AN EXPLORATION OF THE SEQUENTIAL CASCADE OF CHANGES IN PARENTING PRACTICES ENGENDERED BY PARENT MANAGEMENT TRAINING – OREGON

A Dissertation by

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AN EXPLORATION OF THE SEQUENTIAL CASCADE OF CHANGES IN PARENTING PRACTICES ENGENDERED BY PARENT MANAGEMENT TRAINING – OREGON

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To Jon, Lily, my family and dearest friends
One’s destination is never a place but a new way of seeing things.
-Henry Miller
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Treatments for conduct and oppositional behavior problems are the most sought services for young children (Hinshaw & Anderson, 1996; Hinshaw & Lee, 2003). Children who meet criteria for a diagnosis of Conduct Disorder or Oppositional Defiant Disorder are at risk for developing both relational and academic problems. These problems ultimately put them at higher risk for a lifetime of aggression, violence and illicit activity (Achenbach & Howell, 1993; Richters & Martinez, 1993; Hinshaw & Lee, 2003; Weisz, 2004). This trajectory squarely places aggression, disruptive behavior and defiance as the critical presenting problems of youth referred for mental health services (Hinshaw & Anderson, 1996; Hinshaw & Lee, 2003). Therefore, it is essential to not only identify interventions that re-direct this destructive pathway but to understand what mechanisms are at work in those interventions in order to provide the most effective and efficient intervention (Sandler, Schoenfelder, Wolchick & MacKinnon, 2011).

While these maladaptive behaviors are the primary presenting problems of youth referred for mental health services, identifying the true prevalence rate of Conduct Disorder or Oppositional Defiant Disorder is difficult. Problems in accurately ascertaining prevalence rates can be attributed to a number of issues. There is an absence of a national level investigation of the prevalence of childhood mental health disorders. Previous estimates of prevalence have been based on retrospective recall of the age of onset of Conduct Disorder and/or Oppositional Defiant Disorder. Finally, the definition of both Conduct Disorder and Oppositional Defiant Disorder has evolved over time. Depending on which definition was used and who was sampled, prevalence estimates differ (Lahey, Miller, Gordon & Rile, 1999; Hinshaw & Lee, 2003). Despite these difficulties, it is thought that the prevalence of Oppositional Defiant Disorder
ranges from below 1% to beyond 20%, with a mean prevalence estimate of 3% (Hinshaw & Lee, 2003). Weisz (2004) reported the prevalence of Oppositional Defiant Disorder in the general population to be between 10-22%. Estimates of the prevalence of Conduct Disorder are not quite as varied. Hinshaw & Lee (2003) identified the prevalence of Conduct Disorder to be between 1% and 10%; DSM-IV-TR reports the prevalence for males to be 6-16% and 2-9% for females. Weisz (2004) also identified the prevalence of Conduct Disorder to be between 2% and 6% for school-aged youth in a community sample.

Despite the confusion and lack of information about how prevalent Conduct Disorder and Oppositional Defiant Disorder are, what is understood is that Conduct Disorder and Oppositional Defiant Disorder operate on a developmental trajectory that places children at risk for a lifetime of risky behavior. Weisz (2004) pointed out children as young as 2- and 3-years old who exhibit high rates of behavior problems across multiple settings (home, school, etc.) are at risk for meeting diagnostic criteria for Conduct Disorder and/or Oppositional Defiant Disorder. Those children who display established patterns of conduct problems, upon entry into school, are prone to engage in persisting behavioral problems into adolescence. Because the inherent pattern of problem behavior is seemingly established at a young age, Conduct Disorder and Oppositional Defiant Disorder are ripe for intervention during early to middle childhood when risk factors first start to operate. Dishion, Shaw, Connell, Gardner, Weaver, and Wilson (2008) suggested that the development of more serious and antisocial behaviors can be interrupted by intervening in early childhood.

Lack of intervention, or ineffective intervention, has serious consequences. If conduct problems are not effectively addressed during the first eight years of life, when these behaviors are most pliable, children are at risk for a life course trajectory of problematic behaviors and
consequences, such as: academic difficulties, dropping out of school, violence, delinquency, deviant peer association, and drug and alcohol use and abuse (Snyder, 2001; Tremblay, 2000; Piquero et al., 2009). During this early involvement with delinquent activities, children become enmeshed in a variety of deviant peer associations and activities (McCord, Widom, & Crowell, 2001; Piquero, Farrington, & Blumstein, 2003; Piquero et al., 2009) as well as diminishing educational opportunities and constructive social activities that often lead to problems in adulthood such as employment difficulties and relationship problems (Moffitt, 1993; Piquero et al., 2009).

Of treatments available for conduct and oppositional problems, outcome studies indicate Parent Management Training (PMT) is successful in reducing these problematic behaviors (Piquero et al., 2009; Bernazzani, Cote, & Tremblay, 2001; Bernazzani & Tremblay, 2006; Costin & Chambers, 2007; Sandler et al., 2011). While there are multiple treatment interventions classified as PMT, Kazdin (2005) identified the four key characteristics that delineate whether treatment can properly be categorized as PMT. The first component is that the intervention is based on learning theory and research. The second component is an application of principles recognizing the relationship between behaviors and the antecedent and consequent events surrounding those behaviors. The third component is that the intervention teaches specific skills that parents are trained, through active participation, to utilize. Finally, interventions that fit within the rubric of PMT integrate both assessment and evaluation into treatment. PMT utilizes social learning principles targeted at increasing parenting skills (Kazdin, 2005; Weisz, 2004; Forgatch & Patterson, 2010). While research has documented that change in parenting behavior mediates or serves as the mechanism for change in child behavior, the current
study was designed to more carefully explore the sequence and timing of changes in parenting behavior resulting from PMT.
CHAPTER 2
LITERATURE REVIEW

Parents have the primary and long-term responsibility for shaping children’s behavior in hopes of optimizing their children’s developmental success (Forgatch & Patterson, 2010). Parents are responsible for creating routines and structures as well as rules and a learning environment that promote their children’s adaptive social and instrumental skills. When these structures and routines are properly and consistently implemented, the risk of children’s academic and behavior problems is reduced, and their acceptance by prosocial peers, along with the establishment of effective working relationships with teachers and other adults, are increased. Intervention can powerfully promote child competence and reduce child conduct problems by focusing on developing the skills of those who are viewed as the primary socializing agents for children - parents (Kazdin, 2005). Given that parents are the primary socializing agents of children and that children are so deeply enmeshed in family relationships, it is requisite that interventions to effect change in child behavior capitalize on this relationship (Kazdin, 2005; Dishion & Stormshak, 2007). Out-of-home environments become a more powerful influence as children become older. Therefore, the key to maximizing the potential gains engendered by family-focused treatment is to intervene early when the primary socializing agent is still the parent.

PMT is rooted in social interaction learning theory. PMT teaches parents to systematically set the conditions and contingencies to reduce target behavior problems and to develop alternative, skillful behaviors (Kazdin, 2005; Patterson, Forgatch & DeGarmo, 2010). Kazdin (2005) emphasizes that it is through change in the social environment (i.e., the family’s home) that children will learn to engage in positive and appropriate behaviors and are dissuaded
from acting negatively and improperly. Focusing on improving the socialization practices of parents of young children may alter the developmental trajectory of risky behavior. The key to intervention is to minimize ineffectual parenting practices and to strengthen competent and positive parenting practices. According to Patterson and Dishion (1985), the parenting practices most often associated with conduct problems are inconsistent and harsh discipline, poor monitoring and problem solving, and low nurturance and positive involvement. Therefore, PMT is geared towards altering these practices and teaching new parenting skills directed at increasing positive involvement, teaching skills, constructive problem solving, and effective discipline and monitoring. Given reduction in negative parenting practices and an increase in positive parenting practices are the mechanisms through which PMT has its effects on child behavior, it is important to examine these specific parenting practices in closer detail.

Coercive Interaction and Ineffective Discipline

Coercion theory postulates that the day-to-day family environment is a powerful proximal determinant of child behavior. Moment-to-moment parent-child interactions marked by aversive behavior patterns serve to initiate and sustain a cycle in which poor discipline increases the likelihood of a child’s coercive/defiant response. As the rate of child coercion increases, the rate at which parents attempt to provide effective discipline decreases (Patterson, 1982; Patterson, Reid & Dishion, 1992; Forgatch, 1991; Schrepferman & Snyder, 2002). It has been demonstrated that, during bouts of aversive parent-child interaction or conflict, children learn to increase the rate and escalate the aversiveness of their behavior insofar as it allows them to escape or avoid parental criticism, demands and control. This increase in child negative behaviors then serves to trigger increased negative parenting responses that perpetuate this cycle of coercion. Clearly both the child and the parent contribute to this dysfunctional pattern of
relating. Therefore, understanding the system and dynamics of the family as a whole and a reciprocal system is requisite to decreasing child negative behaviors.

Patterson and Forgatch (2010) found that parents who frequently direct negative behaviors toward their child set up this escape/avoidance function because they are overly inclusive in classifying behaviors as problematic. This means that parents of children with conduct and/or oppositional problems respond negatively to trivial and, at times, even neutral child behaviors in the same manner in which they would respond to serious deviant behavior. Thus, parents initiate conflicts and discipline encounters, and this pattern of treating even minor, or non-existent, problems as serious problems results in an almost self-fulfilling prophecy of higher rates of child problem behaviors. PMT addresses this problematic interaction style by teaching parents to discriminate between positive, neutral and problem behaviors in order to focus limit setting and discipline on instances of “serious” problem behaviors.

Ineffective discipline on the part of the parent (Nix, Pinderhughes, Dodge, Bates, Pettit, & McFadyen-Ketchum, 1999), along with that which is harsh and non-contingent, reliably predicts increases in child conduct problems over time (Snyder, Cramer, Afrank & Patterson, 2005). Ineffective discipline was measured by aversive verbal and physical behavior as well as negative affect directed to the child by the parent. Ineffective and irritable parent disciplinary actions and poor monitoring are well-established risk factors for the occurrence and persistence of conduct problems (Kilgore, Snyder, Lentz, 2000).

The skills taught in PMT are designed with these parental barriers and behaviors in mind, and aimed at decreasing negative and coercive parenting practices and replacing them with positive parenting behaviors to foster positive child developmental outcomes (Dishion, Patterson & Kavanagh, 1992). As Schrepferman and Snyder (2002) pointed out, coercive family
interaction is an essential element in the behavioral model of antisocial behavior. Interrupting and replacing these negative exchanges with healthier, more positive, proactive means of parenting is a key to reducing risk for antisocial behavior. Parents of children with conduct problems often utilize coercive tactics (Weisz, 2004) rather than positive parenting practices such as effective limit setting and non-punitive consequences for problem behavior, effective teaching skills including positive reinforcement contingencies, positive involvement or warmth, monitoring and problem solving. If, as the research suggests, coercive parenting practices contribute to the negative outcomes of these children, then part of the solution must be an increase in positive parenting practices.

Positive Parenting

One of the means to reduce coercive parent-child interaction is to foster parents’ skill in effectively setting limits (Dishion, Patterson & Kavanagh, 1992). This skill entails providing the child with clear instructions and a consistent set of rules for behavior. Compliance with instructions and rule following are contingently reinforced, and non-compliance and rule breaking are met with contingent, non-aversive punishment such as time out and response cost (Dishion, Patterson & Kavanagh, 1992). Other components of PMT associated with beneficial child outcomes are a systematic increase in positive parent responses to constructive child behavior, increased emotion communication skills, warmth and effective discipline strategies such as teaching time-out and the importance of contingencies and consistency. Smaller effects have also been documented for the acquisition of problem-solving techniques (Kaminski & Filene, 2008). Forgatch, Beldavs, Patterson and DeGarmo (2008) described aspects of skills related to positive parenting and utilized in the Oregon model of Parent Management Training (PMTO); these skills are detailed in the next sections.
Skill Encouragement and Positive Reinforcement. Skill encouragement entails identifying an important child instrumental skill, and breaking it down into meaningful and manageable steps for the child, tracking progress and utilizing positive reinforcement to shape its acquisition. Edwards (1995) and Westerman (1990) maintained that trying to gain compliance on the part of the child is not merely about avoiding the cycle of coercion but about coordinating with the child and scaffolding based on the child’s current behavioral capacity and effort. By coordinating with the child and building upon the child’s current behavioral repertoire, mothers were more successful at gaining child compliance and instrumental skills with their children than mothers who were less able to coordinate and scaffold tasks. Kazdin (2005) emphasizes the primary focus, the core, of PMT is on positive reinforcement. Parents are taught to recognize and reward constructive child behavior and independence rather than purely focusing on punishing those behaviors the parents find distressing. Positive reinforcement is about shaping and maintaining desired child behavior in intentional ways using attention and praise.

Limit Setting and Effective Discipline. This incorporates strategies such having clear rules and limits, and the use of time-out and privilege removal for targeted child behavior problems. Bernat, August, Hektner and Bloomquist (2007) defined effective discipline as the use of consistent and firm strategies which are geared towards helping a child develop self-regulatory skills. Forgatch, Beldavs, Patterson and DeGarmo (2008) support a balance of encouragement with discipline, resulting in a ratio of 5:1 positive to negative contingencies.

Monitoring. Parental monitoring requires setting rules, being aware of and then tracking child’s whereabouts, behaviors, activities and friends. It also involves proactively arranging a child’s environment to reduce contact with deviant activities and influences, and to increase involvement in constructive, adult-supervised activities outside of the home. Collins, Harris,
Susman (1995) further indicate that parents engage in effective monitoring when they “exert influence by sensitively fitting their behavior to the behavioral cues from children.” Collins et al. (1995) report parents who are ineffective at these key skills have children who are at greater risk for antisocial behavior in middle childhood and adolescence. Holmbeck, Paikoff, & Brooks-Gunn (1995) and Patterson and Strouthamer-Loeber (1984) also found poor monitoring to be the best predictor of delinquent behavior, drug use and risky behavior.

**Problem-Solving.** Effective problem-solving entails clear information exchange, negotiating differences to create potential action plans, establishing agreements about what to do, and then following through on the action plan selected. It creates a proactive and constructive approach to managing conflict, articulating limits, expectations and contingencies, and is central to effective monitoring. It also shapes critical child skills and abilities to independently solve problems they encounter outside the home.

**Positive Involvement.** Positive involvement requires attention to and interest in children’s concerns, activities and interests. Collins et al. (1995) describe the importance of parental warmth and emotional support as keys to reducing the development of child antisocial behaviors. Research by Baumrind (1967, 1991) indicates that parents who are lacking warmth and have poor limit setting skills have children who display more problematic outcomes. Parental indifference and unresponsiveness undermine relationship trust and openness to communication which are fundamental to problem solving, monitoring and the effectiveness of parental praise and attention (Collins et al., 1995).

Longitudinal research provides clear support for the role of parenting practices in children’s adjustment. Burke, Pardini and Loeber (2008) used the term “timid discipline” to describe patterns of parental behavior in which parents resisted or were reluctant to use
disciplinary actions out of fear their children’s negative response. They found that parents who did not engage in effective limit setting and discipline, opting instead to avoid discipline, had children who showed increased rates of ODD in the following year. Reciprocally, they also found that increased rates of ODD over time were linked to a greater reluctance on the part of parents to engage in effective discipline strategies. Hipwell, Keenan, Kasza, Loeber, Stouthamer-Loeber and Bean (2008) also found reciprocal relationships between parenting behaviors and child behavior problems; low parental warmth and harsh discipline predicted an increase in conduct problems over time and increases in conduct problems served to decrease parental warmth and increase harsh disciplinary practices.

**Efficacy of Parent Management Training on Reducing Child Conduct Problems**

Improvements in child behavior resulting from PMT interventions are typically assessed by a reduction in symptoms of child conduct problems from the clinical range to the non-clinical range as documented by both parent and teacher reports on such standardized measures such as the CBCL-Parent Form and Teacher Report Form (Achenbach, 1991). Piquero, Farrington, Welsh, Tremblay and Jennings (2009) and Sandler et al. (2011) conducted recent meta-analytic reviews to assess the efficacy of PMT as treatment for externalizing problems in children and youth. These meta-analytic reviews indicate PMT is an empirically supported treatment for these problematic behaviors.

Piquero et al. (2009) conducted a meta-analytic review of family/parent training programs. The inclusion criteria for this meta-analysis required that the studies: used a randomized control trial design; provided pre-post evaluations of family/parenting programs; had a minimum mean child age of 5 at the start of the intervention; measured child behavioral outcomes within the same developmental period; utilized parent skills training as the major
component of the intervention; and acquired sufficient data to calculate an effect size. This meta-
alysis had no restriction on the geographic location of the studies but did require that all
studies were published in English. Most of the studies included utilized parenting interventions
such as the Incredible Years (Webster-Stratton & Reid, 2003), Triple P-Positive Parenting
(Sanders, Markie-Dadds & Turner, 1998) and Parent-Child Interaction Therapy (Brinkmeyer &
Eyberg, 2003). Seventy-nine studies met the inclusion criteria. These studies were then examined
for independence – that none were utilizing the same sample of data, which resulted in the
exclusion of supplemental studies. The fifty-five remaining studies were incorporated into the
meta-analysis. Of these, forty-seven involved parent training (not home-based) programs.

This meta-analysis found that parent training had a small to moderate effect in reducing
conduct problems in children, and that studies with smaller samples and conducted in the United
States tended to have larger effects than those with larger samples or those conducted outside the
United States. Interestingly, Ogden and Hagen (2008) conducted a randomized trial of PMTO
using a nationwide Norwegian sample of children with conduct problems to examine the
generalizability of PMT outside of the United States. The results of this study indicated that
targeting parents for intervention served to improve disciplinary skills at post-treatment and to
reduce externalizing problems according to parent report of child behavior.

Piquero et al. (2009) speak to the necessity of going beyond short-term effects and of
better understanding the active ingredients or mechanisms that make parent-training
interventions successful at reducing conduct problems. They also recommend that future studies
utilize long-term follow-up data to establish persistence of early effects.

Sandler et al. (2011) took on this challenge by conducting a meta-analytic review of the
long-term effects of parenting programs. Sandler et al. (2011) examined the application of
parenting training programs as preventive interventions; the samples did not include participants whose children had clinical levels of problems at program entry. Inclusion criteria for the meta-analysis required that the programs: 1) had parents who were randomly assigned to a program which was designed to promote effective parenting compared to a control condition; 2) reported a minimum of 1-year follow-up during which there was no further intervention provided to participants; and 3) utilized a program considered to be a universal, selective or indicated prevention intervention. Forty-six randomized experimental trials of parenting interventions were included in the meta-analysis. Different from the meta-analysis conducted by Piquero et al (2009), Sandler et al. (2011) focused on outcomes for children across a range of developmental periods from infancy to adolescence.

In infancy (ages 0 to 3 years), Sandler et al. (2011) identified 13 trials which met the inclusion criteria. Of those trials, three-quarters reported an increase in positive parenting and a decrease in coercive parenting. One-third of the studies included in this developmental period also reported long-term effects on parenting ranging 18 months to 3 years. Finally, in this developmental period, the majority of studies reviewed reported reduced child behavior problems for 1 to 2 years post-program intervention.

In early childhood (ages 4 to 7 years), Sandler et al. (2011) identified eight trials which were aimed at promoting effective parenting strategies. The control conditions, used for comparison, often were described as no-treatment groups, brief informational sessions for parents or mailed information on behavior-oriented parenting skills. Of those eight studies, four assessed effects on parenting practices within 1 year of intervention and found improvements in positive parenting (responsiveness, warmth and use of effective discipline), and nearly all of the studies reported positive effects in child outcomes one year or more after program intervention.
One study identified by Sandler et al. (2011) utilized the Incredible Years parenting program and reported 16 month post-treatment increases in positive parenting, decreases in harsh parenting practices, and reductions in child aggressive behaviors to one-fifth of those in the control group.

Eleven parent training trials were identified by Sandler et al. (2011) as meeting the criteria for middle childhood (ages 8-12 years). One-third of the treatment programs were identified as universal, one-half as selected intervention programs due to their focus on the families of at-risk youth, and approximately one-quarter were classified as indicated interventions due to the pre-existence of child behavioral problems and/or poor academic performance. The comparison condition groups in the studies focused on this developmental period included no-treatment control groups, mailed information on adolescent development or monetary payments to control schools. Three-quarters of these trials reported enhanced parenting practices within one year of program intervention, including: family communication, problem solving, behavior management/discipline and parent-child relationship quality. Positive effects on youth delinquency and substance use were found at one or more years post-treatment. Continued effects were also apparent into adolescence, including decreases in delinquency and conduct problems. Intervention effects were found to be greatest for those families classified as at-risk as well as those whose children had existing behavior problems.

Six trials which focused on substance use and risky sexual behavior were identified for inclusion by Sandler et al. (2011) for the adolescent group (ages 13-18 years). Four of the six studies measured effects on parenting and reported more positive parenting up to one year following intervention, and found decreased rates of externalizing problems compared to those in comparison groups.
Overall, of the studies included in this analysis, twenty tested the long-term effects of the parenting intervention without any additional treatment components. Of these twenty studies, eight found long-term effects in improving parenting practices and thirteen had long-term effects in reducing child behavioral problems.

Outcomes versus Processes

While PMT has been shown to be effective, the need to identify what mechanisms are at work in reducing child behavior problems and promoting child competence continues to be articulated (LaGreca, Silverman and Lochman, 2009; and Piquero et al, 2009). Further investigations of how PMT operates to promote positive outcomes in children’s behavior are needed. To further understand changes in parenting, it is necessary to explore thoroughly the changes in positive and coercive parenting engendered by PMT (Forgatch, DeGarmo & Beldavs, 2005; Schrepferman & Snyder, 2002). It is not enough to provide evidence that an intervention works, as has been the case for much of the research thus far. As noted by Forgatch, Patterson, DeGarmo and Belavs (2009), there is a need to understand the mechanisms by which enduring child behavior change is engendered. Examination of specific parenting practices and the sequence in which they change as a result of parent training interventions may enhance the efficiency, efficacy and effectiveness of these interventions, increase the power of parenting interventions, and better tailor intervention to meet the needs of families and children.

Investigation into the mechanisms of action engendered during intervention provides information about how treatment works. In design and statistical parlance, these mechanisms are called mediators (Kraemer, Wilson, Fairburn, & Argras, 2002; Beauchaine, Webster-Stratton & Reid, 2005). Hinshaw (2007) emphasized that without gaining understanding of these mechanisms, outcome research remains merely descriptive and primitive. Hinshaw (2007)
reflected, “[I]nvestigators should blend the best features of clinical trials with the best aspects of prospective, longitudinal research to achieve the dual goals of internal validity and exploration.” According to Gardner, Hutchings, Bywater and Whitaker (2010), it is important to identify mediators for both advancement of research and clinical practice. From a research perspective, mediators help us better understand the processes that work to bring about behavior change, and to glean how and why the intervention is working in order to further examine causal hypotheses. From a clinical perspective, understanding the active ingredients of the intervention ensures that professionals delivering PMT are careful to target these key mechanisms for change.

Kazdin and Nock (2003) indicated the need for research focused on mechanisms of action which explain why therapy works, recognizing that a better understanding of how it works serves to improve clinical practice and care. La Greca, Silverman and Lochman (2009) continued the call for further investigation beyond efficacy and effectiveness to identify mediators of treatment as a critical step towards wide dissemination and an ability to tailor intervention to the needs of the families. Understanding the processes by which intervention works more readily guarantees that clients are receiving effective treatment. Research exploring processes by which PMT work may reduce the “guess work” about which elements and parenting targets described in PMT manualized treatments are the active ingredients, and may optimize the sequence in which those elements are delivered.

**Identifying and Measuring Mediators**

The means by which mediators are identified and measured has been well described. Baron and Kenny (1986) indicate that mediation is established when, upon inclusion of the mediating variable, direct paths to and from the mediating variable are significant and the direct effect from the independent variable to the dependent variable becomes non-significant. Kazdin
and Nock (2003) described seven conditions need to be met to unambiguously identify that a mechanism of action is present and accounts for treatment effects: 1) strong association; 2) specificity; 3) gradient; 4) experiment; 5) temporal relation; 6) consistency; and 7) plausibility and coherence. First, a strong association indicates that there is demonstrated connection between the mediator and the intervention and between the mediator (parenting practices) and therapeutic outcomes (child adjustment). Second, there should be specificity in the linkages between the intervention, the hypothesized mechanism and the outcome. Specificity is demonstrated when constructs other than the proposed mediator do not account for the outcome. The third requirement is that a gradient response can be shown – an increase in the critical mediating process increases change in the outcome. The fourth requirement is that experimental techniques are employed which show manipulation of the proposed causal (mediating) mechanism is associated with change in the outcome being measured. Fifth, the temporal relation means that the change in the hypothesized mechanism preceded the outcome. The sixth requirement is consistency. This requires the replication of results across studies, samples and conditions to strengthen the validity of the inferences drawn regarding the mechanisms of change. Finally, the seventh requirement of plausibility and coherence refers to an ability to provide a credible explanation of how the mechanism operates (Kazdin & Nock, 2003).

**Studies of Changes in Parenting Practices as Mediators of the Effects of PMT on Child Behavior Problems**

Researchers have accepted the challenge and attempted to parse out the mechanisms by which PMT effects reductions in child behavior problems. As described earlier, the meta-analysis by Sandler et al. (2011) indicated that many parenting interventions that resulted in
improved child behavior also improved parenting practices, especially decreased coercive parenting and increased positive parenting.

Studies which carefully and explicitly examined changes in parenting practices as the mediator of the effects of parenting interventions on child behavior problems are now described. Hinshaw (2007) investigated several mediational processes in a multimodal treatment study of children with a diagnosis of ADHD. Interestingly, while attending the pharmacotherapy appointment (and thereby receiving the appropriate prescription medication) strengthened outcomes for those in the Medication Management and Medication Management plus intensive behavioral therapy (which included behavioral PMT), attendance in the behavioral intervention did not. Hinshaw (2007) suggested that PMT attendance by itself does not insure improvement in parenting practices. This suggests that the acquisition and application to the actual principles taught in PMT are critical processes mediating the outcomes for behavioral treatment.

Research by Beauchaine, Webster-Stratton and Reid (2005) focused specifically on psychosocial treatment (parent training) for child conduct problems. One goal of this study was to utilize focused mediational analyses to examine the impact of changes in parenting practices on child outcomes. This was done by employing latent growth curve models to detect behavior changes at all available data points rather than at pre- and post-assessment. Parenting behaviors were measured at three assessment points: pre-treatment, post-treatment (averaging 6 months after initial assessment), and 1-year follow-up. Their findings indicted that reductions in verbal criticism and ineffective parenting predicted and mediated treatment outcomes on child behavior problems. Beauchaine et al. (2005) also found that treatment outcomes (defined by a reduction in children’s behavior problems) were mediated by reductions in problematic parenting relative to pre-treatment and to increased parenting effectiveness following treatment, but mediation was
not found if those problematic and effective parenting constructs were considered separately. In other words, maximum change was achieved for mothers who scored both relatively high on problematic parenting and low on effective parenting constructs at baseline and improved following intervention.

Eddy and Chamberlain (2000) explored factors that mediated the treatment effects of therapeutic foster care, a specialized behavioral parenting intervention, on youth antisocial behaviors. Eddy and Chamberlain (2000) hypothesized that the more family management skills (supervision, discipline, and positive reinforcement) were increased and deviant peer associations were decreased, the greater the decrease in antisocial behaviors. Family management skills and deviant peer associations were in fact found to mediate the effect of treatment for antisocial youth.

Forgatch, Beldavs, Patterson and DeGarmo (2008) examined the processes that explain the relationship between PMT and improved behavioral outcomes in children in more detail, examining the relative importance and timing of reductions in coercive parenting and increases in positive parenting. This model represents the idea that changes in coercive and positive parenting behaviors are the mechanisms through which change occurs. In this study, Forgatch et al. (2008) focused on the outcome of youth delinquency as measured by teacher reports of behavior problems over a 9-year period following a parent management training intervention for boys in newly divorcing, single mother families. Parenting variables were assessed by direct observations of parent-child interactions. Coercive parenting was defined by negative reinforcement, negative reciprocity and aversive discipline. Positive parenting was defined by observer ratings of parent-child interaction, and included multi-item variates for positive involvement, skill encouragement and monitoring. The hypothesis was that the treatment, Parent
Management Training-Oregon (PMTO), would significantly reduce delinquency and that this effect would be mediated by a growth in positive parenting practices. A second level hypothesis was that early reduction in coercive parenting processes would mediate the effect of PMTO on positive parenting which in turn mediates the reduction in long-term delinquency. Data were analyzed utilizing an intention-to-treat group assignment which provides a conservative effect size (Forgatch, Beldavs, Patterson and DeGarmo, 2008).

Following the guidelines of Baron and Kenney (1986), Forgatch et al. (2008) found support for their hypotheses. The PMTO intervention showed direct treatment effects on reduced delinquency as measured by teacher reports. In the next step, growth in positive parenting was found to mediate treatment effects on reduced delinquency. Reductions in coercive parenting did not have a significant direct effect on delinquency, but did precede and mediate the effects of PMTO on changes in positive parenting. The study showed that there was a reduction in coercive parenting over one year, an increase in positive parenting over three years and an ultimate decrease in delinquency growth over nine years. This indicates parents can impact child adjustment problems by reducing their coercive tactics and increasing their positive parenting skills.

Martinez and Forgatch (2001) investigated how PMT would impact children’s noncompliance and hypothesized that the effect on noncompliance would be equally mediated by changes in coercive and positive parenting. Results indicated that changes in parenting behavior mediated the effects of parenting intervention in reducing children’s non-compliance over three years. However, changes in positive parenting accounted for a greater impact on non-compliance than did reductions in coercive parenting.
While these studies provide a better understanding of what mechanisms in parenting skill programs are operating to effect change in child behavior, the need to continue this investigation at a more disaggregated level is essential. The studies by Beauchaine et al. (2005), Martinez and Forgatch (2001), and Forgatch et al. (2008) indicate that changes in different parenting practices (e.g., reductions in coercive parenting, increases in positive or effective parenting) may not all be one package. They may contribute to outcomes to different degrees, and their change following PMT may vary in timing and sequence. There continues to be a need to examine which changes in parenting are critical. Previous studies continue to collapse various forms of negative and positive parenting practices into global constructs without investigating the impact of specific skills and deficits, the sequencing of those changes, or how those changes in parenting practices are related over time.

**Current Study**

Researchers continue the call for research on the processes by which therapeutic change occurs (Piquero et al., 2009; Beauchaine, Webster-Stratton, Reid, 2005; Kazdin and Nock, 2003; Sandler et al., 2011). Researchers have made progress in answering the causal question regarding what ingredients in parenting intervention account for changes in children’s delinquent and problematic behaviors. The literature identifies changes in positive and coercive parenting as mediators of improvements in child behavior (Sandler et al., 2011; Hinshaw, 2007; Beauchaine, Webster-Stratton and Reid, 2005; Eddy and Chamberlain, 2000; Forgatch, Beldavs, Patterson and DeGarmo, 2008; Martinez and Forgatch, 2001). By better understanding these mediating processes, researchers are contributing to a body of knowledge which serves to boost treatment outcomes by identifying the critical ingredients of intervention. Kazdin and Nock (2003) suggested that manualized parenting training programs contain elements that: a) provide the
effective ingredient, but possibly not at the “dose” appropriate to maximize change; b) may contain elements that are positive in terms of making clients more amenable to receiving delivery of care but do not necessarily contribute to the ultimate change in outcomes; and c) may be included in a treatment package due merely to the “superstitious behavior” of those writing the manuals. It is necessary to better understand how parent training interventions work in order to both identify and to ultimately deliver and sequence the critical skills or elements that lead to child behavior change.

Kazdin and Nook (2003) argue that the best chance for improving clinical care of patients is through this identification of meditational processes. It is in this vein that the current study was undertaken. Recognizing that changes in positive and coercive parenting practices can account for change in outcomes, the current study sought to identify the role and sequences of these practices in greater detail. Based on previous research, the overall, broader goals of PMT are to reduce coercive parenting and bolster positive parenting; however, the mediational research carried to date does not wholly answer the question of when or to what degree negative reinforcement, negative reciprocity and inept discipline decline, and when and to what degree positive involvement, skill encouragement, monitoring and problem solving take hold as a result of parent management training. If practitioners are to truly understand and implement the “active” ingredients that account for change, and to do so with optimal power and efficiency, then a more disaggregated understanding of changes in parenting skills engendered by parent training is needed.
CHAPTER 3

METHODOLOGY

This study uses data from an extant longitudinal, randomized control trial, the Oregon Divorce Study (ODS-II). ODS-II collected careful, observational data on parenting practices at multiple time points, beginning before intervention, and then at 6, 12, 18 and 30 month follow-up after baseline. As such, it provides an ideal platform from which to pursue the objectives of research to more fully examine the mediators of parent management training.

Participants

Participants were 238 recently separated, single mothers and their sons. Mothers were not cohabitating with a new partner. Participants resided in a medium-sized, Pacific Northwest city. Two-thirds of the families were assigned to the experimental group ($n = 153$) and one-third of the families were assigned to the no-intervention control group ($n = 85$). This assignment distribution was done to ensure a sufficient sample size for measuring intervention effects (Martinez & Forgatch, 2001; DeGarmo & Forgatch, 2005; Forgatch & DeGarmo, 1999).

The families were recruited through flyers distributed throughout the community, media advertisements and divorce court records. Mothers were separated from their partners 3-24 months ($M = 9.2$ months) prior to participation in the study, and sons were biological children residing with their mothers. Ninety-two percent of mothers had been married at least once and 77% of them were separating from the target son’s biological father. Fourteen percent of the mothers were not married to the person from whom they were separating. The mean age of mothers was 34.8 years ($SD = 5.4$; range = 21.4 to 49.6) and the mean age of sons participating was 7.8 years ($SD = .93$; range = 6.1 to 10.4). Sons were in grades 1-3 at the inception of the study.
The racial/ethnic composition of boys participating in the study was: 86% White; 1% African American; 2% Latino; 2% Native American and 9% identified as “Other” (which includes those who identify as belonging to more than one racial/ethnic group). This demographic distribution is reflective of the community from which the sample was drawn. The mean family income of participants was $14,900, with 76% of participants receiving public assistance. Seventy-six percent of the mothers participating in the study had academic/vocational training beyond high school. Seventeen percent had a four year degree or higher; 20% were high school graduates and 4% did not complete high school. Of those mothers participating, 32% classified themselves as unskilled workers, 21% identified as semi-skilled workers, 23% identified as clerical/skilled; 22% classified themselves as minor professionals/medium business workers, and 3% identified themselves as major professionals/major business workers. Participants in the experimental group did not differ from those in the control group on these variables except for two characteristics. Mothers in the experimental group had been separated 2.4 months longer than those in the control group ($M = 9.84$ and $7.48$, respectively; $p < .01$). Boys in the experimental group were approximately .28 years younger than those in the control group ($M = 7.65$ and $7.93$, respectively, $p < .05$).

**Parenting Intervention: Parent Management Training-Oregon (PMTO)**

Intervention consisted of 14 parent group meetings held weekly at the Oregon Social Learning Center during the early evening hours. The original PMTO curriculum consisted of 16 weekly meetings, which 31% of the experimental group received. Later, 2 topics were combined and absorbed into other topics to comprise the final 14 week parenting curriculum. Sixty-nine percent of the experimental group participated in the 14 week program. The mean number of
participants in each PMTO group was 9.5 (range = 6-16). The average number of sessions attended by mothers in the experimental group was 8.5 (SD = 5.7).

The targeted parenting practices in the Parenting Through Change (Forgatch, 1994) program, utilized in this study, were: appropriate discipline, skill encouragement, monitoring, problem solving and positive involvement. Given the nature of the participants targeted in this intervention trial, specific issues related to divorcing/separating women were also addressed in the program. These topics included regulating negative emotions and managing interpersonal conflict. This PMTO intervention aimed at decreasing negative and coercive exchanges between parent and child by teaching mothers to respond early and appropriately to challenging child behavior. Mothers were taught to appropriately use time out procedures and privilege removal. Mothers were also given skills in providing contingent positive reinforcement and in teaching instrumental skills by the use of appropriate praise and incentive charts.

The skills were integrated and taught in a step-by-step approach which allowed for each lesson/skill to build upon the foundation set by the previous skill. Session 1, “Working Through Change” served as an introduction to the program. In session 2 “Encouraging Cooperation,” parents are taught to give clear, specific requests to increase the likelihood of cooperation on the part of their children. Session 3, “Teaching New Behaviors” taught parents how to use encouragement and incentive charts, and breaking large goals into achievable steps, as means to encouraging prosocial skills in children and promoting attention and prosocial behavior on the part of the parent. Session 4, “Observing Emotions,” provided information about emotions and how emotions can strengthen or weaken parenting effectiveness. Session 5, “Managing Emotions” provided ways in which parents may regulate their emotional states once they are able to recognize them. In sessions 6, “Setting Limits,” and 7, “Following Through,” parents were
taught how to use of effective discipline strategies such as time-out, work chores, and privilege removal. Session 8, “Communicating with Children” taught effective communication skills with children, including learning to actively listen to children. Session 9, “Problem Solving” involved teaching skills for negotiating and resolving interpersonal problems. Session 10, “Managing Conflict” provided ways of managing interpersonal conflicts with other adults. Session 11, “Monitoring Children’s Activities,” taught skills designed to effectively track children’s activities at school, with friends or while with other caregivers. Session 12, “Promoting School Success,” and session 13, “Building Skills,” targeted positive involvement and reinforcement for school-related behaviors. Finally, Session 14, “Balancing Work and Play” reviewed the curriculum and taught parents the importance and strategies for finding balance between the demands of their multiple roles in order to reduce stress.

These topics and skills were introduced in one or more sessions throughout the course and reviewed regularly throughout the remainder of the program. The leader manual provided instructors/facilitators with the agenda, objectives and rationales, procedures, exercises, role-plays and group process suggestions for each session. The parent manuals provided parents with a summary of the principles covered, home assignments, charts and any other necessary materials to complete the program. Parents also watched a 30 minute video “The Divorce Workout” (Forgatch & Marquez, 1993) which depicted three families using effective parenting strategies which aid children in adjusting to divorce.

**Interventionists**

Eight women with educational experience ranging from high school diplomas to PhDs provided the PMTO intervention. Three of the interventionists had PhDs, two had master’s degrees, one had some college education and two had high school diplomas. Interventionists led
the groups in teams of two, with one experienced leader being paired with one with less experience. The experienced leader was responsible for conducting the group and providing supervision to the co-facilitator.

Interventionists were provided with two to four months of training, depending on their level of experience. Two of the PhDs were exempt from training based on their minimum of 15 years experience with development and delivery of the PMTO intervention at the Oregon Social Learning Center. Interventionists who participated in training received 4 hours of weekly instruction which included reading materials, reviewing videotapes, participating in role plays and attending lectures. Trainees also participated in leading pilot groups which were videotaped and reviewed and evaluated by supervisors prior to intervention implementation.

**Intervention Integrity**

Group leaders completed forms at the end of each parenting session designed to evaluate treatment adherence and quality of the delivery of said treatment. The question asked of interventionists was, “For the whole session, how much of the curriculum was covered?” The question used a four-point scale (1 = 0%–25%; 2 = 26%–50%; 3 = 51%–75%; 4 = 76% – 100%). Aggregating across sessions and controlling for groups, the mean adherence was 3.78 (SD = 0.24), which indicated that the intervention agenda was well covered. Agreement between the leader and co-facilitator on this particular measure was 89%. Three items measured for the quality of each group session: “quality of the session;” “quality of the group process;” and “management of the group.” Each item was scored on a seven point scale (1 = excellent to 7 = terrible; $\alpha = .73$). Quality was scored for each interventionist present. Each interventionist rated her own session management; therefore inter-rater agreement was not calculated. Group leaders
rated the quality of the group high on each variable ($M = 2.56, \text{SD} = 0.83$; $M = 2.48, \text{SD} = 0.74$; and $M = 2.30, \text{SD} = 0.63$, respectively).

Fidelity of the intervention was ensured throughout the duration of the intervention. Marion S. Forgatch, director of the program, viewed approximately half of the videotaped interventions. Weekly two hour supervision was held in which reviewed videotapes were discussed in regards to adherence to and competent implementation of the intervention procedures. Interventionists were also given the task to review and discuss each other’s tapes. Adequate intervention integrity was deemed established due to the standardization of the materials and the close monitoring of their dissemination to participants.

**Measures**

Multi-method measures were gathered at multiple data points. Assessment measures included: structured interviews with each mother and child; observations of parent-child interactions in the laboratory setting; and questionnaires completed by mothers, children and teachers. Data from families were collected at baseline, 6 months, 12 months, 18 months and 30 months. Teacher ratings were collected annually at baseline, 12 months, 24 months and 36 months. Intervention was completed by the 6 month assessment. Two hundred and nine families were participating at 30 month follow-up. There was no significant difference in attrition by group (89.4% participation in the experimental group and 86.9% participation in the control group) at 30 months. Steps were taken to help ensure retention. These steps included: incentive pay; addresses and phone numbers of multiple contacts were collected upon entry into the study; newsletters for reminders and address verifications and public databases were utilized for tracking.
Parenting Practices

Participants engaged in a structured series of Family Interaction Tasks (FIT) that lasted approximately 45 minutes. Tasks included: four 5-minute, mother-son problem solving discussions about current conflicts (school problems, completing chores, etc), a 10-minute teaching task (mother assisting son in completing an academic task set one grade level beyond child’s current grade), a 10-minute unstructured activity (which included instructions on which toys the child was not allowed to play with and to put toys away), and a 5-minute snack break. Family interaction during the FIT was videotaped and coded at a micro-social level using the Interpersonal Process Code (IPC; Rusby, Estes & Dishion, 1991). Coders were thoroughly trained to a 70% reliability criterion prior to coding the data in this study. To ensure continued inter-rater reliability, coders participated in weekly sessions to reduce coder drift. These micro-codes describe the onset and offset of parent and child behaviors and affect along a real time line, using a large number of mutually exclusive and collectively exhaustive categories. Observers also made global ratings of the interaction at the end of each five-minute FIT task (Forgatch, Knutson & Mayne, 1992). Approximately 15% of the interactions were coded and rated by randomly selected pairs of coders to assess for inter-coder reliability at each wave. The average Cohen’s kappa for IPC content codes was .78 (range = .77-.80) and for affect was .70 (range = .67-.76) across all five waves.

Coercive discipline is measured by three indicators: negative reinforcement, negative reciprocity (both based on observer micro-coding) and inept discipline. In previous research on the ODS-II sample, the indicators of coercive discipline were evaluated for their commonalities using a principal-components factor analysis. All indicators loaded significantly on a single factor at each of the five assessment waves and loadings ranged from .71 to .86 across all waves.
Negative reinforcement was defined by the frequency of bouts of conflict initiated by mother and terminated by child as observed during the 45-minute videotaped interaction. Bouts of conflict were identified when mother introduced an aversive behavior following a period of at least 12 seconds of interaction without any previous maternal aversive behavior. The son then had to respond within 12 seconds with an aversive behavior. A bout was determined to be over when there was a period of at least 12 seconds without mother or son displaying an aversive behavior. Child termination of these bouts with an aversive behavior demonstrates negative reinforcement in that the son escaped the aversive situation by displaying his own aversive behavior in response to mother’s which resulted in the mother backing-down. The interclass correlation coefficients (ICCs) for coder reliability were .78, .58, .49, .68 and .60 at baseline, 6 months, 12 months, 18 months and 30 months, respectively.

Negative reciprocity was a microsocial score based on coding of the FIT observation data. The score was derived from the Haberman binomial z score (Gottman & Roy, 1990) which reflects the conditional likelihood that the mother reciprocated the son’s aversive behavior with one of her own. ICCs were .65, .74, .54, .63 and .67 across the assessment time points.

Inept discipline was a scaled score based on ratings made by the coders observing the 45-minute FIT family interaction. The inept discipline score was derived from the mean of 13 rating items scaled 1 (untrue/doesn’t fit) to 5 (true/perfect fit). Sample items assessed whether mother was overly strict and authoritarian, erratic, inconsistent, threatened unlikely discipline and used nagging or nattering to gain compliance. Cronbach alphas showed adequate internal consistency at each wave of assessment and were .91, .92, .92, .92 and .91. ICCs were .70, .85, .78, .77 and .88.
Positive Parenting was defined by four indicators of positive parenting, including: positive involvement, skill encouragement, problem solving and monitoring. The four indicators were derived both from coder ratings of family interaction during the FIT, and in one case (monitoring) also from parent interviewer ratings. The four indicators loaded on a single factor at each of the five waves of assessment and ranged from .62 to .89 across each wave.

Positive involvement was derived from global coder ratings of interaction during the FIT. Likert scale items included: warm, empathetic encouraging, affectionate, and treated child with respect. Cronbach alphas showed adequate internal consistency at each wave and ranged from .90 to .94. ICCs were .83, .90, .82, .79 and .93 for assessment waves from baseline to 30 months, respectively.

Skill encouragement was a mean scale score based on multiple coder ratings of a mother’s ability to promote child skill encouragement through contingent encouragement and scaffolding strategies (breaks tasks into manageable steps, reinforces success, prompts appropriate behavior and corrects in a non-aversive way) during the 10-minute FIT teaching task. Cronbach’s alphas were .69, .73, .81, .70 and .67 at each wave of assessment. ICCs were .73, .67, .66, .48 and .76 across assessment waves.

Problem Solving was based on a scale score of multiple coder ratings made following each of the three FIT problem-solving interactions which involved mother-identified issues. Nine Likert scale items (e.g. solution quality, extent of resolution, likelihood of follow through, apparent satisfaction) were averaged to compute the scale score. Cronbach alphas ranged from .87 to .92 across the three topics and five waves of assessment. ICCs were .77, .81, .76, .84 and .79 across assessment waves.
Monitoring was a scale score based on five items rated by coders and parent interviewers on how effective the mother was in supervising her son. Coders provided global ratings after observing the 45-minute family interaction derived from the FIT. The two Likert scale items assessed both mother’s knowledge of their son’s activities and tolerance of negative behaviors. Parent interviewers provided global ratings on three items: skillful in supervising during the assessment, keeps close track of youngster outside of laboratory and skillful at obtaining information from the child. Cronbach alphas for the scale score were .72, .64, .71, .70 and .55 across assessment waves.
CHAPTER 4

RESULTS

Preliminary Analyses

Prior to calculating descriptive statistics for each of the parenting measures, the two measures of monitoring (coder ratings based on observation and those based on parent interview) were combined to create a single composite measure referred heretofore as “monitoring” because they were significantly related (mean correlation across waves of $r = .25$, $p < .01$). There was considerable variability among the indicators for the parenting measures as indicated by the standard deviations in both the control and PMTO groups (Table 1). This variability was evident across all waves with only small differences across data at baseline and at 6 months, 12 months, 18 months and 30 months after baseline. All of the means were different from 0 at all waves. In general, the mean levels of negative reciprocity, negative reinforcement and inept discipline increased over time in the control group and decreased over time in the PMTO group. In general, positive involvement, skill encouragement and monitoring tended to decrease in the control group but remained similar over time in the PMTO group.

Construct Building

In order to ascertain a clear view of changes in parenting, covariation among the seven parenting variables was examined to assess whether these variables could be combined into composite constructs in a meaningful way. The first step in the development of the parenting constructs involved examining the correlations among the measures at each wave and then conducting a series of factor analyses.

The mean correlations among variates across waves that potentially define a coercive parenting construct are shown in Table 2 separately for the PMTO and control groups.
Correlations among the potential coercive parenting measures (negative reciprocity, negative reinforcement, and inept discipline) ranged from a low of .27 (p < .05) to .47 (p < .01) for the control group, and from .37 (p < .01) to .49 (p < .01) for the PMTO group. Correlations between the coercive parenting measures and the positive parenting measures (positive involvement, skill encouragement, problem solving and monitoring) were negative in both the PMTO and control groups. The mean correlations among measures across waves which potentially define a positive parenting construct ranged from .33 (p < .05) to .48 (p < .01) in the control group and from .33 (p < .01) to .47 (p < .01) for the PMTO group.

Given this pattern of convergent and discriminant correlation among the parenting measures, a principle components factor analysis with varimax rotation was utilized to further determine if each of the parenting measures could be combined to create reliable composite constructs. Each measure was first standardized to create z-scores to rescale all measures on a common metric. The factor loadings of the measures for coercive parenting had a mean equal to or greater than .33 across all waves for the control group and equal to or greater than .39 across all waves for the PMTO group (see Table 3). Factor loadings of the measures for positive parenting had a mean equal to or greater than .61 for the control group across all waves and equal to or greater than .68 for the PMTO group across all waves. Table 3 also shows the range for factor loadings for each parenting measure across waves; there was substantial consistency across waves with the exception of inept discipline which had a lower factor loading (< .30) at one wave in the PMTO and control groups. Factor loadings were not only convergent but also discriminant; the coercive parenting measures were negatively related to the positive parenting measures in both the control and PMTO group, and measures of the positive parenting were negatively related to coercive parenting measures. Given these findings, a composite construct
for coercive parenting and for positive parenting (with and without monitoring) were created by calculating the mean of the z-scores for the measures comprising those constructs.

While the measure of monitoring loaded consistently and reliably on the positive parenting construct, subsequent analyses were performed both including monitoring as part of the positive parenting construct (total positive parenting) and as a separate construct distinct from positive parenting. Because research on the influence of monitoring is typically focused on youth during adolescence rather than during early and middle childhood, further exploration of the impact of monitoring and its relationship to other parenting practices with the younger age group in this sample may yield an important contribution to research.

Group Differences in Parenting

Given these data are derived from an intervention study, it is useful to explore mean-level differences in parenting in the control and PMTO groups. To do this, independent samples t-tests were conducted for monitoring as well as each of the other parenting constructs (coercive parenting, total positive parenting, and positive parenting without monitoring) comparing the control and PMTO group at each assessment point (Table 4). Because each of the composites were transformed to mean z-scores, the means in Table 4 approximate 0 and group differences in scores can be construed as absolute numerical differences at each assessment point in standard deviation units (where 1 SD = 1.00). Positive means indicate higher levels of a parenting construct while negative scores indicate lower levels of a parenting construct. Thus the mean z-scores reflect group differences relative to one another, but cannot be interpreted as within-group change over time.

Overall, there was not a significant difference in the scores on each parenting construct for the control and PMTO groups at baseline as would be expected with randomization of
families to condition. As shown in Table 4, significant differences between groups appeared at 12 months post baseline for monitoring, coercive parenting and positive parenting; these differences indicate that PMTO relative to control show less coercive parenting, and more positive parenting and monitoring. Group differences in monitoring continued to be significant at 18 months post baseline before diminishing at 30 months post baseline. The group differences in coercive and positive parenting diminished and became non-significant at 18 and 30 months post baseline though still favoring the PMTO condition.

Theoretical Models

Three theoretical models were used to test the inter-relationship of parenting behaviors over time. The first model explored the inter-relationship of coercive parenting and positive parenting behaviors in both the control and PMTO groups. The second model examined the inter-relationship of coercive parenting behaviors with monitoring. The third model explored the inter-relationship of positive parenting (not including monitoring) with monitoring.

Figure 1 represents the basic model. The model includes autocorrelations, labeled a-h, which represent how well a parenting behavior at time t predicts the same parenting behavior at time t+1. These autocorrelations are an index of temporal stability in the parenting construct. Figure 1 also includes lead-lag cross construct relationships (represented by i-p). These paths indicate the degree to which one parenting construct predicts the future level of another parenting construct above and beyond prediction by its autocorrelation. For example, if “i” (leading from Construct 1 (w1) is significantly related to Construct 2 (w3), it would indicate Construct 1 (w1) predicts the level of Construct 2 (w3) above and beyond the stability of the construct itself. The direction of influence between parenting constructs (i.e., the temporal order in which they unfold) can be assessed by comparing the size and significance of cross-lagged parameters.
moving in “opposing” directions - i.e., comparing paths i and m. These comparisons may indicate unidirectional influence (e.g., path i is reliably related to its criterion, but path m is not related to its criterion), reciprocal influence (e.g., both paths i and m are both reliably related to their criterion), or no influence (e.g., neither paths i nor m are significantly related to their criterion parenting practice). It is important to keep in mind that the path coefficients do not reflect changes in mean levels but rather reflect shifts in rank order in parenting among families over time.

Model 1: Coercive Parenting and Total Positive Parenting

The first of the theoretical models (Figure 2) examines the relationship between the coercive parenting construct and the total positive parenting construct (including monitoring) across all five waves (baseline, 6 months post treatment, 12 months post baseline, 18 months post baseline and 30 months post baseline). The first step in evaluating the adequacy of this and subsequent models involves the degree to which the model adequately fit the data. There are a number of ways to assess model fit. Raykov and Marcoulides (2000) caution against relying on the chi-square value and its \( p \) value in making decisions regarding the model fit as an increase in sample sizes tends to increase the chi-square \( T \) values, maintain the model’s degrees of freedom and tends to be associated with small \( p \) values. This results in a propensity towards rejecting model fit for models with larger sample sizes even if the model is only somewhat inconsistent with the data. Therefore, it is important to look at additional fit indices such as the comparative fit index (CFI) and the root mean error of approximation (RMSEA) to further evaluate the fit of the model. CFI ranges from 0-1 and the closer to 1 the better the fit of the model. RMSEA scores at or below .08 represent adequate model fit, .09 to .10 mediocre fit and above .10 as poor fit (Eisenberg, Spinrad, Eggum, Silva, Reiser, Hofer, Smith, Gaertner, Kupfer, Popp, &
Michalik., 2010; Raykov and Marcoulides, 2000). The fit for the first theoretical model was modest, $\chi^2 (68, N = 238) = 197.27, p = .00$, CFI = .84, RMSEA = .09 (90% CI = .08 - .10).

The next step in evaluating a theoretical model is to look at the autoregressive paths which examine the stability of the constructs over time. For the first model shown in Figure 2, the autoregressive paths for coercive parenting in the control group were positive and significant (though modestly so) for waves 1-5 ranging from .12 to .28 accounting for 1-8% of the variance. Coercive parenting in the control group was no longer reliably stable from 18 to 30 months post baseline ($b = .06$). The autoregressive paths for coercive parenting in the PMTO group were positive and significant and remained stable over time with $bs$ ranging from .10 to .45, and accounting for 1 – 20% of the variance. The largest autoregressive path in the PMTO group occurred from 18 months to 30 months post baseline ($b = .45$) which is significantly different than the comparable autoregressive path value ($b = .06$) in the control group. The autoregressive paths for the positive parenting construct were positive and significant across all waves. The range of path coefficients in the control group was .36 to .52, accounting for 13-27% of the variance. The range of path coefficients for the PMTO group was .39 to .53, accounting for 15-28% of the variance. The positive parenting construct remained stable over time to a similar degree in groups.

The next step in evaluating this model is to examine the lead-lag relationship between the parenting constructs, keeping in mind that this relationship is estimated in the context of the stability in each construct (i.e., the autocorrelations), and that significant lead-lag relationships account for variance over and above that accounted for by autoregressive paths. Beginning with the control group and examining the paths from coercive parenting to positive parenting, coercive parenting at time $t$ was not a significant predictor of positive parenting at time $t+1$. A
similar pattern of no predictive relationships of coercive parenting at time t to positive parenting at time t +1 was found for the PMTO treatment group (see Figure 2). This indicates that above and beyond changes accounted for by the passage of time (as indicated by the autoregressive paths), coercive parenting did not reliably predict changes in positive parenting at subsequent points in time in either the control or PMTO groups.

Examining the complementary lead-lag relationship of positive parenting at time t to subsequent negative parenting at time t + 1, significant path coefficients were observed in both the control and PMTO groups. The lead-lag paths from positive parenting to subsequent coercive parenting in the control group were negative and significant, and ranged from -.23 to -.46 and accounted for 6-21% of the variance in coercive parenting over and above the temporal stability of coercive parenting. The exception, and unique to the PMTO group, positive parenting at 18 months did not have a non-significant relationship with coercive parenting at 30 months. In general, positive parenting at one assessment point predicted less coercive parenting at the subsequent assessment point. In both groups, there were consistently significant and sizeable same time negative correlations (as shown by the spanners in Figure 2) between coercive and positive parenting.

*Model 2: Coercive Parenting and Monitoring*

The second theoretical model (Figure 3) examined the relationship between the coercive parenting construct and the monitoring construct across all waves (baseline, 6 months post treatment, 12 months post baseline, 18 months post baseline and 30 months post baseline). The fit of the second model (Coercive Parenting and Monitoring) was $\chi^2 (57, N = 238) = 137.49, p = .000, CFI = .81, RMSEA = .08 (90\% CI = .06 - .09)$, indicating a modest fit to the data.
Focusing first on the autoregressive paths for coercive parenting (which estimate stability in coercive parenting over time) in the control group, there is clear evidence of stability from baseline to 12 months after baseline, but a lack of stability thereafter to 30 months post baseline. There was more consistent, significant stability over the 30 month assessment period for coercive parenting in the PMTO, increasing from \( b = 0.23 \) from baseline to 6 months to \( b = 0.49 \) from 18 to 30 months. Temporal stability of monitoring in the control group was not significant from baseline to 6 months, but slowly increased in size and reliability from 6 months to 30 months post baseline. A similar stability pattern was apparent in the PMTO group, except with a large reduction in stability from 18 to 30 months post-baseline.

The next step is to evaluate the lead-lag relationships between the coercive parenting construct and the monitoring construct. In contrast to model 1 (above), the lead-lag relationships indicated that coercive parenting at time \( t \) predicted monitoring at time \( t + 1 \), but the reciprocal relation of monitoring to coercive parenting was not significant. In the control group, the cross lags from coercive parenting to monitoring were significant and negative from baseline to 18 months post baseline but diminished beginning at the 12 to 18 month lag. Coercive parenting at baseline predicted poorer monitoring at 6 months, and coercive parenting at 6 months predicted poorer monitoring at 12 months, over and above the temporal stability of monitoring, and accounted for an additional 16% of the variance in monitoring at 6 and 12 months post baseline. In the control group, monitoring at one assessment point was not reliably predictive of coercive parenting at the next assessment point from baseline to 12 months post baseline, but was reliably and increasingly predictive beginning at 12 months post baseline, reaching \( b = -0.45 \) from 18 to 30 months post baseline. In fact, the direction of the lead-lag relationship between monitoring and
coercive parenting “flipped” at about 12 months post-baseline, with coercive parenting predicting poorer monitoring earlier and monitoring predicting less coercive parenting later.

The lead-lag predictive relationship of coercive parenting to monitoring in the PMTO group showed a somewhat different pattern. Coercive parenting at baseline was unrelated to monitoring at 6 months post baseline, but coercive parenting was a significant predictor of worse subsequent monitoring to 30 months post baseline. However, coercive parenting accounted for only about 6% additional variance in monitoring over and above its temporal stability beginning with the 6 to 12 month lead-lag assessment periods. Unlike the control group, monitoring was not significantly related to subsequent coercive parenting at any time during the 30 month assessment period.

Model 3: Positive Parenting Without Monitoring and Monitoring

The final theoretical model (Figure 4) examined the relationship between the construct of positive parenting without monitoring and the monitoring construct across all waves. The fit of the model to the data was modest, \( \chi^2 (52, N = 238) = 139.36, p = .00, CFI = .83, RMSEA = .08 (90\% CI = .07 - .10). \)

The autocorrelations for positive parenting without monitoring indicated reliable temporal stability across all waves for the control group, ranging from .33 to .43 and with positive parenting at time t accounting for 11-19% of the variance in positive parenting at time t +1. The autocorrelations for positive parenting without monitoring in the PMTO group indicated similarly reliable temporal stability across waves, ranging from .44 to .50 and with positive parenting at time t accounting for 19-25% of the variance in positive parenting at time t +1. There was less temporal stability for monitoring in both the control and PMTO groups. In the control group, the positive relationship for monitoring did not become significant until 12
months post baseline to 30 months post baseline. The temporal stability for monitoring in the PMTO group was even less apparent, with a reliable relationship only from 12 to 18 months post baseline ($r = .31, p < .01$).

First, examining lead-lag relationships from positive parenting to monitoring in the control group, positive parenting without monitoring was positively and significantly predictive of monitoring from baseline to 18 months post baseline, but not from 18 to 30 months post baseline. Where significant, positive parenting at one assessment point predicted better monitoring at the subsequent assessment point. When reliable, positive parenting predicted 7-10% of the variance in subsequent monitoring over and above the temporal stability of monitoring. This indicates that positive parenting at $t$ reliably predicts better monitoring at subsequent points in time ($t+1$). At no time period was monitoring predictive of later positive parenting in the control group.

In the PMTO group, positive parenting without monitoring began to have a positive and significant predictive relationship to subsequent monitoring beginning at 6 months post baseline and continuing to 30 months post baseline. The lead-lag path coefficient from positive parenting to monitoring ranged from .25 to .43 and accounted for 6-19% of the variance in subsequent monitoring. Examination of the reciprocal lead-lag relationships from monitoring to positive parenting indicated only one small but reliable relationship, from monitoring at 12 months post baseline to positive parenting 18 months post baseline. The estimates for the predictive relationships from higher positive parenting to better monitoring were similar for the PMTO and control groups in terms of relative size, but differed somewhat in terms of timing.
CHAPTER 5
DISCUSSION

Treatment for conduct problems are the most sought services for youth and inadequate treatment may fail to alter a trajectory which may result in aggression, violence, illicit activity, academic problems or dropping out of school and possible employment and relationship problems later in life (Hinshaw & Lee, 2003; Richters & Martinez, 1993; Achenbach & Howell, 1993; Weisz, 2004; Snyder, 2001; Tremblay, 2000; Piquero et al., 2009). Research supports PMT as successful intervention for reducing conduct problems (Piquero et al., 2009; Bernazzani, Cote & Tremblay, 2001; Bernazzani & Tremblay, 2006; Costin & Chambers, 2007; Sandler et al., 2011). Parent Management Training has been shown to reduce child behavior problems, and these changes are accounted for by modifications in parenting practices (Sandler et al, 2011; Hinshaw, 2007; Beauchaine, Webster-Stratton-Reid, 2005; Eddy & Chamberlain, 2000; Forgatch, Beldavs, Patterson and DeGarmo, 2008; Martinez & Forgatch, 2001). However, previous research has primarily considered parenting practices as an aggregate, and only examined short-term changes in parenting practices.

The intent of the current study was to explore the timing of and interplay among changes in various parenting practices that serve as the proximal mechanisms of change in Parent Management Training-Oregon. A better understanding of these mechanisms may promote the development and delivery of more effective and efficient intervention by describing what changes in parenting take place and how those changes unfold over time. The call for investigation of the mediators of PMT has been made by many researchers (Piquero et al., 2008; Beauchaine, Webster-Stratton, & Reid, 2005; Kazdin & Nock, 2003; Sandler et al., 2011). Previous research on PMT has established that changes in parenting behaviors mediate the
relationship between participation in PMT and improvements in child behaviors (Sandler et al., 2011; Hinshaw, 2007; Beauchaine, Webster-Stratton & Reid, 2005; and Eddy and Chamberlain, 2000). However, parenting is a complex process involving multiple, inter-related components, and previous research on mediators has not disaggregated this complex construct in order to understand the temporal cascade of multi-level changes in the various parenting components engendered by PMTO nor examined how the temporal changes in those components unfold over time.

Previous research has shown reductions in coercive parenting practices and increases in positive parenting practices resulting from PMT each account for beneficial changes in child behaviors (Patterson & Dishion, 1985; Kazdin, 2005; Patterson, Forgatch & DeGarmo, 2010). However, previous models of changes generated by PMT have been relatively simplistic, focusing on change at one point in time (usually closely following the completion of intervention) and on treating parenting as an aggregate construct (rather than a complex set of distinguishable and potentially hierarchically related processes). As such, identifying the sequence and timing of changes in parenting behaviors resulting from intervention and the potentially transactional nature of those changes has received little systematic attention. This research was an initial attempt to test models that examine the timing, sequencing and transactional nature of changes in multiple parenting behaviors that are set off by PMTO intervention.

**Preliminary Construct Building**

The initial analytic approach entailed identifying reliable constructs of parenting practices. Negative reciprocity, negative reinforcement and inept discipline loaded reliably on the coercive parenting construct. Positive involvement, skill encouragement, problem solving
and monitoring loaded reliably on the positive parenting construct. This replicated previous research utilizing the data from the ODS-II study (Martinez & Forgatch, 2001; DeGarmo & Forgatch, 2005; Forgatch & DeGarmo, 1999; Patterson, Forgatch & DeGarmo, 2010). Previous research utilizing these data also showed short-term changes in parenting behaviors accounted for change in noncompliance and conduct problems, with changes in positive parenting explaining more variance in reductions of child conduct problems than accounted for by changes in coercive parenting (Martinez & Forgatch, 2001; Patterson, Forgatch & DeGarmo, 2010), and that changes in positive parenting occurred prior to coercive parenting. The current study expanded on this research by looking even more closely at the sequencing and timing of changes in parenting behaviors and their inter-relation, and also by separating monitoring from the positive parenting construct to investigate how changes in monitoring relates to changes in coercive parenting as well as other components of positive parenting, and by following these changes over a longer period of time after the PMTO intervention. This was done in order to contribute to a better understanding of the role monitoring plays in parenting children in early and middle childhood, and to understand the longer-term cascade of changes in parenting that result from intervention.

Relative Change in Parenting in the PMTO and Control Groups

Consistent with previous research using this data set, the PMTO relative to the control group was observed to display higher levels of positive parenting and lower levels of coercive parenting following intervention. These differences were first apparent at 12 months after baseline rather than immediately after intervention at 6 months post baseline. This indicates that the impact of PMTO takes some time to “take hold.” However, the group differences in parenting tended to fade over time at 18 and 30 months after baseline, with some remaining
advantage for the PMTO relative to the control group. Changes in monitoring in the PMTO and control groups have not previously been assessed using these data. Similar to other components of parenting, the PMTO group advantage in higher levels of monitoring appeared at about 12 months after baseline (or six months after completion of PMTO), but unlike other parenting practices this advantage was clearly apparent to 30 months after baseline. The persisting effects of monitoring may be particularly important in that the children in the sample were moving toward the adolescent transition by 30 months post baseline, at mean age 11 years and with the oldest children being age 14 years.

**Continuity in Parenting**

Examination of the continuity of the parenting constructs across time indicated that positive parenting both with and without monitoring was stable across all waves in both the PMTO and control group. This suggests that parents’ use of positive parenting skills was quite stable, and that positive parenting may serve as the foundation for changes in other parenting practices. Coercive parenting was less stable in the control group but exhibited a small degree of stability which increased over time in the PMTO group. Monitoring had a small degree of stability that increased over time with the exception in which continuity in monitoring in the PMTO treatment group decreased from 18 to 30 months after baseline. This difference is more discussed in more detail in a later section.

**Cross-Lagged Relationships**

Examination of the general temporal lead-lag relationships among the parenting constructs indicates that that positive parenting at one time point was negatively related to coercive parenting at subsequent time points, that positive parenting at one time point was positively related to monitoring at a subsequent time points, and that coercive parenting at one
time point was negatively related to monitoring at subsequent time points. However, these lead lag relationships were generally not reciprocal.

These general cross-lagged patterns suggest that positive parenting is a core process that is stable across time and is a crucial antecedent to both effective parental monitoring and reduced coercive behavior. Positive parenting can be thought of as encompassing two facets of behavior, one which involves relatively non-contingent warmth, involvement and bonding, and the other of which is more instrumental and contingent - including skills teaching and problem solving. The negative relationship of positive to coercive parenting may indicate that a warm relationship that includes good communication and problem solving decreases conflict and averts frequent and escalating coercive relationship processes. Positive parenting, including warmth and trust, may enhance the willingness of children to communicate their whereabouts and activities, thereby promoting better monitoring. Positive parenting also entails involvement and interest in the child’s daily experiences both of which are needed for a parent to “care enough” to monitor their children’s peer associates, activities and whereabouts. Coercive parenting interferes with the social relationship processes involved in successful monitoring. Coercive exchange disrupts the warmth, trust and openness needed to promote effective communication and problem solving which are critical to effective monitoring (Kazdin, 2005; Dishion & McMahon, 1998; Kerr & Stattin, 2000; Stattin & Kerr, 2000; Patrick, Snyder, Schrepfeman & Snyder, 2005).

**Inter-Relationship Between Positive and Coercive Parenting**

The first model examined in this study examined the temporal and transactional relationship between coercive parenting practices (made up of negative reciprocity, negative reinforcement and inept discipline) and positive parenting practices (made up of positive involvement, skill encouragement, problem solving and monitoring). Although coercive
parenting terms showed some moderate temporal stability in the PMTO and control groups from baseline to 18 months after baseline, large between group differences appeared at the transition from 18 to 30 months post baseline. The modest stability of coercion in the control group diminished and in the PMTO group increased substantially. This suggests substantial shifts in the coercive interaction of parents and children in the control group as children move toward adolescence, whereas that coercive interaction increasingly stabilizes early at relatively lower levels (given mean group differences) in the PMTO group.

The coercion model postulates that children’s disruptive behaviors are shaped by repeated problematic interactions with parents who utilize positive and negative reinforcement in attempts to gain control. Dishion, Patterson and Kavanagh (1992) found that parent training reduces the use of negative discipline and coercive parent-child interaction. Parents participating in PMTO are taught skills on how to disengage from the cycle of coercion in order to reduce conflict and harsh discipline (Forgatch, 1991; Schrepferman & Snyder, 2002; Patterson & Forgatch, 2010). However, the question remains as to whether an increase in positive parenting serves to reduce the likelihood of coercive tactics or whether reductions in coercive tactics precede increases in positive parenting. In the current study, coercive parenting did not predict reductions in positive parenting at subsequent points in time in either the control or PMTO groups. This finding appears contrary to that of Forgatch, Beldavs, Patterson and DeGarmo (2008) who found reductions in coercive parenting preceded the increases in positive parenting, indicating that parents first reduce the rates at which they use coercive tactics prior to the onset of benefits derived from positive parenting. Alternatively, the current study found that while “unpacking” the changes in parenting and examining their relationships with one another, it is positive parenting that reliably predicted subsequent decreases in coercive parenting.
Martinez and Forgatch (2001) asserted that changes in positive and coercive parenting both contribute to changes in non-compliance but did not identify their relative contribution or timing. While this assertion may be true, it continues to be insufficient in terms of informing intervention. As Patterson, Forgatch and DeGarmo (2010) explain, PMTO intervention first teaches parents how to employ positive parenting skills before teaching them to be less coercive. While this has been the generally accepted intervention sequence in terms of targeting parenting skills, the order with which a parenting component is targeted is not necessarily congruent with the order in which changes in parenting practices unfold. However, the data in this study supports the introduction of positive parenting very early in parent training as it more strongly predicts reductions in coercion than vice versa.

Adding Monitoring

The relationships between monitoring and coercive parenting and between monitoring and the other components of positive parenting (positive involvement, skill encouragement and problem solving) were examined in order to better ascertain the relationship of monitoring to other parenting behaviors which has not been thoroughly examined for pre-adolescent children. Longmore, Manning and Giordano (2001) define monitoring as parental awareness of where their child is, who their child is with, and what they are doing, recognizing that monitoring includes a psychological control component in which the parent communicates that the child’s wellbeing is valued in hopes of leading to adherence to the parent’s rules. Veronneau and Dishion (2010) identify monitoring as a crucial parenting strategy for averting problem behaviors in adolescence. The current study sought to better understand monitoring in relation to the other parenting skills targeted in PMTO.
Inter-Relationship Between Positive Parenting and Monitoring

The second model examined the lead-lag relationships of positive parenting and monitoring. The results suggest that positive parenting (skill encouragement, positive involvement and problem solving, without monitoring) predicts better monitoring at subsequent time points but that monitoring does not predict more positive parenting at subsequent time points. Monitoring is not just about parental tracking and child rule following about activities and associates outside the home that is established as a child experiences increasing independence with age, but rather is built on an earlier positive relationship between parent and child that establishes trust and open communication. Monitoring has been defined as a complex process that includes parents’ awareness of the child’s activities, open parent-child communication, and a willingness for truthful disclosure by the child based on a trusting and supportive relationship (Dishion & McMahon, 1998; Kerr & Stattin, 2000; Stattin & Kerr, 2000; Patrick, Snyder, Schrepferman & Snyder, 2005).

An exception to the general pattern of continuity in monitoring and the facilitative impact of positive parenting on later monitoring was observed at the 18 to 30 month post baseline transition in both the control and PMTO groups. As children get older, the process of monitoring itself begins to change to accommodate the child’s increasing independence from adult supervision and increasing autonomy (Kerr & Stattin, 2000 and Stattin & Kerr, 2000). The continuity of monitoring dropped dramatically in the PMTO group, and the impact of positive parenting on monitoring diminished in the control group. This suggests that parents in the PMTO group may be adjusting their monitoring tactics as their children move toward adolescence but that these adjustments are still influenced by previous positive parenting, whereas parents in the
control group are not shifting their monitoring and previous positive parenting serves less as the basis for monitoring as children move into adolescence.

**Inter-Relationship Between Coercive Parenting and Monitoring**

The final model examined the temporal relationship between monitoring and coercive parenting. Consistent with previous findings, earlier coercive parenting predicted lower levels of subsequent monitoring except in the PMTO group from baseline to 6 months post baseline. This is consistent with the notion that effective monitoring is based on good communication, openness and trust, and that coercive parent-child interaction undermines these relationship processes. The absence of a relationship from baseline coercive parenting to monitoring at 6 months post baseline in the PMTO group may indicate that this relationship is disrupted, perhaps suggesting that parents in the PMTO group learn to track their children in more dispassionate ways without the interference of conflict and anger. This may also lead to the improved monitoring beginning at 12 months and continuing to 30 months post baseline in the PMTO (relative to the control) group.

Only in the control group, poor monitoring predicted more subsequent coercive parenting, beginning at 12 months after baseline and increasing from 18 to 30 months after baseline. Ineffective monitoring is likely to generate disagreements and conflict over children’s associates and activities outside of the home (Dishion & McMahon, 1998), and these processes may be exacerbated as children get older. In contrast, improvements in monitoring in the PMTO group beginning at 12 months post baseline may have short circuited this process.
Summary & Implications

The goal of this research was to better understand the sequencing and timing of changes in parenting behaviors engendered by PMTO, and the transactional interaction among those changes. Focusing on the treatment group, the increases in positive parenting at 12 months post baseline facilitate better subsequent monitoring and lower subsequent levels of coercive parenting, and lower levels of coercive parenting facilitates better monitoring. In terms of ensuring more effective and efficient interventions, it appears that PMTO’s current curriculum of introducing positive parenting skills prior to effort to reduce coercive parenting is congruent with the sequencing of changes in parenting found in this study. This supports the idea that positive parenting is a core, prerequisite process for other changes. Skill building focused on positive involvement in the home, skill encouragement, and problem solving are parenting practices taught earlier in PMTO than practices aimed at improving monitoring. This is also consistent with the results in this study which indicate that positive parenting (skill encouragement, positive involvement and problem solving) predicts later increases in monitoring and decreases in coercive parenting, more generally, than the converse.

This analysis informs PMTO intervention by identifying positive parenting as a core and prerequisite process. As warmth, bonding, trust and attachment appear to be core facets of positive parenting which lay the foundation for other parenting processes such as monitoring, perhaps early treatment exposure to positive parenting skills is necessary. However, the question continues to be whether enhanced positive parenting is sufficient. Monitoring becomes increasingly important as children age in order to diminish risk for association with deviant peers and for negative behaviors such as drug and alcohol use in adolescence. In fact, the data on monitoring presented in this report suggest a “sleeper effect.” The influence of monitoring is
apparent in terms of improved monitoring early after intervention, based on a foundation of other positive parenting practices, but the intervention effects on monitoring also persist much longer than intervention effects on other parenting practices. Group differences in the continuity of monitoring may indicate parents in the PMTO condition demonstrate greater flexibility and change in monitoring practices congruent with their children’s increasing independence and autonomy during late childhood and early adolescence. PMTO appears to shift relationships among parenting practices during the first 6 months after intervention and these shifts may result in cascading and rippling effects across multiple facets of parenting for at least another two to three years.

Strengths and Limitations

The observational assessment of multiple parenting behaviors is a strength of the current study. Reliable direct observations collected at five assessment points over 30 months provided the opportunity to examine the temporal, transactional unfolding of changes in multiple parenting practices that would not be possible using self-report measures. The randomized control trial design provided the opportunity to examine how PMTO interventions alter the natural history (as reflected in the control group) of changes in parenting over time and as children grow older, and to begin to better understand how PMTO and other parenting interventions have their sustained and powerful effects on child adjustment (Sandler et al., 2011).

Some interpretive cautions are needed, however. The large differences between groups for the changes taking place at 18 to 30 months could also be viewed as “anomalies” due to two limitations in the assessment design for parenting behaviors. First, this is the only interval for which there is a 12 month rather than a 6 month passage of time. Assessments at 24 months (continuing the 6 month assessment intervals) would have provided a clearer picture about these
later changes in parenting. Another limitation is that these models the analyses do not include data after 30 months post baseline to see if these “anomalies” persist or reflect measurement error or some other unidentified bias.

Monitoring has been demonstrated to operate as a stronger risk factor for problematic behavior in adolescence (Longmore, Manning & Giordano, 2001; Veronneau & Dishion, 2010, Collins et al, 1995; Holmbeck et al, 1995). This study only begins to explore the relationship of monitoring to other parenting behaviors during early and middle childhood. Clearly, continued efforts should be made to understand the relationship of monitoring to other facets of parenting into and during adolescence. The sample used in the ODS II study is another potential weakness. The participants in this sample, while reflective of the community in which they resided, were primarily white and the target children were all male; therefore, generalizability to other groups may be limited. Also, the findings in this research should be contextualized in terms of prevention as the participants are at risk youth from newly divorced families and may not a clinical population. Finally, given the modest fit of the models to the data, interpretations and conclusions from these analyses should be done with some caution.

Despite the cautionary statements above, the current study provides potentially important implications regarding changes in parenting engendered by PMT. Overall, the results of this study indicate that positive parenting practices may truly be the core processes involved in producing change in children’s negative behaviors. Coercion theory postulates that the day-to-day family environment is a powerful determinant of child behavior and that moment-to-moment parent-child interactions marked by aversive behaviors initiate and sustain a cycle in which poor discipline increases the likelihood of child defiance, aggression and disruptive behavior (Patterson, 1982; Patterson, Reid & Dishion, 1992; Forgatch, 1991; Schrepferman & Snyder,
This study suggests that coercion theory may need to be modified in that disrupted parenting may not be initiated by this coercive process but that the coercive process is secondary and reflects failures in positive parenting. As such, it appears that PMTO’s current curriculum of introducing positive parenting skills initially, rather than initially ands solely focusing on the reduction of coercive parenting practices, is the most effective course of action in terms of altering the full parenting practices associated with risk for child conduct problems.
REFERENCES


## TABLE 1

DESCRIPTIVE STATISTICS FOR PARENTING PRACTICES BY GROUP

<table>
<thead>
<tr>
<th></th>
<th>CONTROL</th>
<th>Baseline (w1)</th>
<th>Mean</th>
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<th>6 months (w3)</th>
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<th>Standard Deviation</th>
<th>12 months (w4)</th>
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<th>Standard Deviation</th>
<th>18 months (w5)</th>
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### TABLE 2

**CONCURRENT MEAN CORRELATIONS AMONG PARENTING MEASURES**

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Correlations for the Control group are above the dotted line. Correlations for the PMTO group are below the solid line.

** Significant at the .01 level
* Significant at the .05 level
TABLE 3
Means and Ranges of Factor Loadings For Parenting Practices Across Waves and by Group

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<thead>
<tr>
<th>Control Group</th>
<th>Mean Factor Loadings for Coercive Parenting</th>
<th>Ranges of Factor Loadings for Coercive Parenting</th>
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<td>-.03 to -.36</td>
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<td>.59 to .63</td>
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</table>

PMTO

| Negative Reciprocity | .84 | .80 to .87 | -.12 | -.03 to -.24 |
| Negative Reinforcement | .81 | .73 to .89 | -.15 | -.11 to -.23 |
| Inept Discipline | .39 | .28 to .56 | -.79 | -.66 to -.86 |
| Positive Involvement | -.34 | -.16 to -.63 | .69 | .55 to .85 |
| Skill Encouragement | -.08 | -.41 to .15 | .71 | .63 to .85 |
| Problem Solving | -.17 | -.08 to -.34 | .68 | .53 to .73 |
| Monitoring | -.15 | -.36 to .13 | .70 | .59 to .79 |
TABLE 4

T-test Comparisons of Parenting Practices in PMTO and Control Groups

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Figure 1. Cascade Model with Autocorrelation and Temporal Cross-Lagged Paths
Figure 2. Cascades of Coercive and Positive Parenting

Control

PMTO

Note: p = .05 * Significant at the .05 level
** Significant at the .01 level
Figure 3. Cascades of Coercive Parenting and Monitoring

Control

PMTO

a. $p = .08$

** Significant at the .01 level

* Significant at the .05 level
Figure 4. Cascade of Positive Parenting Without Monitoring and Monitoring

Control

PMTO

** Significant at the .01 level
* Significant at the .05 level