

Translational Issues in the Development and Prevention of Children's Early Conduct Problems:
Challenges in Transitioning from Basic to Intervention Research

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INTRODUCTION

This chapter provides an example of a roadmap for conducting translational research for researchers currently conducting basic research on developmental and clinical issues for children. As indicated by the theme of this volume, there is a need for basic researchers to transfer the focus of their efforts to more applied outcomes, including preventive interventions and clinical treatments that address suboptimal developmental outcomes and clinical disorders. The recent emphasis on translational research is both an exciting and intimidating prospect for researchers whose primary interests have focused on individual differences in normative outcomes among relatively low-risk populations or clinical outcomes among high-risk populations. It is a formidable challenge to spend several years attempting to identify reliable precursors of clinically-meaningful child outcomes; however, it is a challenge of a different kind to generate an intervention based on these findings that is both usable and effective in addressing or preventing child problem behavior. The current chapter provides an example of one such research program that began by identifying developmental precursors of children's early conduct problems and subsequently using findings from this longitudinal research to adapt an already-existing intervention to prevent the development of children's early conduct problems.

Part one of the chapter describes an overview of the issues faced in conducting translational research on conduct problems in early childhood, including the dual challenges of providing data on developmental pathways leading to child problem behavior and developing an intervention that is both feasible and effective in addressing the problem behavior of interest. Part two reviews the specific basic program of research that laid the groundwork for developing our intervention, the Pitt Mother & Child Project. Part three describes the adaptation and

development of the intervention, the Early Steps Project, and an evaluation of its efficacy. Finally, part four is devoted to summarizing the current status of the program of research and remaining challenges.

PART ONE: PATHWAYS TO TRANSLATIONAL RESEARCH IN EARLY CHILDHOOD

Developing a Knowledge Base about a Child Problem Behavior

The challenges for establishing a developmentally-informed program of translational research are somewhat daunting, as validating a developmental trajectory of a problem behavior or developing an effective intervention to prevent its onset in a career would be considered a commendable achievement. The first prerequisite for meeting this challenge is to have a sufficient knowledge base to understand the developmental course of the targeted problem behavior (Conduct Problems Prevention Research Group, 1999). Implicit in this first goal is to identify the mechanisms underlying associations between risk factors and the target problem behavior. Ideally such research would be carried out using prospective, longitudinal designs to identify reliable associations between hypothesized risk factors and later child problem behavior. Some researchers spend careers conceptualizing, testing, and refining models for specific types of child problem behavior and ensuring their findings' generalizability across gender, culture and ethnicity, socioeconomic status and community type. Depending on the expression and stability of the problem behavior in question, this might take 5 to 10, or even more years to initially identify reliable correlates of the problem behavior and follow their course across developmental stages to the age period when the behavior has been shown to be relatively stable over time. For example, in the study of children's conduct problems, a large percentage of early-starters can be identified in early childhood when similar types of problem behavior initially become manifest.

In contrast, clinically-meaningful levels of depressive symptoms are relatively uncommon before age eight for most children, making it more difficult to trace depression's development and correlates prior to formal school entry.

In addition, most of our models of child problem behavior are necessarily incomplete given the complexity of developmental psychopathology in general and the principles of equifinality and multifinality in particular (Cicchetti, & Rogosch, 1996). Equifinality suggests that there are multiple pathways leading to the same child outcome and multifinality highlights the fact that many children with similar profiles at one point in time, including early childhood, often demonstrate divergent longitudinal trajectories in adjustment. Part of the reason for such divergence involves variation in culture, gender, and biological markers that are often not rigorously tested or understood to the extent of other indicators of social risk (e.g., parenting). Despite the complexity of factors related to child development and the substantive and methodological limitations of existing research, at some point researchers need to get beyond the statement, 'more research is needed' and make the transition to intervention. Note that the data sets used to inform the current intervention also was incomplete in accounting for all cultural and biological variation. Despite including a large sample of predominantly low-income, ethnically diverse toddlers followed from infancy through adolescence, the sample was limited by its inclusion of only boys and families living in a predominantly urban environment. Although approximately 40% of families were African American, few were of Latino or other cultural descent. Finally, the study did not have a genetically-informed design, albeit DNA is currently being collected to examine genetic and gene x environment effects.

Development of Interventions to Address Specific Problem Behavior

A second prerequisite for translating the findings of basic research to the domain of prevention and intervention is developing an intervention that successfully reduces the problem behavior of interest. Again, many prevention or clinical scientists spend their entire careers conceptualizing, developing, and refining an intervention, expanding its breadth of coverage to address variations in children's developmental status, gender, and cultural issues over time, as well as issues pertaining to training fidelity and variations in therapist qualifications for successful implementation of the program. These many and varied challenges should not stop basic researchers from working to develop an intervention based on their research findings; however, they should be aware of the inherent complexities of validating an intervention's efficacy initially and if they are fortunate enough to do so, the many follow-up issues that will emerge. For example, Webster-Stratton (1985) began working with preschool-age children whose parents were seeking assistance for child externalizing problems in clinical settings, but became more interested in conducting preventive interventions in community samples of children identified as at risk in Head Start or elementary school settings. Olds (2002) initially tested his nurse practitioner home-visitation model in a largely rural setting in upstate New York with predominantly Caucasian families, but has subsequently conducted trials in two large urban areas (Memphis and Denver) with ethnically diverse families. In addition, while the first two trials were conducted using nurses, he also tested the use of para-professionals in implementing the program. Forgatch's parent-management treatment program (Forgatch, Patterson, & DeGarmo, 2005) was initially developed and tested for families recently experiencing a divorce, but has been adapted and refined for children showing problem behavior regardless of the family's structural context. In addition, Forgatch has devoted significant energy to the issue of

training fidelity and found it to mediate the effectiveness of the intervention across American and Norwegian samples. Finally, and relevant to the current intervention, Dishion and Kavanagh (2003) developed the Family Check Up for adolescents showing problem behavior, and have gradually adapted the model for both school-age children and toddlers.

The Chasm between Identification of Problem Behavior and Engaging Families

The magnitude and complexity of developing and refining an intervention cannot be underestimated. Some basic researchers may desire to pursue the development of their own intervention independently or with only intermittent consultation from experts, and this might be feasible in instances when the scope of the intervention is narrow (e.g., addressing improvements in specific behavior such as sleep) and/or the basic researcher already has some clinical expertise (e.g., practicing psychologist, psychiatrist, or pediatrician). However, it can be helpful to collaborate with an interventionist who has previous experience and expertise in developing similar types of programs *and* testing their efficacy. In the case of the intervention developed for the current project, the Early Steps Project, although the author was an experienced family therapist, a collaboration was sought with Dr. Thomas Dishion, who had spent several years developing and refining an intervention model to address child problem behavior.

A third component of translational research is especially relevant for those wishing to develop a preventive intervention: identifying children at high risk for developing the targeted child problem behavior. This issue may be less salient for interventionists studying problem behaviors for which families typically seek services in mental health clinics, thereby ensuring identification of appropriate children. In such cases, the problem behavior typically causes sufficient functional impairment and distress for children, caregivers, and teachers that parents

are often referred for services for these problems (autism spectrum disorders, ADHD). However, based on the premise that child behavior may be more malleable in early versus later childhood (Dishion & Patterson, 1992), several investigators have invested resources in developing preventive interventions in early childhood and even earlier during the prenatal period (Olds, 2002; Baydar, Reid, & Webster-Stratton, 2003).

Research on the precursors of child conduct problems has identified a plethora of child, family, and community risk factors associated with early-starting problem behavior, providing the field with a fairly refined representation of risk factors associated with early-starting trajectories of conduct problems (e.g., Aguilar et al., 2000; Campbell et al., 1996; Moffitt & Caspi, 2001; Shaw et al., 2003). Nonetheless, identifying young children at risk for problematic trajectories and motivating families to seek assistance for child problem behavior are not synonymous. As discussed later, only a small minority of families with children showing elevated conduct problems in early childhood may decide to ‘take advantage’ of available services. This reluctance to engage in services might be influenced by a few factors. First, if the family with such a child is from a lower socioeconomic strata, they may distrust government services in general and mental health services in particular, as their previous contact with government agencies and researchers may have been unpleasant and aversive. When these families are from minority groups who have a history of mistreatment by researchers, this distrust might be further amplified. For example, more than one African American family in our basic research program was aware of the Tuskegee study that failed to treat African American adults with syphilis over the course of four decades (Corbie-Smith, 1999).

A second type of resistance that parents often express for engaging in preventive interventions for children's *early* conduct problems, especially when "early" means children under the age of two, is their belief that their child will 'grow out of' their disruptive behavior. In many cases parent's perceptions will be correct, as rates of disruptive and oppositional behavior wane between the ages of 2 and 5, validating their intuition. Nonetheless, parental beliefs do not coincide with our longitudinal data, which suggest that correlates of later conduct problems can be identified prior to age 2, an issue we revisit later in the chapter.

A third issue influencing engagement pertains to vehicles for identifying very young children at risk for early-conduct problem trajectories. The pediatrician's office is an important point of entry in identifying children at early risk for problem outcomes, but to use this entire point requires that families have regular contact with a primary care physician. When the intervention is designed to target families on the lower end of the socioeconomic scale, this point of entry is not practicable as many low-income families do not have health insurance or a primary care physician. Currently, educational enrichment program for young children, such as Early Head Start and Head Start, offer points of contact for engaging low income children and their families. In our own research, we have utilized the Women, Infants, and Children Nutritional Supplement Programs (WIC) for this purpose. Similar to Headstart, WIC is a Federally-funded program whose mandate is to promote young children's health, primarily through providing funds for parents of children ages 0 to 5 to purchase nutritional foods. WIC also has a history of promoting prevention by supporting immunization and breast feeding programs, as well as psychosocial programs such as Old's nurse home visitation program and now our Early Steps Program.

A fourth issue that can often hinder family's engagement in preventive interventions is the intervention's fit to actual families' needs. The intervention's user-friendliness will be evaluated by potential families on several dimensions. First, is the intervention carried out in a place that is convenient for families to attend? As low-income families may initially have ambivalent or distrustful feelings about service providers in general and mental health professionals in particular, such fears may be exacerbated by having to meet with professionals outside of their communities or neighborhoods. There are also practical concerns such as childcare issues for the target child and siblings as well as the affordability of transportation and parking costs. Many of these issues can be attenuated by making the intervention more accessible for families. For example, Cunningham and associates (Cunningham, Bremner, & Boyle, 1995) convene parent groups for children with ADHD and other disruptive problem behavior in community settings near families' homes. In trials of our Early Steps Project, families are given the option of having the therapist come to their home and are accompanied by staff to attend to childcare needs. If families feel uncomfortable about having visitors in their home or therapists find that conditions in the home make it difficult for meetings (e.g., too many unplanned interruptions), we meet at our offices or at a coffee shop close to the family's home, with transportation provided to the family if needed. The choice of the meeting place is given to the parent, meeting where she is most comfortable.

PART TWO: THE BASIC PROGRAM OF RESEARCH:

THE GENESIS OF THE PITT MOTHER & CHILD PROJECTS

The goal of our basic research program was to identify developmental precursors of antisocial behavior, with the dual agenda of advancing understanding of pathways leading to

early-starting conduct problems and identifying targets for future preventive interventions (Shaw & Bell, 1993). The study of antisocial behavior in childhood was deemed important because of the direct cost of such behavior to society, not only in terms of damaged property and disruption of normal patterns of living, but also because of the difficulty of treating delinquent youth and the potential emergence of later adult criminality and other serious disorders such as substance abuse (Moffitt & Caspi, 2001; Shaw, Bell, & Gilliom, 2000). Moreover, *early starters*, youth who show a persistent and chronic trajectory of antisocial behavior from early childhood to adulthood, represent approximately 6% of the population yet are responsible for almost half of adolescent crime and three-fourths of violent crimes (Offord, Boyle, & Racine, 1991). Despite the plethora of research on the treatment of antisocial behavior in childhood, efforts to prevent its development have proven to be difficult (Conduct Problems Prevention Research Group, 1999). It was believed that the limited success of effective treatment of conduct problems among school-age children and adolescents was due to an inability to fully understand either the developmental trajectories leading to the disorder or the most appropriate content and timing of the intervention. As an example, past research on treatment of conduct problems has shown that interventions implemented prior to school-age have a higher probability of success than those implemented later (Dishion & Patterson, 1992). In response to the need to more fully understand the origins of early conduct problems (Moffitt, Caspi, Dickson, Silva, & Stanton 1996; Patterson, Capaldi, & Bank, 1991), Shaw and Bell (1993) proposed a bridging model of early conduct problems beginning in early childhood.

Initial Bridging Model of Antisocial Behavior and the Focus on the Toddler Period

The goal of the bridging model was to integrate theory and normative empirical work on young children's development with studies of correlates of older children's conduct problems. The work of several investigators figured prominently in the development of the bridging model. At a broad level, Hirschi's (1969) social control theory provided a mechanism from which to understand parental influence, as the antisocial child's lack of self-control was postulated to emerge from his inability to form an attachment to parents in early development. Sroufe's (1983) conceptualization and application of attachment theory to early conduct problems was also instrumental, describing how avoidant working models are formed during infancy and demonstrating how they predisposed children to show later noncompliant and hostile acting out behavior (Erickson, Sroufe, & Egeland, 1985). Greenberg's and Speltz' (1988) cognitive-affective model, also conceptualized from an attachment perspective, provided specific examples of how parent-child interchanges from ages 2 to 4 would lead to early disruptive behavior based on the dyad's inability to form a goal-corrected partnership. Finally, Patterson's (1982) model of coercion applied principles from social learning theory to explain how patterns of family interaction might produce conduct problems in school-age children, a model adapted and validated in early childhood by Martin (1981). Martin's work provided the critical empirical link by uncovering longitudinal associations between unresponsive caregiving and coercive parent-child interaction, thereby establishing a bridge between attachment and social learning models.

Implicit in this approach is a focus on early childhood, and particularly the transition from infancy to the toddler period, which is marked by the highest rates of aggressive and noncompliant behavior in the life course (Shaw et al., 2000; Tremblay et al., 1999). These atypically high levels of disruptive behavior have been attributed to a confluence of multiple

biological and social factors, as the toddler years represent a time of marked change for children in terms of cognitive, emotional, and physical maturation. Despite growth in all of these areas, children's developing cognitive abilities are not well matched to the challenges afforded by their newfound physical mobility. Their new mobility permits children to ambulate quickly but without the cognitive appreciation to anticipate the consequences of violating other's personal space, understanding the principles of electricity or gravity, or considering the potential hazards of straying too far from caregivers in novel settings (e.g., shopping malls). Thus, toddlers require proactive involvement and monitoring to literally keep them out of harm's way (Gardner, Sonuga-Barke & Sayal, 1999). For parents dealing with this transformation (Shaw et al., 2000), the nature of the parent-child relationship changes from a focus on responsivity and sensitivity to the immobile infant's emotional needs to monitoring a mobile and naive toddler. As a result of this shift, parental pleasure in childrearing has been shown to decrease from the first to second years (Fagot & Kavanagh, 1993). Using the social learning model of Patterson (1982) and attachment models of Sroufe and Fleeson (1986), we hypothesized that this period of developmental transition might be critical for determining how normative increases in disruptive behavior are either attenuated or amplified by individual differences in child, parent, and family risk factors, as well as more distal community-level factors of cumulative adversity.

Methodologically, in developing the model we adopted and integrated the reciprocal effects model of Bell (1968) and the transactional perspective of Sameroff and Chandler (1975). We also considered it critical to incorporate the normal cognitive and emotional changes that children undergo from infancy to school entry. Thus, our framework considered (1) ongoing influences that parents and children have on each other (Bell, 1968), and (2) the previous

behavior of both parents and children in accounting for their later behavior (Sameroff & Chandler, 1975) within the context of children's rapidly evolving development. As is evident from our use of several theoretical frameworks, the model attempted to integrate previous perspectives on developmental psychopathology. The novelty of this bridging model rests primarily on its ability to synthesize perspectives from disparate theoretical frameworks and different developmental periods to provide a cohesive framework for understanding processes leading to the antecedents of conduct problems in early childhood.

The bridging model was originally targeted for young boys from low-income families, capitalizing on the greater risk of serious conduct problems among males from impoverished settings and the more developed research base on the emergence of boys' externalizing disorders. More details regarding the developmental model can be found in Shaw and colleagues (1993, 2000), but are summarized here. The approach was consistent with the observations of earlier investigators taking a developmental perspective towards childhood psychopathology (Renken et al., 1989), in that early conduct problems are generated as a result of transactions between children and their environments over time (Patterson, 1982; Sameroff & Chandler, 1975). Particularly during early childhood, it was believed important to take into account transformations that occur in both child and parent behavior as the child matures. For example, temperamentally difficult infants might be more noncompliant as toddlers, compared to easy infants. Moreover, parents who show low levels of responsivity during infancy and lower levels of positivity during the toddler period in facing the challenges of the 'terrible twos' would be expected to lead to more acrimonious parent-child interactions and higher rates of child disruptive behavior during the toddler and preschool periods. In addition to child and parent

behavior, it was also necessary to consider the potential effects of stressors within and outside the family that compromise the quality of the caregiving environment, including maternal depression and social support, as well as neighborhood quality. In particular, the role of maternal depression was emphasized given its consistent link to both caregiving quality and child maladaptive outcomes (Beardslee, Versage, & Gladstone, 1998; Belsky, 1984; Conger, Patterson, & Ge, 1995; Marchand, Hock, & Widaman, 2002).

Methods and Findings from the Pitt Mother & Child Projects

In the Pitt Mother and Child Project (PMCP) data from two cohorts of children studied from infancy through adolescence have been analyzed to examine normative developmental issues and basic tenants of the bridging model. However, for purposes of the current chapter, findings will be limited to Cohort II because it was both larger (310 versus 100 participants in Cohort I), included intensive assessments, and followed children through adolescence. Cohort II is a sample of 310 boys recruited prior to 18 months of age and at present, followed through age 17 (Shaw et al., 1998, 2000, 2003).

For both cohorts, the source for subject recruitment was low-income families with male infants who used the Allegheny County's WIC Program in the Pittsburgh metropolitan area (Shaw et al., 2003). Three-hundred and ten participants were recruited from WIC sites throughout the Pittsburgh metropolitan area over the course of 2 years. At the time of the first assessment, when infants were 1.5 years old, mothers ranged in age from 17 to 43 years ($M = 28$ years). Fifty-three percent of participants were Caucasian, 36% were African American, 5% were biracial, and 6% were other (e.g., Hispanic). At the age 1.5 visit, 65% were either married or living with a partnerr, 26% were single, 7% were divorced, and 2% were in other living

arrangements. Mean per capita family income was \$2,892 per year and the mean Hollingshead socioeconomic status score was 24.8, indicative of an unskilled, working class sample.

Retention of the families has been high over the study's duration, averaging 90-96% when children between ages 2 and 6, and 85-91% between ages 8 and 15 (i.e., 89% at age 15). In addition, no selective attrition effects at age 15 have been found for child problem behavior or socioeconomic characteristics at assessments when children were ages 1.5, 2, or 3.5.

As the primary focus has been the identification of factors in early childhood associated with school-age and adolescent antisocial behavior, the description of procedures focuses on observational procedures and questionnaires that were administered when children were between the ages of 1.5 and 2, with similar procedures used at ages 3.5 and 5. Throughout the study there has been a focus on identifying developmentally-critical constructs using multiple methods and informants. For example, at ages 1.5 and 2, assessments included structured parent-child interactive tasks, free play, and maternal interviews. Assessment tasks were selected to vary in stress level so that mother and child behavior could be observed across a broad spectrum of conditions, from which observations of negative emotionality and disruptive behavior were rated. The age-2 laboratory visit was preceded by a 1.5-hour home visit (i.e., occurring on the same day) to observe the quality of the home environment and parent-child interaction during structured tasks and during an interview with the mother. As part of both lab visits, mothers completed inventories about risk factors that might compromise parenting quality (Belsky, 1984) or directly affect child adjustment, including such domains as maternal depressive symptoms (Beck et al., 1988), daily parenting hassles (Crnic & Greenberg, 1990), maternal social support (Crnic & Greenberg, 1983), and neighborhood quality. In addition to observing parents

interacting with their children in the home setting during unstructured interactions, mother-son dyads were observed during teaching and clean-up tasks, from which ratings of both rejecting and positive parenting were made.

Identification of Risk Factors Associated with Child and Adolescent Antisocial Behavior. To

identify risk factors associated with conduct problems in middle childhood and more serious forms of antisocial behavior during adolescence, several approaches have been used to analyze the PMCP, including both variable- and person-oriented methods, using parent, teacher, and youth reports of child conduct problems and antisocial behavior. Although parents often have more contact with children than other adults during early childhood and thus we consider their reports to be critical especially during the first five years, it is also important to see if parental reports are validated in contexts outside of the home. This issue is magnified by the use of parental report for many of our early predictors of child problem behavior (e.g., maternal depression). It is also quite possible that even if parental reports of child behavior in the home are accurate, child disruptive behavior might be limited to the home environment. Therefore, after school entry we rely heavily on teacher reports of child disruptive behavior during middle childhood, as well as youth themselves during adolescence when most antisocial activities become covert because of the potential consequences of being apprehended for engaging in more serious forms of antisocial behavior (e.g., physical or sexual assault, drug dealing).

Based on our model, our focus was on three primary risk factor domains: 1) early forms of child disruptive behavior, 2) both negative and positive dimensions of parenting, and 3) risk factors that could compromise parenting (e.g., maternal depression, social support) or directly compromise child functioning. In addition, with our focus on families living in poverty, we were

also concerned with the cumulative impact that living in the context of multiple stressors might have for the development and persistence of conduct problems (Rutter et al., 1975; Shaw, Vondra, Dowdell Hommerding, Keenan, & Dunn, 1994). In addition, we were especially interested in factors that were validated across reporter, time, and context. Thus, most of the findings below rely on predictor variables that were initially assessed using observational methods or parental reports in early childhood and later measures of child disruptive behavior assessed using teacher or youth reports, and in some cases corroborated by parental report.

In the first study of this type to examine how early risk factors were related to school-age conduct problems, cluster analysis was used to identify groups of families who shared characteristics across four domains: child characteristics, maternal parenting behavior, family context, and sociodemographic characteristics (Campbell et al., 2000; Shaw et al., 2000). We then examined how such groups of children fared on measures of conduct problems according to both parents and teachers at school-age. Importantly, this study compared findings from our community sample of low-income, ethnically diverse infants with those of Susan Campbell's predominantly middle-class, European American (EA) preschoolers identified on the basis of ADHD symptoms. In both samples, the children who showed the most consistent pattern of conduct problems at school-age (age 6 in the Shaw sample, age 9 in the Campbell sample) were marked by elevated rates of risk factors across child, parent, family, and sociodemographic domains. At the time of the study entry (age 1.5 in the Shaw sample, age 3 to 4 in the Campbell sample), in both cohorts the multiple risk group demonstrated elevated hyperactivity and aggression, more negative and less positive parenting, and higher rates of maternal depressive symptoms, stressful life events, and sociodemographic risk than families in clusters with fewer

risk factors (e.g., no-risk group, child-risk-only group). In both samples, echoing the findings of Rutter (1975) and others (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Sameroff, Seifer, & Bartko, 1997), children in the multi-problem group were observed to show the most disruptive behavior at study entry and display more conduct problems and lower social competence at follow-up relative to other risk groups.

As children in the PMCP reached age 8 and frequencies of psychiatric diagnoses of disruptive behavior increased, we were able to look back at risk factors in early childhood that discriminated clinically-meaningful problems at school-age (Shaw et al., 2000). The Kiddie-Schedule for Affective Disorders - Epidemiologic Version (K-SADS-E, Puig-Antich, et al., 1980) was administered to mothers to derive diagnoses of DSM-IV disruptive disorders. Teachers completed the Teacher Report Form (Achenbach, 1991) at age 8, from which scores greater than or equal to the 90th percentile on the Aggression factor were used to establish clinical impairment. Children who met criterion for Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), and/or Attention Deficit Hyperactivity Disorder (ADHD) at age 8 were again marked by early problem behavior and multiple family risk factors (e.g., maternal depression, low social support, poor parenting) that were evident in the second year of life. However, because many of the measures of early child and family functioning were derived from maternal report, the sole exception being observed high rejecting and low positive parenting, it was important to corroborate the results using teacher reports.

The first surprise was that maternal reports of infant negative emotionality and age 2 externalizing problems were *not* related to clinically-meaningful conduct problems at school-age as rated by teachers. As seen in Figure 1, boys who were later identified by teachers as being at

or above the 90th percentile on aggressive behavior were not distinguished by parent reports at age 2 ($d = -.1$) and only became reliably discriminated by age 5.5 ($d = .48$). Although somewhat surprising, this finding has been replicated by others (e.g., Aguilar et al., 2000; Moffitt & Caspi, 2001). However, as shown in Figure 2 for maternal depressive symptoms and consistent with our focus on contextual factors, teacher-identified aggressive children were more likely to live in families characterized by high rates of rejecting and low rates of positive parenting, parenting hassles, maternal depression, neighborhood dangerousness, and low social support when children were 1.5 to 2 years old. Effect sizes were in the moderate to high range, spanning from .5 for parenting to .73 and .80 for maternal depressive symptoms and low social support, respectively.

Figures 1 and 2 about here

Using Nagin's (2005) semi-parametric modeling procedures to discriminate children following persistently high trajectories of conduct problems from ages 2 to 8, again observations of both caregiving quality and maternal reports of depressive symptoms discriminated children showing persistent trajectories of conduct problems (Shaw et al., 2003). In addition, one observed child factor discriminated maternal reports of child problem behavior: behavioral inhibition. Children who showed high levels of fearlessness in a behavioral inhibition task were found to have high levels of conduct problems from ages 2 to 8. These findings provided a child variable that had been theorized about but lacked empirical validation in our earlier studies of school-age problem behavior.

Recently we have extended these analyses to ages 11-12 and 15 using the same measures of rejecting/positive parenting and maternal depressive symptoms as predictors of antisocial behavior, drug use, and sexual activity based on teacher and youth reports at ages 11-12 and youth reports at age 15 (Shaw & Gross, 2008). As shown in Figure 3, the same observations of rejecting/positive parenting at age 2 used to discriminate parent and teacher reports of clinically-meaningful conduct problems at age 8, continued to discriminate teacher and youth reports of more serious forms of antisocial behavior at ages 11-12 and 15, including such items as school expulsion, engagement in unprotected sex, and arrest. In addition, at age 15, maternal depressive symptoms at ages 1.5-2 were also found to significantly correlate with age-15 youth reports of theft, having unprotected sex, carrying, threatening, or using a weapon; gang membership, marijuana use, and arrest (all $ps < .05$). These analyses suggest that for boys, two potentially modifiable early risk factors—caregiving quality and maternal depression—predicted serious antisocial behavior, drug use, and risky sexual behavior across time, context, and informant.

Figure 3 about here

These longitudinal findings suggest intervention targets, with certain caveats. First, we would need to be careful about using them to designate targets of intervention in groups different from those in the study: lower income boys of primarily European American and African American descent. Second, they are correlational, thus it is possible that unmeasured factors correlated with maternal depression and parenting behavior might be the actual causal factors in our findings. If so, then we might intervene effectively to alter maternal depression and parental

caregiving and still find no impact on child conduct trajectories. Of course, this is why translational research is not solely applied science, it is also important for the basic science of child development. Finally, although we found only one aspect of child temperament to be predictive (i.e., fearlessness), heritable child characteristics we did not measure might mediate or moderate effects of early parenting and maternal depression on conduct trajectories (see Caspi et al., 2002). This last concern has led us to recently collect DNA so we can examine gene and gene x experience effects in the PMCP.

Research Findings from the PMCP and Implications for Intervention

The results from the PMCP suggest that young boy's pathways leading to serious conduct problems and more serious forms of antisocial behavior *across* context are marked by multiple risk factors across child, parenting, and community domains, and in fact that prior to age 2, merely perceiving one's child as difficult or behaviorally disruptive was not predictive of later conduct problems at school according to teacher reports. Our confidence in these findings was bolstered by the consistency of other investigative teams studying the early antecedents of conduct problems (Renken et al., 1989), including the collaborative study with Campbell et al. (2000). The results suggested potentially malleable targets for preventive interventions for young children from low-income environments, including parenting, maternal well-being, and other factors that compromise both parenting and maternal well-being, as well as the accumulation of these stressors in the children's ecology. In developing our intervention, we also took seriously the reservations of others who have tried to intervene with high-risk families and failed because they neglected to address contextual factors (Kazdin, 1995). Salvador Minuchin, the founder of structural family therapy, gave up working with low-income, high-risk families because he

concluded it was analogous to putting band-aids on people who require surgery (Malcolm, 1979). In addition, there was also an imperative to expand and test the model's validity with other populations, including female children, families living in rural and suburban communities, and those from other cultural groups than Caucasian and African American. To accomplish this goal, collaborations were initiated with other clinical researchers with expertise in these domains and access to ethnically diverse populations living in rural and suburban communities.

Another issue that has been addressed only indirectly in the PMCP that is especially salient for those interested in preventive interventions is motivation for change. As noted earlier, it is one challenge to identify potentially modifiable risk factors associated with pathways to conduct problems; it is another type of challenge to engage families with young children showing problematic behavior or adults reporting low levels of well being to seek assistance. This issue was brought home in the early phases of the PMCP, in which clinical referrals were made to nearly 50% of our families based on elevated levels of child conduct problems and/or maternal depression when children were ages 1.5 and 2. As the author was concurrently serving as the Director of the Psychology Department's in-house mental health clinic and leading the clinic's family therapy team where intervention services were being offered at \$2 per session, it was possible to monitor how many families called the clinic for services over a two-year period. Only 3 of the 148 families (2%) referred for services contacted the clinic, suggesting that more than longitudinal data on risk factors for antisocial behavior would be needed to successfully engage families in a preventive intervention. Missing from our traditional interventions (even at \$2 an hour) were more user-friendly methods to meet family's logistic challenges (e.g., seeing

families at their homes, providing child care during intervention) *and* enhancing parents' motivation to change their behavior for the welfare of their children.

PART THREE: DEVELOPMENT OF FAMILY-BASED PREVENTIVE INTERVENTION FOR TODDLERS: THE FAMILY CHECK UP

For several years, the author contemplated how best to fill the deep chasm between our knowledge base of risk factors associated with early-starting conduct problems and current intervention practices for primarily older children and adolescents (e.g., Henngeler & Bourdin, 1990; Forgatch et al., 2005). In many of these cases, parents had been motivated to change because of feared consequences for their children, such as being removed from a mainstream classroom or school. For adolescents, there was the consequence of incarceration that motivated investment in treatment. For families with young children, the consequences for parents were typically limited to managing their children at home. Nonetheless, knowing that the 'terrible twos' were often a time of distress for parents and having a research base to show parents that proximal factors in the child's ecology may be important in determining the course of children's trajectories, there was potential ammunition for motivating change.

The author was not alone in his concerns, as motivation or resistance to change had become a common theme for prevention scientists studying the development and effectiveness of family-based interventions. For example, resistance to change had been programmatically studied by Patterson and Chamberlain (1994). In general, therapist training in developing collaborative relationships with parents and working through motivation issues in therapy is a key to the change of parenting practices (Shaw, Dishion, Supplee, Gardner, & Arnds, 2006). Miller and colleagues developed the technique of motivational interviewing to encapsulate the

therapist-client dynamics that are most likely to result in productive change. For example, the Drinkers Check Up is a direct application of motivational interviewing designed to promote change in adults who drink heavily (Miller & Rollnick, 2002). Two of the key strategies of the Drinker's Check Up are to use assessment data in a feedback interview to elicit interactions between the client and therapist that influence change, and provide the client with a flexible menu of strategies to achieve reductions in drinking. Several studies reveal that random assignment to the brief Drinkers Check Up is as effective as 28 days of costly inpatient treatment for reducing problem drinking in adults (Miller & Rollnick, 2002).

Inspired by the work of Miller and colleagues on motivational interviewing, Dishion and Kavanagh (2003) developed the Family Check Up (FCU) to serve as the foundation of an ecological approach to child and family interventions. The FCU is a first step in a menu of empirically-supported child and family interventions designed to reduce problem behavior and promote emotional well being in children and families. Thus, the intellectual prayers of the author were answered in 1999 upon meeting Dr. Dishion and learning about the FCU. Dr. Dishion had previously focused on applying the FCU for adolescents and youth transitioning to adolescence, and had recently begun to develop methods for applying the FCU for problem behavior in younger children.

This collaboration also initially included colleague Dr. Frances Gardner. Dr. Gardner had had also been conducting basic research on the contributions of positive and proactive parenting in the development of preschooler's conduct problems. Whereas the author's previous basic research had focused on negative dimensions of parenting such as rejecting and harsh discipline methods, and some positive aspects of caregiving, including responsiveness and involvement,

Dr. Gardner's focus on proactive dimensions extended our frame of reference on parenting to include positive behaviors that prevent the occurrence of coercive parent-child interactions. By focusing on how parents can anticipate problematic situations (e.g., bringing toys for children to play with in the supermarket or on long car trips) or providing structure for children through scaffolding and proactive involvement, parents can avoid getting into situations that are often unpleasant for both parents and children (Gardner, Sonuga-Barke, & Sayal, 1999).

The Family Check Up for Toddlers

In many ways, the FCU model differs from traditional clinical models and practice, especially the salience of assessment and the emphasis on motivating change (Gill, Hyde, Shaw, Dishion, & Wilson, in press). In contrast to the standard clinical model, the FCU is based on a health maintenance model, which explicitly promotes periodic contact with families (yearly at a minimum) over the course of key developmental transitions. Whereas traditional clinical models are activated in response to clinical pathology, the health maintenance model involves periodic contact between client and provider to promote health and proactively prevent problems. Examples of health maintenance models include the use of semi-annual cleanings in dentistry and well-baby check-ups in pediatrics.

The FCU also differs from traditional clinical practice with its explicit focus on providing a comprehensive assessment of child and family functioning. Data obtained from assessments are shared with families in feedback sessions to enhance their motivation for change (Miller & Rollnick, 2002). Feedback sessions are often followed by the introduction of family management techniques (Forgatch et al., 2005) to achieve change in parenting and child problem behavior. The comprehensive assessment essentially drives the intervention, providing detailed

information about domains of child (e.g., negative emotionality), family (e.g., parental depression, marital quality), and community-level (e.g., neighborhood dangerousness) risk factors that past research has shown to be directly related to the development of early-onset conduct problems (Shaw et al., 2006). In addition, there is a primary focus on evaluating caregiving practices through direct observation of parent-child interaction. In the case of the FCU for toddlers, this task is accomplished by having parent-child dyads participate in a series of structured (e.g., clean-up and teaching tasks) and semi-structured (e.g., preparing a meal) tasks commonly used in social development research with young children. The FCU is also “ecological” in its emphasis on improving children’s adjustment across settings by motivating positive parenting practices and thereby reducing the frequency of situations that would elicit coercive parent-child interactions and the use of harsh, rejecting caregiving. Moreover, the comprehensive assessment allows tailoring and adaptation, in that the intervention is ‘fit’ to the family’s circumstances and their desires for more or less or different forms of treatment.

The FCU utilizes two main components to facilitate change: motivational interviewing and family management practices (Gill et al., in press). As noted above, the motivational interviewing component is based on Miller and Rollnick’s work (2002) using the Drinker’s Check-Up, in which assessment data regarding the negative consequences of alcohol abuse on individual’s work and family life are shared in a feedback interview with clients. In working with families of young children, the FCU feedback session is designed to elicit motivation for the parent(s) to change problematic behavior in their child, which is often achieved by modifying parenting behavior (Forgatch et al., 2005) or aspects of the caregiving context that compromise parenting quality. While motivational interviewing was developed for adult drinkers, Dishion

and Kavanagh (2003) initially used the FCU for families with adolescents showing problem behavior. Complier Average Causal Effect models indicated that motivation interviewing was the key component of the intervention linked to long-term reductions in substance use and antisocial behavior (Connell, Dishion, Yasui, & Kavanagh, 2007).

After addressing motivation, the FCU provides options for follow-up intervention. The therapist may give referrals for help with problems outside of parenting; however, the core of most intervention with young children focuses on family management issues. This component includes a collective set of parenting skills, commonly referred to as ‘Parent Management Training,’ based on social learning principles of reinforcement and modeling (Forgatch et al., 2005; Patterson, 1982). Parent Management Training has been consistently associated with improvement in parenting and subsequent reductions in child problem behavior, particularly conduct problems (Bullock & Forgatch, 2005; Patterson, Reid, & Dishion, 1992) and has been formally deemed an “empirically supported treatment” (Chambless & Ollendick, 2001). In the FCU, parent management techniques can be applied to the specific behaviors problems highlighted by the comprehensive assessment.

Empirically Validating the Family Check Up: The Early Steps Projects

Beginning in 1999, with colleagues Dishion and Gardner and informed by the data collected as part of the PMCP, the FCU was initially tested for families with toddler boys at risk for early-starting conduct problems. Using longitudinal data discussed above from the PMCP regarding the predictive validity of such factors as child fearlessness, parenting, maternal depression and social support, as well as incorporating findings from Gardner and colleagues’ (1999) work on proactive dimensions of positive parenting, initial screening and more intensive

assessment protocols were designed to assess these domains, as well as different facets of child problem behavior (e.g., observed and parent-reported aggression, oppositional behavior). WIC was chosen as the target site for recruiting families based on the author's success in using this source in his basic research to identify low-income children at risk for developing serious antisocial behavior. WIC was also selected because it was an existing Federal service program for low-income families. Thus, if the intervention was found to be successful, it offered the possibility of administering the program at WIC agencies not only in Pittsburgh, but across the country. Pittsburgh was selected at the site for the pilot study because of the author's existing ties with local WIC administrators. To further enhance parental engagement, all assessments were conducted in family's homes, with families given the option of having intervention sessions conducted at their home or the lab, with most families choosing the home. Therapists were labeled as 'parent consultants' to denote their expert status and make engagement more promising and less 'shrink-like.'

As many boys in the PMCP had demonstrated average to above-average adjustment despite coming from low socioeconomic backgrounds and in some cases, living in suboptimal neighborhoods, a gating procedure was instituted to increase the probability of identifying toddlers with a high risk for developing early conduct problems based on risk factors identified in the PMCP and by other researchers (e.g., Bates, Maslin & Frankel, 1985; Nagin & Tremblay, 1999; Renken et al., 1989; Wakschlag & Hans, 1999). Screening factors identified by other researchers included child negative emotionality (Bates), maternal substance use (Wakschlag), and teen parent status (Nagin). Note that child conduct problems were included in the screening as a risk factor at age 2 despite not being found to reliably discriminate conduct problems at age

8 according to teacher reports (Shaw et al., 2000) to provide ‘ammunition’ for parent consultants to use in motivating parents to address child problem behavior. In fact, parent perceptions of child conduct problems were found to be fairly stable over time in the PMCP, with 88% of parents who viewed their children at or above the 90th percentile on the CBCL Aggression scale at age 2 reporting their children to show clinically-elevated levels of Aggression at age 5 (Shaw, Gilliom, & Giovannelli, 2000). These findings mirror the findings of other researchers studying the stability of *parent* perceptions of child conduct problems from the toddler to preschool or early school-age periods (e.g., Campbell, 1990; Jersild & Markey, 1935; Richman, Stevenson, & Graham, 1982). Thus, risk criteria for recruitment were defined as at or above one standard deviation above normative averages on several screening measures within the following three domains: (a) child behavior (conduct problems, high-conflict relationships with adults), (b) family problems (maternal depression, daily parenting challenges, substance use problems, teen parent status), and (c) socio-demographic risk (low education achievement and low family income using WIC criterion).

The Early Steps pilot study was limited to boys because much of the data on children’s early risk factors for later conduct problems had been limited to boys including the PMCP. In the pilot study, we targeted children between the ages of 1.75 and 2.5, balancing our ability to predict later conduct problems (i.e., as early as 18 months) with parents’ openness to address child problem behavior for children as young as 18 month. In the end, parents were approached at WIC sites and invited to participate if they had a son between 1.75 and 2.50 years of age and met the study criteria by having socioeconomic, family, and/or child risk factors for future behavior problems. Based on these criteria, the demographic characteristics of the Early Steps

Pilot study reflected those of a low SES, urban sample, with the average family income being \$15,374 per year ($SD = 8,754$), 66.6% of the sample having a high school education or less, the majority of the sample being African American (48.3%) or biracial (11.7%), and 55% being single and never married (50%), or separated, divorced, or widowed (5%).

Results from the Early Steps Pilot Study. The initial Early Steps Project involved 120 high-risk families recruited from multiple WIC clinics in the Pittsburgh metropolitan area, with half of the sample being randomly assigned to the FCU and the other half of the sample followed passively during yearly assessments from ages 2 to 4. There were several advantages to having a small pilot intervention study before embarking on the Early Steps-Multisite (ES-M) study. First, it provided an opportunity to test the intervention for its cultural sensitivity and developmental appropriateness. Second, it provided an experiential basis for preparing manuals describing the range of services. Third, it allowed us to examine parents' receptivity to addressing child conduct problems in early childhood in general, and specifically prior to age 2.

So far, we have two published reports based on these pilot data. In the first, Shaw et al. (2006) found significant intervention effects on observed parent involvement and the boys' problem behavior by preschool. Specifically, using an intention-to-treat analysis in which all families assigned to the intervention group were compared to families assigned to the control group regardless of their actual contact with parent consultants, caregivers randomly assigned to the intervention condition were shown to maintain high levels of involvement with their young child from ages 2 to 4, whereas control families decreased their level of involvement, as observed by home visitors. Similarly, parent ratings of problem behavior on the Child Behavior Checklist (destructive factor) showed decreases for the intervention group relative to the control

group at age 3. In addition, for children with a high-risk profile of high child fearlessness and maternal depression at age 2, intervention effects on child conduct problems were evident at age 4. In the second paper, Gardner Shaw, Dishion, Supplee, and Burton (2007) examined direct observations of family interaction and found that parents in the intervention group used more proactive and positive parenting at child age 3 than did the control group. Furthermore, increases in proactive parenting also predicted decreases in child problem behavior. These intervention gains were accomplished with an average of 3.27 sessions ($SD = 2.34$), including the get-to-know-you and feedback sessions as two of these meetings, and with only one dose of the intervention. Thus, the pilot study was largely successful in several areas; engaging families with toddlers at high risk for early starting conduct problems, identifying malleable intervention targets (parent involvement, proactive parenting), and providing preliminary data in support of the intervention reducing young children's problem behavior. In addition, despite the relative brevity of the intervention and only one dose, two years later, intervention effects were evident for families with profiles (high child fearfulness and high maternal depression at age 2) comparable to the highest-risk families in the PMCP.

The Early Steps Pilot Study also was critical in providing data about parental engagement in the intervention. Essentially, our goal was to recruit low-income families with a toddler demonstrating high rates of conduct problems and other family and socioeconomic risk factors into a family-based intervention, for which the author's efforts had proved largely futile in the PMCP. In contrast, 92% of families randomly assigned to the intervention group in the Early Steps Pilot Study engaged in the intervention, as indicated by meeting with parent consultants for at least a Get-To-Know-You and a Feedback session. Second, we learned that parents with

children under the age of 2 were reticent to address children's conduct problems even in cases where they were concerned about the child's behavior because of their conviction that the child would 'grow out of it.' These data prompted us to move the recruitment period back from 1.75 to 2.0 years in our next study despite data from the PMCP that we could comparably predict later child behavior from age 1.5 or 1.75 as well as from age 2. Third, we found no dose response for the intervention (Shaw et al., 2006), as the number of sessions families met with parent consultants was unrelated to the magnitude of reductions in child conduct problems. There are several plausible explanations for the lack of a dose response. For example, although a greater contact with parent consultants would be expected to be associated with greater reductions in child problem behavior, it is sometimes the case that families facing higher levels of social and emotional adversity stay in treatment longer without significant improvements in child behavior because of the chaotic and stressful nature of these family's lives. However, an alternative explanation and consistent with the premise of motivational interviewing is that if properly motivated, parents can make the changes themselves. We kept these findings and questions in mind as we sought to expand the scope of the intervention in our next and more ambitious trial.

Despite these important findings, the Early Steps Pilot Study was limited by its relatively small sample size, the use of only male children from European American and African American ethnic backgrounds recruited from one urban community, and the limited dose of intervention services offered to the families. In reference to the limited dosage of the intervention, it was expected that from the perspective of a health maintenance model, repeated dosages of the FCU would be associated with longer-lasting and broader gains in both child behavior and parenting. At a psychological level, it was also believed that repeated contact with the same parent

consultant might promote parental support and confidence in their abilities, based on the knowledge that an expert in child mental health was watching out for the welfare of their child and family during the early childhood years. Finally, although intervention gains were found for both child conduct problem and positive parenting, our theoretical perspective suggested that intervention effects should be mediated by changes in family processes, most notably parenting, which was only partially supported in the Early Steps Pilot Study (Gardner et al., 2007).

The Early Steps Multisite Study

The Early Steps Multisite Study was initiated to remedy many of the limitations of the Early Steps Pilot Study. First, the sample included equal numbers of boys *and* girls. Second, the size was expanded to include 731 at-risk families, half of whom were randomly assigned to the FCU versus WIC as usual. Third, the families were recruited from three geographically and culturally unique regions, including metropolitan Pittsburgh, Pennsylvania, suburban Eugene, Oregon, and rural Charlottesville Virginia. The sample also broadened our representation of cultural diversity, including African American (27.9%), Hispanic American (13.4), biracial (8.9%), and other races (8.9% including American Indian and Native Hawaiian families). We also expanded the potential targets of change, including multiple aspects of child behavior, parenting, and parental depression, as well as examining potential mediating mechanisms underlying change. Finally, the Multisite Study gave us the opportunity to see if the effects of the intervention could be amplified by repeated dosage administered at child age 2 and 3.

With the exception of moving the age of child eligibility criterion from 1.75 to 2.0 years, the screening and assessment protocol remained largely intact from the Early Steps Pilot study, with translation of all materials generated in Spanish for recently immigrated Latino

families. Videoconferencing, used extensively for contact between Dr. Dishion and the Pittsburgh site in the pilot study for supervision of intervention cases, was expanded to include all three sites to facilitate intervention fidelity among parent consultants across sites. Both assessment examiners and parent consultants were certified and re-certified every few months to ensure reliability in both the administration of assessments and delivery of intervention services.

To address continuing concerns about cultural differences about parenting, focus groups also were conducted with African American families at the Pittsburgh and Virginia sites and Latino families at the Oregon site to find out more about how parents viewed caregiving practices in general and issues that might prevent them from engaging with parent consultants in our intervention specifically. For African American families, there was a focus on commanding respect and compliance to authority in terms of parenting, and a concern that parent consultants would not condone their use of corporal punishment to maintain this respect from children. For Latino families, many of whom were recent immigrants, there was a greater emphasis on warmth and family unity with respect to parenting, and concerns about their ability to provide proper care for their children without a better understanding of the English language.

Results from the Early Steps Multisite Study. The Early Steps Multisite is currently ongoing with funding provided from the National Institute on Drug Abuse to continue the intervention and follow-up of child outcomes through middle childhood; however, data on its efficacy are now available up to age 4. There were a few important differences in the findings from the Early Steps Pilot and Multisite studies. On the one hand, in the ES-M we had more power to detect group differences compared to the Early Steps Pilot Study because of the much larger sample size. On the other hand, there is often a ‘dilution’ effect when intervention programs are

expanded in size and/or delivered across new populations and types of communities (e.g., work of Olds, Webster-Stratton). In the current case, this meant testing the intervention's efficacy for the first time with female toddlers, children living in suburban and rural communities, and Latino families, as well as coordinating the complexities of reliably delivering the intervention across three sites.

All of the findings reported below were again analyzed using an intention-to-treat design, knowing that a significant minority of families in the intervention group never had contact with parent consultants (77% and 70% rates of engagement at ages 2 and 3, respectively). Note that an important initial finding consistent with a dilution effect is that our rate of engagement was still relatively high, but lower than found in the pilot study (i.e., 92% in the pilot study).

Our first goal was to attempt to replicate and expand the findings from the Early Steps Pilot Study as to whether the intervention was effective in reducing child conduct problems from ages 2 to 4. Using latent growth modeling, we found a consistent pattern of intervention effects for our primary target of change: child conduct problems. In addition, we examined the extent to which intervention effects on conduct problems were mediated by changes in two factors consistently associated with conduct problems and more serious forms of antisocial behavior in our basic work: parenting and maternal depression. In the domain of parenting, we included aspects of positive parenting (e.g., responsivity, involvement, low frequencies of rejecting behavior), found to be important in the author's earlier work, but also incorporated more proactive dimensions of parenting, including anticipating and structuring potentially problematic situations (e.g., providing structure for the the child while preparing a meal, making sure the child understands the goals of a clean-up task at the task's outset). As can be seen in Figure 4,

not only was the intervention condition associated with reduced growth in child conduct problems from ages 2 to 4 and found to improve parenting from ages 2 to 3, but slope in child conduct problems was found to be reduced as a function of increases in positive parenting.

Figure 4 about here

We also examined whether the FCU was associated with reductions in child maternal depressive symptoms, and if found whether reductions in maternal depression, if found, mediated reductions in both child internalizing and externalizing symptoms from ages 2 to 4 (Shaw, Dishion, Connell, Wilson, & Gardner, in press). Similar to the intervention effects found for child conduct problems, the FCU was associated with reduced growth in child internalizing problems. Additionally, reductions in maternal depression were found from ages 2 to 3, and reductions in both child conduct problems and internalizing problems were mediated by decreases in maternal depression.

We recently explored the extent to which the intervention is effective in reducing distinct constellations of children’s behavior problems, including co-occurring versus conduct-only versus internalizing-only problems at age 4 (Connell et al., in press). Latent transition analysis was used for this analysis, in which broad-band CBCL Externalizing and Internalizing factors were aggregated and then dichotomized into nonclinical and clinical groups, then modeled to create 4 latent groups: Internalizers, Externalizers, Comorbid, and Normal. Intervention effects were subsequently found for both the comorbid and internalizing groups, indicating reductions in problem behavior for children in these groups compared to those in the Externalizing and

Normal groups. These results may have particular implications for the FCU to prevent pathways leading to early-onset drug use because of the high risk of drug use among comorbid children.

Extending the scope of child outcomes to areas that would be particularly relevant to school readiness, we also examined whether the intervention was associated with improvements in language development and inhibitory control, and whether changes in positive parenting would mediate these changes (Lunkenheimer et al., 2008). Again, intervention effects were found for language skills and inhibitory control, and these changes were mediated by improvement in parenting.

Finally, we examined moderators of intervention effects among initial sample characteristics, exploring whether families at relatively higher or lower risk are more likely to benefit from the intervention in relation to improvements in child conduct problems at age 4 (Gardner et al., 2008). As direct contact with the intervention remained brief in the multisite study, albeit slightly higher than in the pilot study (i.e., $M = 3.7$ sessions annually versus 3.3 in the pilot study), there is some worry that the intervention might be more effective for families who are less distressed or relatively more economically advantaged. In fact, results suggest that the intervention was comparably effective for parents who varied in sociodemographic and family risk factors (e.g., maternal depression, low income, history of parental drug use), with two exceptions: lower educational attainment predicted greater improvement in conduct problems following intervention, and single parent status predicted lesser improvement in conduct problems following intervention. Overall, findings suggest that a brief family-centered intervention can be equally effective for reaching the most distressed and disadvantaged families, as well as those who are relatively more advantaged, within a high-risk, low-income sample. The

findings present a relatively optimistic picture of outcomes for the most hard-to-reach families, compared to some of the extant literature on parenting interventions. The results also have implications for the FCU's application with other comparable high-risk samples.

PART FOUR: SUMMARY AND FUTURE DIRECTIONS

Informed by a program of basic research on the developmental precursors of conduct problems, the Early Steps Projects represent an effort to target reliable predictors of child conduct problems using motivational interviewing to promote change among families with toddlers at risk for early conduct problems that do not typically use mental health services. In addition to extending the range of child and parent outcomes shown to improve as a result of the intervention and demonstrating that changes in both positive parenting and maternal depression mediate these intervention effects, the multisite study found intervention effects to be similar across child gender, culture, and community type.

In terms of the mechanisms of change, empirical support was found to explain that improvements in child behavior were accounted for by changes in positive parenting and maternal depression (Shaw et al., 2008). The mediation of changes in child problem behavior by positive parenting was posited a priori and corroborates findings from other family-based interventions conducted during early and middle childhood (Bayard et al., 2003; Forgatch et al., 2005). Although in the author's basic research, dimensions of rejecting and positive caregiving has been related to later child conduct problems, in the two trials of the Early Steps intervention, greater support has been found for the causal role of positive parenting, as it has been shown to mediate intervention effects on conduct problems, inhibitory control, and language development. A couple of plausible explanations may explain this difference in emphasis in the intervention

work. First, it could be that in high-risk samples such as the Early Steps' cohorts, there are 'ceiling effects' for rejecting parenting because a disproportionately high percentage of parents show high rates compared to non-gated samples of low-income families. Second, as a result of increasing parent's ability to anticipate and attend to children in potentially aversive situations (e.g., long car rides, providing the child with an activity when the parent is busy with chores), parents in the intervention group might be reducing rates of harsh and punitive discipline. This is an issue that we are currently exploring in the Early Steps – Multisite data set.

The mediational contribution of maternal depression was less expected, but consistent with a large body of research suggesting a consistent association between maternal depression and child conduct and internalizing problems (Farmer, McGuffin, & Williams, 2002). Although maternal depression was explicitly treated in less than 20% of cases, improvements in depressive symptoms were likely related to generic aspects of the establishment of the parent-parent consultant relationship, including such factors as trust, having a confidant to talk to (even if this contact does not occur often), and access to an expert to discuss the challenges of raising a toddler (Shaw et al., in press). Cumulatively, these factors may have resulted in improving maternal depressed mood. In addition, parent consultants were available to provide assistance to mothers who suffered short-term crises (e.g., lack of food, no money to pay for electricity), or long-term challenges in living (e.g., recent immigrants' lack of familiarity with the English language and American culture, moving out of project neighborhoods, social isolation). As families were screened on the basis of multiple risk domains and during a development period known to be challenging even for parents with greater economic and family resources, it is likely that having repeated contact with someone to help navigate these challenges may have reduced

initial levels of depression.

Despite our optimism regarding the intervention's effectiveness across two-year follow-ups in two studies, we realize there are many issues that lie ahead for further consideration. First, although we presented evidence to suggest that the FCU is associated with improvements in child problem behavior and maternal depressive symptoms, effect sizes, albeit meaningful from a public health perspective, were relatively modest (d 's ranged from .18 to .23), particularly in relation to the pilot study, where d 's ranged from .45 to .65. Consistent with the dilution effect, further work is needed to recapture effect sizes found in the pilot study. However, unique to the multisite project, gains were seen in many more domains of child and parent functioning, as well as support for the mediational contributions of positive parenting and maternal depression.

Second, it will also be important to continue to follow the course of intervention effects through middle childhood to truly test whether the FCU is effective in preventing the onset and early-starting pathways of antisocial behavior. It is not necessarily the case that interventions conducted in the context of the home will translate to reductions in child problem behavior in such settings as schools, after-school care, or in the neighborhood. Whereas some of our intervention effects were corroborated by standardized tests (i.e., language development), most were based on maternal reports of child problem behavior; thus, it will be important to see whether improvements in child adjustment are maintained across time and context from the viewpoints of teachers and after-school care providers. In this regard, while retaining an emphasis on parent-child functioning in the home, we are expanding the scope of assessments to include children's behavior with peers and adults at school, in after-school care, and in the neighborhood, providing feedback to parents with the help of teachers and after-school care

providers to motivate parents to increase their involvement in their children's lives as they spend proportionately more time outside of the home. We also hope to increase parental involvement in these settings to monitor child problem behavior before it becomes functionally impaired.

The current findings corroborate previous evidence that changes in child disruptive behavior can be achieved with a brief intervention and that such change appeared to be mediated by improving parenting practices (Shaw et al., in press). This was achieved using a nationally-available, service delivery setting with low-income children at risk for early-starting conduct problems whose families do not typically use mental health services (Haines et al., 2002).

The goal of the chapter was to present 'a' model for how basic research on developmental processes could be translated into an intervention; however, it should be noted that there are many models for achieving this aim. Consistent with the principle of equifinality, there are many examples of interventions developed using different frameworks and starting points (e.g., works of Olds, Webster-Stratton) than the current perspective. The current approach is specifically directed at researchers studying basic processes who might be a bit hesitant about moving into intervention work. Although intervention research does present a number of idiosyncratic challenges (e.g., training and supervision of therapists, refinement of intervention across child gender and culture), it represents the logical extension of many researcher's current work on basic developmental processes and provides the opportunity to test hypotheses using a truly experimental design. Thus, this author has found it an exceptionally rewarding experience that also provides a feedback loop back to inform his basic program of research.

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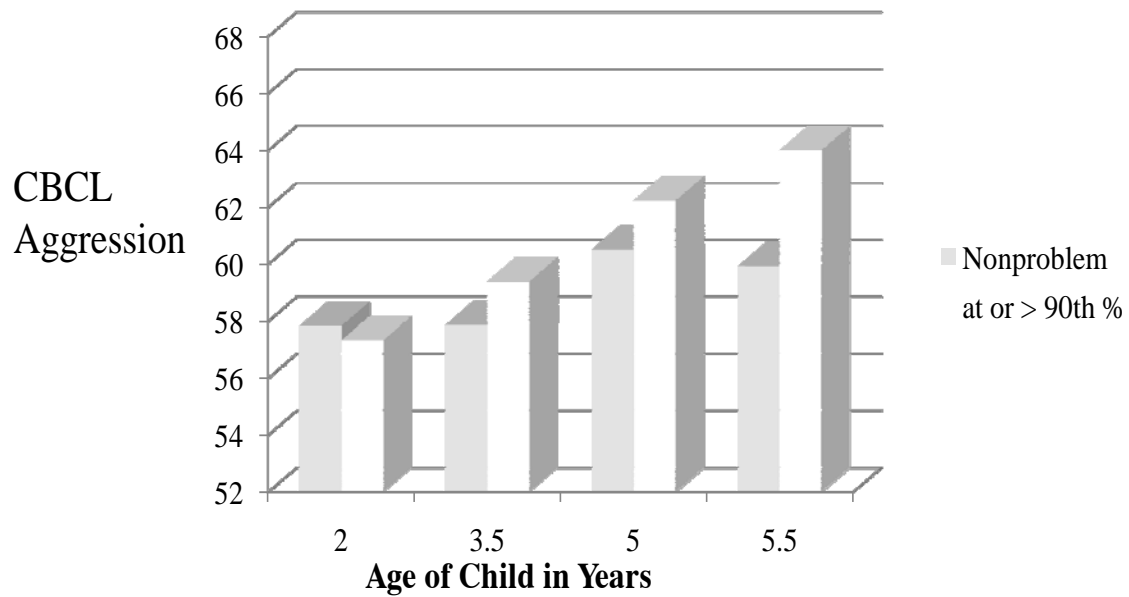
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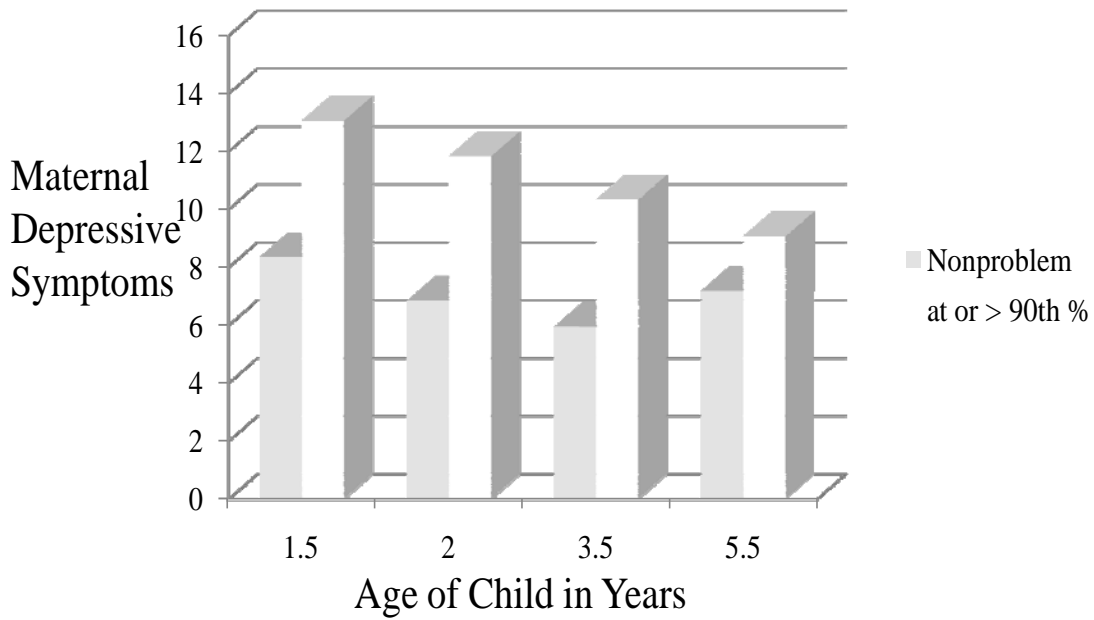
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Figure 1. Trajectories Leading to Clinically-Elevated Scores on TRF Aggression at age 8: CBCL Aggression at Ages 2, 3.5, 5, & 5.5



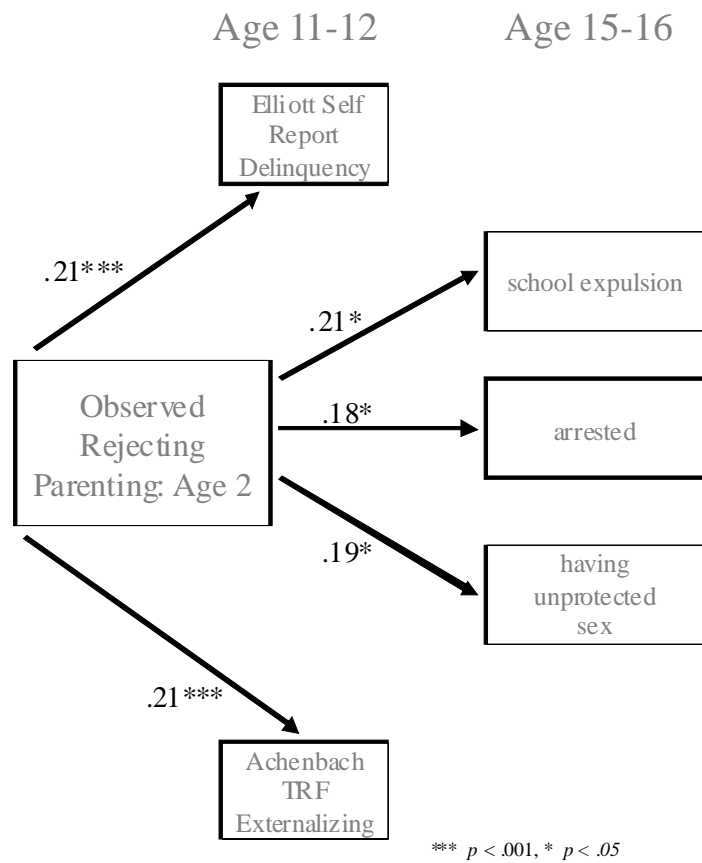
Effect size = -.1 - .48 sd

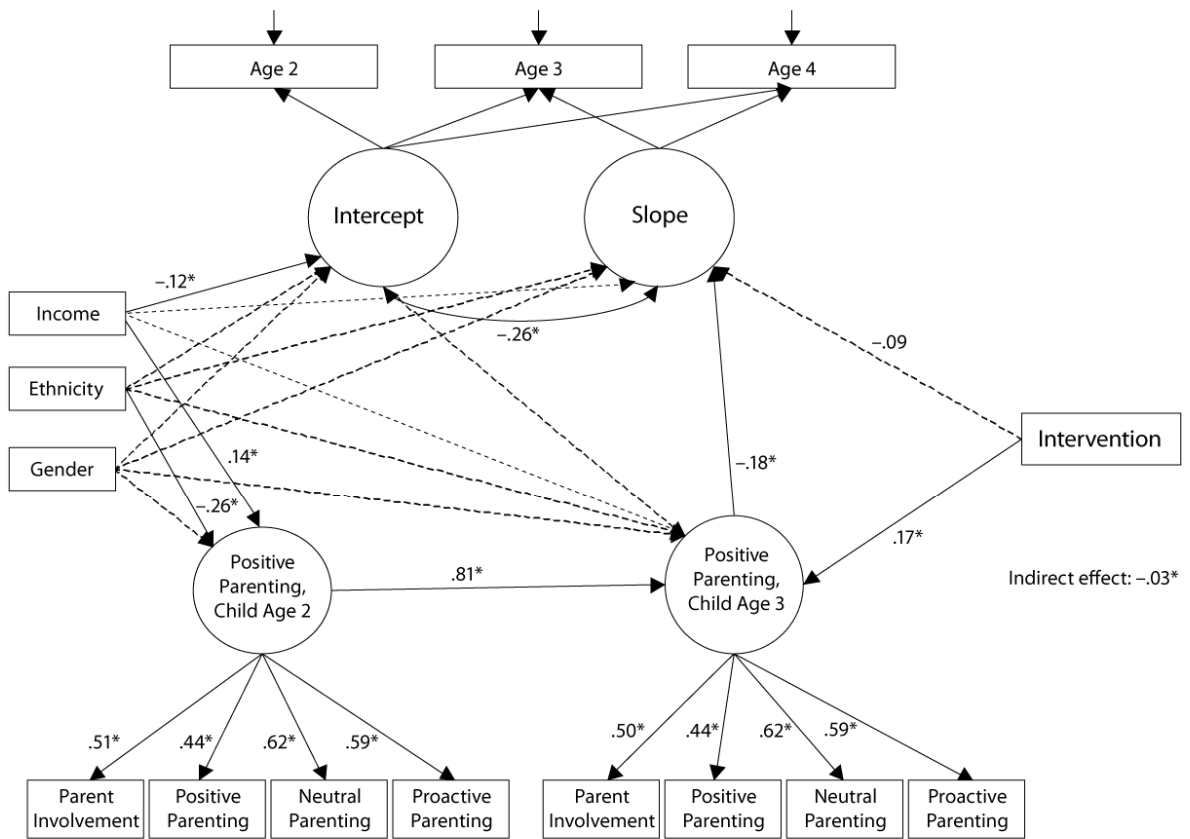
Figure 2. Trajectories Leading to Clinically-Elevated Scores TRF Aggression at age 8: Maternal Depressive Symptoms At Ages 1.5, 2, 3.5, and 5.5



Effect size = .27 - .73 sd

Figure 3. Associations between Observed Rejecting Parenting at age 2 and youth and teacher reports of antisocial behavior at ages 11-12 and 15-16: Pitt Mother & Child Project





Mediation model: CBCL Externalizing.