage in problem behavior;" When your child engages in problem behavior, do you sometimes withdraw the demand;" and "After withdrawing the demand, does your child sometimes calm down?" An affirmative answer to each question would suggest that one type of coercive process is operating in the home.

A second implication is the value of assessing coercive processes in specific family contexts. The study suggests that if practitioners focus behavioral assessment in specific family routines, they can identify specific types of coercive processes. In routines in which parents are busy and not attending to the child with a disability, practitioners may find attention-driven coercive processes. In routines where parental demands are common, they may find escape-driven coercive processes. Such targeted assessments may increase the overall efficiency of behavioral assessment and intervention development with families.

Third, developing behavioral interventions that help families transform coercive processes into constructive processes of interaction in valued family activity settings may enhance the sustainability of interventions in family contexts. Assessment of coercive processes in family routines would offer a more complete understanding of the ecology of problem behavior, including functions of problem behavior, parent-child interaction, and physical and cultural features of activity settings (e.g. place, time, people, resources, tasks, goals and values). Interventions then could be designed to address and fit each level of ecology in the routine. This would include teaching the child functionally equivalent behavior to replace problem behavior and teaching the family to recognize and build constructive patterns of interaction. Reciprocal processes of positive and negative reinforcement would define these new patterns of interaction but instead of reinforcing problem behavior and ineffective parenting they would strengthen adaptive behavior and effective parenting practices. The aim would be to replace negative reciprocity between parent and child with positive forms of reciprocity (Dishion, Patterson, & Kavanagh, 1992). In addition, knowledge of the

physical and cultural features of the routine could help interventionists customize interventions to fit the time, place, people, resources, tasks, and goals and values of the routine as defined by the child's family (Bernheimer & Keough, 1995; Lucyshyn, Kayser et al., 2002). By doing so, interventionist may prevent or minimize sources of variability that undermine the maintenance of improvements in child behavior and parenting practices (e.g., a mismatch of intervention to function of child behavior; child effects on parenting behavior, ecological features of routines that make it difficult to implement or sustain behavioral interventions). Recently, the concept of *contextual fit* has been advanced as a means to promote the maintenance of positive behavioral interventions in home and community settings (Albin, Lucyshyn, Horner, & Flannery, 1996; Clarke, Dunlap, & Vaughn, 1999; Moes & Frea, 2000). The construct of coercion in family routines, if utilized in behavioral family intervention research, may help to further advance the notion of contextual fit as a consideration in intervention design.

Four limitations of the study require acknowledgment. First, although we used a common formula for calculating interobserver agreement (Aspland & Gardner, 2003), it also is one that has been criticized because it does not control for chance agreement (Watkins & Pacheco, 2000). Thus, our agreement scores may be overestimated. Efforts to minimize error in measurement included the employment of a professional coder to serve as training coordinator and master coder, and weekly checks on observer drift to ensure accuracy of coding. When drift checks revealed systematic error in a coded observation, the master coder retrained the primary coder on the relevant codes and the primary coder then recoded the observation session. These recoded sessions were entered into the Noldus *Observer* software program for subsequent analysis. Second, although the Parent and Child Coding System was able to detect attention-driven coercive processes, an error in its initial design appeared to make it less able to detect escape-driven coercive processes. Specifically, PACCS did not adequately discriminate decreases in problem behavior when the child exited the physical area of routines. Thus, results may underestimate the occurrence of a four-step coercive process in routines in which parent demands were common. A third shortcoming is the restriction of behavioral coding to only mother-child interaction. The study is mute on the role fathers and siblings in coercive processes. Patterson's early work, which examined coercive interaction with mothers, fathers, and siblings, indicated that mothers were the most common partners in coercive exchanges with their aggressive child (Patterson, 1980). Studies of families of children with disabilities show that mothers assume a larger portion of caregiving responsibilities for the child (see Byrne & Cunningham, 1985). Our initial assessment of routines was consistent with these findings, showing that mothers were primary caregivers for their child with a disability, and that child problem behaviors often occurred in routines in which the father was not present. Nevertheless, our findings may offer only a partial picture of coercive interaction in routines. A fourth limitation is the study's small sample size. The participation of only ten families requires caution in generalizing the results to other families raising young children with developmental disabilities and problem behavior.

The study offers the following directions for future research. First, researchers who seek to replicate these findings with other families of children with developmental disabilities

should first improve the measurement system. This would include enhancing the ability of the Parent and Child Coding System to detect decreases in child problem behavior and using a Kappa statistic (Cohen, 1977) to measure interobserver agreement. The external validity of findings would be strengthened by replication across a larger sample of families and by including fathers and siblings in the analysis. Finally, the construct validity of coercion in family routines would be strengthened if the evidential and consequential validity of the construct's use (i.e., its utility and social consequences) were examined (Messick, 1988). Such a study would examine the extent to which the construct contributes to the design of interventions that are effective, acceptable, and sustainable when implemented by families in valued but problematic routines.

Acknowledgments

The study was supported by Grant Number 1R03HD35876 from the National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health (NIH) to Teaching Research Division of Western Oregon University. It also was funded in part by Grant Number L01-0018 from the University of British Columbia (UBC) to the Department of Educational and Counselling Psychology and Special Education within the Faculty of Education at UBC. The opinions expressed within do not necessarily reflect the position or policy of NICHD, NIH, or UBC and no official endorsement by NICHD, NIH, or UBC should be inferred.

We would like to thank the following individuals for their assistance in the conception, development and completion of the study: Drs. John Reid, Gerald Patterson, and Michael Stoolmiller of the Oregon Social Learning Center, and Dr. Roger Bakeman of Georgia State University. We also wish to thank Dr. Marie Bristol-Power of the National Institute of Child Health and Human Development, National Institutes of Health for her support and encouragement. We thank the families who graciously permitted us to visit their homes for a period of nine months to one year and to videotape parent-child interaction in family routines that were unsuccessful due to problem behavior. The families' trust and forbearance allowed us to make discoveries that would not have been possible without their participation and cooperation. Following the completion of observation sessions, we also appreciated the opportunity to provide families with behavioral consultation and support for the routines that were the focus of the study. Finally, we wish to dedicate this study to Robelyn Laverty, Project Coordinator, who recently passed away. We warmly remember her many contributions to the project as well as her kindness and humanity.

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Table 1

Sequential Analysis of Hypothesized Attention-Driven Coercive Process in Routines

Sequential analysis of steps in coercive sequence using Cycles logic	Statistics	Hypothesized attention-driven routines								Aggregate results across 8 routines and 5 families
		F1A	F1B	F4A	F6A	F6B	F7A	F10A	F10B	
2-Steps: Given PBS, conditional probability of CPR within a cycle	JNTF	143	114	45	72	152	80	69	89	764
	CONP	.37	.39	.58	.45	.30	.43	.23	.38	.35
	ADJR	5.49	2.93	2.38	6.57	6.42	2.49	6.05	5.05	13.8
	PVALUE	<.001	<.01	.02+	<.001	<.001	.01+	.01+	<.001	<.001
3-Steps: Given PBS followed by CPR in a cycle, conditional probability of PAT in the next cycle.	JNTF	133	57	21	68	141	62	52	77	646
	CONP	.93	.51	.48	.94	.93	.79	.75	.86	.85
	ADJR	3.20	2.47	1.71	2.20	4.12	2.10	6.81	2.35	5.07
	PVALUE	<.001	.01+	.09+	.03+	<.001	.04+	<.001	<.02	<.001
4-Steps: Given PBS followed by CPR in the first cycle, conditional probability of PAT followed by CAB or **CAR** in the next cycle.	JNTF	60	21	9	**20**	**31**	**35**	**13**	34	212
	CONP	.42	.18	.20	**.28**	**.20**	**.49**	**.19**	.39	.28
	ADJR	2.11	2.09	1.93	**2.34**	**−0.73**	**1.71**	**2.09**	2.37	2.05
	PVALUE	<.04	<.03	<.05	**.02+**	**.46−**	**.09+**	**.04+**	<.02	<.04

Note. PBS = Parent Busy/Unresponsive; CPR = Child Problem Response; PAT = Parent Attention; CAB = Child Appropriate/Acceptable Behavior; **CAR (in bold)** = Child Appropriate/Acceptable Behavior or Reduce Problem Behavior. JNTF = Observed Joint/Lagged Frequencies; CONP = Conditional Probability; ADJR = Adjusted Residual; PVALUE = Probability Value. F1A = Family 1 Dinner Routine; F1B = Family 1 Free-time/Dishwashing Routine; F4A = Family 4 Free-time/Working on Computer Routine; F6A = Family 6 Free-time/Talking with Older Daughter Routine; F6B = Family 6 Dinner Routine; F7A = Family 7 Free-time/Dishwashing Routine; F10A = Family 10 Free-time/Dinner Preparation Routine; and F10B = Family 10 Dinner Routine.

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Table 2

Sequential Analysis of Hypothesized Escape-Driven Coercive Process in Routines: I

Sequential analysis of steps in coercive sequence using Cycles logic		Hypothesized escape-driven routines									
	Statistics	**F2A**	**F3A**	**F4B**	**F5A**	**F5B**	**F7B**	**F8A**	**F9A**	**F9B**	**Aggregate results**
2-Steps: Given PTR, conditional probability of CPR within a cycle	JNTF	322	84	33	64	235	170	17	230	201	1318
	CONP	.64	.80	.33	.45	.77	.78	.29	.43	.78	.60
	ADJR	5.43	1.92	7.10	5.60	10.91	3.60	4.97	8.90	2.63	35.4
	PVALUE	<.001	<.06	<.001	<.001	<.001	<.01	<.001	<.001	<.01	< .001
3-Steps: Given PTR followed by CPR in a cycle, conditional probability of PW in the next cycle.	JNTF	135	49	21	58	167	109	10	123	111	847
	CONP	.42	.58	.84	.92	.72	.65	.63	.54	.56	.62
	ADJR	−4.52	4.56	.69:	−1.75	−3.69	−.24	−1.97:	.90	.84	−10.58
	PVALUE	<.001−	<.001+	.49+	.08−	<.001−	.81−	.05−	.37+	.40+	< .001−
4-Steps: Given PTR followed by CPR in the first cycle, conditional probability of PW followed by CAB in the next cycle.	JNTF	22	20	8	35	16	12	3	30	23	169
	CONP	.07	.24	.32	.56	.07	.07	.19	.11	.12	.12
	ADJR	−5.87	−2.21	−2.08:	−3.55	−10.98	−4.42	−4.53:	−2.79	−2.2	−21.43
	PVALUE	<.001−	<.05−	<.05−	<.001−	<.001−	<.001−	<.001−	<.01−	<.05−	< .001−

Note. PTR = Parent Trigger (Demand); CPR = Child Problem Response; PW = Parent Withdraws Demand; CAB = Child Acceptable/Appropriate Behavior. JNTF = Observed Joint/Lagged Frequencies; CONP = Conditional Probability; ADJR = Adjusted Residual; PVALUE = Probability Value. F2A = Family 2 snack routine; F3A = Family 3 homework routine; F4B = Family 4 structured play routine; F5A = Family 5 dinner routine; F5B = Family 5 table games routine; F7B = Family 7 dinner routine; F8A = Family 8 lunch routine; F9A = Family 9 structured play routine; F9B = Family 9 reading routine. : = Adjusted residuals *approximate* conditions of normal distribution.

Table 3

Sequential Analysis of Hypothesized Escape-Driven Coercive Process in Routines: II

Sequential analysis of steps in coercive sequence using Cycles logic		Hypothesized escape-driven routines									
	Statistics	**F2A**	**F3A**	**F4B**	**F5A**	**F5B**	**F7B**	**F8A**	**F9A**	**F9B**	**Aggregate results**
2-Steps: Given PTR, conditional probability of CPR within a cycle	JNTF	322	74	33	64	235	170	17	230	201	1318
	CONP	.64	.70	.33	.45	.77	.78	.29	.43	.78	.60
	ADJR	5.43	14.25	7.10	5.60	10.91	3.60	4.97	8.90	2.63	35.4
	PVALUE	<.001	<.001	<.001	<.001	<.001	<.01	<.001	<.001	<.01	< .001
3-Steps: Given PTR followed by CPR in a cycle, conditional probability of PR in the next cycle.	JNTF	195	22	10	20	88	95	9	166	154	797
	CONP	.61	.37	.40	.32	.38	.57	.56	.73	.77	.60
	ADJR	2.17	2.89	−0.05	2.59	2.50	.27	1.56	2.70	3.22	11.88
	PVALUE	.03+	<.01	.96−	.001+	.01+	.79+	.12+	< .01	.001+	< .001
4-Steps: Given PTR followed by CPR in the first cycle, conditional probability of PR followed by CAR in the next cycle.	JNTF	33	4	5	5	12	26	2	77	56	231
	CONP	.10	.05	.20	.08	.05	.14	.13	.34	.28	.17
	ADJR	−3.39	2.53	.06	1.89	1.23	−1.2	.51:	.26	.95	2.53
	PVALUE	<.001−	.01+	.95+	.06+	.22+	.23−	.61+	.78+	.34+	< .01

Note. PTR = Parent Trigger (Demand); CPR = Child Problem Response; PR = Parent Reduces Demand; CAR = Child Appropriate/acceptable Behavior or Reduce Problem Behavior. JNTF = Observed Joint/Lagged Frequencies; CONP = Conditional Probability; ADJR = Adjusted Residual; PVALUE = Probability Value. : Adjusted Residuals *approximate* conditions of normal distribution

Table 4

Sequential Analysis of Alternative Hypothesis about Parent-Child Interaction in Routines

Sequential analysis of steps in coercive sequence using Cycles logic		Hypothesized escape-driven routines									
	Statistics	**F2A**	**F3A**	**F4B**	**F5A**	**F5B**	**F7B**	**F8A**	**F9A**	**F9B**	**Aggregate results**
4-Steps: Given PTR followed by CPR in the first cycle, conditional probability of PWR followed by CPR in the next cycle.	JNTF	74	20	4	11	46	42	5	26	45	287
	CONP	.23	.24	.16	.17	.20	.25	.31	.10	.23	.21
	ADJR	2.21	2.81	1.98:	3.13	3.32	1.15	5.70	.71	.95	8.98
	PVALUE	<.05	<.05	.05+	<.01	<.001	.25+	<.001	.48+	.34+	< .001

Note. PTR = Parent Trigger (Demand); CPR = Child Problem Response; PW = Parent Withdraws Demand; PR = Parent Reduces Demand; CAB = Child Appropriate Behavior. JNTF = Observed Joint/ Lagged Frequencies; CONP = Conditional Probability; ADJR = Adjusted Residual; PVALUE = Probability Value. : = Adjusted residuals *approximate* conditions of normal distribution.