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Longitudinal Health Consequences of Childhood Adversity: The Mediating Role of Purpose in Life

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ABSTRACT

Early life adversity has long-term detrimental effects on physical health. Although biological, behavioral, and social factors have been explored as intermediate mechanisms, little research has explored psychosocial factors as potential mediators. This study examined whether purpose in life longitudinally mediates the relationship between childhood adversity and two measures of adult health. Data were obtained from 3,871 participants in the Midlife in the United States (MIDUS) study. We tested a longitudinal mediation model from childhood adversity to adult health via purpose in life, controlling for baseline measures of health. Results indicated that childhood adversity is associated with poorer adult health through direct and mediated paths. Childhood adversity may restrict individuals' sense of purpose in life, and reduced purpose in life is subsequently associated with poorer subjective health and increased likelihood of functional limitations. The findings of this study can be used to inform the development of psychosocial and therapeutic intervention programs and services for adults with a history of childhood adversity.

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Growing up under adverse circumstances has long-lasting repercussions for adult health. Substantial evidence now shows that children who experienced economic hardship or dysfunction in their home environment or who were neglected or abused are more likely to develop a wide range of negative health conditions later in adulthood (Felitti et al., 1998; Hughes et al., 2017). Although a growing body of work has explored mechanisms underlying this relationship (e.g., Nurius et al., 2019; Taylor, 2010), psychosocial resources have received little attention as potential intermediaries between early life adversity and later health. Having a sense of purpose in life is an important psychosocial resource that is associated with multiple markers of physical well-being and predicts future health and longevity (Hill & Turiano, 2014; Zilioli et al., 2015). However, early life adversity has been shown to predict a diminished sense of purpose in adulthood (Hill et al., 2018), raising the possibility that some of the long-term effects of childhood misfortune on

health might be conveyed through reduced purpose in life. The purpose of this study was to test this idea. By exploring a potential intermediary linking childhood adversity and later health outcomes, we seek to offer tangible implications for social work practice and programs to improve the health and well-being of adults with a history of childhood adversity.

Overview of childhood adversity and health

The original Adverse Child Experiences (ACE; Felitti et al., 1998) study was one of the first studies to systematically investigate the connection between childhood adversity and adult health. Over 9,000 members of a health maintenance organization completed retrospective reports of exposure to a range of adverse child experiences including physical, emotional, or sexual abuse, and various forms of household dysfunction such as substance abuse, mental illness, witnessing violence, and incarceration. There was a graded relationship between total exposure to adverse experiences and the presence of adult diagnoses including heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease. Converging evidence supports the original ACE findings (see Ehrlich et al., 2016; Hughes et al., 2017 for reviews) and it is now widely accepted that psychosocial stress during childhood and adolescence has long-term detrimental effects on adult health.

Multiple mechanisms, including psychosocial resources, have been proposed to explain how adverse childhood events might impact health decades later. Psychosocial resources refer to the skills, beliefs, and personal dispositions that people bring to stressful encounters that help them interpret difficult or stressful events as less threatening and help them to manage their responses. Resources such as optimism, sense of control or mastery, self-esteem, and social support from others have been found to buffer against psychological and physiological damage from stress (Ben-Zur & Michael, 2020; Taylor et al., 2008). They also are associated with positive outcomes such as reduced vulnerability to infection and chronic illness (Cohen et al., 2003; James et al., 2019), better self-rated health and functional status, and lower mortality (Seeman & Lewis, 1995; Shifren & Anzaldi, 2018). However, people who experience adversity during childhood are often at a disadvantage for developing these beneficial, resilient resources (Chiang et al., 2018; Repetti et al., 2002). Indeed, it has been shown that exposure to childhood adversity predicts more problematic and less supportive social networks (Repetti et al., 2007), feelings of helplessness or lack of personal control (Repetti et al., 2002) and reduced dispositional optimism (Brodhagen & Wise, 2008).

There are multiple ways to operationalize childhood adversity. Most existing assessment tools focus on household dysfunction and child maltreatment, but do not include academic or occupational difficulties (Felitti et al., 1998). Yet these types of problems are common and have significant associations with

adult cardiometabolic health and global health (Friedman et al., 2015; Kuhlman et al., 2018). Adverse events also tend to cluster, with additional exposures showing increased health impacts (Felitti et al., 1998). For this reason, this study assessed a wide range of potential adversities using more items than are typically found in other measures.

The life course perspective provides a useful framework for understanding how psychosocial resources might connect early adverse experience to health problems in later life. This perspective considers the life course as a whole, recognizing that what happens in one period of a person's life is connected to what happens in other periods of that person's life. It views life trajectories as continuous and thus posits that experiences during childhood and adolescence have the potential to shape later life psychosocial and health outcomes (Elder et al., 2003).

Purpose in life as a potential mediator

Purpose in life, defined as the sense that one's life has meaning, set goals, and a direction (Ryff, 1989), is a psychosocial resource that has important implications for health. People who feel that their life has meaning and purpose have been shown to live longer, even when controlling for a variety of potentially confounding variables (Hill & Turiano, 2014; Krause, 2009). Purpose in life has been linked with reduced risk of heart attack and stroke among older adults (Kim, Sun, Park, Kubzansky et al., 2013; Kim, Sun, Park, Peterson et al., 2013), healthier cardiovascular indicators (Ryff et al., 2004), and reduced allostatic load (Zilioli et al., 2015). In regard to behavioral aspects of health, both cross-sectional and longitudinal studies have revealed associations between life purpose and health-promoting behaviors such as preventive checkups, exercise, and relaxation (Holahan & Suzuki, 2006; Kim et al., 2014). Collectively, these findings indicate that having a sense of meaning or purpose in life is a key psychosocial resource that may help to cope with stress, slow the effects of aging, and even add years of life.

The purpose of the present study was to examine the role of diminished purpose in life as a mechanism that may sustain the harmful effects of childhood adversity. That is, if childhood misfortune predicts lower purpose in life, and lower purpose in life predicts poorer health, perhaps childhood adversity's influence on health in later life is conveyed in part by this reduction in purpose in life. Using a national longitudinal study, we tested a longitudinal mediation model linking exposure to childhood adversity with adult health outcomes via purpose in life. Based on the life course perspective and evidence reviewed above, we tested the following two hypotheses: (a) childhood adversity will be associated with poorer self-rated health and increased likelihood of functional

limitations in late adulthood, and (b) purpose in life will mediate this longitudinal association.

Method

We conducted secondary data analysis using longitudinal data obtained from the Midlife in the United States study (MIDUS; Brim et al., 2004). MIDUS is a publicly available data set, and this study was deemed exempt from institutional review by the IRB at Grove City College. Longitudinal mediational models were estimated in which the dependent variables were physical health measures, with early life adversity as the key predictor and purpose in life as the mediator.

Study sample

MIDUS I consists of a national probability sample of 7,108 English-speaking, non-institutionalized adults ranging in age from 25 to 74 when they were first assessed in 1995–1996 (Time 1; T1). Additional waves of data collection were conducted approximately 9 and 18 years later with approximately 70% of respondents participating at each subsequent wave: MIDUS 2 (T2) and MIDUS 3 (T3). A telephone interview and a self-administered questionnaire were conducted at all three time points. Our sample included 3,871 MIDUS participants who had valid data for childhood adversity (assessed at MIDUS 2) and demographic controls (assessed at MIDUS 1). Participants who did not participate in the second wave of MIDUS or who failed to complete these survey questions were more likely to be male ($\chi^2(1) = 52.02, p < .001$), more likely to identify as a minority racial status ($\chi^2(1) = 111.57, p < .001$), less likely to have completed at least some college ($\chi^2(1) = 51.98, p < .001$), and were significantly younger ($t(7106) = 6.82, p < .001$), than those who completed the survey items.

Measures

Physical health

We used two measures of physical health: self-reported physical health and functional limitations. Self-reported physical health was assessed via questionnaire at all three time points by asking participants, “Using a scale from 0 to 10 where 0 means ‘the worst possible health’ and 10 means ‘the best possible health,’ how would you rate your health these days?” Self-rated health has been consistently longitudinally linked to a range of objective health outcomes (Benyamini, 2011) and the 11-point scale used here has been specifically linked with mortality in the MIDUS data (Ferraro & Wilkinson, 2015). Functional limitations were assessed by asking

participants to indicate on a four-point scale (1 = *a lot*, 4 = *not at all*) the extent to which their health limited their basic activities of daily living. Specifically, participants were asked to note their limitations for bathing or dressing and walking one block. Scores were reverse-coded and averaged. However, the distribution of responses was zero-inflated (70% of respondents reported no limitations at T3) and highly skewed. For this reason, we collapsed all affirmative responses and treated functional limitations as a dichotomous variable (0 = *no limitations*, 1 = *some limitations*).

Purpose in life

The 7-item purpose in life subscale from the Psychological Well-Being scale (PWB; Ryff, 1989) was used to assess purpose in life. Items included: "I live life one day at a time and don't really think about the future;" "Some people wander aimlessly through life, but I am not one of them;" "I sometimes feel as if I've done all there is to do in life" (reverse scored); "I have a sense of direction and purpose in life;" "I don't have a good sense of what it is I'm trying to accomplish in life" (reverse scored); "My daily activities often seem trivial and unimportant to me" (reverse scored); "I enjoy making plans for the future and working to make them a reality." Scoring was reversed and items were summed so that higher scores reflected more positive appraisals. Cronbach's alpha for this measure was $\alpha = .74$. Composite scales were based on the mean of completed items for cases that had valid values for at least one item. Item-level missingness was less than 1% for each of these items.

Early life adversity

Early life adversity was assessed at MIDUS 2 using two sets of questions. The first set of questions asked respondents about eight life events that may have happened during their childhood or teen years, including the following: repeating a school year, being sent away from home because they did something wrong, having a parent out of a job when they wanted to be working, one or both parents drank so often it caused problems, one or both parents used drugs so often it caused problems, ever dropping out of school, ever flunking out of school, and ever being expelled or suspended from school. The second set of questions asked participants if they ever experienced any of the following events: fired from a job; parental death; parental divorce; sibling death; lost home to fire, flood, or natural disaster; physically assaulted or attacked; sexually assaulted; detention in jail or comparable institution; went on welfare; entered the armed forces. If participants indicated that an event had happened to them, it was followed by an open-ended question asking them how old they were when it occurred. Each event was counted only if it occurred before age 18, and a total childhood adversity score was computed by adding all counts across both sets of questions. This catalog of events was developed using MIDUS data and was intended to tap a wide range of possible adversities. It

has been shown to predict adult health in a dose-response manner with academic problems and abuse showing the strongest relationships with health (Friedman et al., 2015).

Control variables

Demographic variables included baseline characteristics of age (continuous), sex (0 = *male*, 1 = *female*), education (0 = *high school or less*, 1 = *some college or more*), and race (coded 0 = *white*, 1 = *other* because of the small number of minorities in the sample). We also controlled for depressed affect at T2 using the items “During two weeks in the past 12 months, when you felt sad, blue, or depressed, did you lose interest in most things? Feel more tired out or low on energy than is usual? Lose your appetite? Have more trouble falling asleep than usual? Feel down on yourself, no good, or worthless? Think a lot about death?” A total depressed affect variable was constructed by taking the total number of “yes” responses to the items (Wang et al., 2000). Finally, neuroticism was assessed at T2 by asking participants how much each of four self-descriptive adjectives (“moody,” “worrying,” “nervous,” “calm” (reverse scored)) described them using a scale ranging from 1 (*a lot*) to 4 (*not at all*) (Rossi, 2001). Scores were reversed where necessary and averaged so that higher scores reflected higher neuroticism.

Analytic strategy

In the longitudinal mediational models, childhood adversity, the key predictor, was expected to have a direct effect on T3 self-rated health and functional limitations, controlling for self-rated health and functional limitations at T1. Childhood adversity was also expected to have a negative association with purpose in life at T2. Purpose in life at T2 was expected to show significant associations with T3 self-rated health or functional limitations, controlling for health at T1. The indirect effect of childhood adversity through T2 purpose in life was expected to be significant. Each model adjusted for age, sex, education, and race by regressing all endogenous variables on these covariates. Logistic regression was used for all analyses in which functional limitations were the dependent variable. Sensitivity analyses were conducted to control for the possibility that participants’ T2 self-reports of their mental state accounted for any associations between childhood adversity and purpose in life.

We used MPLus Version 7.3 with full information maximum likelihood (FIML) estimation (Muthén & Muthén, 2013). FIML handles missing data by using all available means and intercepts to estimate each model path. Mediating effects were computed using the product of the coefficients method (MacKinnon et al., 2007) and bias-corrected 95% confidence intervals were estimated using 1,000 bootstrapped samples.

Table 1. Sample descriptive characteristics (N = 3871).

Characteristic	%	<i>M</i>	<i>SD</i>	Range
Biological sex (% female) ^a	55.4			
Education (% at least some college) ^a	65.0			
Race (% White) ^a	93.7			
Childhood adversity (% any event)	48.3			
At least some limitations at T1	11.2			
At least some limitations at T3	29.9			
Age at T1		47.37	12.43	25–75
Age at T2		56.31	12.37	34–84
Age at T3		64.17	11.42	43–93
Childhood adversity total		0.82	1.12	0–11
Purpose in life at T2		38.48	6.94	10–49
Self-rated health at T1		7.57	1.50	0–10
Self-rated health at T3		7.36	1.58	0–10

^aAssessed at T1.

Results

Sample descriptive statistics are presented in Table 1. Most participants were female, had completed at least some college, and were White. Consistent with other research using this set of adverse events with MIDUS data (Friedman et al., 2015), nearly half the sample experienced one or more adverse events. Table 2 shows bivariate correlations among study variables. Childhood adversity was significantly related to lower purpose in life, poorer health, and greater functional limitations. Purpose in life showed positive correlations with self-rated health and negative correlations with functional limitations at both time points.

Figure 1 summarizes the results of the path analysis for self-rated health. Standardized coefficients for self-rated health are presented above the paths. Childhood adversity was significantly inversely associated with purpose in life at T2, adjusting for T1 self-rated health, age, sex, education, and race, $\beta = -0.07$, $p < .001$. The path from childhood adversity to T3 self-rated health adjusting for T1 self-rated health and other covariates was not significant, $\beta = -0.034$, $p = .084$. There was a significant indirect effect of childhood adversity on self-rated health at T3 through purpose in life at T2, controlling

Table 2. Bivariate correlations among study variables.

Variables	1	2	3	4	5	6	7	8	9
1. Female	–								
2. Education	–.08***	–							
3. Race	.05**	–.02	–						
4. Age	–.02	–.11***	–.04**	–					
5. Adversity	–.05**	–.14***	.05**	–.07***	–				
6. T2 purpose	–.01	.16***	–.03	–.06***	–.10***	–			
7. T1 health	–.01	.05**	–.01	.04*	–.09***	.23***	–		
8. T3 health	–.01	.10***	–.02	–.05*	–.09***	.24***	.43***	–	
9. T1 limitations	.08***	–.15***	.07***	.07***	.06**	–.16***	–.31***	–.17***	–
10. T3 limitations	.10***	–.19***	.01	.26***	.10***	–.17***	–.25***	–.46***	.26***

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

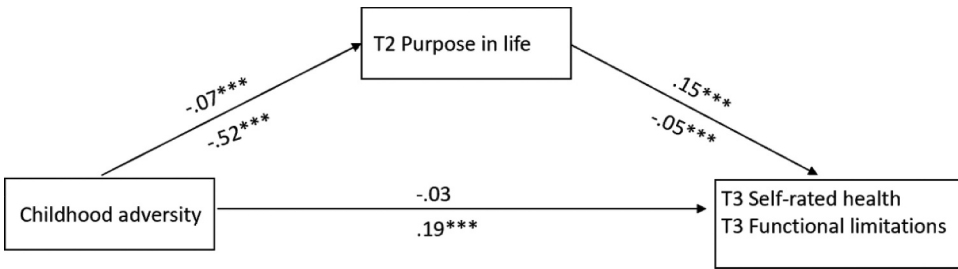


Figure 1. Path model results showing associations among childhood adversity, purpose in life, and two health outcomes. Numbers represent standardized path coefficients (β). Coefficients above the paths are for self-rated health. Coefficients on underside of paths are for functional limitations and are expressed in log odds. Additional control variables (not shown) were age, sex, education, race, and T1 self-rated health or functional limitations. * $p < .05$. ** $p < .01$. *** $p < .001$

Table 3. Summary of mediation pathways linking childhood adversity with two health outcomes through purpose in life.

Outcome: Self-rated health at T3 ^a	β	p	95% CI
Direct effect of childhood adversity	-0.034	.084	[-0.073, 0.005]
Total indirect effect of childhood adversity through T2 purpose in life	-0.011	.001	[-0.016, -0.005]
Total effect of childhood adversity	-0.045	.030	[-0.073, -0.005]
Outcome: Functional limitations at T3 ^b	β	p	95% CI
Direct effect of childhood adversity	0.189	.001	[0.106, 0.272]
Total indirect effect of childhood adversity through T2 purpose in life	0.026	.001	[0.013, 0.039]
Total effect of childhood adversity	0.215	.001	[0.131, 0.300]

Estimates are standardized coefficients. Coefficients for functional limitations are expressed in log odds. ^aCovariates include age, sex, education, race, and self-rated health at T1. ^bCovariates include age, sex, education, race, and functional limitations at T1.

for health at T1 and other covariates, $\beta = -0.010$, $p < .001$, 95% CI (-0.016, -0.005). Table 3 provides a summary of direct and indirect effects.

To address the possibility that the participants' T2 self-reports of their childhood adversity and purpose in life might be confounded by depressed affect or a pessimistic outlook, we refit the model adding depressed affect and neuroticism as covariates. The path between childhood adversity and purpose in life remained significant $\beta = -0.035$, $p = .025$, and the direct effect from childhood adversity to T3 health remained nonsignificant, $\beta = -0.022$, $p = .239$. The indirect effect from childhood adversity to self-rated health at T3 via purpose in life at T2 was significant, $\beta = -0.004$, $p = .038$, 95% CI (-0.008, 0.000).

Figure 1 presents results of the path analysis for functional limitations, with standardized coefficients presented on the underside of each path. Paths that terminate at T3 functional limitations are expressed in log odds. Childhood adversity was significantly inversely associated with purpose in life at T2, adjusting for T1 functional limitations, age, sex, education, and race, $\beta = -0.52$, $p = .001$. Childhood adversity showed a significant positive association with functional limitations at T3, adjusting for T1 functional limitations and other covariates, $\beta = 0.189$, $p < .001$. Furthermore, the indirect effect of childhood adversity on functional limitations at T3 via purpose in life at T2

was significant, $\beta = 0.026$, $p < .001$, 95% CI (0.013, 0.039). A summary of direct and indirect effects is presented in [Table 3](#).

To control for possible confounding effects of mental state on the participants' self-reports at T2, we refit the model including depressed affect and neuroticism. The path from childhood adversity to T2 purpose in life remained significant, $\beta = -0.263$, $p = .005$, and the path from childhood adversity to T3 functional limitations was also significant, $\beta = 0.189$, $p < .001$. The indirect effect from childhood adversity to functional limitations at T3 through purpose in life at T2 remained significant, $\beta = 0.013$, $p = .010$, 95% CI (0.003, 0.024).

Discussion

Based on the life course perspective and previous research, this study investigated the associations between a history of childhood adversity and health in mid to late life. We also examined the mediational role of purpose in life between childhood adversity and later life health.

Based on previous work in this area, we expected that retrospective reports of childhood adversity would be associated with poorer self-rated health and increased functional limitations in late adulthood. Although the bivariate correlation between early life adversity and T3 self-rated health was significant, this relationship was no longer significant when controlling for previous health ratings and other covariates. As expected, the association between adversity and T3 functional limitations was significant even after controlling for previous levels of limitations and other covariates. Effect sizes for the direct relationships between early adversity and later life health were small. Namely, each additional standard deviation unit of exposure to adversity during childhood and adolescence was associated with changes in self-rated health and log odds of functional limitations that were less than one-tenth of a standard deviation unit. These small effect sizes may highlight that exposure to childhood adversity does not deterministically lead to an adulthood marked by poor health and functional limitations. The life course perspective posits continuity, not immutability, across the lifespan, and there is room for individuals to make choices and exercise agency that will enhance (or worsen) their own health (Elder, 1994). As prior studies suggest, the availability and use of intermediaries, such as psychological resources, positive health behaviors, or education attainment can mitigate the long-term health effects of childhood adversity (Montez & Hayward, 2014; Nurius et al., 2019; Taylor et al., 2008).

Our second hypothesis was also supported: purpose in life significantly mediated the association between adverse child experiences and later life health outcomes and this indirect association remained significant when controlling for depressed affect and neuroticism. Consistent with previous research, people who experienced early life adversity tended to report reduced

purpose in life, and lower purpose in life was ultimately associated with poorer health. These relationships persisted even when controlling for mental state at the time that purpose in life and childhood adversity were assessed. Given the myriad benefits of purpose in life, our results suggest that people who experienced childhood adversity may lack other subtle but potentially health-protective beliefs and behaviors that may be influenced by purpose in life. For example, there is evidence that having strong purpose in life leads people to feel more in charge of their health (Zilioli et al., 2015), which in turn has been linked with health-promoting behavior (Steptoe & Wardle, 2001) and reduced allostatic load (Zilioli et al., 2015). Presumably there are multiple paths linking purpose in life to physical health and consistent with the life course perspective, the accumulation of small effects can add up to measurable differences in health by later life.

Given the health benefits of purpose in life, a central question is whether a sense of purpose in life can be further cultivated and promoted. While most therapeutic interventions attempt to reduce distressing symptoms, well-being therapy (WBT) is a therapeutic approach that attempts to maximize positive psychological assets (Fava et al., 1998). When used in a clinical setting in combination with standard cognitive behavioral treatments, WBT has been shown to produce increases in purpose in life and other dimensions of psychological well-being, as well as better clinical outcomes (Fava et al., 2004). Another targeted intervention is the Lighten Up! Program, a community-based group intervention intended to promote psychological well-being in older adults (Friedman, et al., 2017). The focus of the program is teaching participants to identify and savor positive life experiences through self-observation, journaling, psychoeducation, and cognitive behavioral strategies. Preliminary results showed that at the end of the 8-week program, participants reported significant increases in well-being, including purpose in life. Because the study did not include a control group, additional research is needed to confirm that the program itself produced the positive changes; nevertheless, the study demonstrated that purpose in life is indeed modifiable.

Such interventions might be particularly beneficial relatively early in the life span. Theoretically, establishing a purpose in life begins during adolescence and continues into emerging adulthood as part of the young person's striving to establish autonomy and a mature identity (Arnett, 2000; Erikson, 1968; Hill et al., 2013). Research has confirmed that youth do engage in purpose exploration as part of their broader search for personal identity, and that young people who have discerned a purpose report feeling happier, have higher academic self-concepts, and are less vulnerable to common adolescent risks such as underage drinking, drug use, and depression (Dukes & Lorch, 1989; Hill et al., 2013). However, young adults with a history of adversity may lack personal and material resources for exploring their identity and concomitant purpose

in life, suggesting that it is crucial to provide opportunities for empowerment and personal growth for this age group.

This study has several limitations. First, the items measuring childhood adversity were based on retrospective reports which are vulnerable to the fallibility of human memory. However, some scholars have argued that retrospective reports are sufficiently valid to be used for research purposes, and evidence suggests that under-reporting is more common than over-reporting (Hardt & Rutter, 2004). Our model is subject to error, as not all possible confounds were included in the model. In addition, a single-item measure of self-rated health may lack robustness; however, it is one of the most widely used measures of perceived current health status (Benyamini, 2011). Another limitation involves attrition, as participants included in our sample were more likely to be White, female, older, and to have completed more education than those who did not complete the measures used in this study. Lastly, the MIDUS is largely representative of White Americans; thus, our results may not be generalizable to racial and ethnic minorities whose sense of purpose in life may work differently in how early adversity affects long-term health. Future research should investigate whether and how race and ethnicity plays a role in utilization of psychosocial resources, such as purpose in life.

Despite these limitations, the current study makes a significant contribution to the extant literature. Previous work has shown that early life adversity predicts both purpose in life and physical health in adulthood (Ehrlich et al., 2016; Hill et al., 2018) and that purpose in life predicts subsequent health (Krause, 2009). Thus, the present study connects these previous findings in a meaningful way and adds to the substantial body of work that has identified pathways linking early psychosocial stress with later health. This study also suggests directions for future research and social work practice. Given the links between psychosocial resources and health, it is important to explore other psychosocial resources that may mediate the path between childhood adversity and adult physical health. In addition to extending our understanding of how early psychosocial stress jeopardizes later health, such research would suggest additional areas for intervention. Individually, each psychosocial resource may have only a small association with health but targeting multiple psychosocial resources within one intervention may produce greater resilience. Consistent with this idea, social workers should strive to help adults with a history of adversity connect with programs that might foster their psychosocial resources. Future research should continue to develop effective programs that support individuals with a history of adversity and promote their resilience. Finally, it is important to increase public awareness about the potential impact of childhood adversity on individuals across the life course so that broader social settings, such as organizations or local communities, can incorporate trauma-sensitive practices (e.g., trauma-informed community

building; Weinstein et al., 2014).

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