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The mediating role of neighborhood social cohesion and trust in the relationship between childhood material hardship and adolescent depression

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ABSTRACT

Objective: The purpose of this study is to examine the association between childhood material hardship and adolescent depression and how the relationship is mediated by neighborhood social cohesion and trust. Previous studies on childhood material hardship and adolescent depression have consistently pointed to the importance of social and environmental contexts in explaining health inequalities among children in socially disadvantaged families. However, little is known about the extent to which neighborhood social context contributes to increasing or decreasing the strength of the association between childhood material hardship and adolescent depression.

Method: Using data from the Future of Families and Child Wellbeing Study (FFCWS) waves 3 and 6, this study conducted Structural Equation Modeling (SEM) analysis to examine whether levels of neighborhood social cohesion and trust mediates the association between childhood material hardship and adolescent depression. The study sample consisted of 2,096 children at age 3 and 15.

Results: Findings from the SEM analysis suggest that childhood material hardship is linked with higher levels of adolescent depression and this pathway is partially mediated by neighborhood social cohesion and trust.

Discussion: Results suggest that neighborhood conditions played a role in mediating the association between childhood material hardship and adolescent depression. The implications of the findings are discussed in relation to policy and practice.

1. Introduction

Depression in adolescents has been recognized as a major mental health problem in the U.S. According to the Substance Abuse and Mental Health Services Administration (SAMHSA)'s 2021 report, 17% (4.1 million, or approximately 1 in 6) of adolescents aged 12–17 years in 2020 had experienced major depression in the past year. Depression refers to a feeling of persistent sadness and hopelessness, or irritable mood (Centers for Disease Control and Prevention [CDC], 2022a). The rate of adolescents experiencing depression in the U.S. has increased over time (Bitsko et al., 2018; CDC, 2022b; SAMHSA, 2021). For example, adolescent prevalence rates of depression have increased from 9% (2.2. million) in 2004 to 17% (4.1 million) in 2020, an increase of 86% (SAMHSA, 2020, 2021).

Previous literature suggests adolescent depression is associated with short-term and long-term negative consequences, including psychiatric comorbidity, poor physical health, suicide, obesity, and elevated inflammation, as well as unemployment, academic failure, marital difficulties, and increased substance abuse (Armstrong & Costello, 2002; Bardone et al., 1998; Brent et al., 1993; Byrne et al., 2015; Clayborne et al., 2019; Finning et al., 2019; Fletcher, 2008; Fombonne et al., 2001; Stice et al., 2004). A substantial body of previous literature on adolescent depression has mainly focused on predictive factors at the individual- and family-level, such as individual sociodemographic characteristics, childhood trauma, peer relations, substance use, family conflict, family history of depression, and parenting style including warmth, withdrawal, aversiveness, and overinvolvement (Cairns et al., 2014; McLeod et al., 2007; Stirling et al., 2015; Yap et al., 2014).

However, other work based on Bronfenbrenner's ecological framework (Bronfenbrenner, 1977) has focused on neighborhood

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characteristics as contextual determinants of adolescent depression. These characteristics include a) neighborhood structural disadvantage such as concentrated poverty, socioeconomic inequality, and higher composition of racial and ethnic minorities (Behnke et al., 2011; Caughy et al., 2008; Wight et al., 2005), and b) neighborhood safety like physical disorder and violence rates (Lambert et al., 2010; Rosario et al., 2008). Another body of literature based on Sampson and colleagues (1997) has focused on neighborhood social processes, such as social cohesion and trust, and social ties (Sampson et al., 1997; Simons et al., 2005). Sampson and colleagues (2002) argue that neighborhood social processes play a crucial role in influencing child development because these social processes are more closely connected to a child's daily life within the neighborhood. Among the various indicators representing neighborhood social processes, social cohesion and trust have gained prominence as they are considered a critical measure for indicating levels of bonding and shared values among residents in a neighborhood (Sampson, 2003; Sampson et al., 1997).

Another line of research on adolescent depression suggests the crucial impact of material hardship on individual-level mental health among adolescents (Edmunds & Alcaraz, 2021; Hardi et al., 2022; Heflin & Iceland, 2009). Edmunds and Alcaraz (2021) found that higher levels of material hardship measured by deprivation in such dimensions as financial problems related to housing, utilities, bills, medical care, and food expenditure in childhood resulted in higher depressive symptoms in adolescence. The most recent study by Hardi et al. (2022) found that earlier exposure to material hardship in childhood is associated with decreased development in brain structure and function in adolescence, which is measured by white matter connectivity of amygdala–prefrontal cortex associated with symptoms of depression and anxiety.

Taken together, as previous studies suggest, social cohesion and trust and material hardship are each likely to have an impact on adolescent mental health. Of note, most previous studies have focused on social cohesion and trust as a moderator instead of a mediator intervening in the association between child poverty and adolescent depression (e.g., Kingsbury et al., 2020). Thus, little is known about the potential mediating role of neighborhood social cohesion and trust in the association between childhood material hardship and depression among adolescents, an important gap given the potential for policy and program interventions which could impact social cohesion and trust. Therefore, the current study aims to investigate the role of neighborhood social cohesion and trust as a potential mediator of the association between material hardship in childhood and depression in adolescence toward the end of recommendations to reduce adolescent depression.

2. Background

In the present study, elements of the life course health development (LCHD) framework (Halfon et al., 2018) and theories of neighborhood social context (Evans & Kantrowitz, 2002; Sampson et al., 1997) are integrated to describe associations among childhood material hardship, neighborhood social cohesion and trust, and adolescent depression. The mechanisms through which neighborhood context impact adolescent health have not been fully elucidated using a comprehensive set of pathways in a systematic way. Given the lack of findings regarding the impact of neighborhood conditions on adolescent depression, this study attempts to employ two main theoretical lenses to explain the relationships among them.

2.1. The life course health development (LCHD) framework

The life course health development (LCHD) framework is a useful perspective for understanding the influence of childhood material hardship on adolescent mental health (Halfon & Hochstein, 2002; Halfon et al., 2018). The LCHD framework explains that the compounding factors experienced in childhood throughout the lifespan play a crucial role in determining individuals' overall health and well-being based on seven key principles: health development, unfolding, complexity, timing, plasticity, thriving, and harmony. Among them, the first four key principles can offer guidance to this study. First, *health development* is defined as "a lifelong adaptive process that builds and maintains optimal functional capacity and disease resistance" (Halfon & Hochstein, 2002). This means that health and developmental processes are interconnected with each other to shape overall well-being (Halfon et al., 2018). Second, *unfolding* describes that health development occurs continuously across one's life, and is affected by previous life experiences and interactions with the environment. For example, family material hardship can create parental stress, which, in turn, will influence parents' investment in their children and positive parenting behavior (Brooks-Gunn & Duncan, 1997; Duncan et al., 1994; Gershoff et al., 2007; Williams et al., 2015). These adverse experiences during early childhood may impact the developing brain and emotional regulation systems, thereby leading to long-term consequences for mental health in adolescence. Third, *complexity* illustrates that health development is a result of dynamic, multifaceted interactions between individuals and their physical, natural, and social surroundings. Children actively engage with and respond to the experiences provided by their environments, such as material hardship, family dynamics, and community supports, thereby influencing the development of mental health issues, including depression or behavioral problems, in adolescence (Edmunds & Alcaraz, 2021; Heflin & Iceland, 2009; Zilanawala & Pilkauskas, 2012). Fourth, *timing* indicates that health development is influenced by the timing and social context of environmental exposures and experiences. For instance, experiencing material hardship during critical developmental periods, such as early childhood, may have more significant and lasting impacts on mental health in later life compared to less sensitive periods (Center on the Developing Child, 2007). In this context, the LCHD framework is key to understand and assess the complex and interrelated association between childhood material hardship and adolescent mental health.

2.2. Neighborhood social context

A central thrust of the current study is to examine how exposure to different neighborhood social contexts may mediate the relationship between exposure to material hardship and later mental health. Neighborhood social context has been conceptualized and operationalized in a number of different ways. One body of work stems from social disorganization theory (Shaw & McKay, 1942), which defines social disorganization as the breakdown of sharing common values among neighbors and the ensuing loss of the ability to have effective controls for the neighborhood (Shaw & McKay, 1942). The original social disorganization theory posited that disadvantaged neighborhoods, which Shaw and McKay (1942) suggested were characterized by concentrated poverty, residential instability, and racial heterogeneity, may result in individual-level negative outcomes (Shaw & McKay, 1942). This early conceptualization of neighborhood social context suggested that concentrated hardship experienced at the individual level might produce detrimental outcomes, particularly emphasizing crime and delinquency and leading to a narrowly defined concept of neighborhood disadvantage, missing a structural lens.

Since the introduction of social disorganization theory, many scholars have built on that theory or introduced alternative conceptualizations of neighborhood social context to model the potential impacts of neighborhoods on residents' wellbeing. For instance, Wilson (1987) argues that neighborhood-level economic status such as concentrated poverty and residential segregation should be viewed as demonstrating a lack of key resources to maintain social institutions (e.g., schools, churches) within a neighborhood. More recently, Krieger's ecosocial theory (1994, 2012) highlights that individuals' health and wellbeing are influenced by the complex interplay among historical, societal, and ecological conditions. Particularly, Krieger (1994, 2012) emphasizes that the distribution of ecosocial diseases may be affected by factors such

as social inequalities, including racial discrimination. Additionally, in their place attachment framework, Altman and Low (1992) emphasize that the psychological bond individuals form with a geographical location, such as a neighborhood, can have a positive impact on their psychological and social wellbeing. They underscore the importance of residential satisfaction and positive perceptions of the residential environment for an individual's health.

Still other scholars push beyond the emphasis on material features of neighborhoods. Sampson and colleagues (1997) contend that the conceptualization of social disorganization needs to shift toward non-materialistic aspects of the neighborhood, including social cohesion, trust, or informal social controls. Evans and Kantrowitz (2002) propose a model to explain how the relationship between socioeconomic status (SES) and heath can be mediated by environmental quality. They emphasize the importance of both physical environmental conditions as well as social relationships within the neighborhood, such as social cohesion and trust. Taken together, socially disorganized neighborhoods, characterized by concentrated poverty, racial segregation, social isolation, residential instability, and physical and social disorder, may be key determinants to affect individual-level outcomes including mental health. In terms of process-oriented mechanisms, structurally disadvantaged neighborhoods can impose serious burdens on resources, social interaction, and supervision of parents on adolescents, in turn, forcing adolescents' biopsychosocial system to be exposed to a number of stressors, leading to an increased levels of stress among those adolescents (Aneshensel, 2010; Caspi et al., 2000; Cutrona et al., 2006; Hill & Maimon, 2013; Massey & Denton, 2019; Ross, 2000; Wandersman & Nation, 1998).

2.3. Adolescent depression, childhood material hardship, and neighborhood social cohesion & trust

Adolescent depression. Depression (also known as major depressive disorder or clinical depression) in adolescents is defined as a depressed mood, decreased interest, or loss of pleasure that has lasted at least two weeks (American Psychiatric Association, 2013). According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), to make a diagnosis of depression, an individual must experience at least four additional symptoms during the same two weeks: feeling of worthlessness or guilt, suicidal ideation, lack of energy, changes in sleep patterns, changes in appetite or weight, poor concentration, and psychomotor retardation (Malhi & Mann, 2018; Miller & Campo, 2021). Regarding adolescent depression, particularly, unipolar depressive disorder is a prevalent mental health problem among adolescents globally and in the U.S. (Bernaras et al., 2019; Mojtabai et al., 2016). According to the Centers for Disease Control and Prevention (CDC), about 1.9 million or 3.2% of children aged 3–17 years are diagnosed with depression as of 2020 in the United States (CDC, 2020). Research suggests that the root cause of depression is difficult to precisely identify because it results from various levels of interactions across biological, psychological, and social systems (Cicchetti & Toth, 1998). Research has pointed out that unipolar depressive disorder among adolescents has a wide range of negative consequences: social and educational impairment, a major risk for suicide, and behavioral problems such as smoking, substance abuse, and obesity (Thapar et al., 2012). Although two classification systems such as International Classification of Disease (ICD) and the American DSM-5 are used for diagnosing depression among adolescents, the full 20 items from the Center for Epidemiologic Studies Depression Scale (CES-D), which was developed by Radloff (1977), are typically used to identify and assess the presence of depression and its degree (mild, moderate, or severe) (Perreira et al., 2005; Radloff, 1977). In this study, a short form of the CES-D consisting of five items such as feeling blues, sad, happy, not worth living, or depressed, is used to measure adolescent mental health disorder as the 5-item CES-D is a valid measure compared with the full 20-item CES-D (Perreira et al., 2005).

Childhood Material Hardship. Childhood material hardship is defined as the state of lacking minimum levels of necessities such as food, clothing, and medical care among children (Heflin & Iceland, 2009). Research suggests that measuring material hardship equals to capturing the lived experiences of economic deprivation (Heflin, 2016; Heflin & Iceland, 2009). Material hardship in childhood consists of four major components that children may experience: food insecurity, unaffordable housing, the inability to cover bills and utilities, and limited access to medical services (Heflin, 2016). A substantial portion of the U.S. children is exposed to material hardship. Based on recent data from the Household Purse Survey conducted by the Census Bureau, nearly 45% of children face material hardship in the U.S., measured by their inability to meet regular expenses within the past week (Sherman et al., 2020). Research suggests that material hardship has serious consequences for child well-being, in particular mental health outcomes (Duncan et al., 1994; Gershoff et al., 2007). Duncan and colleagues (1994) found that increased family economic deprivation is associated with a higher incidence of internalizing behavior problems in children, such as excessive fearfulness, anxiety, unhappiness, sadness, or depression. Similarly, Gershoff et al.'s 2007 study suggests that increased material hardship is linked to reduced child social-emotional competence, as indicated by the subscales of the Social Rating Scale, including internalizing mental health problems such as anxiety, loneliness, low self-esteem, or sadness.

Neighborhood Cohesion & Trust. Neighborhood social cohesion and trust are defined as the collective perception of individuals regarding the extent to which their neighbors share beliefs and values, and trust one another (Sampson et al., 1997). This leads to a sense of connectedness among neighbors at the neighborhood level (Sampson, 2003; Kingsbury et al., 2020). Conceptually, neighborhood collective efficacy consists of two main sub-concepts: neighborhood social cohesion and trust and informal social controls (Sampson et al., 1997). The former refers to the neighborhood-level connectedness among neighbors; whereas, the latter denotes the neighborhood-level capacity to exercise informal social controls for the community. In relation to child heath, more cohesive neighborhoods may enhance a child's resilience to cope with adversity, including mental health problems (Breedvelt et al., 2022; Kingsbury et al., 2020; Kress et al., 2020). Thus, this study focuses on neighborhood social cohesion and trust as an indicator of the level of connectedness among residents in neighborhoods (Sampson et al., 1997).

2.4. Empirical evidence

2.4.1. Consequences of adolescent depression

Adolescent depression is associated with various negative outcomes, including impaired social and educational functioning, an increased risk of suicide, and behavioral challenges such as smoking, substance abuse, and obesity (Thapar et al., 2012). First, highly depressed adolescents are more likely to have poor academic performance (Fletcher, 2008; McLeod & Kaiser, 2004), poor attendance at school (Finning et al., 2019), and low peer support (Stice et al., 2004). Second, adolescents with severe depression tend to experience suicidal ideation and attempts (Brent et al., 1993; De Man, 1999). Third, teenagers with serious depressive symptoms are susceptible to engaging in smoking (Audrain-McGovern et al., 2004), delinquency (Beyers & Loeber, 2003), substance abuse (Armstrong & Costello, 2002), as well as experiencing challenges with obesity (Goodman & Whitaker, 2002). In addition to the influence of depression on adverse consequences among adolescents in the short term, research suggests that in the long term, adolescent depression is connected to negative outcomes in adulthood (Elmore & Crouch, 2020; Kimberlin & Berrick, 2015). These outcomes include lower completion rates in postsecondary education, unemployment, early marriage, decreased social support, adult depression, high prevalence of other psychiatric disorders, and obesity (Bardone et al., 1998; Byrne et al., 2015; Clayborne et al., 2019; Fombonne et al., 2001).

2.4.2. Childhood material hardship and adolescent depression

Previous research suggests that childhood material hardship is associated with psychological health later in childhood (Brooks-Gunn & Duncan, 1997; Edmunds & Alcaraz, 2021; Gershoff et al., 2007; Kingsbury et al., 2015; Zilanawala & Pilkauskas, 2012). In particular, childhood material hardship is not only associated with adolescent depression but also has a causal effect on adolescent depression (Heflin & Iceland, 2009). The main pathways from childhood material hardship to adolescent depression are explained as direct and indirect. In terms of direct pathways, children from low-income family experiencing material hardship are exposed to stressful life events, limited resources, and restricted opportunities, resulting to an elevated psychological burden to cope with adversity (Edmunds & Alcaraz, 2021; Heflin & Iceland, 2009; Weaver et al., 2018). In terms of indirect pathways, when children residing in low-income family experiencing material hardship are forced to endure deteriorated living conditions or relocate to more disadvantaged neighborhoods just to meet their basic survival needs, it hampers their capacity to handle external and internal stressors due to limited access to appropriate resources and opportunities (Hill & Maimon, 2013; Kingsbury et al., 2020). Research suggests that children experiencing material hardship are more likely to be exposed to stressors along with such hardships, thereby increasing the risk of adverse mental health outcomes including depression and anxiety. Although many studies have examined the direct relationship between childhood material hardship and adolescent depression, only a limited number of studies (e.g., Kingsbury et al., 2020) investigate the indirect relationship, particularly focusing on the mediating role of neighborhood social cohesion and trust.

2.4.3. Childhood material hardship and neighborhood social cohesion & trust

Research suggests that regarding the relationship between childhood material hardship and neighborhood social cohesion and trust, family economic precarity (e.g., material hardship) may lead to living in settings with physical quality problems, including residences, educational institutions, workplaces, and neighborhoods. In particular, in the context of neighborhood conditions, family poverty and hardship increased the likelihood of residing in highly disadvantaged neighborhoods (Aneshensel & Sucoff, 1996; Brooks-Gunn & Duncan, 1997; Engle & Black, 2008; Evans & Kantrowitz, 2002; Massey & Denton, 1993; Wilson, 1987). Highly disadvantaged neighborhoods are often described as those with higher levels of violence, crime, and adult unemployment rates; lower levels of collective efficacy; and poorer environmental quality such as exposure to toxic wastes, air pollution, overcrowding, and noise (Evans & Kantrowitz, 2002). In addition, previous research suggests a negative link between neighborhood disadvantage and the levels of social cohesion and trust. This means that residents living in disadvantaged neighborhoods often perceive reduced social cohesion and trust within their communities (Evans & Kantrowitz, 2002; Sampson et al., 1997).

2.4.4. Neighborhood social cohesion & trust and adolescent depression

Research suggests that neighborhood context is strongly linked with mental health status of individuals (Hill & Maimon, 2013). Neighborhood context is conceptualized using various terms such as neighborhood structural disadvantage, structure, disorganization, disorder, experience, and social cohesion and trust (Hill & Maimon, 2013). Among these terms, neighborhood social cohesion and trust are of special interest in this study. Previous research suggests an association between neighborhood social cohesion and trust and adolescent depression (Aneshensel & Sucoff, 1996; Breedvelt et al., 2022; Dawson et al., 2019; Kingsbury et al., 2015). Neighborhood-level social cohesion has an impact on child development and mental health (Donnelly et al., 2016; Hurd et al., 2013), particularly in decreasing adolescent depression (Kingsbury et al., 2015, 2020; Solmi et al., 2017). For instance, higher levels of perceived neighborhood social cohesion and trust are associated with reduced levels of depression among adolescents (Aneshensel & Sucoff, 1996; Breedvelt et al., 2022; Dawson et al., 2019; Kingsbury et al., 2015). To the best of our knowledge, there are no studies that have used social cohesion at the neighborhood-level as a mediator between the link of childhood adversity and adolescent depression, although Kingsbury et al.'s 2020 study uses it as a moderator to mitigate the negative association between childhood adversity and adolescent depression.

2.4.5. Childhood material hardship, neighborhood social cohesion & trust, and adolescent depression: direct and indirect pathways

Although childhood material hardship, neighborhood social cohesion and trust, and adolescent depression may be interrelated in complex ways, an SES-environment-health model developed by Evans and Kantrowitz (2002) suggests a sequential relationship from SES (including material hardship) to environmental quality (including neighborhood social cohesion and trust as a subscale of collective efficacy) to health (including adolescent depression). In this model, an underlying conceptual process (SES → Environmental Quality→ Health) is crucial for understanding health disparities. Evans and Kantrowitz (2002) argue that economically disadvantaged individuals, particularly those belonging to marginalized racial and ethnic groups, were more likely to be exposed to detrimental environmental factors such as toxic waste (e.g., lead, solvents, pesticides), air pollution (e.g., sulfur oxides, fine particulates, cotinine), or water pollution (e.g., coliform). Many studies have demonstrated that exposure to these outdoor or indoor pollutants is associated with respiratory problems, psychological distress, adverse emotional experiences, aggressive behaviors, and cognitive abnormalities (Evans, 1994; Holgate et al., 1999; Rotton, 1983; Sciarillo et al., 1992). Evans and Kantrowitz (2002) also suggest that low-income and marginalized racial and ethnic group identified residents face greater exposure to noise (e.g., airports) and crowding (e.g., the number of people per room) compared to more affluent and white citizens. Most research has demonstrated that the community noise exposure and residential crowding are positively related to increased psychological distress (Baum & Paulus, 1987; Evans et al., 2001; Lercher et al., 2002; Stansfeld, 1992). Furthermore, Evans and Kantrowitz (2002) found that low-income families are more likely to reside in low-income, high-crime neighborhoods with lower perceived social cohesion and trust. Studies show that residing in neighborhoods with lower levels of social cohesions and trust, along with higher crime rates, is associated with poor mental health for both adults and children (Garbarino et al., 1992; Osofsky, 1995). The findings indicate that social cohesion and trust, developed through social interactions among neighbors, are associated with enhanced feelings of control and well-being in residential settings (Evans, 2003; Evans & Kantrowitz, 2002). Given that evidence, Evans and Kantrowitz (2002) contend that individuals who are economically disadvantaged may be more likely to experience a disproportionate exposure to unhealthy environmental conditions. They demonstrate that SES is related to environmental quality, and, in turn, the quality of the environment has an impact on health.

A causal pathway from individual-level poverty to neighborhood-level conditions, ultimately influencing health, has been empirically demonstrated by several previous studies (Aneshensel & Sucoff, 1996; Brooks-Gunn & Duncan, 1997; Engle & Black, 2008; Massey & Denton, 1993; Wilson, 1987). This work posits that the SES of families determines the physical placement of adolescents in neighborhoods characterized by limited opportunities, resources, and exposure to more adverse social stressors, thereby reducing child wellbeing, including adolescent mental health (Aneshensel & Sucoff, 1996; Breedvelt et al., 2022; Brooks-Gunn & Duncan, 1997; Dawson et al., 2019; Engle & Black, 2008; Evans & Kantrowitz, 2002; Kress et al., 2020; Massey & Denton, 1993; Wilson, 1987).

Some scholars may argue that the causal direction could be reversed - for example, one might posit a path from neighborhood social cohesion

and trust to childhood material hardship or from adolescent depression to neighborhood social cohesion and trust. While the present study cannot definitively rule this out, we approach this study grounded in the SES-environment-health model developed by Evans and Kantrowitz (2002) which assumes a one-directional path from childhood material hardship to neighborhood social cohesion and trust and a one-directional path from neighborhood social cohesion and trust to adolescent depression, as evidenced by previous studies (Aneshensel & Sucoff, 1996; Breedvelt et al., 2022; Brooks-Gunn & Duncan, 1997; Dawson et al., 2019; Kress et al., 2020).

2.4.6. Controlling preceding variables

This study controls for child and maternal characteristics based on evidence from previous studies. Child characteristics include variables such as the child's sex, race and ethnicity, and health insurance coverage status. Maternal characteristics encompass the mother's age, race and ethnicity, and employment status. Regarding a child's sex, research indicates that girls tend to exhibit higher scores on measures assessing adolescent depression than boys (Butler, 2014; Dawson et al., 2019; Edmunds & Alcaraz, 2021; Fletcher, 2008). Previous studies suggest that children's race and ethnicity, particularly among adolescents with diverse racial and ethnic backgrounds, may be associated with an increased likelihood of achieving high scores on depression scales (Butler, 2014; Das et al., 2006; Dawson et al., 2019; Edmunds & Alcaraz, 2021; Fletcher, 2008). Research has found that children's access to public or private health insurance coverage plays a key role in reducing mental health problems among adolescents (Ashiabi & O'Neal, 2007; Glied et al., 1997; Hamersma & Ye, 2021). Studies explain that having health insurance is more likely to increase the likelihood of accessing primary care and utilizing mental health care services. In terms of maternal age, prior research has shown that a younger maternal age is linked to higher depression among adolescent (Duncan et al., 2018; Fergusson & Lynskey, 1993; Fergusson & Woodward, 1999; Tearne, 2015). Research indicates that parental immaturity may affect child-rearing, particularly regarding emotional support and stability for their children, which in turn can impact children's health development. With regards to maternal race and ethnicity, scholars argue that mothers being from racial and ethnic minority background are more likely to increase depression symptoms in their children (Brooks-Gunn & Duncan, 1997; Gershoff et al., 2007; Lazarevic et al., 2020; Zarei et al., 2023). Studies suggest that parents who belong to a marginalized racial and ethnic group are more likely to experience unstable socioeconomic situations, which can lead to stressors, thereby increasing the risk of depression among children. According to previous studies (Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 2000; Kopp et al., 2023; Wille et al., 2008), maternal unemployment has been shown to be a key predictor of children's mental health. Scholars propose that economic instability such as unemployment can cause tension between parents and children, resulting in an increase of emotional problems (Berger et al., 2008; Brooks-Gunn et al., 2010; Kopp et al., 2023; Nomaguchi, 2006).

2.5. Current study

The present study examines the mediating role of neighborhood social cohesion and trust in the relationship between childhood material hardship and adolescent mental health in the U.S. Building on previous literature applying the LCHD framework and theories of neighborhood social context to assess the complex associations among childhood material hardship, neighborhood social cohesion and trust, and adolescent mental health outcomes, this study is among the first to analyze a process-oriented mechanism from socioeconomic status (SES) in childhood and mental health in adolescence in the U.S. Given the lack of findings on the indirect link from childhood material hardship to adolescent mental health, the present study provides a key contribution to our knowledge of the relationship between SES and health (Glymour et al., 2014; Heflin & Iceland, 2009) by examining the indirect pathway from material hardship through neighborhood social cohesion and trust to mental health among children. Using a mediation analysis, this study addresses two research questions. First, is material hardship at child age 3 related to depression at child age 15? Second, does neighborhood social cohesion at child age 3 mediate the relationship between material hardship and adolescent depression?

3. Method

3.1. Data source and study sample

Data from the third (age 3) and sixth (age 15) waves of the Future of Families and Child Wellbeing Study (FFCWS) were used to evaluate the association between childhood material hardship and adolescent depression with neighborhood social cohesion and trust as a mediator. The FFCWS is a population-based longitudinal study of 4,898 children born in 1998–2000 within 75 hospitals across 20 cities in the U.S. (FFCWS, 2018). The FFCWS is a representative and longitudinal sample of children and parents living in the U.S. urban areas with multistage probability sampling technique, consideration of welfare generosity policy context at state-level, and purposive oversampling of unmarried parents (Reichman et al., 2001, p. 310). As of 2023, the FFCWS data is publicly available from the first to the sixth wave. The FFCWS contains information about demographic characteristics, socioeconomic status, physical and mental health, and welfare program participation, as well as neighborhood characteristics for both parents and/or non-parental primary caregivers (FFCWS, 2018).

The present study used data from the third (interviewed in 2001–2003) and sixth (interviewed in 2014–2017) waves of the FFCWS (FFCWS, 2020). The selection of these two waves provides a chance to test a temporal causal relation between childhood material hardship, neighborhood social cohesion and trust, and adolescent mental health. This study particularly focuses on children at age 3 because the initial five years of a child's life, spanning from birth to age 5, represent critical developmental phases. During early childhood, children experience rapid physical, cognitive and socio-emotional growth, and they especially are susceptible to external stressors (Knudsen, 2004; Mazza et al., 2017). For example, the family's economic circumstances during early childhood play a crucial role in shaping not only their physical, cognitive, and emotional development but also their later outcomes when they reach adulthood (Brooks-Gunn & Duncan, 1997; Duncan et al., 2010; Engle & Black, 2008). For instance, Brooks-Gunn and Duncan's 1997 study suggests that exposure to economic precarity during early childhood can lead to poor physical health, greater likelihood of learning disabilities and developmental delays, and increased risk for emotional and behavioral problems. Thus, examining material hardship during early childhood may be more critical than in other developmental phases. Therefore, prioritizing measurement of material hardship in early childhood and considering data availability, this study selected wave 3 (child age 3). By removing missing cases across variables, 2,096 children at ages 3 and 15 were selected as an analytic sample.

3.2. Measures

3.2.1. Adolescent depression

The depression measure in the present study was an abbreviated form (5 items) based on the full 20 items from the Center for Epidemiologic Studies Depression Scale (CES-D). As mentioned previously, this short form of child depression measure has been proved as reliable and effective in terms of cross-cultural comparability (Perreira et al., 2005). Children at age 15 (wave 6) were asked whether they had ever experienced the following mental health symptoms including: 1) feeling I cannot shake off the blues, even with help, 2) feeling sad, 3) feeling unhappy, 4) feeling life is not worth living, and 5) feeling depressed. Adolescent depression responses were ordinal (1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree, 4 = strongly disagree). To

make the high scores in each question a high level of depression, those responses were reversely coded (0 = strongly disagree, 1 = somewhat disagree, 2 = somewhat agree, 3 = strongly agree). For internal consistency, the Cronbach's alpha for these items was 0.758.

3.2.2. Childhood material hardship

Childhood material hardship at age 3 (wave 3) was assessed using six indicators: 1) receiving free food or meals, 2) not paying rent or mortgage due to financial problems, 3) not paying utilities (gas, oil, electricity bills), 4) borrowing money from friends and families, 5) not buying clothes due to cost, and 6) working overtime or taking a second job. Responses to childhood material hardship were binary (1 = yes, 2 = no). For proper interpretation, those responses were recoded (1 = yes, 0 = no). The Cronbach's alpha for these items was 0.626.

3.2.3. Neighborhood social cohesion and trust

Neighborhood social cohesion and trust at age 3 (wave 3) was assessed using five indicators regarding the degree of agreement to the following statements: 1) people around here are willing to help their neighbors, 2) this is a close-knit neighborhood, 3) people in this neighborhood can be trusted, 4) people in neighborhood get along, and 5) people in neighborhood share values. Responses to neighborhood social cohesion and trust were ordinal (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree). To make the high scores in each question a high level of neighborhood social cohesion and trust, those responses were reversely coded (0 = strongly disagree, 1 = disagree, 2 = agree, 3 = strongly agree). The Cronbach's alpha for these items was 0.797.

3.2.4. Covariates

The control variables included child characteristics such as the child's sex, race and ethnicity, and health insurance coverage status, and maternal demographic factors such as the mother's age, race and ethnicity, and employment status. Child's sex was measured as a categorical variable (boy = 0; girl = 1). Child's race and ethnicity were assessed as a dummy variable (non-Latinx, White = 0; Person of color [non-Latinx, Black; Latinx; or other race] = 1). Child's health insurance coverage status was measured as a binary variable (insured by public or private health insurance = 0; uninsured by public or private health insurance = 1). Mother's age was used as a continuous variable ranging from 29 to 62. Maternal race and ethnicity were assessed as a dummy variable (non-Latinx, White = 0; Person of color [non-Latinx, Black; Latinx; or other race] = 1). Mother's employment status is evaluated as a binary variable (employed = 0; unemployed = 1).

3.3. Data analysis

In the present study, structural equation modeling (SEM) was conducted to assess the associations among childhood material hardship, neighborhood social cohesion and trust, and adolescent depression. The SEM, defined as multivariate analysis with at least one latent variable, is an advanced statistical methodology to investigate the suitability of an empirical model consisting of the complex relations between key concepts or variables based on theoretical framework that may explain the entire process suggested by the model (Hu & Bentler, 1999). Because the current study focuses on studying the path relationships between three key concepts as latent constructs, SEM is used as an appropriate statistical approach for analysis.

In terms of constructing main pathways, several assumptions were checked prior to conducting a SEM analysis. First, theoretically, assumptions about the relationships among three key latent constructs in the SEM model were checked. In general, it is acknowledged that the causality between a predictor (X) and a predicted variable (Y) can be established when the following three points are satisfied: 1) temporal precedence (i.e., X should occur before Y), 2) association (i.e., X and Y should covary), and 3) no alternative explanation (i.e., no spurious relationship by controlling potential confounding factors). The present study satisfies the first and second assumptions, while the third assumption is difficult to fully address empirically. What we can offer are both a theoretical basis for the structure of the paths we examine in this study (grounding our assumptions about the direction of relationships between key variables in established theory which is supported by empirical evidence) as well as controlling for a robust set of confounding variables. While we are convinced of the validity of our model, we certainly acknowledge that we cannot make causal claims about the relationships we examine in this study as we cannot control for all of the potential confounding factors that may affect the relationship between X and Y.

The study's analysis was conducted in two steps. First, a confirmatory factor analysis was conducted for three latent variables (childhood material hardship, neighborhood social cohesion and trust, and adolescent depression) to examine how each measurement model may be plausible. Second, the SEM was identified with sixteen variables representing three latent concepts and conducted with controlling for six variables regarding mother's and child's characteristics based on a full dataset (N = 2,096). Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) are goodness-of-fit indices to evaluate the adequacy of a particular SEM model (Hu & Bentler, 1999). Both CFI and TLI that are greater than or equal to 0.90 is used as a benchmark for adequate model fit (Bowen & Guo, 2011; Hu & Bentler, 1999). RMSEA is a measure of how the model-implied variance-covariance matrix is close to the observed matrix, with a smaller value suggesting more acceptable model fit (Bowen & Guo, 2011; Kline, 2015). The RMSEA is considered as an adequate model fit for a value below 0.08 (Bowen & Guo, 2011; Hu & Bentler, 1999). All the analyses were conducted using Stata 17.0 (StataCorp, 2021).

4. Results

4.1. Descriptive statistics

Table 1 presents descriptive statistics of mothers and their children aged 15. More than three fourths of the mothers in the sample identified as people of color (76.53%): White (23.47%), Black (51.53%), Latinx (21.71%), and other race and ethnic groups (3.29%). The average age of the mothers was 40 years old. More than one third of the mothers in the sample were employed in insecure jobs (37.60%). Nearly half of the

Table 1
Sample characteristics at adolescent age 15 (N = 2,096).

Variables	N (%)
Demographic Characteristics	
Mother's race and ethnicity	
White, non-Latinx	492 (23.47)
Black, non-Latinx	1,080 (51.53)
Latinx	455 (21.71)
Other	69 (3.29)
Mother's employment status	
Secure (Regular Work)	1,308 (62.40)
Insecure	788 (37.60)
Child's sex	
Boy	1,074 (51.24)
Girl	1,022 (48.76)
Child's race and ethnicity	
White, non-Latinx	491 (23.43)
Black, non-Latinx	1,011 (48.23)
Latinx	437 (20.85)
Other	157 (7.49)
Child's health insurance coverage	
Uninsured	90 (4.29)
Insured	2,006 (95.71)
	Mean (SD)
Mother's age	40.33 (6.02)

Note: SD=Standard Deviation. The FFCWS is representative of the U.S. urban areas (20 cities).
Source: Data from the Future of Families and Child Wellbeing Study (FFCWS), waves 3 and 6.

Table 2
Correlations, means, and standard deviations of sixteen observed variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Adolescent Depression (LV1)																
1. Felt blue	1.000															
2. Felt sad	0.346***	1.000														
3. Felt unhappy	0.238***	0.474***	1.000													
4. Felt not worth	0.242***	0.399***	0.367***	1.000												
5. Felt depressed	0.309***	0.598***	0.479***	0.439***	1.000											
Childhood Material Hardship (LV2)																
6. Food insecurity	0.009	0.049**	0.016	0.008	0.043**	1.000										
7. Not paying rent/ mortgage	0.031	0.072***	0.059***	0.058***	0.066***	0.222***	1.000									
8. Not paying utilities	0.020	0.035*	0.040*	0.006	0.044**	0.175***	0.307***	1.000								
9. Borrowing money	0.012	0.028	0.000	−0.006	0.038*	0.256***	0.304***	0.313***	1.000							
10. Not buying clothes	0.023	0.049**	0.043**	0.025	0.048**	0.192***	0.216***	0.279***	0.282***	1.000						
11. Working overtime	−0.004	−0.026	−0.030	−0.002	−0.001	0.015	0.121***	0.176***	0.163***	0.164***	1.000					
Neighborhood Cohesion & Trust (LV3)																
12. Willing to help	−0.048**	−0.018	−0.017	−0.030	−0.030	−0.052**	−0.035	−0.071***	−0.048**	−0.103***	0.003	1.000				
13. Close-knit	−0.052**	−0.033	−0.041*	−0.035	−0.031	−0.049**	−0.031	−0.084***	−0.066***	−0.104***	−0.011	0.689***	1.000			
14. Trusted	−0.087***	−0.039*	−0.061***	−0.049**	−0.079***	−0.066***	−0.036*	−0.060***	−0.061***	−0.114***	−0.026	0.597***	0.628***	1.000		
15. Getting along	−0.057***	−0.023	−0.065***	−0.017	−0.036*	−0.079***	−0.044**	−0.031	−0.028	−0.058***	−0.007	0.321***	0.337***	0.392***	1.000	
16. Sharing values	−0.074***	−0.024	−0.029	−0.018	−0.037*	−0.071***	−0.045**	−0.044**	−0.041*	−0.060***	−0.008	0.312***	0.314***	0.378***	0.497***	1.000
Mean	0.122	0.189	0.307	0.309	0.092	0.076	0.202	1.337	2.170	1.807	2.334	0.918	0.574	0.404	0.210	0.442
SD	0.327	0.392	0.461	0.462	0.289	0.265	0.401	0.655	0.773	0.898	0.887	0.828	0.764	0.640	0.534	0.722

*$p < .05$, **$p < .01$, ***$p < .001$.
Note: LV = Latent Variable.
Source: $N = 2{,}096$. Data from the FFCWS, waves 3 and 6.

children were girls (48.76%) and more than three fourths of them were people of color (76.57%): White (23.43%), Black (48.23%), Latinx (20.85%), and other race and ethnic groups (7.49%). Almost all the children were insured by either public or private health insurance (95.71%).

In addition to examining descriptive statistics, prior to the main SEM analysis, Pearson's correlations, means, and standard deviations are checked to examine the correlated structure of key variables, which serves as the basis for generating the model-implied variance-covariance matrix. Correlations among sixteen variables are displayed in Table 2.

4.2. Result from measurement model

Table 3 presents the results from the measurement model using Confirmatory Factor Analysis (CFA) with standardized factor loadings and standard errors. All the factor loadings except for one factor loading (0.262 for working overtime or taking a second job) are higher than 0.3, indicating the moderate relationship between each observed variable and each factor (Tavakol & Wetzel, 2020). The factor loadings ranged from 0.419 to 0.779 for adolescent depression; from 0.262 to 0.587 for childhood material hardship; from 0.447 to 0.825 for neighborhood social cohesion and trust. All the factor loadings were statistically significant at 0.001 level.

Prior to conducting a structural model, the rule of model identification for three measurement models was checked in this study. Each specific model should be identified by following the rule: the number of parameters estimated in the model is less than the number of data points that means p(p+1)/2 elements in the input variances-covariances matrix of p measured variables (Ullman & Bentler, 2013, p. 665; Yuan & Bentler, 2006, p. 304). The measurement model for adolescent depression used five observed variables, resulting in 15 data points (5×6/2=15). The measurement model for adolescent depression used 5 factor loadings and 5 error variances, i.e., 10 parameters. Thus, the degrees of freedom that are equal to the number of data points minus the number of parameters were 5 (=15-10). Likewise, the degrees of freedom in the measurement model for neighborhood social cohesion and trust with 5 observed variables were 5 (=5×6/2–10). The degrees of freedom in the measurement model for childhood material hardship with 6 observed variables were 9 (=6×7/2–12).

In addition, Table 3 presents the model fit statistics for the measurement model. The values are: CFI = 0.942; TLI = 0.931; RMSEA = 0.045. This indicates that the observed variables adequately reflect the meanings of the latent variables.

Table 3
Standardized factor loadings of observed variables on latent constructs.

Latent Construct	Factor Loading	S.E.
Adolescent Depression		
Feeling I cannot shake off the blues, even with help	0.419***	0.023
Feeling sad	0.764***	0.017
Feeling unhappy	0.620***	0.023
Feeling life is not worth living	0.554***	0.025
Feeling depressed	0.779***	0.019
Childhood Material Hardship		
Receiving free food/meals	0.382***	0.028
Not paying rent/mortgage due to financial problems	0.516***	0.026
Not paying utilities (gas/oil/electricity bills)	0.556***	0.025
Borrowing money from friends/families	0.587***	0.025
Not buying clothes due to cost	0.487***	0.020
Working overtime or taking a second job	0.262***	0.027
Neighborhood social cohesion and trust		
People around here are willing to help their neighbors	0.797***	0.014
This is a close-knit neighborhood	0.825***	0.013
People in neighborhood can be trusted	0.767***	0.014
People in neighborhood do get along	0.465***	0.022
People in neighborhood do share values	0.447***	0.022

Note: N = 2,096. The CFA model shows adequate fit: CFI = 0.942; TLI = 0.931; RMSEA = 0.045.
Source: Data from the FFCWS, waves 3 and 6.

Table 4
Effects of childhood material hardship on adolescent depression.

Pathways	Estimates
Direct Effect	
A. Childhood Material Hardship → Neighborhood Social Cohesion and Trust	−0.176***
B. Neighborhood Social Cohesion and Trust → Adolescent Depression	−0.059*
C. Childhood Material Hardship → Adolescent Depression	0.084*
Indirect Effect (=A×B)	
Childhood Material Hardship → Neighborhood Social Cohesion and Trust → Adolescent Depression	0.010*
Total Effect (=A×B+C)	
Childhood Material Hardship → Adolescent Depression	0.094**

*$p < .05$, **$p < .01$, ***$p < .001$.
Note: N = 2,096. The SEM model shows adequate fit: CFI = 0.900; TLI = 0.883; RMSEA = 0.045.
Source: Data from the FFCWS, waves 3 and 6.

4.3. Result from the overall structural equation model

Table 4 presents direct, indirect, and total effects of childhood material hardship on adolescent depression. The overall model shows good fit. The values are: CFI = 0.900; TLI = 0.883; RMSEA = 0.045. First, all three direct paths were statistically significant. The direct impact of childhood material hardship on neighborhood social cohesion and trust was −0.176 (p < .001); the direct impact of neighborhood social cohesion and trust on adolescent depression was −0.059 ($p < .05$); the direct impact of childhood material hardship on adolescent depression was 0.084 ($p < .05$). Second, the indirect path was statistically significant. The indirect impact of childhood material hardship on adolescent depression mediated through neighborhood social cohesion and trust was 0.010 (=−0.176×−0.059) ($p < .05$). Third, the total impact of childhood material hardship on adolescent depression was 0.094 (=0.010+0.084) ($p < .05$). These indirect and total effect sizes indicate that approximately 11% (=0.010/0.094) of the total effect associated with childhood material hardship and adolescent depression was attributed to the inclusion of the neighborhood social cohesion and trust. The overall model is visualized in Fig. 1.

5. Discussion

This study provides novel evidence suggesting that neighborhood social cohesion and trust may mediate the association between childhood material hardship and adolescent depression. This study examined the relationships among childhood material hardship, neighborhood social cohesion and trust, and adolescent depression. The findings confirmed that material hardship at child age 3 was related to higher levels of depression at age 15; this relationship was in part mediated by neighborhood social cohesion and trust. Childhood material hardship was directly associated with lower levels of neighborhood social cohesion and trust; in turn, neighborhood social cohesion and trust was associated with subsequent lower levels of depression controlling for child and maternal characteristics.

The results provide support for the four key principles of LCHD framework (Halfon et al., 2018). First, regarding the *health development* principle, the results suggest the importance of improving conditions at both the individual and neighborhood levels to which children are exposed during their early developmental stages to achieve overall good health in their adolescence. These results are consistent with previous studies (Brooks-Gunn & Duncan, 1997; Duncan et al., 2010; Evans & Kantrowitz, 2002; Linver et al., 2002). Second, the direct effect of childhood material hardship on adolescent depression supports the *unfolding* principle, suggesting that economic deprivation in early childhood may have negative impacts on adolescent health. Previous research also shows that childhood material hardship is related to psychological health later in childhood (Brooks-Gunn & Duncan, 1997;

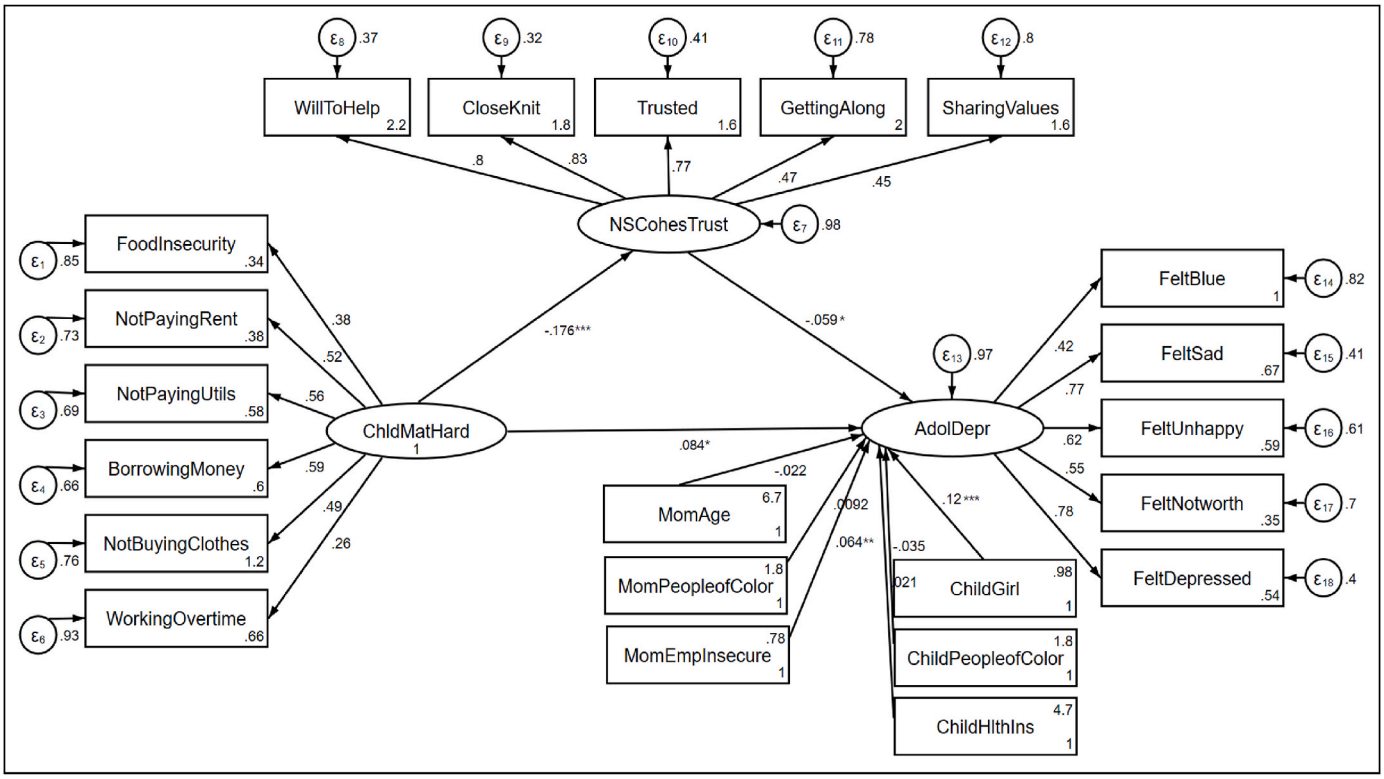

Fig. 1. Path Diagram of the Full Model.
*$p < .05$, **$p < .01$, ***$p < .001$ Note: $N = 2{,}096$. All the pathways are standardized.
Source: Data from the FFCWS, waves 3 and 6.

Edmunds & Alcaraz, 2021; Gershoff et al., 2007; Kingsbury et al., 2015; Zilanawala & Pilkauskas, 2012). Third, the finding that the relationship between childhood material hardship and adolescent depression was partially mediated by neighborhood social cohesion and trust supports the *complexity* principle. This suggests the necessity of considering neighborhood characteristics among multilevel factors to understand the link between poverty and child health. Previous studies also indicate that neighborhood characteristics, particularly neighborhood social cohesion and trust, may play a key role in reducing the effects of poverty on child health problems (Kingsbury et al., 2015; Maguire-Jack et al., 2022). Lastly, the result that material hardship at age 3 was related to higher levels of depression at age 15 supports the *timing* principle. Early childhood (from birth to age 5) is seen as a sensitive period of child development (Knudsen, 2004; Mazza et al., 2017). A family's economic precarity, particularly experienced during early childhood, may play a role in shaping children's mental health in later life (Brooks-Gunn & Duncan, 1997; Duncan et al., 2010; Edmunds & Alcaraz, 2021).

The association between neighborhood social cohesion and trust and adolescent depression is consistent with key theories of neighborhood social context (Evans & Kantrowitz, 2002; Sampson et al., 1997). Prior theoretical work suggests that lower levels of social cohesion and trust within a neighborhood can lead to increased parental stress, resulting in elevated levels of depression among adolescents (Evans & Kantrowitz, 2002; Sampson et al., 1997). This study's findings are consistent with previous work also documenting an association between neighborhood social cohesion and trust and adolescent depression (Kingsbury et al., 2015, 2020; Solmi et al., 2017). Building on this prior work, the present study examines a potential protective factor to buffer against adolescent depression and explores the mediating role that neighborhood social cohesion and trust may play between childhood material hardship and adolescent depression. In addition, the finding that childhood material hardship is linked to reduced levels of neighborhood social cohesion and trust indicates that family circumstances, particularly low SES, can push families into worsened neighborhood climates through several processes such as housing preferences or choices and subsequent residential segregation (Aneshensel & Sucoff, 1996; Bruch & Mare, 2006; Massey & Denton, 2019).

Another important finding of this study is that among control variables, the child's sex ($p < .001$) and the mother's employment status ($p < .01$) had a statistically significant relationship with adolescent depression. The finding that girls tend to exhibit more depression is consistent with previous studies (Butler, 2014; Dawson et al., 2019; Edmunds & Alcaraz, 2021; Fletcher, 2008). While there is no consensus on the reasons, recent research has suggested reasons such as the higher exposure of girls to stress and their increased vulnerability to its impact compared to boys (Morken et al., 2023). The present findings underscore the need to examine the underlying mechanisms for these established patterns in order to take effective steps toward preventive efforts to reduce depression in adolescent girls (Morken et al., 2023). Regarding the mother's employment status, the finding that maternal unstable employment status is more likely to increase adolescent depression is also consistent with prior research (Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 2000; Kopp et al., 2023; Wille et al., 2008). The finding suggests the need for policies and programs aimed at helping mothers secure and maintain stable jobs (Kopp et al., 2023; Wille et al., 2008).

This study is not without limitations. First, due to limited generalizability of the data, i.e., being representative of U.S. urban areas, the findings should be interpreted with caution and may not describe families' experiences across the U.S. or in other locations. Second, the measure of neighborhood social cohesion and trust used in this study may not be fully adequate to capture structural neighborhood advantage and disadvantage. Particularly, the self-reported nature of responses to the quality of neighbors and their network tends to be judged by respondents' own value system so that their perceptions of social cohesion and trust may be biased. While objective measures of social cohesion,

such as neighborly interaction (i.e., the frequency of greetings, visits, and conversations with neighbors) and community participation (i.e., the frequency of participation in community grassroots and volunteer organizations, as well as involvement in fitness, religion, and hobby groups) can reduce reporting bias, such measures do not transcend the inherently subjective nature of experiences of social cohesion and trust. Higher frequencies of physical interactions or in local activities may not necessarily lead to higher levels of perceived social cohesion and trust. The self-reported measure used in the present study is well-established and has been demonstrated to be reliable and consistent in previous work (e.g., Barnhart & Maguire-Jack, 2016; Hong et al., 2023; Maguire-Jack & Marçal, 2022; Maguire-Jack & Showalter, 2016; Maguire-Jack et al., 2022; McCloskey & Pei, 2019).

Third, the relationship between childhood material hardship and neighborhood social cohesion and trust is subject to concerns about reverse causation, as both measures are based on data from the same survey (age 3). Finally, the present study is unable to control for all the potential confounders that may intervene in the relationships among the three latent factors due to limitations of data availability. For example, other environmental quality factors such as inferior environmental conditions like noxious waste, air pollution, overcrowding, and noise pollution, as well as compromised physical settings like residences, schools, workplaces, and communities (e.g., peer, religious, and activity groups) may continue to influence adolescent depression (Evans & Kantrowitz, 2002).

Despite these limitations, the present study has important implications for policy and practice. The finding that neighborhood social cohesion and trust was associated with reduced levels of depression among adolescents suggests the value of interventions tailored to enhance social cohesion and trust among neighbors. This is because the neighborhood climate, as a form of structural benefit such as community resilience (Sherrieb et al., 2010) or collective efficacy (Cohen et al., 2008; Jackson et al., 2016; Sampson et al., 1997), may have effects on child health. For example, various community-based interventions can promote adolescent mental health, including volunteer programs in the community, participation in art, cultural, or sports activities, engagement in online community groups, the provision of green space, and neighborhood regeneration programs (Anderson et al., 2003; Braumüller, 2020; Breedvelt et al., 2022; Bungay & Vella-Burrows, 2013; Greene et al., 2020; Langbein & Bess, 2002; Ohmer, 2007; Wray et al., 2020). Previous studies have shown that increasing social connections through volunteering in neighborhood organizations is associated with prevention of mental health problems among adolescents (Anderson et al., 2003; Breedvelt et al., 2022; Ohmer, 2007). Participating in creative activities (e.g., music, dance, singing, art) within the community or engaging in school sports activities (e.g., varsity sports) may influence adolescent mental health by increasing a sense of belonging and cooperative behavior among groups (Bungay & Vella-Burrows, 2013; Langbein & Bess, 2002). Enhancing social interaction and building relationships with neighbors through online networks and green space can also be conducive to promoting adolescent mental health (Braumüller, 2020; Wray et al., 2020). Lastly, Greene et al. (2020) demonstrated that a neighborhood regeneration program can have a positive impact on improving mental health by increasing neighborhood social cohesion and trust.

Thus, various community-based interventions, supported by a strong coalition among policy makers, community leaders, residents, as well as medical professionals and social workers, may enhance strong ties among neighbors through the encouragement of behaviors (Anderson et al., 2003; Breedvelt et al., 2022). These coordinated efforts may contribute to creating neighborhood-level proactive detection and awareness system to prevent or reduce the occurrence and worsening of depression among adolescents in that neighborhood (Anderson et al., 2003; Breedvelt et al., 2022). Taken together, although this study could not analyze all potential means of reducing adolescent depression, the findings imply that improving neighborhood conditions through policy interventions and direct practices toward the creation of a positive neighborhood climate based on shared values and trust could contribute to reducing adolescents' adverse mental health outcomes, in particular major depressive disorder.

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