

# the Behavior Therapist

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## Feature

During the 38th Annual Convention in New Orleans, Past-President Gerald R. Patterson graciously accepted the Parenting and Families SIG's Trailblazer Award, which is offered to individuals who have caused us to rethink important aspects of research and clinical work with children and families. Following a moving introduction by Dr. Marion Forgatch, Dr. Patterson shared his vision of "The Next Generation of PMTO Models," and in so doing, conjured the essence of the award, challenging us to rethink conventional wisdom about parent training models. The address also inspired, pointing the way toward potentially more effective strategies for working with families and putting healthy parenting and our efforts to promote it into context. We regretted that mention of Dr. Patterson's address was not able to be included in the regular convention program. So for the many more of you who might have attended but could not, Dr. Patterson's edited address appears below.

—THE EDITOR

## The Next Generation of PMTO Models

Gerald R. Patterson, *Oregon Social Learning Center*

Parent Management Training Oregon model (PMTO) is a manualized set of procedures designed for parents of antisocial children (Bank, Rains, & Forgatch, 2004; Forgatch, 1994). Three randomized trials for small samples of clinical referrals showed the training was effective (Patterson, Chamberlain, & Reid, 1982; Walter & Gillmore, 1973; Wiltz & Patterson, 1974). The effects were further replicated in randomized trials with chronic offending delinquents (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991). Chamberlain (1990) and Eddy, Whaley, and Chamberlain (2004) applied PMTO techniques to randomized trials for chronic offenders in foster care settings. The procedures were also adapted for randomized trial prevention studies involving preadolescents at risk for substance use (Dishion, Patterson, & Kavanagh, 1992), recently divorced mothers (Forgatch & DeGarmo, 1999), stepparent families (Forgatch, DeGarmo, & Beldavs,

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in press), and families living in high crime  
areas (Reid, Eddy, Fetrow, & Stoolmiller,  
1999).

One of the unusual features of the  
PMTO approach is that it is tied to a theory  
about the causes of aggression (Patterson,  
1982; Reid, Patterson, & Snyder, 2002).  
The theory includes a specification of the  
measurement models that describe the con-  
tributions of parents, siblings, and peers in  
determining a wide spectrum of child out-  
comes (Patterson, Reid, & Dishion, 1992).  
Recent studies used randomized prevention  
and intervention trials to provide experi-  
mental tests of the causal status for the key  
mechanisms (Chamberlain, Fisher, &  
Moore, 2002; Forgatch & DeGarmo, 1999,  
2002).

Recent studies have also introduced  
some interesting developments in the un-  
derlying theory. These, in turn, point to the  
need for modifications in the intervention.  
This report summarizes the recent innova-  
tions together with some targeted areas of  
change.

## Early Changes in PMTO

Parent-management intervention strat-  
egies emerged from the loose collaboration  
among three groups of investigators. One  
group was led by Connie Hanff at the med-  
ical school in Portland, Oregon, and an-  
other by Robert Wahler in the psychology  
department in the University of Tennessee.  
The third group was led by myself from the  
department of psychology at Oregon.  
Later, at the Oregon Research Institute,  
John Reid rejoined the group and played a  
major role when the group became the  
Oregon Social Learning Center. Each group  
followed slightly different paths but all  
three shared some characteristics in com-  
mon. We shared in common a focus on con-  
tingencies found in family interaction that  
controlled child behavior and a deep com-  
mitment to the use of observation data.

Since the inception of PMTO in the late  
1960s, there have been at least a dozen  
noteworthy changes in Oregon. Forgatch  
(1984, 1989) carried out extensive studies  
of family problem-solving exchanges (rule  
setting) together with a rating system to  
classify outcomes. Observation data from  
family problem-solving exchanges is one of  
our most reliable predictors (DeGarmo &  
Forgatch, 2004). With extensive funding  
by NIMH we were able to specify the mea-  
surement models defining five different  
parent practices (discipline, positive sup-  
port, monitoring, problem solving, parent  
involvement) thought to control family  
contingencies for both prosocial and de-  
viant child outcomes (Forgatch &  
DeGarmo, 2002; Patterson et al., 1992).  
Confirmatory factor analyses suggest that  
one can indeed differentiate among these  
parenting practices (Dishion, Li, Spracklen,  
Brown, & Haas, 1996). The existence of  
measurement models makes it possible to  
construct a theory of aggression expressed  
in terms of variance accounted for when  
predicting individual differences in aggres-  
sion.

It was clear that most efforts to train  
parents were met with resistance (Patterson  
& Forgatch, 1990). We spent 5 years exam-  
ining this aspect of PMTO (Patterson &  
Chamberlain, 1988, 1994) and learned that  
if there was no resistance, there was also no  
change. We learned to use extensive role-  
play as a means for minimizing parent resis-  
tance.

Although our effort to apply PMTO to  
treating chronic delinquents might be  
deemed a statistical success (Bank et al.,  
1991), those of us who served as therapists  
would claim otherwise. Patti Chamberlain  
came out of that experience determined to  
find a better way of treating chronic offend-  
ing delinquents. Her resolve led to the de-  
velopment of one of OSLC's major shifts in  
PMTO procedures. She introduced Treat-

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ment Foster Care (Chamberlain, 1990), and it became one of OSLC's most successful intervention programs.

The most recent innovation in PMTO procedures involves the addition of a component designed specifically to alter the behavior of siblings (Miller Brotman et al., in press). This material will be reviewed in more detail in a later section of the report.

### PMTO

The basic assumption for the PMTO approach is that the problem solution does not lie in the child; it lies in the social environment (Patterson, 1982). If you are to be successful in changing the behavior of aggressive children, you must change how the social environment reacts to them (Reid et al., 2002). In the short run, aggressive behaviors are functional in that they control the immediate reactions of the other family member. Family members learn to avoid temper tantrums by giving in to the demands of the problem child. Given a conflict bout, the problem child learns to escalate the amplitude of the aversive reactions and thus wins the bout (Snyder, Edwards, McGraw, Kilgore, & Holton, 1994). Snyder and Patterson (1995) showed that in normal families the child learns to use prosocial skills (humor, negotiate) as well as coercive skills in resolving conflict bouts. However, in distressed families, the child learns that coercive methods are functional whereas prosocial skills are not. The same study showed that the relative rate of reinforcement for coercive behavior correlated .83 with the relative rate of coercive behavior observed in the home a week later. Snyder, Schrepferman, and St. Peter (1997) went on to demonstrate for a clinical sample that the relative rate of reinforcement for deviant behavior observed in the home predicted police arrest rates 2 years later.

The contingency studies required 5 to 10 hours of observation in the home. For most investigators this level of cost is prohibitive. It seems that there are two ways of handling this problem. Recently, Lucyshyn et al. (2004) devised a means for tailoring each observation to make the data maximally relevant to testing coercion contingencies. The result is a marked reduction in the amount of observation required. Our own less elegant solution was to assume that an assortment of parenting skills controlled the contingencies and that the parenting skills could be measured at much less cost. We spent several years developing multimethod agent measures for each of the five parenting skills (positive support, disci-

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pline, problem solving, positive involvement, and monitoring). The measurement model is detailed in Capaldi and Patterson (1989), Forgatch and DeGarmo (1999, 2002), and Patterson et al. (1992).

Typically, each construct in a structural equation model is defined by multiple indicators. One of the earliest models showed that latent construct for parent monitoring and another construct, discipline, together

would account for a minimum of 30% of the variance in a latent construct measuring antisocial behavior in the child. Forgatch (1991) constructed models from three different samples that satisfied these requirements. In keeping with the theory, disrupted parenting was associated with antisocial child outcomes. The general strategy also stipulates that the impact of such contextual variables as poverty, divorce,

stress, or marital conflict on child outcomes would be mediated by their effect on parenting practices. For example, a divorce does not automatically produce an antisocial child; it depends upon whether or not the parenting practices are disrupted. The context studies are reviewed in Patterson et al. (1992) and Capaldi, DeGarmo, Patterson, and Forgatch (2002). The edited volume by Reid et al. (2002) details other relevant tests of the model and the relation of the theory to intervention and prevention trials.

The first and very important step in validating an intervention is to demonstrate with replicated randomized trials that the intervention has a reliable impact on child outcomes. These studies were noted earlier. In the last decade, it has been possible to move the PMTO model much further than that. Given a theory that not only specifies a measurement model but in addition specifies the mechanisms that purport to bring about change implies a whole new level of discourse. In the present instance, the theory stipulates that changes in contingencies and in parenting practices will produce improvements in child outcomes. Given a randomized trial design, the predictions are straightforward. The theory underlying PMTO would predict improvements in parenting practices for families in the experimental group as compared to no improvement in parenting for the comparison group. We already know from prior studies that PMTO produces significant reductions in child problems for the experimental group but not for the children in the comparison group.

The next question is the most interesting of all. Can it be said that the magnitude of the changes in parenting covaries with the magnitude of the changes in child outcomes? This suggests the status of parenting practices and contingencies as causal mechanisms. Of course, only an experiment can tell us about possible causal mechanisms. We have now collected the data from five such experiments and used the Baron and Kenny (1986) method to determine the extent to which changes in parenting bring about the changes in child outcome. In all of the studies, the findings support the hypothesized mediational model (Dishion, & Andrews, 1995; Forgatch & DeGarmo, 1999; Forgatch et al., in press; Reid et al., 1999). The studies are consistent in declaring that changes in parenting produce changes in child outcome.

### *Social Cognitions*

Most investigators would now agree that the evidence shows that working with parents can lead to improvements in problem behavior children. However, they would be in marked disagreement as to how these problems emerged in the first place. They would also disagree as to what mechanisms produce the changes brought about by PMTO. There have been three main efforts to explain how these changes are brought about. The primary focus of developmental psychology has been upon the role of social cognitions (Dodge, Pettit, Bates & Valente, 1995; MacKinnon-Lewis et al., 1994) and the contribution of emotional dysregulation (Gross & Munoz, 1995; Lewis, 2000). Behaviorists tend to emphasize the contribution of contingencies (Patterson, 1982; Patterson, Littman, & Bricker, 1967; Snyder & Patterson, 1995). Historically, each of the three positions engaged in a wholehearted pursuit of the null hypothesis and largely ignored the literature in the other three areas. Each of them repeatedly proved that their explanation for aggression was better than no theory at all.

Recently this situation has shifted to an approach that emphasizes the relative contributions of several perspectives. For example, Lemerise and Arsenio (2000) propose a model that integrates social information and emotion processes. Although Patterson (1982, p. 280) proposed a model with a path from maternal negative attribution to disrupted discipline practices, it was two decades before such an integrated model was tested. The study by Nix et al. (1999) showed that the relation between negative maternal attribution and school antisocial (teacher plus peer reports) was mediated by disrupted parental discipline practices. Snyder, Cramer, Afrank, and Patterson (in press) provided correlational data that were consistent with the findings from the Nix study. In the Snyder study, it was also possible to move beyond the question of individual difference or intercept models and consider growth in antisocial behavior measured at three points in time. It was the case that growth in antisocial behavior at home predicted growth at school. Neither baseline measures of negative attribution nor discipline predicted growth in antisocial behavior. However, the product term (negative attribution)(discipline) was a significant predictor for growth in both settings. If the parents attributed intentionality to child misbehaviors, it increased the likelihood that there would be a continuation of inef-

fective discipline practices, in turn producing continued growth in antisocial behavior. Miller and Prinz (2003) showed that parents who attribute the causes for child misconduct as being in the child were unwilling to alter their discipline practices. It seems then that mediational and moderator models rather than a simple direct effects model may provide the best account for the contribution of social cognition to understand children's aggression.

The findings suggest that components might be added to PMTO that are specifically designed to shift maternal negative attributions to more neutral or positive ones. This might speed up the intervention process as well as contributing to its long-term maintenance. It may also be the case that these changes are already a salient feature of successful cases and we simply have not measured it

### *Emotional Regulation*

Integrated models that included negative emotion as a key variable require a reliable means of identifying emotional reactions. The seminal studies by Gottman and his colleagues serve that valuable function in their development of the Specific Affect Coding System (SPAFF; Gottman & Levenson, 1985). When used to code videotapes of family problem-solving interactions, none of the parent- or child-coded emotions correlated directly with a construct measuring delinquency (Forgatch & Stoolmiller, 1994). A simple direct-effects model was rejected. However, the data showed that mother-adolescent mutual contempt was associated with disrupted monitoring; and this, in turn, was a significant predictor for delinquency. In keeping with this finding, a study by Patrick, Snyder, Schrepferman, and Snyder (2004) showed that parental warmth in kindergarten was associated with future increases in parental monitoring. The findings emphasize the fact that while emotion variables do not serve as simple direct models in explaining aggression, their contributions are important but they are indirect.

A longitudinal study by Stoolmiller and Snyder (2004) used survival and regression analyses to measures of emotion coded from videotapes of family interactions for a sample of Head Start families. This sophisticated model examined the interaction of child efforts to regulate their own emotion in conjunction with parent efforts to discipline. The findings were fascinating. The data showed that young antisocial children underutilized sad and fearful reactions

when reacting to parental negative emotion and disapproval. The findings provide a nice fit to earlier laboratory models that showed antisocial individuals tended to be hypo-responsive to punishment (Lykken, 1957) and to parent disapproval (Patterson, 1965).

Existing PMTO procedures already provide for increasing parental positives as a necessary preamble to intervention. So increasing parental warmth has always been an integral part of effective intervention. But the present findings suggest that something like extensive role-playing directly with the child to comply while showing neutral or positive emotion to the parent and requests and prohibitions might speed up the treatment process. The prediction would be that such an enhancement component might facilitate treatment outcomes.

### *Siblings*

Our very first observations in the home left little doubt that understanding sibling contributions to the socialization process was going to be a key issue. It seemed that siblings were probably an important source of reinforcement for problem child behavior (Patterson, 1979, 1982, 1986). We knew that scores summing the observed frequency of deviant behavior in the home were highly correlated for siblings and for the problem child. In fact, it was often a bit of a mystery as to why a particular child was selected as "problem child" (Arnold, Levine, & Patterson, 1975).

However, it remained for Bank and his colleagues to disentangle the complex patterns of influence (Bank, Burraston, & Snyder, 2004). They used longitudinal data from the Oregon Youth Study to define a latent construct for sibling conflict and another for unskilled parenting. Although the two constructs were highly correlated (.54), a confirmatory factor analysis showed they were in two differentiable constructs (rather than one). A structural equation model constructed for the age group 10 to 12 years showed the expected strong path (path .55) to a construct for antisocial behavior assessed at age 12 years. The path from parenting assessed at ages 10 to 12 years to antisocial assessed at age 16 years was .46. It was the case that a latent construct for sibling conflict made a unique contribution even after partialing out the contribution of the effective parenting construct. The path from sibling conflict assessed at ages 10 to 12 years to antisocial behavior assessed at age 16 years was .31.

It has been well established that contingencies supplied by parents are significant contributors to antisocial outcomes. The correlational analyses suggest that the theoretical model must be expanded to include contingencies supplied by siblings during conflict bouts. It also seems reasonable to initiate studies where procedures are introduced that specifically reduce reinforcement supplied by siblings for deviant behavior. This last step has, in fact, already been carried out by Lew Bank and his colleagues. Cases were accepted that included either younger or older siblings with the identified problem child. The cases were randomly assigned to PMTO as usual or PMTO plus sibling enhancement component. The enhancement component involved intensive role-play with both siblings. Preliminary analyses of the data showed that adding the sibling component significantly enhanced the effect of PMTO. What is of particular interest is that the children in the enhancement group also showed decreased interactions with deviant peers.

### *Deviant Peers*

Our first decade of studies focused almost entirely on what was going on in the home and only secondarily on what was happening in the classroom. When we decided to study delinquency we were forced to find a place for peer group processes in our models. The early-onset model for delinquent offending put the role of deviant peer in training for deviancy in center stage (Patterson et al., 1989; Patterson & Yoerger, 1997, 2002). According to this model, antisocial children who became involved in early adolescence with deviant peers were at significant risk for adult offending. Antisocial boys who did not become involved with deviant peers were not at risk for adult offending. Dishion, Spracklin, Andrews, and Patterson (1996) went on to show that a likely mechanism was the positive reinforcement contingent on deviant talk. The data showed that members of the deviant peer group provided positive reinforcement for rule-breaking behaviors. Patterson, Dishion, and Yoerger (2000) showed that peer reinforcement accounted for over 50% of the variance in a construct measuring growth in three forms of deviancy (police arrest, substance use, health-risking sexual behavior).

The longitudinal study by Stoolmiller and Snyder (2004) showed that deviant peer contributions to deviancy training began as early at kindergarten. Again, it

was the antisocial child starting kindergarten who was most likely to come under the aegis of the deviant peer group. The reinforcement occurred roughly every 3 minutes, and much of the reinforcement was for deviant talk.

The correlational models strongly emphasize the relative importance of parents, siblings, and now deviant peers to the deviancy training process. It seems that one of the important goals for PMTO should include restricting access to, or time spent with, deviant peers. Several avenues exist for bringing this about. For example, school classrooms and playgrounds can be programmed in such a way that aggressive interactions are drastically reduced. As shown in the well-designed interventions by Kellam, Rebok, Ialongo, and Mayer (1994) and by Reid et al. (1999), it is possible to reduce total output of aggressive behaviors. Presumably this would also be accompanied by reductions in time spent with deviant peers and reductions in delinquent behavior.

Correlational models would also suggest yet another avenue for reducing contact with deviant peers. Correlational models consistently identify a path from disrupted parental monitoring to deviant peer involvement as well as a path from deviant peer involvement to delinquency (Patterson & Dishion, 1985; Patterson & Yoerger, 1993, 1997). These models imply that improving parenting practices, such as monitoring or discipline, would result in decreased contact with deviant peers; and this, in turn, would be accompanied by reductions in delinquent behavior. Eddy and Chamberlain (2000) carried out just such an experiment in a randomized intervention trial based on PMT procedures adapted for use with foster care families working with adolescent delinquents. Improved parenting (including monitoring) was accompanied by reductions in time spent with deviant peers. The decrease in delinquency for those in the experimental group was mediated by the changes in parenting.

In that study, it was not feasible to measure changes in parenting. This omission was corrected in the randomized designed prevention trials for a sample of recently divorced mothers and their sons (DeGarmo & Forgatch, 1999, in press). The study was designed as an experimental test of the early-onset model (Patterson et al., 1989). As predicted, the improvements in parenting were associated with later reductions in deviant peer affiliation and deviancy training. These, in turn, predicted significant decreases in delinquency growth as assessed

by teachers' ratings. There was no overlap in raters for either the mediator or the outcome variable. In keeping with the predictions, improving parenting was associated with reductions in delinquency. This effect, in turn, was mediated by reductions in involvement with deviant peers.

### *Family as a System*

One of the common critiques of behavioral approaches to intervention, such as PMTO, is that the treatment is shallow in that the real causes for the problem behavior are overlooked and ignored. From this perspective, the information about improving parenting practices is no more than one could expect to find in a *Reader's Digest* account of good parenting. In other words, the approach contains little more than what is already part of the conventional wisdom. The fact that the interventions are effective and that they persist would lead one to ignore remarks of this kind. However, recent efforts to recast family process in dynamic systems terms suggest a more interesting alternative (Granic, 2000; Granic & Dishion, 2003; Granic & Hollenstein, 2003). From this same perspective, Sameroff (1989) suggests that one of the prime characteristics of such a system might be its interconnectedness. One implication of this is that change introduced in one aspect of a family process might carry with it collateral changes in some other aspect of the system. The data requirements for building such models are a bit unusual. To examine change within families would require pre- and postassessments embedded in a randomized intervention trial. We would need to measure changes in parenting mechanisms thought to produce changes and measures of the resulting changes in child outcomes. These are, in fact, characteristics for many prevention studies carried out at OSLC. However, the most difficult requirement is for repeated assessments at regular intervals during the intervention and the follow-up. This is a characteristic of several of the Forgatch prevention trials (Forgatch & DeGarmo, 1999; Forgatch, DeGarmo, & Beldavs, in press). This kind of data enables us to examine the collateral changes produced by PMTO at one point of time with changes in another family member, both at the same point in time as well as lagged effects occurring later.

To date, we have studied the collateral change process only in the sample of divorced mothers. DeGarmo, Patterson, and Forgatch (2004) found that there was an orderly sequence of change during and after

the intervention. An examination of effect sizes showed that parenting skills changes in the first 12 months were followed by changes in child outcome variables. Reductions in maternal depression occurred at several points, including a dramatic shift at 30 months. There were several examples of collateral changes. The most striking finding was the covariation (path .51) between negative growth in child externalizing and negative growth in maternal depression. The findings strongly support the notion that changes in the behavior of one family member can alter the way that another family member feels.

The second study of family change process involved only the families in the experimental group who received PMTO (Patterson, DeGarmo, & Forgatch, 2004). The data showed that for some mothers, there was a reduction in depression even before the problem child changed. Simply being involved in a treatment group was associated with a decrease in depression. It was hypothesized that mothers who showed this early change would be most likely to continue improving their parenting a year later. In other words, early change in the mother (depression) served as a positive feed-forward loop. The model for these changes was consistent with these hypotheses.

These preliminary findings support the idea that changes in one's behavior can be accompanied by changes in how it is that the social environment reacts to you. It makes sense that changes in social environment reactions can be accompanied by changes in how one perceives oneself and others. Notice that in this model the changes in feelings and perceptions are the collateral products of changes brought about by PMTO. Changes in cognitions and perceptions do not seem to be the prime engines driving change. Rather, it seems that they are the products that accompany change.

The systems metaphor for thinking about changes in families seems particularly apt in that alterations at one point in time can set in motion changes in other parts of the family that can lead to emerging characteristics of a very different system.

### **Discussion**

In retrospect, it seems incredible that psychology could proceed for so long in constructing hypothetical models that narrowly focused on emotional regulation or social cognitions or contingencies. In our own case, we engaged in the solitary pursuit

of contingencies associated with children's aggression, even though we could see that many of the exchanges among family members carried emotional overtones. We also could see that some of the disruptions came about because the parent saw what the child was doing as deviant, even though in our view it was not.

In our view, part of the problem was the unfamiliarity of the terrain. We simply could not specify the measurement models required in building models that included cognition and emotional regulation. Even when the measurement problems could be addressed, it required a half decade to build the new variables into fundable research proposals and another half decade to get the papers published.

The studies reviewed in this brief report suggest that the new generation of investigations of aggression will be focused on building integrated models that trace out both the direct and the indirect effects of these three mechanisms to child outcomes. The new studies suggest that it is time to give the emperor some new clothes. It is not a case of indecent exposure; it is just that a new royal costume is now available.

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