

**FAMILY DYNAMICS THROUGH CHILDHOOD:
A SIBLING MODEL OF BEHAVIOR PROBLEMS***

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Working Paper no. 7

April 2000

*An earlier version of this paper was presented at the annual meetings of the American Sociological Association, Toronto, Canada, August 1997. This research was supported by a grant to the first author from the National Institute of Child and Human Development (R01HD34293), and a grant to the second author from the National Science Foundation (SES-8911211). The opinions and conclusions stated in this paper are those of the authors and do not necessarily represent any of the funding agencies. We thank Andy Cherlin and Daphne Kuo for helpful comments on an earlier draft. Address all correspondence to Lingxin Hao, Department of Sociology, Johns Hopkins University, 3400 N. Charles St., Baltimore, Maryland 21218.

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Abstract

This article examines mothers' life course changes and parent-child interactions in models of children's behavior problems. We use an integrated framework that uses social capital theories to conceptualize parents' investments in their children, life course perspectives to conceptualize the timing of mothers' life course transitions, and child development research to specify the effects of parenting practices on children's behavior problems. Our models examine the timing and duration of mothers' poverty, single motherhood, welfare, employment, and kin coresidence through early and middle childhood. They also specify parent-child interactions as a reciprocal outcome of parenting and children's behavior. To estimate the models, we use data on mothers and children from the NLSY. To control for unobserved family heterogeneity and reciprocal causation, we estimate fixed-effects sibling models with lagged endogenous predictors and instrumental variables. These models make strong demands on the data, but provide strong tests of relationships. Using this strategy, we find several robust relationships. Child behavior problems are shaped by poverty and kin coresidence in early and middle childhood, and by parents use of physical punishment.

FAMILY DYNAMICS THROUGH CHILDHOOD: A SIBLING MODEL OF CHILD BEHAVIOR PROBLEMS

Sociologists have become increasingly concerned with the ways in which families shape children's development and overall well-being. This growth of interest has been fueled by rapid transformations in family structure, deepening poverty among children, and the deteriorating well-being of disadvantaged children. Children's behavior problems, in particular, are an important aspect of child development, and may be implicated in later adult outcomes. For example, life course research finds that early child temper tantrums may lead to later problems in life, such as downward occupational mobility, erratic work lives, and divorce and separation (Caspi, Elder, and Bem 1987). Child development research finds continuity between early behavior problems and later antisocial behavior (Olweus 1979; Loeber 1982), while criminological research finds continuity between behavior problems and later delinquency and crime (Farrington 1986; White et al. 1990). Such offenders in turn are more likely to suffer adult problems like joblessness, poverty, violence, and imprisonment (Nagin, Farrington, and Moffitt 1995; Farrington 1989; Hagan 1991).

The significance of the family in the genesis of children's behavior problems is well-documented. Both the internal dynamics of parent-child interactions and structural relationships involving families are implicated in the development of children. Research in child psychology has emphasized the importance of parenting styles on the well-being and control of children. Coercive or authoritarian control based on force, threat, or physical punishment of children tends to be ineffective in controlling and shaping children. In contrast, inductive or authoritative control based on reasoning, explaining, and understanding tends to be effective in shaping the lives of children (Baumrind 1978; Boronfenbrenner 1979; Rollins and Thomas 1979). Such differences in parenting styles can have a direct effect on child behavior problems and juvenile delinquency (Patternoster and Stouthamer-Loeber

1984; Patterson, Reid, and Dishion 1992). Criminological research has found that anti-social and delinquent behavior is associated with parental rejection (or lack of attachment), as well as weak parental supervision and involvement with the child (e.g., Hirschi 1969; Loeber and Southamer-Loeber 1986; Cernkovich and Giordano 1987).

Both child development and parent-child interactions are conditioned by social structure. This includes both the family's internal closure as well as the family's ties to other institutions. The lack of internal closure, reflected in single-motherhood, isolation from extended kin, and parents working outside the home may impede parent-child interactions and increases problem behavior (Sampson 1987; Matsueda and Heimer 1987; Wu and Martinson 1993; Parcel and Mengahan 1994). In addition, teenage motherhood may increase the likelihood of developmentally disadvantaged children (Nagin, Pogarsky, and Farrington 1997).

Families that are embedded in society have greater resources to invest in children, resulting in quality interactions and nonproblematic behavior. Conversely, families that are isolated from the labor market, impoverished, and stigmatized by welfare will have fewer social and material resources to invest in their children. The result will be weaker parent-child bonds and greater behavior problems exhibited by the children.

We use the concept of family social capital to conceptualize parent-child interactions, family structures, and family social context. Thus, we focus on the structural relations that give rise to social resources available for parents to invest in their children, and the different ways in which parents invest those resources (Coleman 1988). Here we emphasize the building of trust, the exchange of information, and the mutual obligations that develop between parents and their children. Each of these processes inhere in structural relations. Families with both biological parents present, with strong kinship networks, and with parents embedded in the community (through jobs, voluntary associations, and the

like) have structures that are conducive to building reciprocal trust, stable expectations, and strong normative controls. Family social capital invested in children is manifested in parenting practices, or parent-child interactions. Parents invest in their children by developing warm emotional bonds, building strong norms with consistent, positive sanctions, and providing support. These investments can dissuade children from problem behavior.

But families influence children's social development through a dynamic process, which unfolds over the life course of the child. Therefore, we follow recent theorizing in criminology and adopt a life course framework for examining family social capital and child behavior problems (Sampson and Laub 1993; Hagan, MacMillan, and Wheaton 1996; Hagan 1997). We conceptualize parents' life course transitions as structural relations both within the family and between the family and other institutions. Parental role transitions, such as movements into and out of states such as poverty, welfare, employment, single-parenthood, and coresidence with extended kin, represent major shifts in internal closure within the family and the embeddedness of the family in society. Moreover, not only is the transition itself important, but the *timing* of that transition and the *duration* of the state is significant for the child (Hogan 1978; Elder 1985). For example, chronic poverty may deplete social resources (e.g., information about ways to dissuade children from problem behavior) and thereby impair the control of children. Or early childhood poverty could have lasting effects on children by undermining the formation of parent-child bonds at a critical life stage.

This paper uses an integrated framework drawn from social capital theory, life course perspectives, and child development research to examine the relationships between parental life course transitions, parent-child interactions, and children's behavior problems. Our models have three features that allow us to examine important substantive and methodological issues raised by our integrated framework.

First, life-course and child-development perspectives emphasize the importance of the timing of mother's life course transitions within the developmental stages of the child. Therefore, our models examine whether structural sources of social capital are more consequential for child outcomes if they are present early in childhood, are present late in childhood, or change frequently throughout childhood. Second, child development research suggests that parenting is not a unidirectional process, but entails contributions to interactions by children as well as parents. Therefore, our models examine effects of parenting practices on child behavior problems while controlling for possible reverse causation. Third, because our explanatory variables (including parental life course transitions and parent-child interactions) are not exogenous treatments, their effects on child outcomes could be biased due to unmeasured family factors. Therefore, we use fixed-effects models for sibling data to control for the effects of unobserved family heterogeneity.

FAMILY SOCIAL CAPITAL AS AN INTEGRATING FRAMEWORK

Following recent research on family dynamics and children's behavior problems (e.g., Parcel and Menaghan 1994; Sampson and Laub 1993), we use the concept of social capital to link social structure, mother's life course transitions, and parent-child interactions. In developing social capital theory, Coleman (1988) tried to integrate a sociological framework, which views "actors as socialized and action as governed by social norms, rules, and obligations," into a rational choice perspective that emphasizes human capital investments. Applied to the family, human capital approaches specify a household production function, in which the utility of parents depends not only on their own consumption, but also on the utility of their children (Becker 1991). Parents invest time, energy, and material resources in their children to increase their children's well being. In return, children refrain from undesirable behavior, acquire greater human capital, land more prestigious jobs, and accumulate greater wealth. Thus, descendants in all generations are linked by a dynastic utility function relating

parents' utility to that of their children (Becker 1991).

Social capital theories build on an individual decision-making model, but explicitly consider social relationships in the context of social structure and organization. For Coleman (1988, 1990), the concept of social capital captures the process by which individuals develop social relations, which, in turn, generate resources facilitating action. Social capital inheres in social relations and takes on three forms: (1) reciprocal obligations, expectations, and trust; (2) information that provides the basis for rational action; and (3) norms and effective sanctions that govern behavior and, in particular, induce action in the interest of a collectivity, like the family. Conditional on family background, the concept of social capital features three major components—embeddedness of the family in the broader society, internal closure within the family, and interactions between parents and children, which we call “family social capital” (Parcells and Mengahan 1994).

Family background, reflected in human capital (parental education) and financial capital (parental income), provides parents with resources to invest in their children. Educated parents have greater knowledge to build supportive cognitive and emotional environments for their children, while wealthy parents have income to invest in quality homes, safe neighborhoods, and stimulating environments. This background conditions family dynamics and children's developmental trajectories.

Families derive greater social and material resources when they are strongly tied to other social institutions. Social capital, in particular, inheres in “parents' relationships with the institutions of the community,” including neighborhoods, labor markets, educational institutions, government, and community (Coleman 1988, p. S113). Closure with respect to these broader structures is achieved through closed reciprocal social relations that remain stable over time. For example, poverty and joblessness will increase isolation from conventional institutions and increase the likelihood of residence in disorganized, crime-ridden neighborhoods. Similarly, welfare dependency may reinforce social

isolation by stigmatizing parents and families. In general, structural disadvantages undermine relations between parents and their neighbors, co-workers, and community organizations, thereby reducing social resources available to the family. Such disadvantages may ultimately interfere with parent-child relations directly, and indirectly by undermining internal closure in the family.

Family social capital also inheres within the structure of the family. Here, closure is achieved when family members retain reciprocal social relations with each other. This enables parents to build trust and obligations with each other, and impose their expectations on each other. Thus, the physical absence of adults is a “structural deficiency in social capital” (Coleman 1988, p. 111, including families headed by single mothers, or nuclear families with both parents working, without compensating extended kin near the household. Incomplete nuclear family structures can be partly compensated by the presence of kin, such as grandparents, who help rear the child (Stack 1974). Social capital is also impeded by large sibships, which dilute the attention of parents, and the presence of step-parents which can create conflicting expectations for children, which undermines parent-child interactions (Cherlin 1978).

Parents’ investments in their children, derived from resources inherent in structural relations, take the form of parenting, or more precisely, parent-child interactions. For example, mothers invest in their children by discussing personal matters and expressing high educational expectations (Coleman 1988), which translates into future financial capital and well being. Parents who pay attention to their children, supervise them closely, and expect them to succeed are investing in their children’s social capital, which reduces antisocial behavior (Sampson and Laub 1993; Hagan, MacMillan, and Wheaton 1996; Hagan and McCarthy 1997). Conversely, merely using coercive measures, such as physical punishment, to control children in the short-run, may reflect a lack of investment in the long-term well-being of children

MOTHERS' LIFE COURSE TRANSITIONS THROUGH CHILDHOOD

As noted above, family social capital is increased by closure within the family and between the family and external social institutions. Closure, in turn, is achieved through stable reciprocal social relations. Coleman stated these relations as static entities, stressing the structural nature of closure. In reality, however, social relations are dynamic and evolving, which opens new puzzles for the analysis of social capital. We draw from the literature on life course and child development to conceptualize the timing of parents' life course transitions through the stages of childhood. We focus on the life course changes of mothers—the primary caretakers in most families—and consider the effects of the timing of important life course events in creating social capital and affecting child development.

Life course perspectives emphasize that lives are interdependent and linked through time, stress that both children and parents actively shape interaction rather than passively responding to structural constraints, and focus on the timing and sequencing of events (Amato and Booth 1997; Elder 1985). Important events for child development include structural transitions such as family structure, welfare, poverty, unemployment, and kinship co-residence. This emphasis echoes family demographers' recent concerns about the unfolding dynamics of childhood experiences and subsequent child outcomes. Much of this work focuses on the timing of childhood experiences of poverty. It distinguishes permanent, chronic, persistent, recurrent, occasional, and transient forms of poverty (Ashworth et al. 1994) and differentiates effects of childhood patterns of poverty on child outcomes (Bolger et al. 1995; Duncan et al. 1994; McLeod and Shanahan 1993; Hao 1995). Similar work has examined histories of family structure, distinguishing current, early, and unstable family structures, and their effects on child outcomes (e.g., Menaghan et al. 1997; Corcoran 1995; Lichter 1997).

Wu and Martinson (1993), in particular, have lent some conceptual clarity to this literature by applying three specific hypotheses to the timing of family structure and premarital births. *Early* family

structure corresponds to a child socialization hypothesis, in which early socialization produces trajectories that persist through adolescence. *Current* family structure corresponds to a social control hypothesis, in which close supervision dissuades adolescents from deviance. *Unstable* family structure corresponds to a family change hypothesis, in which frequent changes in family structure, and the attendant stress produced, undermines adolescent development (Wu and Martinson 1993). Following this approach, we draw on life course and child development literatures to conceptualize the process by which the timing of family social capital influences child outcomes.

Socialization in Early Childhood

Child development researchers emphasize socialization early in a child's life, which spawns life course trajectories. In the transition from infancy to early childhood, parents shift from a caretaker role to a role of directing, shaping, and reinforcing children's behavior (e.g., Baumrind 1978). Children acquire language, develop cognitively, and participate in symbolic interaction with parents, which facilitates critical early learning. Parenting consists of modeling, reinforcing, and punishing behavior. According to this view, divorce, dependence, and joblessness may have particularly harmful effects during early childhood, generally defined as infancy through the first five years of life (Hetherington, Cox, and Cox 1978; Wallerstein and Kelly 1980). Some research finds that parent-child separation early in a child's life leads to negative life course trajectories (Rutter and Quinton 1984).

From the standpoint of social capital theory, we would expect that some forms of family social capital cumulate over time, making early child experiences critical. For example, not only are the building of trust and the internalization of norms cumulative, but the very ability to trust and internalize norms are likely to be acquired early in life. Therefore, structural changes in the family that disrupt closed social relations may be particularly consequential for a child's well-being when they occur in the first five years of life. For example, during this period, if mothers are working outside the home, fathers

are absent, and grandparents are not nearby, parent-child relations will be undermined, social capital depleted, and children's behavior problematic. On this point, Amato and Booth (1997) found that divorces occurring early in the child's life had persistent negative effects on child well-being, particularly for families experiencing marital discord, and these effects were due to a lessening of parental support. Net of their effects on financial capital, poverty and AFDC reciprocity can impede early parent-child bonds by stigmatizing the family, widening the gap between the family and other institutions (such as integrated neighborhoods and communities), and ultimately draining the family of social relationships upon which to build social capital.

Social Control in Middle Childhood

During middle childhood, children begin to reason, empathize, and take the role of the other. Effective parenting is not longer restricted to direct reinforcement and modeling, but also capitalizes on reasoning and role taking by emphasizing systems of social relations. Parents use social approval, social disapproval, and inductive reasoning to teach the child how to infer others' reactions to their behavior, and how to engage in role taking (Baumrind 1978). Moreover, as children gain a sense of self and independence, parental supervision and involvement becomes increasingly important for social control. Structural changes, such as divorce, welfare, and unemployment, may affect children's social development by impeding parents' ability to supervise and control their children (Matsueda and Heimer 1987). Parents act as capable guardians in reducing the likelihood of antisocial behavior (Cohen and Felson 1979).

From this view, structural changes in the closure of family relations, such as father-absence, working mothers, and absence of extended kin will undermine normative controls and effective sanctions and increase child behavior problems. This effect may vary by the form of problem behavior. Social control by parents may be more effective in curtailing externalizing behaviors, such as aggression

and temperamental, which are easily observed and corrected, than internalizing behaviors, such as depressive and unsociable behavior, which are more nebulous, covert, and difficult to correct.

Family Instability and Reduced Social Capital

Although Coleman (1988) stressed that structural change undermined social capital – e.g., frequent family moves attenuate community ties – he did not specify precisely whether social capital is undermined more by having few social relations, experiencing frequent changes in social relations, or experiencing changes earlier in life. The life course literature offers some help here, arguing that the precise timing of life-course transitions is less important than the total number of transitions (Wu and Martinson 1993). More changes in structural arrangements leads to greater stress on the family, which has negative effects on child development. We suggest that frequent changes (instability) in family structure, employment, poverty, welfare, and kin coresidence may damage parent-child relations and undermine family social capital, including shared values and norms, trust, expectation, and obligations embedded in these relations. Reduced social capital, in turn, may lead to greater problem behavior exhibited by children. Some research finds that family disruption leads to aggression, impulsivity, and unhappiness (Hetherington 1987; Wallerstein and Kelly 1980), and repeated stressful events are associated with negative child outcomes (Rutter 1983). In particular, Amato and Booth (1997) found that frequent changes in marital status had negative effects on children's later psychological well-being by undermining parental support.

In sum, our approach emphasizes the role of post-birth social capital in child behavior problems. From this perspective, mothers' life-course transitions (closure in social relations) affect parent-child interactions (family social capital). These transitions and interactions, in turn, affect the behavior problems exhibited by the child. By taking a dynamic view, we can examine whether the effect of life-course transitions varies by its timing in the developmental life of a child, and whether early changes,

recent changes, or the absence of changes are most important for child development.

PARENT-CHILD INTERACTIONS

As noted above, from the standpoint of social capital theory, parenting is a way of investing in children. Thus, parents build up mutual trust and obligations with their children, provide them with useful information for their futures, and socialize their children to abide by conventional norms. This conceptualization takes the viewpoint of the parent, relegating the child to an uninteresting or passive actor that does not contribute to his or her own socialization. Much research, however, suggests that children are active contributors to interactions with their parents, and an exclusive focus on parents provides an incomplete picture and can lead to methodological problems in empirical analyses.

Research from life course and child development perspectives assume that children are active agents who contribute to their socialization. Thus, parenting is conceptualized as a joint accomplishment between parents and their children. Of course, parents have the power to force compliance in children, but differences in children's behavior can lead to differences in parental responses (e.g., Bell 1968; Bell and Harper 1977; Patterson and Yoerger 1997). For example, children who are difficult and temperamental may elicit more punitive responses from parents. Such interactions can escalate into episodes of physical punishment of the child. In contrast, responsive and sociable children may facilitate attachments to parents and more authoritarian parenting behaviors. The result can be a spiraling process of increasingly positive or negative interactions, causing parent-child dyads to diverge in parenting styles and children's behaviors.

We will examine the effects of parent-child interactions on children's behavior problems while controlling for possible effects of children's behavior on parenting. We examine dimensions of parent-child interactions based on the concept of social capital and the literature in child development. For example, we hypothesize that positive parenting—praising a child, showing physical affection, and

saying positive things—will reduce problem behaviors by teaching children the boundaries of behavior in a non-threatening way (Patterson et al. 1992; Baumrind 1978). In contrast, the use of physical punishment may increase aggression by legitimizing the use of violent and aggressive behavior to solve problems (Olweus 1980; Larzelere 1986; Straus 1991). Fathers who spend time with their children are investing in the well-being of their children. Therefore, we hypothesize that, net of parental disciplinary styles—children who spend more time with their fathers will exhibit fewer behavior problems.

Moreover, it may be that the kinds of activities that parents share with their children are important for children's adjustment. Thus, parents who invest in the cultural capital of children, such as taking them to museums and other cultural events, will increase their prosocial behaviors and decrease their antisocial behaviors.

DATA AND MEASURES

The National Longitudinal Survey of Youth

We use data from the main file of the National Longitudinal Survey of Youth (NLSY) and its matched mother-child file. The NLSY is based on a national probability sample of 12,686 American youths who were aged 14-21 in January 1979, and who have been reinterviewed annually through 1994. Of the 6,283 females sampled, 456 were originally in the military and dropped after 1985, and 901 were poor whites and dropped after 1991. In 1994, 77 percent of the 4,480 female respondents interviewed were mothers of at least one child.

In 1986, the NLSY began adding to the survey all children born to the NLSY females. Every other year, the NLSY assesses the children's development, including their behavior problems and home environments. By 1994, five waves of assessments had been completed with the 7,089 NLSY children and 16 waves of interviews had been completed with the 4,480 NLSY mothers. We take advantage of this survey design to estimate sibling models that examine relationships between child behavior

problems and childhood experiences of poverty, single motherhood, AFDC receipt, kin support, and parenting practices.

We confine our analysis of behavior problems to children aged 6-14 in the years of 1986, 1988, 1990, 1992, and 1994. We exclude three categories of youth for substantive reasons. First, we exclude non-school age children because our assessments included activities both at home and in school. Second, we exclude older teenagers because they have advanced into a different developmental stage, one in which, for example, adolescent delinquency has replaced child behavior problems. Third, we exclude children born prior to the beginning of the NLSY longitudinal survey (1979), because retrospective data on mothers are incomplete.

Our sibling model places an additional requirement on our sample. Our fixed-effects sibling model requires data on at least two siblings in a family; therefore, we exclude families with only one child observed. In our sibling model, we choose one observation per child using a criterion that maximizes the difference in childhood experience of mothers' life course transitions. For example, in a two-child family, we choose the earliest observation of the older child and the latest observation of the younger child. This strategy yields greater within-family variance for variables describing childhood experiences of mothers' life-course transitions, which is important for obtaining stable estimates of sibling models.¹ The resulting sample of children with valid behavior problem assessments includes 4,351 children born to 1,805 mothers. Among the 1,805 mothers, 1,236 had two children, 431 had three children and 138 had more than three children included in our sample.

Measurement

Behavior Problems. Since 1986, the NLSY has administered to mothers a checklist of their children's

¹We also estimated models in which we randomly selected the measure of child behavior problems at one wave. This sampling method drops the within-family variance. Sensitivity analyses find that this way of sampling yields estimates that are identical in sign, but smaller in magnitude and statistical significance.

behavior problems derived from the Achenbach Behavior Problems Checklist (Achenbach and Edelbrock 1981). We specified two confirmatory factor models, one with a single latent construct and the other with two latent constructs—externalizing and internalizing symptoms (see Appendix Table 1 for items of the two-factor model).² These specifications were derived from Achenbach and Edelbrock's (1981) original analysis, as well as the analyses of Zill (1985) using the National Health Interview Survey, Parcel and Menaghan (1988) and McLeod and Shanahan (1993) using the 1986 assessment of the NLSY children, and Lizotte et al. (1992) using data from the Pittsburgh and Rochester Youth Surveys. Both one-factor and two-factor structures appear consistent with earlier research, theoretical considerations, and psychological diagnostic classifications. Each of the models provides a reasonable fit to the data and exhibit reasonable factor loading. The discriminant validity of the factors, as revealed by the inter-factor correlations, is less apparent. In our two-factor model, internalizing and externalizing factors are correlated .84 (.70 after computing factor scores). Although discriminant validity is not strong, we follow research in child psychology and report the full results for the single factor and internalizing vs. externalizing. Our composites are factor scores using weights from our confirmatory factor models, which give more weight to indicators that have greater reliability.³

At-Birth Conditions. We measure several variables at the time of birth of a given child. Teenage motherhood refers to a woman who gave birth to her first child while she was a teenager. It is invariant across siblings. However, teenage childbearing (maternal age at birth of each child) varies between siblings. Other variables measured at birth of the child are static measures that vary between siblings. These include mother's educational level and family income at birth of each child, indicating the human

²The behavior problem checklist for 1986 has four fewer items. Therefore, we estimated separate confirmatory factor models for the 1986 data, and computed separate factor scores for 1986.

³Detailed results from the confirmatory factor analysis are available from the authors upon request.

⁴We also examine a more detailed classification of family structure, distinguishing stepfamilies and cohabitation from single status. Multivariate analyses reveal that neither detailed nor simple family structure explains children's

and financial capital available in the family when the child was born. Mothers' smoking and drinking during pregnancy captures prenatal health conditions that may affect fetal development. Some psychological research suggests that prenatal substance use can lead to child behavior problems. An alternative argument, however, suggests that rather than the substances per se, it is a mother's propensity of risk-taking and self-destruction (reflected in drinking and smoking during pregnancy) that influences a child's behavior problems. Our sibling model controls for mother-specific heterogeneity (including her propensity for risk-taking and self-destruction), and therefore, can test these competing hypotheses.

Childhood Experiences of Mother's Life-course Transitions. During a child's life course, parents' demographic and socioeconomic status changes, which changes their potential for investment in their children. We measure childhood experiences of mother's life-course transitions using four dimension—family structure, grandparent co-residence, AFDC participation, and poverty. For family structure, we focus on intact family.⁴ Intact family structure is defined from each child's perspective. If the child lives with both biological father and mother, we define it as an intact family for the child. Such defined, intact family structure may differ across siblings: an intact family for the younger sibling can be a stepfamily for the older sibling. Grandparents' coresidence is defined as the mother and child living in grandparents' home. If the mother received AFDC payments in a year, we consider her as an AFDC participant. When the family income falls below the poverty line, the family is called living in poverty.

Because different siblings grow up in different life stages of their parents, their experiences of parental life-course transitions may differ. Thus, we want to examine hypotheses corresponding to the timing of parental life-course transitions with respect to each child. We modify the approach of Wu and Martinson (1993) to arrive at two conceptualizations of the life-course timing and duration of family

⁴We also examine a more detailed classification of family structure, distinguishing stepfamilies and cohabitation from single status. Multivariate analyses reveal that neither detailed nor simple family structure explains children's behavior problems. Therefore we use the simple classification in the analysis.

structure, grandparent co-residence, AFDC participation, and poverty. To illustrate the two conceptualizations, we use the example of poverty.

The first conceptualization of poverty captures *early childhood exposure* (0-5 years) with the cumulative duration of the first six years the child spent in poverty (see Wu and Martinson 1993, p. 216). The second conceptualization captures *recent continuous duration* in poverty.⁵ We are extending Wu and Martinson (1993), who found no support for a snapshot of current poverty status. We hypothesize that it is not merely a *snapshot* of current poverty status, but rather *duration* in current poverty status that will affect child behavior problems from a social control view. Current duration captures the stability of the current poverty status and equivalently controls for the instability of family financial situation.

Parenting Practices. The NLSY administered a short form of the Home Observation Measurement of the Environment (HOME). Previous research assumes HOME is a unidimensional construct capturing the home environment. We will deconstruct the index and examine whether distinct sub-dimensions affect behavior problems distinctly. We draw upon theories of child psychology, previous operationalizations of parenting, and the substantive meanings of the HOME items to specify five major dimensions of parenting. The dimensions are mother's positive parenting, physical punishment (spanking), taking the child to cultural activities, father's time spent with the child, and home reading activities. We estimated a confirmatory factor model, tested its goodness of fit, and then computed factor scores for each construct. Positive parenting is measured with a composite of three items, including the number of times a parent praised a child, showed physical affection, and said positive things. The spanking item is measured on an interval scale, which we truncated at eight to reduce the potential influence of outliers (0.6% of children experienced spanking greater than 8 times in

⁵ Preliminary analyses found empirical support for this specification. Models that interacted current life-course status with duration in that status provided a better fit to the data than models that used only current status.

a week). Cultural activities include taking children to museums and performance. Time the father spent with the child is based on spending time and having meals and outdoor activities with the child. Home reading activities include children's own reading and mothers' reading to children.

SPECIFICATION OF THE MODELS

Our empirical examination of parental life course transitions, parent-child interactions, and child outcomes raises a number of substantive and methodological issues. Our analyses proceed in two steps. First, we examine the effects of family background and parental life course transitions on child behavior problems. Second, we examine the effects of parenting on child behavior problems, controlling for family background and parental life course transitions.

Models of Family Background and Parental Life Course Transitions

Our models of family background and parental life course transitions raise the question of how best to control for family background, including both measured and unmeasured family characteristics. Model I will be of the following form. Let y_{ijt} be one of the measures (scalers) of behavior problems for child j in family i , assessed at time t . \mathbf{X}_{ijt} is a vector of the child's characteristics as controls (age, gender, birth order, health condition, age of the youngest child, and the number of siblings at home at the time of assessment). The vector \mathbf{B}_{ij} denotes at-birth conditions, including the i th mother's age at birth of the child (young teen, old teen vs. adulthood) and financial, human, and health resources at birth of the j th child. We use \mathbf{C}_{ijt} to denote a vector of variables describing childhood exposure to parents' life course transitions up to time t , the year of assessment. A model that controls for observed family background is a standard regression model that can be estimated with OLS.⁶

$$(1) \quad y_{ijt} = \beta_1' X_{ijt} + \beta_2' B_{ij} + \beta_3' C_{ijt} + u_{ijt}$$

⁶ We use the subscript t to indicate that siblings were assessed in different years. In later specifications, it also helps indicate lagged variables. The data structure used for analysis is one record per child.

This model regresses child behavior problems on the child's characteristics, at-birth conditions, and parental life course transitions. Because it excludes endogenous variables representing parent-child interactions, this is a reduced-form of our complete model, providing total effects of exogenous variables on behavior problems.

The OLS model, however, fails to disentangle between-family error variance from within-family error variance. A random effects (RE) model, which estimates unobserved family heterogeneity, a_i , under the assumption that a_i is orthogonal to other regressors that vary across siblings (B_{ijt} , and C_{ijt}):

$$(2) \quad y_{ijt} = \beta_1' X_{ijt} + \beta_2' B_{ij} + \beta_3' C_{ijt} + \alpha_i + u_{ijt} .$$

If the variance of a_i is non-zero, then the RE model estimated by GLS will provide more efficient estimates than OLS.

If, however, unobserved family heterogeneity is correlated with other regressors, then OLS and GLS will yield biased and inconsistent estimates of parameters. We expect that such heterogeneity (such as unmeasured parent characteristics, parents' own socialization history in their families of origin, and parents' child rearing strategies) would be correlated with childhood experiences that vary across siblings (such as parental life course transitions and parent-child interactions). Therefore, we specify a fixed-effects model that relaxes the orthogonality assumption (Hsiao 1986). We can estimate the model using the following equation that differences out both observed and unobserved family heterogeneity:

$$(3) \quad y_{ijt} - \bar{y}_i = \beta_1'(X_{ijt} - \bar{X}_i) + \beta_2'(B_{ij} - \bar{B}_i) + \beta_3'(C_{ijt} - \bar{C}_i) + u_{ijt} - \bar{u}_i$$

Fixed-effects models also control for persistent measurement errors in mothers' reports on child behavior problems—such persistent errors are absorbed in our unobserved family heterogeneity component. To test the RE hypothesis that a_i is orthogonal to other regressors, which obviates the need for FE, we use a Hausman test (Greene 1993).

The comparison of the OLS, RE and FE estimates can shed some light to our understanding of the fixed effects models. While OLS and RE estimator make use of both between and within family variations, FE estimator differences out all between-family variation. Between-family variation includes three components: (1) observed family fixed variables, such as parents' education; (2) the between-family portion of observed variables that can vary between and within families, such as childhood experience; and (3) unobserved family-specific heterogeneity in the family of origin and procreation common to a sibship.⁷ We also use the OLS, RE, and FE models in examining effects of parenting practices on child behavior problems.

Models of Parenting Practices

Our models of parent-child interactions, add parenting practices, \mathbf{P}_{ijt} , to the model of background characteristics and mother's life course transitions (making the latter model a reduced form). This gives us Model II:

$$(4) \quad y_{ijt} = \beta_1' X_{ijt} + \beta_2' B_{ij} + \beta_3' C_{ijt} + \beta_4' P_{ijt} + \alpha_i + u_{ijt}.$$

As noted above, however, child development researchers suggest that children contribute to their own development by eliciting parental responses. Therefore, parenting and child behavior problems may be reciprocally related. Any examination of parenting on child behavior problems must control for possible correlation between \mathbf{P}_{ijt} and u_{ijt} produced through reciprocal causation. The fixed effects, α_i , helps to reduce the correlation between parenting and the error term but does not solve the problem completely. Therefore, assuming that current child behavior problems cannot influence past parenting, we substitute lagged parenting for current parenting in Model III:

⁷Because the estimates of our fixed-effects model are conditional on the sample in that α_i are treated as fixed (and estimable) rather than random and drawn from a probability distribution, we are limited in our ability to make out-of-sample predictions beyond the sample values of α_i (Chamberlain 1982).

$$(5) \quad y_{ijt} = \beta_1' X_{ijt} + \beta_2' B_{ij} + \beta_3' C_{ijt} + \beta_4' P_{ij,t-1} + \alpha_i + u_{ijt}.$$

However, a further problem arises. Past parenting can affect past behavior problems, which, in turn, produces current behavior problems (state dependence). In other words, past parenting is confounded with state dependence in the dependent variable. To disentangle lagged parenting from state dependence in behavior problems, we control for lagged behavior problems. This may result in biases due to correlations between endogenous predictors and disturbances – most commonly from serial correlation in the presence of a lagged dependent variable. Therefore, we use an instrumental variables (IV) estimator, using the second-order lagged behavior problems as an instrument of the first-order lagged predictor (Hsiao 1986). Model IV specifies a clear temporal ordering between parenting and behavior problems and separates the state dependence of behavior problems from the causal effect of parenting:

$$(6) \quad y_{ijt} = \beta_1' X_{ijt} + \beta_2' B_{ij} + \beta_3' C_{ijt} + \beta_4' P_{ij,t-1} + \gamma \hat{y}_{ij,t-1} + \alpha_i + u_{ijt}.$$

This model, using a FE estimator to control for unobserved heterogeneity, lagged endogenous predictors to control for state dependence, and an IV estimator to control for serial correlation in the presence of a lagged dependent variable, provides a very strong test of our hypotheses. At the same time, however, it makes great demands on the data, and therefore, we will compare it with our other models, which make fewer demands.

RESULTS

Table 1 describes the distribution of variables used to estimate our reduced form model, Model I. The three measures of behavior problems are standardized to unit variances. The age of children ranged between 6-14 years of age, with a mean of 8. About half the children are boys, one-third are first born, and the mean level of poor health is .22 on a 6-point scale. The average size of a sibship is just under

three children, with the youngest child averaging five years of age.

(Table 1 about here)

Although 19% of the children had mothers who had given birth to at least one child before age 18 (teenage motherhood), only 3% of the children had themselves been born to a mother under 18. The mothers in our sample are relatively disadvantaged: their average family income (at the time of birth of the child) was about \$20,590 and their average educational level was less than 12 years. Nine percent of the mothers drank during pregnancy and 8% smoked. Thus, at the time of birth, children faced relatively disadvantaged home environments. These disadvantages persisted through childhood. For example, on average, children spent only 3.8 years in intact families but 2.1 years in poverty out of their first six years. Only 54% of the children spent their childhood (up until the year of assessment between ages 6-14) in intact families while 31% of them were currently living in poverty at time of assessment. Among those living in poverty currently, the average duration is 5.8 years (not shown in the table).

The use of sibling data to control for unobserved family heterogeneity requires that variables used in the analysis exhibit sufficient variation within families. Greater percentages of variance within families allow more precise estimates of the fixed-effects model. We take caution in interpreting results for variables with low percentages of within-family variation because coefficients may be estimated with large sampling variability. The last column of Table 1 presents within-family variance of each variable as a percentage of total variance. The percentage of within-family variance for internalizing and externalizing symptoms is more than 40%, whereas for overall behavior problems, it is slightly lower. The percentage of within-family variance for the right-hand-side variables ranges from 3.5% for mother's education at birth to 84.3% for the first-born. Variables with substantial within-family variance (30% and above) include most of the child characteristics and the conditions at-birth. Childhood exposure to parents' life course transitions varies moderately (8.4-46%) within families and

parenting varies between 32-46%.

Parents' Characteristics, Child Characteristics and Conditions at Birth

Turning to our multivariate substantive models, Table 2 presents the OLS, RE, and FE estimates of Model I. The dependent variables are standardized, so we can compare the relative magnitudes of effects across equations. The bottom of the table shows the p-valued of the Hausman tests, indicating that we can reject the null hypothesis that unobserved family heterogeneity is orthogonal to sibling-varying regressors. Thus, FE estimates are consistent, while OLS and RE are not. The R^2 s of the FE estimator refer to the percentage of within-family variance in behavior problems explained by explanatory variables. The R^2 s of the RE estimator are the weighted sums of within and between R^2 s. Finally, the OLS R^2 s are unweighted sums. Overall, the R^2 s of our models are moderate in size (.06-.10), similar or somewhat larger than previous research using these data on individuals (e.g., Parcel and Menaghan 1993, 1994). In addition, the FE R^2 s are not substantially different from those of OLS or RE.

(Table 2 about here)

The effects of parents' characteristics are estimated using OLS and RE but not FE. In fixed effects models, parents' characteristics are identical for siblings, and therefore, are differenced out of the estimation equations. That is we control for both observed and unobserved heterogeneity, but do not estimate these effects. Nevertheless, in OLS and RE models, these variables do not appear to be decisive for child behavior problems.

Examining the effects of child characteristics, we find that, as expected, sex is an important predictor of behavior problems: boys engage in more behavior problems than girls. As expected, the effect of sex is particularly strong for externalizing behaviors. Results across the three estimators are consistent in both magnitude and significance. A similar consistency emerges for the strong and detrimental effect of poor health on behavior problems. Effects of other child characteristics are less

consistent. For example, age significantly reduces internalizing symptoms for models estimated by OLS and RE, but not FE. Number of siblings and age of youngest sibling reduce overall behavior problems using the FE and RE estimators, but do not affect the specific internalizing and externalizing symptoms taken separately.

With one exception, the effects of variables measured at birth fail to survive controls for unobserved heterogeneity. The exception is teenage childbearing, which significantly *reduces* internalizing symptoms for each of the three estimators. Thus, net of our measures of family disadvantages, teenage childbearing actually exerts a positive effect on internalizing symptoms. The significant effect of teenage childbearing on externalizing symptoms using OLS, however, does not survive controls for unobserved heterogeneity. Similarly, the effects of drinking and smoking during pregnancy disappear in the fixed-effects model. In these cases, we cannot rule out the possibility that the effects are spurious, due to unobserved family heterogeneity. Stable characteristics – such as mothers' personalities – may lead her to smoke and drink during pregnancy, and also cause her children to exhibit problem behavior.

Mothers' Life-Course Transitions

Childhood experiences of mothers' life-course transitions reflect the family's internal closure (family structure and grandparent coresidence) and the family's external embeddedness in broader social structures (poverty and AFDC), and thus, provide structural conditions for social capital. For instance, poverty reflects material deprivation as well as isolation from mainstream society. AFDC brings in payments from the government but at the same time produces social stigma and isolation. Intact families and grandparents residing in the home create closure of interpersonal relationships in the family. We are also interested in the timing of these transitions in the development of the child, which correspond to developmental (early in life), social control (recently), and stress hypotheses (unstable).

Overall, we find support for the developmental hypothesis for early child experiences of grandparent coresidence and poverty. Children who lived with their grandparents early in life exhibited fewer internalizing and externalizing symptoms. This result holds when controlling for unobserved family heterogeneity and family structure. Interestingly, intact families do not exert significant effects on behavior problems, regardless of their timing. Early child exposure to poverty increases all three indexes of behavior problems, even when controlling for unobserved heterogeneity in the FE models. This finding is consistent with that of Duncan et al. (1994) and supports the developmental hypothesis that early child experiences of deprivation have a persistent effect on outcomes even when controlling for recent deprivation or changes in deprivation.

We find little support for a social control view, in which recent experiences of mother's life course transitions affect behavior problems. Indeed, only current poverty affects externalizing and overall behavior problems, but this effect, significant in OLS and RE models, does not survive control for unobserved heterogeneity in the fixed-effects model. Thus, we cannot rule out the possibility that the effects are spurious due to unmeasured stable family effects. The same holds for unstable poverty, which exerts significant effects on externalizing and overall behavior problems in OLS and RE models, but not FE models. In general, we find little support for the family change hypothesis, which argues that unstable family social capital undermines the well being of children.

In sum, while we fail to find support for the effects of family structure and AFDC at any stage of child development, we do find support for the developmental hypothesis that early childhood experiences of deprivation (poverty) and social support (grandparent living in the home) will influence later behavior problems. Thus, closure and embeddedness that occurs early in a child's life facilitates socialization and reduces later behavior problems. Controlling for these early experiences, recent closure does not substantially increase social control over their children. Social control may rest less on

current closure and more on actual parenting practices, to which we now turn.

Parenting Practices

We conceptualize parenting practices as a form of investment in child development. We hypothesize that parents who invest in their children by refraining from physical punishment, taking an active interest in their lives, and praising them for positive behavior will have children with fewer behavior problems. We estimated Model II using equation (4), and reported the results for parenting variables in Table 3. We find that physical punishment exhibits a robust and significant effect on each of our three measures of behavior problems for all three estimators. As predicted, physical punishment has a particularly strong effect on externalizing behaviors (50% greater than that on internalizing). Children who are spanked eight times a week score more than a standard deviation higher on behavior problems than those who are not spanked. Moreover, this effect persists even when controlling for unobserved family heterogeneity in the fixed-effects model. Thus, we can rule out the possibility that the deleterious effect of physical punishment is spurious due to stable parent or family characteristics.

Cultural activities also exhibit significant effects on all three measures of behavior problems, which survives controls for family heterogeneity in the fixed-effects model. Children who are taken to museums and performances by their parents show fewer behavior problems. Reading activities significantly reduce externalizing symptoms and overall behavior problems, controlling for family heterogeneity. For internalizing symptoms, however, the effect becomes statistically indistinguishable from zero in the fixed-effects model. Positive parenting significantly reduces all three measures of behavior problems when estimated by OLS and RE, but not FE. Therefore, we cannot rule out the possibility that the effect is spurious due to omitted stable family factors. Similarly, father's time spent with children reduces internalizing and overall behavior problems when estimated by RE, but becomes nonsignificant when controlling for family heterogeneity in the FE model.

(Table 3 about here)

The parenting effects in Table 3, however, are subject to possible bias due to reciprocal causality. Increases in spanking can be a response to children's aggressive behavior and greater shared activities can be a result of children's good behavior. We turn to Model III (equation 5) which specifies lagged parenting rather than current parenting. Model III places greater demands on the data because two consecutive observations for each sibling must be available to estimate lagged effects. This reduces the sample size to 1,326 families with 3,107 children, which results in smaller within-family variation and reduced power of statistical tests. Using this smaller sample, we estimated Model III and reported the results for parenting variables in Table 4.

(Table 4 about here)

The deleterious effect of spanking is again robust across all measures of behavior problems and all estimators. The magnitude of the lagged effect is slightly smaller. For example, for our FE estimate for externalizing, the standardized coefficient of current spanking was .194, while the corresponding estimate of lagged spanking is .135 (not shown in the table). The smaller coefficient in lagged models could reflect the long length of lag—two years, which is the time between child assessments in the NLSY. Conceivably a shorter lag could produce a stronger estimate. The effect of reading activities, which was significant for externalizing and overall problems using all three estimators, now is substantially reduced in the FE model and no longer significant. Thus, we cannot rule out the possibility that this effect is spurious due both to family heterogeneity and reciprocal causality. That, of course, assumes that the two-year lag is correct.

Although Model III specifies a temporal ordering between parenting and behavior problems that coincides with the assumed causal ordering, it does not disentangle lagged parenting from lagged behavior problems, which likely predict current behavior problems. Thus, the effects of lagged

parenting could be confounded with state dependence in behavior problems. Model IV, specified in equation (6), addresses this problem by controlling for lagged behavior problems. To overcome possible biases due to correlations between parenting and behavior problems (arising through serial correlation in the presence of a lagged dependent variable, we use an instrumental variables (IV) estimator, using second-order lagged behavior problems as an instrument for first-order lagged behavior problems. This strategy requires three consecutive observations for each sibling, reducing the sample to 905 families with 2,051 children. Power of tests and within-family variation are further reduced in estimates of Model IV, which are presented in Table 5.

(Table 5 about here)

As expected, behavior problems show remarkable continuity, particularly for OLS and RE models (standardized coefficients about .80), which leads to substantially larger R^2 s. The FE estimates are substantially lower— .24 for internalizing symptoms, .53 for externalizing, and .41 for overall problems. This implies that much of the state dependence in child behavior problems is actually due to unobserved family heterogeneity. Such heterogeneity accounts for 70% of continuity for internalizing, 36% for externalizing, and 50% for overall problems. Again, the Hausman test rejects the null hypothesis of orthogonality specified in the RE model.

But what effect does controlling for state dependence have on our substantive parameter estimates? After separating out the effect of the lagged predicted dependent variable, the effect of spanking effect is still significant for all three estimators and for all three outcomes, internalizing, externalizing, and overall problems. In some cases, the coefficients are somewhat smaller. For example, for externalizing problems, the standardized coefficient of lagged spanking is reduced from .135 to .083 when controlling for continuity in behavior problems. Thus, the significant effect of spanking persists across all of our models, after controlling for unobserved family heterogeneity,

specifying a two-year lagged effect, and controlling for state dependence. In contrast, the effects of positive parenting disappear for all three estimators and all three outcomes when controlling for state dependence. As in the earlier models, father's time with the child and the home reading activities significantly affect some behavior problems using OLS and RE, but do not survive controls for unobserved family heterogeneity in the FE model.

CONCLUSIONS

This article has examined a model of children's behavior problems that draws upon social capital theory, life course perspectives, and child development research. Our findings suggest three important conclusions. First, we find that, among our measures of family closure and embeddedness—including poverty, single mothers, welfare, and kin coresidence—exposure to poverty and kin coresidence in early childhood significantly affects child behavior problems. The effect of kin coresidence is consistent with ethnographic studies of the family (Stack 1974). Moreover, the effect of poverty is consistent with other research emphasizing the role of poverty (Lichter 1997; Corcoran 1995; Duncan et al. 1994), and suggests that policies designed to ameliorate poverty may be more effective in improving child development. We argued that poverty reflects a family's lack of embeddedness in broader social structures, including neighborhoods and communities. But it also reflects the absence of financial capital available to the family. Our models partial out financial capital at birth of the child, and therefore, the effects of poverty in early childhood capture primarily social capital, whereas poverty in middle childhood captures social capital and certain changes in financial capital in middle childhood.

Second, decomposing the HOME index into separate dimensions is illuminating. Among our parenting variables, physical punishment exerts a strong and significant effect on behavior problems. This finding is consistent with previous research examining negative effects of physical punishment (e.g., Straus 1991), but provides much stronger support given that our models have controlled for

unobserved family heterogeneity, reverse causality, and endogeneity. More generally, this finding illustrates the complexity of theorizing about social capital investments. Parents' spanking of their children may put an end to immediate behavior difficulties—such as crying or acting out—but have a long-term negative effect on other more important behavior problems. Future research is needed to apply the same rigorous statistical models to other dimensions of parenting identified in the child development literature. For example, are problem behaviors exacerbated by the pure use of physical punishment or the anger and authoritarianism of the parent that usually accompanies spanking? Beyond physical punishment, does inductive reasoning reduce the likelihood of children's behavior problems more effectively than strict enforcement of rules (Baumrind 1978)?

Third, using a sibling model to control for unobserved family heterogeneity, we fail to find support for the hypothesis that children born to teenage mothers are developmentally disadvantaged. In fact, we find that, net of our observed covariates measuring structural disadvantage, teen childbearing may have a positive effect on internalizing symptoms. This is consistent with Geronimus et al.'s (1992) finding using cousin models, but inconsistent with individual-level analyses of Nagin et al. (1997). The observed negative association between teenage motherhood and child development appears to result from teenage mothers being disproportionately drawn from disadvantaged backgrounds.

Our empirical results did not provide evidence to support the predicted effects of other indicators of family social capital, including structural conditions described by family structure and AFDC participation, as well as parents' social capital investments described by positive parenting. This is due in part because of the strength of our statistical models, which control for unobserved family heterogeneity with fixed effects, reciprocal causation with lagged effects, and endogeneity with instrumental variables, and thereby come closer to approximating a controlled experiment than previous studies. Such models make great demands on the data, and future research using larger samples and

designs that increase within-family variance on predictors is needed to rule out these effects definitively.

But perhaps more importantly, our measures of family social capital—although they follow closely from the logic and illustrative empirical work of Coleman (1988)—nevertheless use relatively standard measures of family processes. Additional theoretical and empirical work is needed to specify the precise social capital investments relevant to child development. Theoretically, we need to specify the exact mechanisms by which structural relations translate into family social capital. For example, are weak ties with important information more important than strong ties with weak information? How does this trade-off vary by outcomes—that is, by specific returns? Empirically, we need to identify stronger measures of family social capital. Measures of social relations should take into account the composition of networks, the characteristics of network members, and the actual interactions between network members. Moreover, the precise nature of important information transmitted needs to be specified.

Future research can extend these analyses to examine issues we have been unable to address fully. First, the longitudinal data on children's behavior problems will allow us to examine the dynamics of children's behavior problems within the developmental course of the child. Such data would also allow one to control for unobserved heterogeneity both between families and between individual children. Second, covariance structure models would allow one to model dynamic processes in which parents make decisions about investment in children. Here one could develop a model in which the behavior problems of the first-born would influence parents' decision concerning social capital investment in subsequent children. In this way, between-children outcomes would be dynamically interrelated (e.g., Becker 1991; Rosenzweig and Wolpin 1995).

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Appendix Table 1. Measurement Model for Child Behavior Problems

	Externalizing	Internalizing
Items		
Bullies	0.729	--
Cheats	0.635	--
Breaks	0.709	--
Disobedient	0.661	--
Argues	0.665	--
Not sorry for mischievous acts	0.550	--
Hangs with troublemakers	0.613	--
Stubborn	0.742	--
Strong temper	0.730	--
High strung	0.697	--
Not concentrate	0.646	--
Confused	0.647	--
Restless	0.622	--
Impulsive	0.710	--
Fearful	--	0.633
Depressed	--	0.755
Worthless	--	0.758
Not loved	--	0.606
Obsessive	--	0.680
Paranoid	--	0.754
Worries	--	0.534
Trouble getting along	--	0.754
Not liked	--	0.652
Withdrawn	--	0.630
Secrets	--	0.563
Demands attention	--	0.566
Depends	--	0.588
	0.0467	
Goodness of Fit (RMSEA)		
Factor Correlation		
Externalizing	1.000	<i>0.700</i>
Internalizing	0.838	

Note: Estimated using diagonally weighted least-squares estimator, based on polychoric correlation matrix of valid data from all children of NLSY (N=7,028). The 2-factor model fits the data well. Correlation among the underlying factors obtained in the confirmatory factor analysis is displayed below the diagonal; correlation among the constructed composites is displayed above the diagonal (in italic).

Table 1. Descriptive Statistics of Variables Used in Static Analysis

Variable	Mean	S.D.	% within Variance
Child Behavior Problems			
Internalizing	-.13	.98	42.0
Externalizing	-.07	.97	40.0
Overall	-.04	.97	37.0
Background			
Black	.32	.47	0
Mother even been a teen-mom	.19	.39	0
Mother's AFQT	32.86	26.34	0
Missing AFQT	.05	.22	
Child Characteristics			
Male	.52	.50	59.9
First born	.35	.48	84.3
Age	8.05	2.40	77.0
Age squared	70.50	45.52	76.3
Poor health	.22	.76	50.8
Number of siblings	2.81	1.14	18.4
Age of youngest sibling	5.04	3.35	64.7
Missing number of siblings	.00	.04	58.4
Missing age of youngest sibling	.01	.10	59.5
At-Birth Conditions			
Mother was <18 at birth	.03	.17	58.8
Family income at birth (in \$1,000)	20.59	46.93	54.6
Mother's education at birth	11.67	2.21	3.5
Mother drank during pregnancy	.09	.27	40.8
Mother smoked during pregnancy	.08	.27	26.9
Missing family income at birth	.21	.41	51.1
Missing drinking	.05	.21	54.4
Missing smoking	.05	.22	54.7
Early Childhood Experience (0-5)			
Cumulative duration of intact family	3.83	2.78	22.7
Cumulative duration of living in grandparent home	.71	1.38	27.2
Cumulative duration of receiving AFDC	1.35	2.11	9.4
Cumulative duration of living in poverty	2.11	2.34	8.4
Current Experience			
Intact family	.54	.50	22.4
Living in grandparent home	.04	.20	46.0
Receiving AFDC	.19	.39	25.0
Living in poverty	.31	.46	25.4
Duration of current experience			
Duration of living in grandparent home	.12	.76	45.2
Duration of receiving AFDC	1.08	2.64	22.0
Duration of living in poverty	1.83	3.32	20.7
Missing Experience			
Missing intact family	.01	.09	11.5
Missing living in grandparent home	.09	.29	22.1
Missing receiving AFDC	.09	.28	18.5
Missing living in poverty	.56	.50	29.1

(continued)

(table 1 continued)

Variable	Mean	S.D.	% within Variance
Parenting			
Spanking	.79	1.30	46.2
Cultural activities	1.75	.63	38.7
Positive parenting	5.27	4.02	31.9
Father's time	3.26	1.13	34.6
Reading activities	3.59	.89	45.1
Missing spanking	.17	.38	63.7
Missing cultural activities	.22	.42	65.9
Missing positive parenting	.25	.43	64.3
Missing father's time	.24	.43	64.9
Missing reading activities	.15	.35	64.0
Number of Children	4,351		
Number of Families	1,805		

Source: National Longitudinal Survey of Youth, youths 1979-1994, children 1988-1994.

Table 2. A Sibling Model of Child Behavior Problems: Child Experience of the Family Conditions

Variable	Internalizing			Externalizing			Overall		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Background									
Black	.006 (.038)	.009 (.045)	--	-.016 (.038)	-.009 (.044)	--	.000 (.038)	.004 (.045)	--
Mother ever been a teen mom	.006 (.044)	-.017 (.052)	--	.020 (.044)	-.002 (.051)	--	.049 (.044)	.029 (.052)	--
Mother's AFQT	-.000 (.001)	-.000 (.001)	--	.001 (.001)	.001 (.001)	--	.001 (.001)	.001 (.001)	--
Child Characteristics									
Male	.073 * (.029)	.072 ** (.027)	.066 * (.031)	.281 *** (.028)	.281 *** (.027)	.281 *** (.031)	.226 *** (.028)	.226 *** (.026)	.225 *** (.030)
First born	-.011 (.042)	-.011 (.038)	.022 (.043)	-.071 (.041)	-.077 * (.038)	-.066 (.043)	.020 (.041)	-.000 (.037)	-.027 (.041)
Age	.172 ** (.058)	.107 * (.054)	-.017 (.062)	.082 (.057)	.053 (.053)	-.001 (.061)	.076 (.057)	.079 (.052)	.084 (.059)
Age squared	-.007 * (.003)	-.003 (.003)	.004 (.003)	-.003 (.003)	-.002 (.003)	.002 (.003)	-.003 (.003)	-.003 (.003)	-.003 (.003)
Poor health	.185 *** (.019)	.160 *** (.018)	.111 *** (.022)	.155 *** (.019)	.135 *** (.018)	.096 *** (.022)	.185 *** (.019)	.160 *** (.018)	.120 *** (.021)
Number of siblings	-.004 (.017)	-.008 (.019)	.011 (.032)	-.005 (.017)	-.019 (.019)	-.034 (.031)	-.030 (.016)	-.057 ** (.019)	-.104 ** (.030)
Age of youngest sibling	.005 (.007)	.006 (.007)	.014 (.008)	.000 (.007)	-.001 (.006)	-.002 (.008)	-.008 (.007)	-.014 * (.006)	-.022 ** (.008)
At-Birth Conditions									
Mother was <18 at birth	-.573 *** (.097)	-.528 *** (.091)	-.462 *** (.106)	-.222 * (.097)	-.167 (.090)	-.071 (.105)	-.121 (.096)	-.049 (.088)	.021 (.101)
Family income at birth (in \$1,000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.001 (.000)	-.000 (.000)	-.000 (.000)
Mother's education at birth	-.029 ** (.009)	-.025 * (.010)	-.045 (.033)	-.041 *** (.009)	-.040 *** (.010)	-.044 (.033)	-.059 *** (.009)	-.060 *** (.010)	-.066 * (.032)
Mother drank during pregnancy	.078 (.053)	.075 (.053)	.063 (.069)	.119 * (.052)	.100 (.052)	.057 (.069)	.116 * (.052)	.097 (.051)	.064 (.066)
Mother smoked during Pregnancy	.233 *** (.055)	.202 *** (.057)	.126 (.088)	.308 *** (.054)	.253 *** (.057)	.066 (.087)	.285 *** (.054)	.215 *** (.057)	.020 (.084)

(continued)

(table 2 continued)

Variable	Internalizing Problems			Externalizing Problems			Overall Behavior Problems		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Early Childhood Experience									
Cumulative duration of intact family	.011 (.011)	.013 (.011)	.022 (.014)	-.001 (.011)	-.001 (.011)	.003 (.014)	.003 (.011)	.001 (.010)	.003 (.013)
Cumulative duration of living in grandparent home	-.040 ** (.013)	-.049 *** (.013)	-.065 ** (.020)	-.022 (.013)	-.028 * (.013)	-.039 * (.020)	-.020 (.013)	-.025 (.013)	-.025 (.019)
Cumulative duration of Receiving AFDC	.008 (.011)	.014 (.012)	.016 (.020)	-.005 (.011)	-.003 (.012)	-.034 (.020)	-.004 (.011)	-.002 (.012)	-.026 (.019)
Cumulative duration of living in poverty	.027 * (.011)	.028 * (.012)	.046 * (.020)	.043 *** (.011)	.042 *** (.011)	.050 ** (.019)	.046 *** (.011)	.045 *** (.011)	.049 ** (.019)
Current Experience									
Intact family	-.013 (.055)	-.019 (.056)	-.009 (.077)	-.021 (.055)	-.029 (.055)	-.011 (.076)	-.028 (.055)	-.029 (.055)	.004 (.073)
Living in grandparent home	.030 (.112)	-.024 (.107)	-.144 (.127)	.138 (.111)	.051 (.105)	-.092 (.126)	.141 (.110)	.050 (.104)	-.062 (.122)
Receiving AFDC	.012 (.070)	.004 (.069)	.015 (.087)	.065 (.070)	.026 (.068)	-.071 (.086)	.066 (.070)	.012 (.067)	-.090 (.083)
Living in poverty	.074 (.057)	.077 (.056)	.092 (.070)	.123 * (.057)	.121 * (.055)	.092 (.069)	.128 * (.057)	.112 * (.054)	.057 (.067)
Duration of Current Experience									
Duration of living in Grandparent home	.005 (.030)	.025 (.028)	.058 (.033)	-.025 (.029)	-.008 (.028)	.016 (.033)	-.019 (.029)	.006 (.027)	.039 (.032)
Duration of receiving AFDC	.012 (.011)	.010 (.011)	-.003 (.014)	.008 (.011)	.009 (.011)	.004 (.014)	.008 (.011)	.012 (.011)	.012 (.013)
Duration of living in poverty	-.006 (.008)	-.006 (.009)	-.009 (.011)	-.022 ** (.008)	-.019 * (.008)	-.014 (.011)	-.022 ** (.008)	-.017 * (.008)	-.007 (.011)
Hausman Test (p-value)		.000			.000			.001	
R ²	.085	.083	.103	.096	.094	.070	.101	.099	.057

Source: National Longitudinal Survey of Youth, youths 1979-1994, children 1988-1994.

Note: Model estimates are based on a sample of 1,805 families with 4,351 children who had one observation. All models include the dummy variables indicating missing. Standard errors are in parentheses. We report R-squares overall for RE models and R-squares within for FE models.

* p<.05 ** p<.01 *** p<.001

Table 3. A Sibling Model of Child Behavior Problems: Child Experience of the Family Conditions and Parenting

Variable	Internalizing Problems			Externalizing Problems			Overall Behavior Problems		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Parenting									
Spanking	.121 *** (.011)	.114 *** (.011)	.096 *** (.014)	.175 *** (.011)	.168 *** (.011)	.149 *** (.014)	.164 *** (.011)	.154 *** (.011)	.134 *** (.014)
Cultural activities	-.044 (.023)	-.049 * (.023)	-.063 * (.029)	-.088 *** (.023)	-.089 *** (.023)	-.082 ** (.030)	-.073 ** (.023)	-.075 ** (.023)	-.071 * (.029)
Positive parenting	-.012 ** (.004)	-.009 * (.004)	-.005 (.005)	-.013 *** (.004)	-.011 ** (.004)	-.005 (.005)	-.013 *** (.004)	-.011 *** (.004)	-.005 (.005)
Father's time	-.033 * (.014)	-.029 * (.014)	-.005 (.018)	-.020 (.014)	-.026 (.014)	-.025 (.018)	-.026 (.014)	-.028 * (.014)	-.019 (.018)
Reading activities	-.038 * (.017)	-.033 * (.016)	-.012 (.020)	-.098 *** (.017)	-.089 *** (.016)	-.057 ** (.020)	-.084 *** (.017)	-.074 *** (.016)	-.041 * (.019)
Hausman Test (p-value)		.002			.000			.000	
R ²	.187	.185	.205	.173	.172	.129	.160	.158	.099

Source: National Longitudinal Survey of Youth, youths 1979-1994, children 1988-1994.

Note: Presented are fixed-effects model estimates based on a sample of 1,805 families with 4,351 children who had one observation. All models include child characteristics, at-birth conditions, childhood experience, and the dummy variables indicating missing values. Standard errors are in parentheses. We report R-squares overall for RE models and R-squares within for FE models..

* p<.05 ** p<.01 *** p<.001

Table 4. A Sibling Model of Child Behavior Problems with Lagged Parenting

Variable	Internalizing Problems			Externalizing Problems			Overall Behavior Problems		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Lagged Parenting									
Spanking	.093 *** (.014)	.079 *** (.014)	.048 ** (.017)	.135 *** (.014)	.124 *** (.014)	.098 *** (.017)	.128 *** (.014)	.113 *** (.013)	.084 *** (.017)
Cultural activities	-.016 (.030)	.001 (.030)	.036 (.038)	-.036 (.030)	-.017 (.030)	.041 (.039)	-.027 (.030)	-.004 (.029)	.046 (.038)
Positive parenting	-.014 ** (.005)	-.012 * (.005)	-.005 (.007)	-.013 ** (.005)	-.013 ** (.005)	-.006 (.007)	-.014 ** (.005)	-.013 ** (.005)	-.006 (.006)
Father's time	-.057 ** (.018)	-.055 ** (.017)	-.042 (.022)	-.023 (.017)	-.027 (.017)	-.028 (.023)	-.039 * (.018)	-.041 * (.017)	-.035 (.022)
Reading activities	-.033 (.022)	-.020 (.021)	-.006 (.026)	-.087 *** (.022)	-.068 ** (.021)	-.033 (.027)	-.074 ** (.022)	-.054 * (.021)	-.027 (.026)
Hausman Test (p-value)		.011			.004			.001	
R ²	.105	.103	.071	.151	.149	.101	.149	.146	.101

Source: National Longitudinal Survey of Youth, youths 1979-1994, children 1988-1994.

Note: Presented are estimates based on a sample of 1,326 families with 3,107 children who had two observations. All models include child characteristics, at-birth conditions, childhood experience, and the dummy variables indicating missing values. Standard errors are in parentheses. We report R-squares overall for RE models and R-squares within for FE models.

* p<.05 ** p<.01 *** p<.001

Table 5. A Sibling Model of Child Behavior Problems with Lagged Parenting and Lagged Dependent Variable

Variable	Internalizing Problems			Externalizing Problems			Overall Behavior Problems		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Lagged Parenting									
Spanking	.092 *** (.017)	.086 *** (.017)	.054 * (.024)	.107 *** (.016)	.104 *** (.016)	.066 ** (.024)	.104 *** (.016)	.099 *** (.016)	.064 ** (.023)
Cultural activities	-.011 (.029)	-.010 (.030)	-.013 (.046)	.005 (.028)	.007 (.028)	.036 (.045)	.003 (.028)	.005 (.028)	.017 (.045)
Positive parenting	.002 (.005)	.001 (.005)	.001 (.009)	-.004 (.005)	-.004 (.005)	-.006 (.009)	-.002 (.005)	-.002 (.005)	-.004 (.008)
Father's time	-.060 ** (.017)	-.057 ** (.018)	-.003 (.030)	-.030 (.017)	-.030 (.017)	-.006 (.029)	-.045 ** (.017)	-.044 ** (.017)	-.007 (.029)
Reading activities	-.045 (.025)	-.041 (.025)	-.025 (.035)	-.050 * (.024)	-.049 * (.024)	-.055 (.035)	-.049 * (.024)	-.047 * (.024)	-.048 (.034)
Lagged Predicted Dependent Variable	.808 *** (.044)	.748 *** (.045)	.239 *** (.065)	.834 *** (.037)	.823 *** (.037)	.532 *** (.055)	.807 *** (.035)	.786 *** (.036)	.406 *** (.053)
Hausman Test (p-value)		.000			.000			.001	
R ²	.246	.246	.059	.325	.325	.1610	.329	.329	.125

Source: National Longitudinal Survey of Youth, youths 1979-1994, children 1988-1994.

Note: Presented are fixed-effects model estimates based on a sample of 905 families with 2,051 children who had three observations. All models include child characteristics, at-birth conditions, childhood experience, and the dummy variables indicating missing values. Standard errors are in parentheses. We report R-squares overall for RE models and R-squares within for FE models.

* p<.05 ** p<.01 *** p<.001