



The Negative Impact of Economic Hardship on Adolescent Academic Engagement: An Examination Parental Investment and Family Stress Processes

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Abstract

Academic success is a strong predictor of adolescent adjustment and subsequent adult social, psychological, and economic well-being. Importantly, research has established a negative relationship between family economic hardship and children's educational outcomes. Despite being disproportionately represented among the most financially disadvantaged, African Americans remain an understudied group. The current study utilizes a longitudinal study design and prospective data from the Family and Community Health Study ($n = 422$, 52% girls, average age = 10.5 years at Wave 1), an African American sample, to investigate the impact of economic hardship on adolescent academic engagement by testing explanations offered by two commonly employed perspectives: the parental investment model and family stress model. While both models yielded significant results when tested separately, only the processes specified by the family stress model remained significant in a combined model, demonstrating that it is the superior explanation. By addressing many of the deficits of past research on the parental investment model and family stress model, the study was able to shed new light on the specific pathways by which economic disadvantage exerts an effect on youth outcomes. In doing so, the results question whether potentially middle-class, Eurocentric models (e.g., the parental investment model) are applicable when studying economically distressed African American youth.

Keywords Academic engagement · Adolescents · African Americans · Economic hardship · Parenting · Theory

Introduction

Economic hardship has negative consequences for a variety of youth outcomes including academic performance (Landers-Potts et al. 2015), internalizing problems (Conger et al. 2002), and conduct problems (Simons et al. 2016). Further, there is substantial evidence of racial disparity in the prevalence of economic hardship. For example, according to the National Kids Count data center (2019), the child poverty rate for African American children below age 18 (32%) was nearly twice the national average (18%) and is three times higher than the rate for White children (11%). While institutional racism and discrimination are

primary causes of poverty among racial and ethnic minority groups in the United States, there is still much to learn about the penalties of economic hardship for African Americans. Despite an increased focus in the past two decades (see Danziger and Lin 2009; Hardaway and McLoyd 2009; Quillian 2012), identification of the factors that account for the adverse consequences of economic hardship for African American families remains a salient research topic given the link between family economic hardship and poor child outcomes. Academic engagement is one such outcome of concern.

Lack of academic success is associated with negative consequences in the short term, including conduct problems (Hirschfield and Gasper 2011) and health risk behaviors (Crosnoe 2006), as well as in the long term including lower lifetime educational achievement (Diemer et al. 2019), greater unemployment (Caspi et al. 1998), and participation in adult criminal behavior (Henry et al. 2012). African Americans are significantly less likely than the general population to graduate from high school and those that do

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are less likely to attend college (U.S. Department of Education 2016), putting them at greater risk for such negative consequences. The need to understand how economic hardship leads to increased risk for such problems is highlighted by potentially high future costs associated with academic difficulties such as these. For example, declines in academic performance are common during adolescence, particularly among economically disadvantaged and minority youth, although parenting has been identified as a protective factor (Wang and Eccles 2012; Wang et al. 2014). The current study extends past research by using longitudinal data to investigate investigating two popular explanations for the link between family disadvantage and African American adolescents' academic engagement.

The Parental Investment Model and the Family Stress Model

The literature on economic disadvantage and youth outcomes has primarily focused on explanations offered by the parental investment model and the family stress model. These two frameworks are both based on social causation, the idea that financial problems lead to variations in social, psychological, and physical functioning. Each model specifies unique mechanisms that explain the link between economic hardship and youth outcomes. Although much of the support for these two models has been from White samples, the over-representation of African Americans among those experiencing economic hardship and lower academic achievement suggests that the models are applicable.

The parental investment model is based upon economic principles of investment. According to Schofield et al. (2011), the parental investment model asserts that families with greater economic resources are able to make greater investments in their children. While more disadvantaged families must invest in immediate material needs of the family, parents with greater resources are likely to invest their economic, educational, and occupational capital in ways that facilitate the well-being of their offspring from childhood into the adult years. These parental investments include the provision of an adequate standard of living, the presence of learning materials in the home, and behavioral investments in children by parents (Martin et al. 2010). Parents' behavioral investments may take many forms, including time spent with the child engaged in academics, communicating with the child's teachers, and even encouraging the child's participation in extracurricular activities.

The primary application of the parental investment model has been to academic outcomes. Results from Melby et al. (2008) showed that parental investment behaviors were associated with educational attainment in early

adulthood, but other studies employing this perspective have focused primarily on the cognitive development or school performance of children. For example, Linver et al. (2002) found that parental investment explained the relationship between income and cognitive development in children ages 3–5 years and Davis-Kean (2005) demonstrated that the effect of SES on academic achievement among youth ages 8–12 years was partially explained by parental investment.

While most research on the parental investment model has utilized samples of children, a few studies have focused on adolescents. These studies have highlighted the need to assess parental investment with developmentally and contextually appropriate measures. For instance, Wang and Sheikh-Khalil (2014) and Hill and Tyson (2009) have found that parents' approach to involvement evolves as adolescents age and as they enter middle school where more academic autonomy is expected of students. Specifically, parents engage in less school-based investment (e.g., attending parent-teacher conferences, volunteering at school) and more home-based investment (e.g., providing structure, monitoring homework) and academic socialization (e.g., communicating their expectations for the youth's educational performance, making plans for their academic future). Results of a meta-analysis indicate that parents' academic socialization is more predictive of adolescents' school engagement than either their home-based or school-based investment (Hill and Tyson 2009). Thus, while parental investment is related to academic success for adolescents, the strength of that association is based upon the extent to which parents adapt their approach in response to the developmental and contextual needs of youth.

A different explanation for why poverty is associated with youth development is offered by the family stress model, first proposed by Conger et al. (1992; 1994) and based upon the seminal work of Elder (1974). According to this perspective, the adverse impact of financial hardship on parents and children is a result of stress associated with having to manage inadequate financial resources. For parents, this results in a greater likelihood of psychological distress (i.e., depression), which, in turn, is associated with an increase in marital conflict as well as a decrease in the quality of parenting. Poor parenting increases risk for various adverse outcomes for offspring (Simons and Conger 2007; Simons et al. 2013). There has been widespread support for the family stress model across age ranges (Conger et al. 2002; Mistry et al. 2002), among a variety of ethnic groups (Conger et al. 1994; Landers-Potts et al. 2015; Nievar and Luster 2006) and cross-culturally (Emmen et al. 2013).

The family stress model has been applied to a broad range of child and adolescent outcomes. Conger et al. (1992; 1994) first utilized the family stress model to explain

the impact of family economic pressure on adolescents' positive adjustment (school performance, peer relations, self-confidence) and adjustment problems (conduct problems, depression, hostility). More recently, the model has demonstrated success in predicting various outcomes for children and adolescents. For example, Simons et al (2016) found that the mechanisms in the family stress model explained the impact of economic distress on adolescent delinquency, Hardaway and Cornelius (2014) demonstrated the efficacy of the model in linking financial hardship to youth substance use, and White et al (2012) used the model in a study of adolescent psychological problems.

While early research on the family stress model focused primarily on youths' developmental outcomes more broadly, a few studies have more closely examined academic and school-related outcomes. Landers-Potts et al. (2015) showed that the family stress model predicted academic success among African American early adolescents while Benner and Kim (2010) found support for the model in explaining the link between financial instability and adolescents' grade point average among a sample of Chinese American families. Likewise, findings from Mistry et al. (2002) demonstrated support for the family stress model in linking parents' perceived economic pressure to teachers' reports of externalizing problems, hyperactivity, and frequency of disciplinary action for children ages 5–12 years. These studies have emphasized the need to test the applicability of the family stress model using a more comprehensive measure of adolescents' academic effort and accounting for competing theoretical frameworks such as the parental investment model. Indeed, studies have shown adolescents' academic engagement is linked with achievement-related outcomes (e.g., standardized tests and grades) and likelihood of school drop-out (Fredricks et al. 2004).

It is likely that the concepts in the parental investment model and the family stress model are correlated with each other. For example, parents who engage in warm, nurturing parenting practices are also likely to be involved in the child's school and extracurricular activities. Thus, it may be that these two models are complementary, not opposing, explanations for the negative effect of economic disadvantage on youth development. The few studies that have simultaneously examined the predictions of both models on academic success suffer from limitations such as a cross-sectional study design or missing components of one or both of the models and most have focused on the cognitive development of young children. For example, one study (Davis-Kean 2005) examined the impact of parenting behaviors and investment on the academic competence of 8- to 12-year-olds, but the model failed to include a key component of the family stress model, caregiver conflict. Further, it employed a combined measure of parental

warmth and investment, thus muddling the distinctive components of parenting from the parental investment model and the family stress model. Linver et al. (2002) and Iruka et al. (2012) found that both parenting practices and parental investment were associated with cognitive abilities in children between ages 3 and 5 years in five ethnic groups, but these studies did not include assessments of caregiver conflict. In a cross-sectional study, Yeung et al. (2002) examined a broader set of propositions from the parental investment model and family stress model and found that the latter better explained behavioral problems among 3- to 5-year-olds. Another study found support for both the parental investment model and family stress model using a large, nationally representative sample of adolescents in an examination of educational aspirations (Wickrama and Noh 2010). This study, however, did not include assessments of caregiver conflict, caregiver psychological distress, or parental investment. No studies of adolescent academic outcomes, however, have used longitudinal study design to assess all aspects of both the parental investment model and family stress model while controlling for the effects of the other.

The Importance of Neighborhood Context

Disadvantaged neighborhoods are characterized by high density, crime, and little opportunity for academic socialization (Engle and Black 2008) and children residing in resource-poor neighborhoods experience a number of negative consequences. For instance, Kohen and colleagues (2008) found that neighborhood disadvantage was negatively associated with children's verbal abilities. Further, youth who live in areas of concentrated disadvantage have little social capital, poor physical and mental health, high rates of substance use (Mennis and Mason 2012) and delinquency (Simons et al. 2005), as well as lower educational attainment (Wickrama and Noh 2010). This may be due, in part, to the ways in which neighborhood disadvantage negatively impacts parenting.

Despite the centrality of neighborhood disadvantage to the parental investment model, only a few studies testing this perspective have included an assessment of neighborhood disadvantage. Wadsworth and Ahlqvist (2015) argue that neighborhoods characterized by concentrated disadvantage and high levels of crime and violence limit parents' time and ability to engage in parental investment even when they are motivated to so. They contend that effective parenting in such neighborhoods is more likely to require strict discipline and intensive monitoring, thereby reducing the opportunity for parental investment. Facing the persistent strain of residing in a neighborhood with scarce economic resources and high rates of crime and violence, parents may be less able to find the time and energy needed

to engage in parental investments such as helping children with school work, becoming more involved in children's schools or helping children to be a part of extracurricular activities (Pinderhughes et al. 2001).

On the other hand, wealthier parents are more likely to be able to reside in areas that promote a child's association with conventional friends, provide access to good schools as well as involvement in a neighborhood or community environment that provides resources for the developing child such as parks, child-related activities, and successful role models. Findings from Dearing et al. (2009) demonstrated that high family income predicted living in neighborhoods that were affluent, safe, and orderly. In turn, these neighborhood conditions predicted youth participation in various community activities, in some cases directly and in other cases indirectly through parental investment. Neighborhood affluence significantly predicted child participation in afterschool programs, lessons, church activities, and summer camp. Children living in more affluent neighborhoods were, in general, more likely to participate in activities than were children in less affluent neighborhoods. Thus, according to the parental investment model, economic well-being will be positively related to residential neighborhood advantage, which, in turn, influences parental behavioral investments and child-rearing activities expected to foster the academic and social success of a child. Importantly, the parental investment model does not assert that all parental investments are based upon conscious decisions on the part of parents to invest or not invest in the well-being and future of their offspring. Instead, investments, including the neighborhood in which one resides, are primarily driven by available economic resources. Thus, a complete test of the parental investment model would include an assessment of neighborhood disadvantage.

To a lesser extent there is evidence for the salience of neighborhood context with regard to the family stress model. Martin et al. (2010), included an assessment of neighborhood dilapidation, while Wickrama and Noh (2010) assessed crime rates and collective efficacy. Further, White et al. (2012) used American Community Survey data to assess the impact of neighborhood disadvantage on the psychological well-being for Mexican-American youth while Gutman et al. (2005) found that that perceived neighborhood disadvantage was associated with lower academic achievement for adolescents. A broader assessment of neighborhood characteristics was included in an examination of youth conduct problems (Simons et al. 2016). Each of these studies found support for the contention that neighborhood characteristics were related to youth outcomes through the mechanisms proposed by the family stress model. While not part of the original model, this is a potentially promising extension deserving of attention.

Because the consequences of economic disadvantage on family processes, particularly parenting, and child outcomes are largely based on the sociocultural contexts in which families rear their children, additional research that uses this expanded approach is needed. Although financial disadvantage is highly correlated with one's residential location, a complete test of the family stress model could benefit from an assessment of neighborhood quality. Indeed, Conger et al. (2010) highlighted the contributions of the research that expanded upon the original family stress model in this way.

Current Study

This study endeavored to address several of the shortcomings of previous research. First, in assessing economic hardship, rather than focusing solely on income, a comprehensive measure that includes negative financial events and economic pressure was used. Second, the study utilized a sample of African American adolescents given that this group is disproportionately represented among the economically disadvantaged and those with lower academic achievement. Third, the study attempted to assess the relative predictive power of the parental investment model and family stress model. To do this, first, each model was examined separately in order to establish that, independently, they explain the link between economic hardship and youth academic engagement. Next, the extent to which the models are complementary was examined by testing a combined model containing all constructs from the parental investment model and the family stress model. Finally, given the importance of neighborhood disadvantage the parental investment model and, to a lesser extent, the family stress model, an assessment of neighborhood disadvantage was included in the analysis. It is important to note that the causal flow of the variables in each model was based upon the models as they have been established and widely employed in numerous previous studies.

Additionally, this study addressed shortcomings of past research on minority youth noted by Garcia-Coll et al. (1996) that continue to persist: (1) the dearth of longitudinal investigations on the normative development of minority children; (2) an emphasis on outcomes rather than on process in the research on children of color; (3) focus on risk and pathology instead of resilience and positive youth outcomes among minorities; (4) an emphasis on between-group comparisons instead of attention to intragroup variability; (5) a failure to address the diversity inherent in some minority groups. In response to those criticisms of past research, the current study uses longitudinal data to test two popular process models as explanations for variation in academic engagement among an all-African American

sample of adolescents from a variety of community and family contexts.

There are three research questions addressed. First, processes suggested by the parental investment model, which focuses on the extent to which the effect of economic hardship and neighborhood disadvantage on academic engagement is mediated by the extent of parental involvement in their adolescent's academic and extracurricular activities, were examined. Second, mechanisms proposed by the family stress model were examined. This model asserts that the effect of economic hardship on adolescent academic engagement will be explained through its impact on the psychological distress of caregivers, conflict between caregivers, and parenting behaviors. Third, a model that combines the variables from the parental investment model and family stress model was tested with the goal of revealing any complementary processes. It is expected that the variance in academic engagement explained by the combined model will be greater than that explained by either of the models on their own.

Method

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Sample

The Family and Community Health Study (FACHS), a multisite investigation of neighborhood and family effects on the health and development of African Americans, includes families from a wide range of community contexts. The FACHS focuses on a nonprobability sample that consists of 889 African American children (54% girls) and their primary caregivers who were recruited in 1997 from communities in Iowa and Georgia. If a co-caregiver was living in the home at the time of recruitment, he or she was also invited to participate.

Using 1990 U.S. census data, 259 block group areas—115 in Georgia and 144 in Iowa—were identified in neighborhoods in which African American families made up 10% or more of the population and in which 20–100% of children lived in poverty. Participants were recruited by obtaining a roster of all fifth graders from schools zoned for the identified neighborhoods. Families were contacted by phone, and 84% of the families contacted agreed to participate in the study. At W1, the sample comprised 13.4% of families who lived in rural areas and small towns and 86.6% who lived in urban areas, one quarter of whom resided in major metropolitan cities. See Simons et al. (2002) for additional information on sampling procedures.

Mothers made up the majority (83.5%) of primary caregivers at W1; 5.5% were the child's father; 5.6% were the child's grandmother; stepparents, other relatives, or foster or adoptive parents comprised less than 5%. Over 90% of the primary caregivers were female, and their ages ranged from 23 to 80 years, with a mean age of 37.1 years. The modal level of education for primary caregivers was high school completion (42%) and ranged from less than high school (18%) to advanced graduate degrees (3%). Co-caregivers were the adolescents' father (35.1%), stepfather (17.1%), grandmother (10.9%), aunt (6.9%), mother (6.2%), another relative (20.2%) or primary caregiver's cohabiting romantic partner (3.7%). Household incomes ranged from <\$10,000 (16%) to >\$100,000 (1.4%). The average per capita income for the families in the Georgia sample was \$8242 (SD = \$6990), and in the Iowa sample, it was \$9536 (SD = \$6437). The Georgia and Iowa samples did not differ significantly with regard to these demographic characteristics.

Data came from W1, W2, and W3 when the target children were, on average, 10.5, 12.5, and 15.5 years of age, respectively. The participation rate at W2 was 88% ($N = 779$) of the original sample, and at W3, it was 86% ($N = 767$). Families retained in the study at W3 did not differ from nonparticipants at W1 with regard to primary caregiver education, marital status, family income, or type of residential community. Because a central component of the family stress model is partner conflict, this study focused only on the 422 families with two caregivers living in the home with the target child (221 girls and 201 boys).

Procedure

Based upon participant preference, interviews were conducted in their homes or in a convenient location near their home (e.g., library, school, church). Compensation was based on the length of interview for each participant. Primary caregivers received \$100, co-caregivers received \$50, and target children received \$70. Each family member completed a self-report questionnaire including questions on topics such as family dynamics, neighborhood characteristics, and financial hardship at the first visit. The interviewer read each question aloud, and responses were entered on a keypad viewed and operated solely by the respondent. On the second visit, which occurred within two weeks of the first, family members completed two 20-minute videotaped interaction tasks. The interviewers provided instructions, set up the video equipment, gave participants a set of discussion questions, and then left the room so that they could not hear conversation between family members. The questions asked the primary caregiver and child to discuss a range of issues in their daily lives, from activities they do together to how they handle conflicts and disagreements. Next, the two

caregivers completed a second set of questions using the same format.

Videotaped data were coded using the Iowa Family Interaction Rating Scales (Melby and Conger 2001). Behaviors were rated by African American observers who had successfully completed 240 hours of training. A second observer subsequently rated 25% of all tapes, selected at random, in order to evaluate inter-observer reliability. The two observer ratings were then compared to calculate an intraclass correlation coefficient. Observers' reports were included in the assessments of caregiver conflict and parent-child interaction, described below.

Measures

Economic hardship

This variable was assessed with three indicators at W1 using primary caregiver and co-caregiver reports of experiences over the preceding year: income, negative financial events, and economic pressure. First, *per capita income* was calculated including all sources of income in the past year (e.g., hourly wages, salary, government assistance, child support, alimony, unemployment, disability, pensions, social security). Total household income was then divided by the number of individuals in the household and multiplied by -1 and standardized so that higher scores indicate lower per capita income. Next, *negative financial events* were calculated based on the occurrence (1 = *yes*, 0 = *no*) of 16 undesirable financial events in the past year, such as taking a cut in wages/salary, loss of a job, eviction, and other employment or financial problems. Items were summed to form an index of adverse financial events. This index has demonstrated significant predictive validity in earlier studies (see Conger et al. 1994, 2002). Third, *economic pressure* was comprised of unmet material needs, the inability to make ends meet, and financial cutbacks. Caregivers reported their ability to afford adequate housing, food, clothing, and medical care on a scale of 1 = *strongly agree* to 4 = *strongly disagree*. Items were standardized and summed to form an index of unmet material needs ($\alpha = 0.83$). Both caregivers then reported on the level of difficulty they had paying their bills during the past 12 months. Responses ranged from 1 = *no difficulty at all* to 2 = *a great deal of difficulty*. Primary caregivers and co-caregivers also indicated how much money they had leftover at the end of each month on a scale of 1 = *more than enough money left over* to 5 = *not enough to make ends meet*. These two items were standardized and summed to signify an inability to make ends meet ($\alpha = 0.73$). Lastly, financial cutbacks included 12 items indicative of adjustments to financial difficulties faced in the previous year such as having to delay medical care, reduce or eliminate

home or auto insurance, and having to use credit cards to pay for bills or other expenses. Caregivers indicated whether cutbacks were made using a dichotomous scale (1 = *yes*, 0 = *no*). Items were standardized and summed to form an index of financial cutbacks for each of the included indices so that higher scores indicate greater economic pressure. Predictive validity for this measure has been established in earlier studies (Conger et al. 1994, 2002).

Neighborhood disadvantage

This construct was measured at W1 using three indicators: (1) neighborhood dilapidation, (2) neighborhood crime, and (3) concentrated disadvantage. Neighborhood dilapidation was assessed with a three-item scale (Sampson et al. 1997). Primary caregivers were asked to indicate how much of a problem issues such as litter, graffiti, and vacant housing were in their neighborhood ($\alpha = 0.75$). Neighborhood crime was assessed with a four-item scale (Sampson et al. 1997). Primary caregivers were asked to what extent drinking in public, selling and using drugs, groups of teens or adults hanging around and causing trouble, and gang activity were a problem in their neighborhood ($\alpha = 0.89$). Responses for the items measuring dilapidation and neighborhood crime ranged from 1 = *not at all* to 3 = *a big problem*. Concentrated disadvantage was measured using 1990 census data and comprised four items that indicated the proportion of the households in the block group area that were unemployed, below the poverty level, on public assistance, and headed by single mothers ($\alpha = 0.90$). The concentrated disadvantage measure was formed by standardizing and summing the scores on these four items.

Caregiver psychological distress

At W1, caregiver psychological distress was measured using two self-report scales from the Mini Mood and Anxiety Symptom Questionnaire (Clark and Watson 1995). The first scale included eight questions reflecting anhedonia, or the absence of pleasure, such as how often caregivers felt withdrawn from people, felt like nothing was enjoyable, or had a lot to look forward to (reverse coded). Items were summed to form measures of primary caregiver anhedonia and co-caregiver anhedonia ($\alpha = 0.80$ for primary caregivers, $\alpha = 0.80$ for co-caregivers). The second scale was composed of five items reflecting general distress and depressed mood. Primary caregivers and co-caregivers indicated how much they had felt depressed, discouraged, hopeless, like a failure, or worthless in the past week using a scale from 1 = *not at all* to 3 = *extremely*. Responses again ranged from 1 = *not at all* to 3 = *extremely*. Items were summed to form indicators of primary caregiver depressed mood and co-caregiver depressed mood ($\alpha = 0.81$ for

primary caregivers, $\alpha = 0.82$ for co-caregivers). These scales have adequate reliability and convergent and discriminant validity (Clark and Watson 1995).

Caregiver conflict

This construct was measured at W1. Two scales were used to evaluate the quality of the relationship between caregivers: (1) observer ratings and (2) participant reports of relationship warmth and hostility. These scales have exhibited high predictive validity in prior studies (Conger et al. 1994, 2002). Primary caregivers described the behavior of the co-caregiver over the past year and vice versa. Warmth was assessed through a seven-item scale, indicating how often the other caregiver engaged in behaviors such as affection, humor, and acted supportively. Hostility was determined by four items that specified how often the other caregiver engaged in behaviors such as shout/yell, insult, or criticism. Responses ranged from 1 = *always* to 4 = *never*. Items were coded such that higher scores indicated lower warmth and higher hostility. Alphas for these measures ranged from 0.72 to 0.90.

Second, trained observers rated each caregiver's interactions toward the other on behaviors such as warmth, listener responsiveness, hostility, escalation of hostility, and verbal attack. A rating scale of 1 = *no evidence of this behavior* to 9 = *high level of behavior displayed* was used and reverse coded to generate a measure of low warmth and high hostility. Interrater reliability was over 0.7 on all assessments, and internal reliability for the observer's reports ranged from 0.85 to 0.91. Lastly, scores for caregiver and observer reports were standardized and summed to form measures of low warmth ($\alpha = 0.88$) and high hostility ($\alpha = 0.85$).

Nurturant-involved parenting

This construct was assessed at W2. Measurement of caregiver parenting focused on the preceding 12 months and was derived from three sources: (1) trained observers, (2) caregivers, and (3) target children. The observer and both family member reports of parenting have been shown to have validity in previous studies (Conger et al. 2002; Conger and Elder 1994).

Observers assessed primary caregivers on the extent to which they used hostility, verbal attacks, and coerciveness in interactions with the target child on a rating scale of 1 = *no evidence of these characteristics* to 9 = *high levels of these characteristics*. Interobserver reliability for the summed scale was 0.70. Observers additionally rated primary caregiver nurturance using three 9-point scales of caregiver positive communication, warmth, and listener responsiveness. The interobserver reliability for the summed scale was

0.73. Target children also reported on parental hostility by indicating how often their primary caregiver had engaged in seven hostile behaviors in the past year, such as getting angry, threatening, or criticizing them, on a scale of 1 = *always* to 4 = *never*. Target children additionally indicated how often their primary caregiver practiced warmth and support on the same 1 to 4 scale using nine indicators of support such as letting the target know that they care about them, acting supportive, or being affectionate ($\alpha = 0.85$). The observer and target items were standardized and summed to form two composite measures of primary caregiver hostility ($\alpha = 0.79$) and warmth ($\alpha = 0.78$). The scale was coded so that low hostility and high warmth were consistent with greater nurturance.

Observers additionally assessed primary caregivers' child management skills on a number of dimensions, including monitoring, consistent discipline, use of inductive reasoning, interrogation, positive reinforcement, and harsh discipline, using a rating scale of 1 = *no evidence of these characteristics* to 9 = *high levels of these characteristics*. Interobserver reliability for the summed scale was 0.70. Target children and primary caregivers also rated primary caregivers' management skills using 22 items that assessed monitoring, consistent discipline, communication, inductive reasoning, and positive reinforcement using a scale ranging from 1 = *never* to 4 = *always*. Observer, target, and primary caregiver rating of child management skills were standardized and summed to form the child management construct ($\alpha = 0.72$). The scale was coded so that high child management was consistent with nurturant-involved parenting.

Parental investment

This construct was assessed at W2 with 13 items that asked the extent to which primary caregivers engaged in success socialization (e.g., talked to the child about the importance of doing their school work, encouraged participation in extracurricular athletics, academic clubs, or performing arts at school or in the community, aided them in attending lessons outside of school to improve particular skills, tried to serve as a role model, encouraged them to spend time with successful adults). This scale was developed for the Family and Community Health Study. Responses ranged from 1 = *never* to 4 = *every day*. Items were summed and coded so that a high score indicated a high level of parental investment ($\alpha = 0.72$).

Academic engagement

This construct was measured at W1 and W3 with seven items. Using a scale of 1 = *strongly agree* to 4 = *strongly disagree* adolescents reported on their agreement with statements such as "you try hard at school," "grades are

very important to you,” “your teachers think you are good student,” and “even when there are other interesting things to do, you keep up with your schoolwork.” Items were coded so that a high score indicated greater academic engagement, standardized, and summed ($\alpha = 0.80$).

Analytic Strategy

Three waves of data were used to examine the family processes over time (e.g., the persistent influence of economic hardship at W1 on parenting at W2 leading to youth academic engagement at W3). Academic engagement was controlled at W1 in order to examine the change in academic engagement between W1 and W3. In order to rule out the possibility that either or both the parental investment model and family stress model might do a better job predicting academic engagement for girls vs. boys, adolescent gender was controlled.

All analyses were performed with Structural Equation Modeling (SEM) using Mplus Version 8.1 (Muthén and Muthén 2017). SEM allows for the creation of unobserved latent constructs using measured variables as multiple indicators. The use of multiple indicators enables correction for attenuation in structural regression coefficients due to measurement error, thereby yielding more accurate estimates of path coefficients. Multisite samples were used to examine the models, but they were not independently

selected. To correct for clustering bias, a complex sampling design model available in the Mplus 8.1 statistical software (TYPE = COMPLEX function; Muthén and Muthén 2010) was employed. This model allowed for the estimation of actual standard errors for clustered data in complex mediation or moderation models (MacKinnon et al. 2007).

Because all longitudinal studies include some missing data, maximum likelihood parameter estimates with standard errors that are robust to non-normality and non-independence of observations were used. The maximum likelihood estimates provide more consistent, less biased estimates than ad hoc procedures for dealing with missing data such as listwise deletion, pairwise deletion, or imputation of means (Allison 2003; Muthén and Muthén 2010).

Results

Descriptive statistics for all study variables are presented in Table 1. Also included are factor loadings for the indicators of each latent construct. All factor loadings are statistically significant ($p < 0.05$) and of satisfactory magnitude.

Table 2 shows bivariate correlations among all the study variables. In support of the parental investment model, financial need, neighborhood crime, and neighborhood dilapidation were negatively associated with parental investment which was positively correlated with academic

Table 1 Descriptive statistics and factor loadings

Variables	<i>n</i>	<i>M</i>	SD	Loadings	Latent construct
Low income (W1)	311	0.00	1.00	–	
Negative financial events (W1)	370	0.00	1.64	–	
Ends meet (W1)	370	0.00	1.65	0.73	Economic hardship (W1)
Financial Need (W1)	370	0.00	1.67	0.60	
Cutbacks (W1)	370	0.00	1.62	0.67	
Concentrated disadvantage (W1)	422	–0.20	0.92	0.31	Neighborhood disadvantage (W1)
Neighborhood crime (W1)	418	5.74	2.46	0.88	
Neighborhood dilapidation (W1)	421	4.11	1.51	0.85	
PC depressed mood (W1)	422	6.32	1.66	0.77	PC psychological distress (W1)
PC anhedonia (W1)	422	12.78	3.13	0.60	
CO depressed mood (W1)	418	6.15	1.73	0.81	CO psychological distress (W1)
CO anhedonia (W1)	418	12.19	3.19	0.68	
PC-CO low warmth (W1)	421	0.00	2.53	0.60	Caregiver relationship conflict (W1)
PC-CO high hostility (W1)	421	0.00	2.53	0.60	
Nurturance (W2)	371	0.00	2.34	0.60	Nurturant-involved parenting (W2)
Child management (W2)	373	0.00	6.30	0.79	
Parental investment (W2)	370	0.00	0.48	–	
Academic engagement (W1)	415	0.00	0.67	–	
Academic engagement (W3)	359	0.00	0.69	–	
Valid <i>n</i>	422				

All factor loadings are statistically significant at $p < 0.05$

PC primary caregiver, CO co-caregiver, W1 wave 1, W2 wave 2, W3 wave 3

Table 2 Bivariate correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 Low income	–																		
2 Negative financial events	0.36**	–																	
3 Ends meet	0.46**	0.56**	–																
4 Financial Need	0.42**	0.44**	0.59*	–															
5 Cutbacks	0.27**	0.58**	0.48**	0.41**	–														
6 Concentrated disadvantage	0.31**	0.13**	0.14**	0.23*	0.12*	–													
7 Neighborhood crime	0.34**	0.26**	0.25**	0.29**	0.15**	0.26**	–												
8 Neighborhood dilapidation	0.30**	0.14**	0.23**	0.27*	0.12**	0.27**	0.75**	–											
9 PC depressed mood	0.21**	0.28**	0.32**	0.24**	0.16**	0.04	0.17**	0.19**	–										
10 PC anhedonia	0.07	0.13**	0.21**	0.17*	0.11*	–0.04	0.03	0.05	0.46**	–									
11 CO depressed mood	0.17**	0.32**	0.33**	0.27**	0.29**	0.06	0.16**	0.08	0.13**	0.07	–								
12 CO anhedonia	0.16**	0.30**	0.24**	0.20**	0.24**	0.06	0.11*	0.08	0.15**	0.12*	0.56**	–							
13 PC-CO low warmth	0.11	0.05	0.23**	0.21**	0.08	0.01	0.16**	0.10*	0.10*	0.16**	0.22**	0.25**	–						
14 PC-CO high hostility	0.08	0.19**	0.12*	0.12*	0.12*	0.02	0.09	0.05	0.15**	0.20**	0.21**	0.18**	0.34**	–					
15 Nurture	–0.07	–0.08	–0.08	–0.10	–0.10	0.06	–0.04	–0.02	0.01	–0.10*	–0.10	–0.10	–0.15**	–0.13*	–				
16 Child management	–0.06	–0.10*	–0.19**	–0.18**	–0.07	0.01	–0.16**	–0.13*	–0.09	–0.14**	–0.17**	–0.06	–0.23**	–0.21**	0.29**	–			
17 Parental investment	–0.07	–0.05	–0.10	–0.19**	–0.06	–0.07	–0.13*	–0.14**	0.05	–0.14**	0.00	–0.05	–0.14**	–0.11*	0.18**	0.20**	–		
18 Academic engagement (W1)	–0.07	–0.13**	–0.13**	–0.17**	–0.09	0.00	–0.10*	–0.09	–0.05	–0.06	0.04	0.01	–0.05	–0.08	0.23**	0.13*	0.23**	–	
19 Academic engagement (W3)	0.09	–0.05	–0.05	–0.05	–0.02	–0.02	0.02	–0.01	0.00	–0.06	–0.03	0.02	–0.08	–0.08	0.20**	0.19**	0.18**	0.26**	–

N = 422

PC primary caregiver, CO co-caregiver, W1 wave 1, W2 wave 2, W3 wave 3

* $p < 0.05$, ** $p < 0.01$

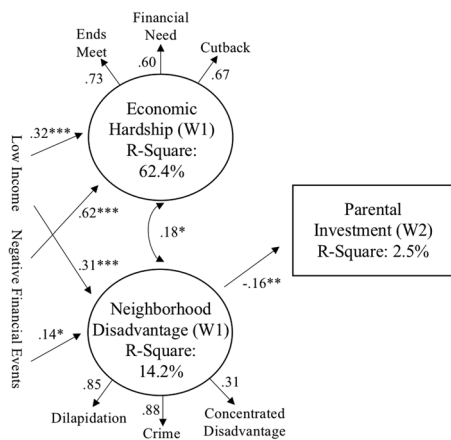


Fig. 1 Parental Investment Model. $N = 422$. The values presented are standardized parameter estimates. Target gender included as a control. *PC* primary caregiver, *CO* co-caregiver, *W1* wave 1, *W2* wave 2, *W3* wave 3. $\chi^2_{(49)} = 139.29; p < 0.01$; CFI = 0.92; TLI = 0.90; RMSEA = 0.06. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

engagement. In accordance with the family stress model, measures of economic hardship were positively related to caregiver psychological distress. Caregiver psychological distress was positively associated with caregiver conflict, and caregiver conflict was negatively associated with parental nurturance and child management. Both indicators of nurturant-involved parenting were positively correlated with academic engagement.

Turning to the results of the SEM, the parental investment model and family stress model were first run separately using fully recursive models controlling for academic engagement at wave 1, target sex, and primary caregivers’ educational attainment. Nonsignificant paths were then deleted one by one. Analyses were initially run separately for boys and girls, but no significant gender differences in the structural coefficients were detected. The absence of significant interactions by gender does not, however, preclude the possibility of cofounds due to some of the study constructs being correlated with gender. Therefore, gender continued to be included as a control and a path from gender to all other variables in the model was allowed. There were no gender differences, with the exception of boys being less likely to exhibit academic engagement than girls ($W3: \beta = -0.21, p < 0.001$; $W1: \beta = -0.15, p < 0.01$). Next, the possibility was explored that the highest level of education completed by the primary caregiver may be influential for adolescent academic engagement. Results indicated target children’s academic engagement was not influenced by primary caregiver’s educational attainment.

The results of the reduced parental investment model appear in Fig. 1 using standardized coefficients. The various fit indices suggested that the proposed model provided an adequate fit to the data ($\chi^2_{(49)} = 139.29; p < 0.01$; CFI = 0.92; TLI = 0.90; RMSEA = 0.06). As hypothesized, low

income and negative financial events significantly predicted economic hardship ($\beta = 0.32, p < 0.001$, and $\beta = 0.62, p < 0.001$, respectively) and neighborhood disadvantage ($\beta = 0.31, p < 0.001$, and $\beta = 0.14, p < 0.05$, respectively). In turn, neighborhood disadvantage negatively impacted parental investment ($\beta = -0.16, p < 0.01$). Ultimately, parental investment increased adolescent academic engagement at $W3 (\beta = 0.13, p < 0.05)$ after controlling for the impact of academic engagement at $W1 (\beta = 0.19, p < 0.001)$. Overall, the parental investment model explained 10.7% of the variance in adolescent academic engagement.

Indirect effects were tested using 95% confidence intervals (CIs) generated with bias-corrected bootstrapping (iterations = 1000). Results using standardized coefficients presented in Table 3 indicate evidence for mediation from left to right constructs in the model. The indirect effect from low income to academic engagement via neighborhood disadvantage and parental investment was significant (indirect effect = -0.006 , 95% CI [$-0.017, -0.002$]). The indirect effect from negative financial events to academic engagement via neighborhood disadvantage and parental investment was also significant (indirect effect = -0.003 , 95% CI [$-0.012, -0.001$]).

Next, the family stress model was run using fully recursive paths controlling for academic engagement at wave 1 and target sex. Nonsignificant paths were then deleted one by one. The results of the reduced family stress model appear in Fig. 2 using standardized coefficients. The various fit indices suggested that the proposed model provided a satisfactory fit to the data ($\chi^2_{(97)} = 176.94; p < 0.01$; CFI = 0.93; TLI = 0.92; RMSEA = 0.04). Net of the included controls, family economic hardship was positively related to both primary caregiver and co-caregiver psychological distress ($\beta = 0.44, p < 0.001$, and $\beta = 0.50, p < 0.001$, respectively), both of which in turn increased caregiver relationship conflict ($\beta = 0.26, p < 0.01$, and $\beta = 0.42, p < 0.001$, respectively). Caregiver conflict reduced levels of nurturant-involved parenting at $W2 (\beta = -0.55, p < 0.001)$. Lastly, nurturant-involved parenting significantly increased adolescent academic engagement ($\beta = 0.25, p < 0.001$). The family stress model accounted for 14.8% of the variance in adolescent academic engagement.

Indirect effects for the reduced family stress model were tested using 95% CIs generated with bias-corrected bootstrapping (iterations = 1000). Results using standardized coefficients presented in Table 3 indicate evidence for mediation from left to right constructs in the model. The indirect effect from low income to academic engagement via economic hardship, primary caregiver psychological distress, caregiver conflict, and parenting was significant (indirect effect = -0.005 , 95% CI [$-0.014, -0.001$]). Similarly, the indirect effect from low income to academic engagement via economic hardship, co-caregiver psychological distress,

Table 3 Results of indirect tests for the hypothesized models

Causal path	β	95% CI
Parental Investment Model Only		
Low income → neighborhood disadvantage → parental investment → academic engagement	−0.006*	(−0.017, −0.002)
Negative financial events → neighborhood disadvantage → parental investment → academic engagement	−0.003*	(−0.012, −0.001)
Family Stress Model Only		
Low income → economic hardship → PC psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.005*	(−0.014, −0.001)
Low income → economic hardship → CO psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.009*	(−0.019, −0.004)
Negative financial events → economic hardship → PC psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.010*	(−0.028, −0.003)
Negative financial events → economic hardship → CO psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.018*	(−0.038, −0.007)
Combined model		
Low income → economic hardship → PC psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.005*	(−0.014, −0.001)
Low income → economic hardship → CO psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.010*	(−0.020, −0.004)
Negative financial events → economic hardship → PC psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.010*	(−0.027, −0.002)
Negative financial events → economic hardship → CO psychological distress → caregiver conflict → nurturant-involved parenting → academic engagement	−0.020*	(−0.038, −0.010)

Values represent standardized coefficients

PC primary caregiver, CO co-caregiver

* $p < 0.05$

caregiver conflict, and parenting was significant (indirect effect = −0.009, 95% CI [−0.019, −0.004]). Further, both paths from negative financial events to academic engagement via economic hardship, primary/co-caregiver psychological distress, caregiver conflict, and parenting were significant (path through primary caregiver psychological distress indirect effect = −0.010, 95% CI [−0.028, −0.003]; path through co-caregiver psychological distress indirect effect = −0.018, 95% CI [−0.038, −0.007]).

Finally, we ran a model that combined the variables from the parental investment model and the family stress model, controlling for academic engagement at W1. This model included all possible pathways between variables to explore the idea that the family stress model and parental investment model may be complementary rather than competing explanations. As expected, parental investment was positively correlated with nurturant-involved parenting ($\beta = 0.31$, $p < 0.001$). Caregiver conflict at W1, in addition reducing nurturant-involved parenting ($\beta = -0.56$, $p < 0.001$), also negatively impacted levels of parental investment ($\beta = -0.15$, $p < 0.05$). We then ran a reduced model that deleted nonsignificant paths. The results of the reduced model are displayed in Fig. 3 using standardized coefficients. The various fit indices suggested that the proposed model provided a good fit to the data ($\chi^2_{(158)} = 294.48$; $p < 0.01$; CFI = 0.92; TLI = 0.91; RMSEA = 0.04).

The pattern of coefficients provided strong support for the family stress model. As predicted by the family stress model, net of neighborhood disadvantage and parental investment, family economic pressure continued to impact the psychological distress of primary caregivers and co-caregivers ($\beta = 0.45$, $p < 0.001$, and $\beta = 0.51$, $p < 0.001$, respectively). Both primary caregivers' and co-caregivers' psychological distress also continued to influence caregiver conflict ($\beta = 0.25$, $p < 0.01$, and $\beta = 0.41$, $p < 0.001$, respectively), which, in turn, decreased nurturant-involved parenting ($\beta = -0.56$, $p < 0.001$). The impact of nurturant-involved parenting in increasing adolescent's academic engagement at W3 also remained unaffected with the inclusion of the parental investment model ($\beta = 0.28$, $p < 0.001$). Shifting to the parental investment model, the relationship between neighborhood disadvantage and parental investment continued to be significant ($\beta = -0.12$, $p < 0.05$). However, the relationship between parental investment and adolescent academic engagement was reduced to nonsignificance, indicating no support for the parental investment model once the family stress model was controlled for. The combined model accounted for 15.9% of the variance in adolescent academic engagement.

Indirect effects for the combined model were tested using 95% CIs generated with bias-corrected bootstrapping (iterations = 1000). Results using standardized coefficients

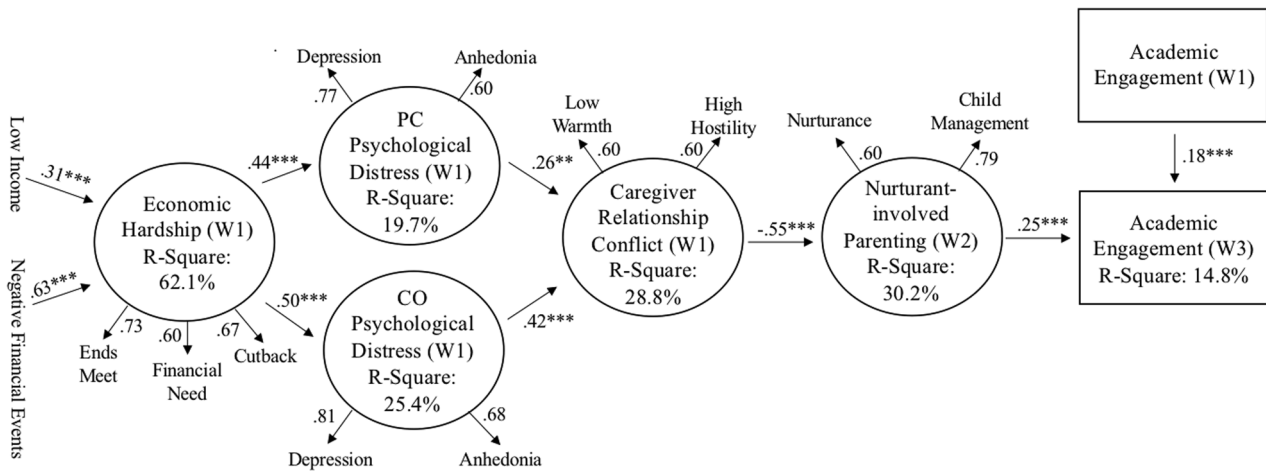


Fig. 2 Family Stress Model. $N = 422$. The values presented are standardized parameter estimates. Target gender included as a control. *PC* primary caregiver, *CO* co-caregiver, *W1* wave 1, *W2* wave 2, *W3* wave

3. $\chi^2_{(97)} = 176.94; p < 0.01$; CFI = 0.93; TLI = 0.92; RMSEA = 0.04. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

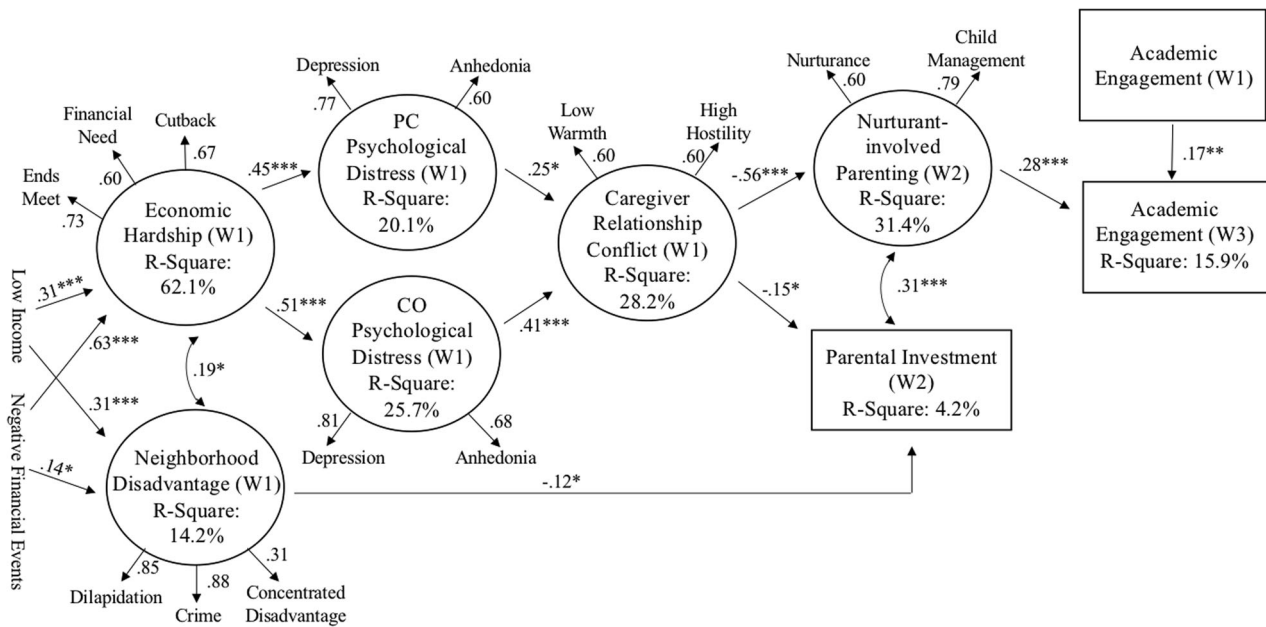


Fig. 3 Combined Parental Investment and Family Stress Model. $N = 422$. The values presented are standardized parameter estimates. Target gender included as a control. *PC* primary caregiver, *CO* co-caregiver,

W1 wave 1, *W2* wave 2, *W3* wave 3. $\chi^2_{(158)} = 294.48; p < 0.01$; CFI = 0.92; TLI = 0.91; RMSEA = 0.04. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

presented in Table 3 indicate evidence for mediation from left to right constructs in the model. The indirect effect from low income to academic engagement via economic hardship, primary caregiver psychological distress, caregiver conflict, and parenting continued to be significant (indirect effect = -0.005 , 95% CI [-0.014 , -0.001]). Correspondingly, the indirect effect from low income to academic engagement via economic hardship, co-caregiver psychological distress, caregiver conflict, and parenting was again significant (indirect effect = -0.010 , 95% CI [-0.020 , -0.004]). Turning to the indirect effects from negative financial events to academic engagement, both paths from negative financial

events to academic engagement via economic hardship, primary caregiver psychological distress, co-caregiver psychological distress, caregiver conflict, and parenting were significant (indirect effect including primary caregiver psychological distress = -0.010 , 95% CI [-0.027 , -0.002]; indirect effect including co-caregiver psychological distress = -0.020 , 95% CI [-0.038 , -0.010]).

Sensitivity Analysis

Sensitivity analysis was performed in order to examine the possibility that the nonsignificance of parental investment in

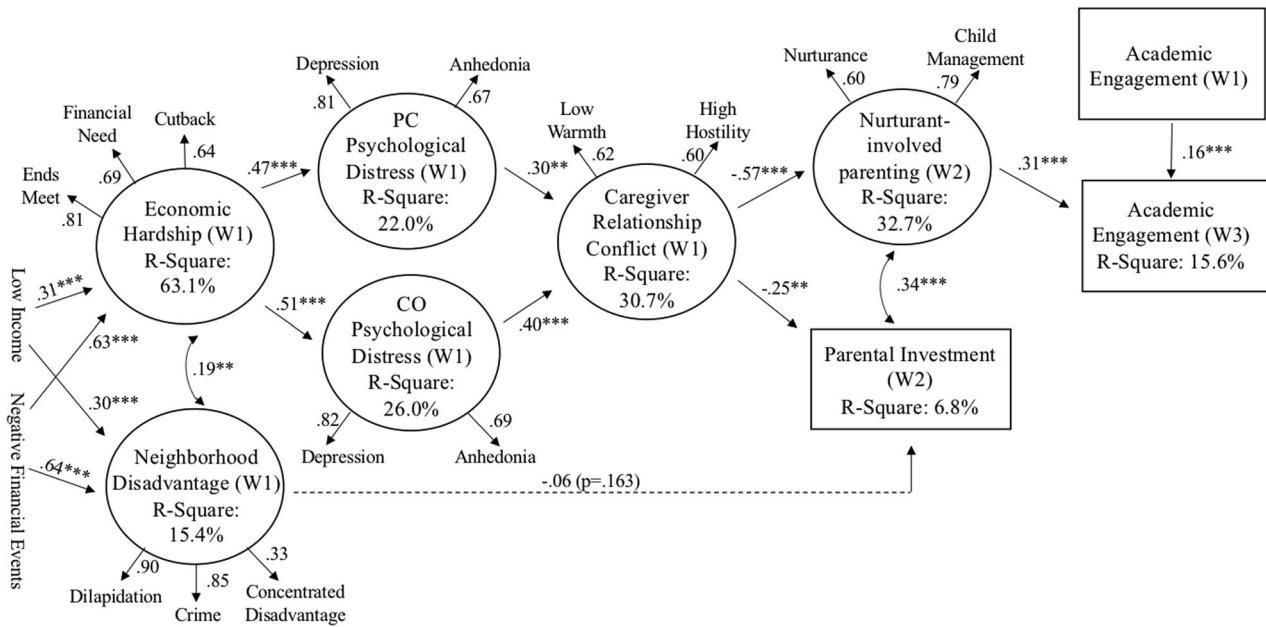


Fig. 4 Combined Parental Investment and Family Stress Model using full sample. $N = 884$. The values presented are standardized parameter estimates. Target gender included as a control. *PC* primary caregiver,

CO co-caregiver, *W1* wave 1, *W2* wave 2, *W3* wave 3. $\chi^2_{(157)} = 293.24$; $p < 0.001$; CFI = 0.94; TLI = 0.93; RMSEA = 0.03. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

the final, combined model (Fig. 3) was a result of measure misspecification. First, a more comprehensive measure of parental investment that included home- and school-based involvement was constructed. This expanded measure included items such as how well primary caregivers knew and talked to the target adolescent’s teachers, and how often they helped the target adolescent with their homework, and is consistent with past research that has found support for the parental investment model in tests that focus on young children or pre-adolescents. Results for the parental investment model were virtually identical to the more developmentally appropriate measure utilized in the original assessment of parental investment. Next, the combined family stress model - parental investment model was run with the updated measure of parental investment. Results were similar to those from the initial combined family stress-parental investment model; the effect of parental investment on adolescent academic engagement was again reduced to nonsignificance when nurturant-involved parenting was accounted for.

Next, in order to explore the idea that limiting the analyses to two-parent families might produce endogenous selection bias, an independent samples t-test was used to compare academic engagement at W1 and W3 in two vs. single-parent families. Results indicated children in two-parent families ($M = 0.04$, $SD = 0.65$) were not significantly different from those in single-parent families ($M = -0.05$, $SD = 0.65$) in academic engagement at W1 ($t(868) = 1.894$, $p = 0.059$). Likewise, children in two-parent families ($M = 0.01$, $SD = 0.65$) were not significantly different from those in single-parent families

($M = -0.02$, $SD = 0.69$) in academic engagement at W3 ($t(764) = 0.627$, $p = 0.531$). To further ensure the robustness of findings, the combined model was repeated using all available data ($N = 884$) for adolescent measures and primary caregiver measures and full information maximum likelihood (FIML) to handle missing data for couple measures. As shown in Fig. 4, this sensitivity analysis revealed a pattern virtually identical to those in Fig. 3, suggesting there is no sample selection bias present.

Finally, where possible, multiple reporters of constructs were utilized in order to reduce the problem of shared method variance. Parental investment, however, was assessed using caregiver self-report because only caregivers reported on these behaviors. Thus, it is possible that some of the differences obtained when contrasting the two theoretical frameworks could be conflated with the measurement strategy. Therefore, we rotated through the various reporters of nurturant-involved parenting (i.e., caregiver, adolescent, observer) and each produced the same results (i.e., support for the propositions of the family stress model and very limited support for the propositions of the parental investment model in the combined model).

Discussion

Past research has established that economic hardship, disproportionately experienced by minority groups in the United States, has negative consequences for families and individuals. Poor academic outcomes are one such consequence.

Lack of academic success is associated with adverse outcomes such as conduct problems and health risk behaviors in the short term as well as long term consequences such as lower lifetime educational achievement, greater unemployment, and participation in adult criminal behavior (Caspi et al. 1998; Crosnoe 2006; Diemer et al. 2019; Henry et al. 2012; Hirschfield and Gasper 2011). Thus, there is a need to understand how economic hardship leads to increased risk for such problems. This study examined the mechanisms that explain the impact of economic hardship on adolescent academic engagement in a sample of African Americans and extended the research on this topic in several ways.

First, more comprehensive assessments of key constructs of the two dominant theoretical models, the parental investment model and the family stress model, were assessed. Specifically, a measure of economic hardship that included negative financial events and economic pressure in addition to income was included whereas most studies have used only income. There was also the inclusion of neighborhood characteristics. This is important because although neighborhood disadvantage is a key component of the parental investment model, it is routinely excluded in tests of that model. Second, whereas much of the past research has been cross-sectional, this study used a longitudinal study design and prospective data in order to better establish causal priority between variables. Third, the impact of economic hardship was assessed on adolescent academic engagement in a sample of African American adolescents, an understudied population. Fourth, after establishing that the propositions of the parental investment model and the family stress model were supported in separate models, the relative predictive power of each was examined in a combined model. This allowed for the exploration of the possibility that these two models are complementary, not competing, explanations for the effect of economic hardship on youth outcomes. Finally, using the propositions of the parental investment model and family stress model, controls for earlier levels of academic engagement were included in order to allow for assessment of relative change in the outcome over time.

Results indicated that, when tested independently, both the parental investment model and the family stress model yielded significant results. Consistent with the parental investment model, parental investments mediated the relationship between neighborhood disadvantage and adolescents' academic engagement. This finding is consistent with suggestions by Gutman et al. (2005), that neighborhood disadvantage interferes with parents' ability to share activities with their offspring that promote positive youth development, due to residing in areas with fewer resources and safe areas for interaction between parents and offspring. This, in turn, negatively affects adolescents' academic outcomes. As predicted by the family stress model, the

effect of family economic hardship on adolescent academic engagement was fully mediated by parents' psychological distress, caregiver conflict, and parenting practices.

In the combined model, the propositions of the family stress model were significant, even when controlling for the variables in the parental investment model. On the other hand, the predictions of the parental investment model were not supported when the variables associated with the family stress model were included. Sensitivity analysis revealed that these findings held regardless of whether school-based, home-based, or success socialization were included in the assessment of parental investment. This pattern of findings is consistent with the results of Yeung et al. (2002), who found in a cross-sectional comparison of the parental investment model and family stress model that the family stress model best explained behavior problems among young children. Simons et al. (2016) reported similar findings by evaluating both models longitudinally and using adolescent delinquency as an outcome. The current study is the first to replicate this pattern of results using academic engagement as the outcome. While past research focused on the parental investment model has demonstrated that all forms of parental investment are important for the cognitive and academic outcomes of young children, Hill and Tyson (2009) note that, for middle school youth, success socialization is the most efficacious form of parental investment, home- and school-based involvement on the part of parents is less effective for that age group. The adolescents in the present study were, on average, 15.5 years of age, suggesting that, by high school, the same pattern may have developed with regard to parents' success socialization.

Although the primary focus of the study was on the extent to which the family stress model and parental investment model explained academic engagement, this investigation was also concerned with whether there might be complementary processes operating between the two models. Results showed that there was a significant relationship from caregiver conflict to parental investment, but not between caregiver psychological distress and parental investment. Neighborhood disadvantage was, however, negatively correlated with nurturant-involved parenting. This is consistent with past research showing that families living in disadvantaged neighborhoods are often challenged when it comes to engaging in optimal parenting practices (Gutman et al. 2005; Simons et al. 2005). In addition, nurturant-involved parenting was positively associated with parental investment, suggesting that parents who engage in the supportive parenting practices associated with positive youth outcomes also tend to facilitate their child's participation in activities. These associations between the central parenting constructs in the parental investment model and family stress model underscore the need for analyses that examine the effects of each model while controlling for the

effects of the other. While there was limited evidence of complementarity between model variables, the variance explained by the combined model was only 1% greater than the family stress model. Thus, results indicate that it is the parenting practices as described by the family stress model, rather than the specific parental investments proposed by the parental investment model, that best explain the link between family economic hardship and adolescent academic engagement. The positive effect of nurturant-involved parenting on the development of adolescents' characteristics such as self-regulation and self-control (Brody et al. 2013) may explain why nurturant-involved parenting is predictive of academic engagement and parental investment is not when both are in the model. This suggests that the relationship between parental investment and youth academic outcomes reported in previous research may actually be spurious due to its association with nurturant-involved parenting. Given the widespread support for the parental investment model, future research on this model would benefit from the inclusion of nurturant-involved parenting as a control variable in an attempt to replicate or refute the current findings. Because the combined model explained 15% of the variance in academic engagement, it is clear that there are additional influential factors not specified by the family stress model or parental investment model (e.g., parent-child conflict). Future research could benefit from a more comprehensive assessment of family processes.

Although the current study extended past research in several respects, it also suffered from certain limitations. First, the measure of investment focused on parents' behavioral investment but did not assess the home environment (e.g., availability of learning materials in the home) because such measures were not available. Such considerations have proven relevant in tests of the parental investment model that have focused on cognitive development in young children, but it is not clear whether they would be relevant for adolescents or would be related to their academic engagement. It is possible that a broader measure of investments may have yielded more support for the parental investment model. This limitation is offset, at least partially, by the inclusion of neighborhood characteristics, an important investment construct but one that has been rarely included in tests of the parental investment model.

Second, the study focused on families with two caregivers. This is because caregiver conflict is a central component of the family stress model; thus the model cannot be fully tested in families with only one caregiver. The inclusion of a second caregiver, however, advantaged the parental investment model. That is, by assessing the parental investment of two caregivers, there was an increased likelihood of detecting significant effects of parental investment (Wagmiller et al. 2010). Third, although the sample focused

on an understudied group, African Americans, the results need to be replicated with samples comprised of other ethnicities.

Finally, while the purpose of this study was to focus on family processes and economic disadvantage, evidence that schools within low-income communities are economically under-resourced cannot be ignored. Unfortunately, such data were not available. It is worth noting, however, that while such measures would be useful, the inclusion of school environment would equally influence results for both the parental investment model and the family stress model, not privilege one over the other. Thus, the pattern of results would likely remain the same.

Despite these limitations, the current study makes a significant contribution to the understanding of how economic hardship is associated with a decrease in adolescent academic engagement. By addressing many of the deficits of past research on the parental investment model and family stress model, the study was able to shed new light on the specific pathways by which economic disadvantage exerts an effect on youth outcomes. In doing so, the results question whether potentially middle-class, Eurocentric models (e.g., the parental investment model) are necessarily useful when studying economically distressed African American youth. Specifically, such skepticism of the parental investment model is warranted by the finding that parents' success socialization or encouragement of their child's involvement in various organizations and activities is less consequential to academic engagement than the provision of nurturant-involved parenting. This is heartening for families experiencing financial hardship because the ability to engage in warm, supportive parenting is not determined by economic status, even when they may lack the economic resources necessary to facilitate their children's participation in extracurricular activities or become involved at their children's school.

These findings have potential implications for parental education and family intervention. Specifically, family-based preventative intervention programs that have demonstrated success in reducing problem behaviors among African American youth by emphasizing the parenting practices specified by the family stress model suggest that such a strategy may also be effective in promoting positive youth behaviors (i.e., academic engagement). Namely, the results provide support for programs specifically designed for at-risk African American youth, such as the Strong African American Families project, which emphasizes teaching parents to engage in nurturant-involved parenting (see Brody et al. 2006). This program has demonstrated that, when it comes to deterring problem behaviors and encouraging those associated with positive youth development, parenting practices are more important than the type of neighborhood in which the family lives or the child's

level of participation in extracurricular activities. The results reported in the present study findings are consistent with this approach and suggest that a focus on nurturant-involved parenting would benefit programs aimed at increasing academic engagement among economically disadvantaged African American youth.

Conclusion

The impact of economic hardship on adolescents' academic success is best explained by the mechanisms proposed by the family stress model. In other words, economic hardship increases caregiver psychological distress and conflict between parents/caregivers. This, in turn, is related to a decrease in nurturant-involved parenting. Less nurturant-involved parenting is associated with lower academic engagement on the part of adolescents. The propositions of the parental investment model were not significant after controlling for the propositions in the family stress model and a model combining the variables from both models did not significantly increase the variance in academic engagement explained by the family stress model. These findings suggest that the impact of economic hardship on academic engagement is best understood by focusing on the family processes specified by the family stress model.

Authors' Contributions LGS conceived of the study, participated in its design and coordination and drafted the manuscript and MES performed the statistical analysis, interpretation of the data and assisted in drafting the manuscript. All authors read and approved the final manuscript.

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Data Sharing and Declaration This manuscript's data will not be deposited.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This project on which this study was based was approved by the appropriate institutional and/or national research ethics committee. This study has been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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