Early Life Adversity and Adult Health

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Abstract

Research shows that early life adversity can have implications for a range of health outcomes later in life. Specifically, childhood experiences such as socioeconomic disadvantage, parental maltreatment, and parent divorce or death have been linked to outcomes such as cardiovascular disease, diabetes, cancer, and mortality. Recently, however, research has focused increasingly on what factors can protect against these poor health outcomes and what promotes resilience, despite early life adversity. The present chapter reviews the research linking early life adversity to health, with a particular focus on highlighting what psychosocial factors have been found to protect individuals' health, even in the face of early life adversity. Such protective factors include social and relational factors, such as maternal nurturance, as well as beliefs and coping strategies. The chapter concludes by suggesting areas of future research, including additional investigation of what psychosocial factors protect health and how they might interact to do so, and how early life adversity might affect adult health across different social and cultural groups and throughout the lifespan.

Introduction

A large body of literature suggests that psychosocial stress in early childhood has implications for a range of health outcomes later in life (Miller, Chen, & Parker, 2011; Repetti, Taylor, & Seeman, 2002; Shonkoff, Boyce, & McEwen, 2009; Wegman & Stetler, 2009). Growing up in lower socioeconomic status (SES) environments, being mistreated in childhood, or experiencing other types of childhood adversity increases one's risk for a range of chronic diseases of aging and earlier mortality. Previous literature has demonstrated that these associations can be explained in part by a number of factors, including biological programming of proinflammatory tendencies and hormone dysregulation that are initiated during childhood, unhealthy behaviors, and reduced physical and psychosocial resources, among others (Braveman & Barclay, 2009; Danese & McEwen, 2012; Repetti, Robles, & Reynolds, 2011; Shonkoff & Garner, 2012; Taylor, 2010). Recently, however, research has focused increasingly on what factors can protect those who experience early life adversity from poor health outcomes (Chen & Miller, 2012).

The present chapter reviews the literature on the association between early life adversity and adult health outcomes, focusing in particular on the psychosocial factors that may protect the health of people who have experienced adversity in early life. We begin by reviewing the literature on early life adversity and adult health, which shows that people who have grown up in lower SES environments, people who have experienced abuse as children, and others who have experienced adversity have a range of poor health outcomes, including greater risk for cardiovascular disease, cancer, type 2 diabetes, and morality. We then briefly review some mechanisms underlying this

association. Next, we review research showing what psychosocial factors might buffer people who have experienced adversity against poor health outcomes. These include social relationships, especially a warm family environment and maternal nurturance, as well as certain strategies for coping with adversity. We conclude by outlining directions for future research. Throughout the chapter, we focus primarily, although not exclusively, on studies from the Midlife in the U.S. study (MIDUS). Because MIDUS assesses a wide range of psychosocial factors, including multiple types of early life adversity, and includes biomarker data, it is well positioned to illuminate multiple factors that contribute to or mitigate the associations between early life adversity and later life health.

Background Literature on Early Life Adversity and Adult Health

A robust association between early life adversity and adult health has been found across a range of types of adversity and health outcomes. With respect to self-reported outcomes, research using samples of adults in MIDUS, other samples of healthy middle aged adults, and healthy children shows that people who have experienced different types of adversities in childhood, including poverty and other economic difficulties, exposure to violence, and frequent moves all rate their overall health as worse in adulthood (Boynton-Jarrett, Ryan, Berkman, & Wright, 2008; Bures, 2003; Greenfield & Marks, 2009a; Laaksonen, Rahkonen, Martikainen, & Lahelma, 2004). Research using MIDUS further shows that adversity in early life also predicts later self-reported functional limitations, such as difficulty climbing up a flight of stairs, and a higher number of acute symptoms and chronic conditions in adulthood (Greenfield & Marks, 2009a; Maier & Lachman, 2000).

Similar early life experiences have also been linked to physiological measures, such a metabolic syndrome, allostatic load, and inflammation, that indicate heightened risk for a number of chronic diseases of aging. For example, research from MIDUS shows that people who grow up in lower SES environments are more likely to develop metabolic syndrome in adulthood (Miller, Lachman, Chen, Gruenewald, Karlamangla, & Seeman, 2011). This is a cluster of symptoms, defined by the International Diabetes Federation as including abdominal obesity, as well as elevated blood pressure, elevated triglycerides, elevated fasting glucose, and low high-density lipoprotein levels (Cornier et al., 2008), that is associated with risk for cardiovascular disease, type 2 diabetes, and all-cause mortality (Cornier et al., 2008; Ford, 2005; Lakka et al., 2002). A similar association has been documented in MIDUS between self-reported abuse in childhood and metabolic syndrome in adulthood (Lee, Tsenkova, & Carr, 2014). MIDUS data also show that people who have experienced SES disadvantage or other stressors (e.g., parental death, divorce, or abuse) in early life are at greater risk for developing higher levels of allostatic load, or the dysregulation that develops across multiple systems as the result of repeated attempts to maintain allostatis in the face of ongoing stress (Friedman, Karlamangla, Gruenewald, & Seeman, 2015; Gruenewald et al., 2012). Allostatic load, in turn, has been linked to conditions such as hypertension, obesity, diabetes, and cardiovascular disease (Juster et al., 2010; Seeman, Epel, Gruenewald, Karlamangla, & McEwen, 2010; Seeman et al., 2001). Finally, early life adversity has been linked to higher levels of inflammation in adults in MIDUS (Hostinar, Lachman, Mroczek, Seeman, & Miller, 2015; Slopen et al., 2010), with inflammatory markers in turn

predicting risk for cardiovascular disease and other chronic diseases of aging (Ridker, Hennekens, Buring, & Rifai, 2000; Ridker, Rifai, Stampfer, & Hennekens, 2000).

As these associations between early life adversity and physiological risk suggest, early life adversity is further associated with risk for the development of chronic diseases of aging and, ultimately, mortality. Studies using MIDUS (Friedman, Montez, Sheehan, Guenewald, & Seeman, 2015) and other data (Dong et al., 2004) show that experiencing a greater number of different types of adverse events in childhood predicts cardiovascular disease in adulthood. Early life adversity has similarly been linked to cancer. For instance, a study of Jewish Israelis who emigrated from Europe after World War II (i.e., had potentially been exposed to the Holocaust) were found to have higher rates of cancer than those who left earlier (Keinan-Boker, Vin-Raviv, Liphshitz, Linn, & Barchana, 2009). Abuse in childhood also predicts cancer occurrence in adult MIDUS participants (Morton, Schafer, & Ferraro, 2012). Finally, as this heightened risk for diseases such as cardiovascular disease and cancer might suggest, different types of early life adversity have also been linked to mortality. Research using MIDUS data has found that women who report being abused in childhood have higher rates of all-cause mortality, even controlling for depression (Chen, Turiano, Mroczek, & Miller, 2016). Research using other data has also linked higher mortality rates to lower childhood SES (Galobardes et al., 2004) and to experiencing a higher number of list of adverse events in childhood (Kelly-Irving et al., 2013).

Mechanisms: MIDUS Advances on Health Behaviors and Psychological Resources

Research, including work using MIDUS, has shed light on some of the psychosocial and behavioral mechanisms through which early life adversity might give

rise to poor health in adulthood. While there are a number of biological and psychosocial mechanisms thought to underlie the association between early life adversity and adult health, we focus here on psychosocial factors that have been highlighted by research with MIDUS, namely health behaviors and psychological resources.

Early life adversity is associated with a number of unhealthy behaviors in adulthood, multiple studies using MIDUS data show. For example, those who experience physical abuse in childhood are more likely to smoke regularly as adults and also to smoke for a longer period of time, which partially explains their greater incidence of respiratory disease (Goodwin & Wamboldt, 2012; Taha, Galea, Hien, Goodwin, 2014). Having experienced psychological and physical violence in childhood is also linked to a greater likelihood of using food to cope with stress (Greenfield & Marks, 2009b). In turn, this way of coping with stress has been linked to the consumption of high fat and high sugar foods, obesity, and poor health in samples of healthy adults (i.e., medical students, and adults from community who came into the lab; Epel et al., 2004; Oliver et al., 2000; Tsenkova, Boylan, & Ryff, 2012). Use of food to cope with stress also explains part of the association between childhood violence and obesity in adulthood (Greenfield & Marks, 2009b). Finally, childhood socioeconomic disadvantage and other adverse childhood experiences predict decreased physical activity in adulthood, which is one of the mediators of the relationship between early childhood adversity and adverse outcomes such as higher levels of inflammation and diabetes in adulthood (Hostinar et al., 2015; Tsenkova, Pudrovska, & Karlamangla, 2014).

In addition to unhealthy behaviors, research using MIDUS shows that early life adversity has been linked to psychological states that give rise to poor health in

adulthood. The majority of this work with MIDUS has focused on the role of psychological well-being. For example, research using MIDUS data shows that early life adversity can increase one's risk for depressive symptoms, negative affective states, or other indices of lower psychological well-being in adulthood. Specifically, people experiencing adversities in childhood such as parental divorce or having parents who used authoritarian (high demands and low responsiveness), rather than authoritative (more reasonable demands and high responsiveness) styles of parenting, report more depressive symptoms as adults (Maier & Lachman, 2000; Rothrauff, Cooney & An, 2009; Uphold-Carrier & Utz, 2012). Furthermore, people who experienced abuse as children have higher levels of distress, including depression and anxiety, as adults (Schrepf, Markon, & Lutgendorf, 2014). Childhood psychological violence and lower quality parental relationships predict lower frequency of positive affect and higher frequency of negative affect in adulthood (Greenfield & Marks, 2010b; Mallers, Charles, Neupert, & Almeida, 2010). Finally, people who experienced a lack of affection and support from parents or abuse from parents in childhood have lower levels of eudaimonic psychological well-being—that is, a sense a meaning or self-realization—as adults (An & Cooney, 2006; Greenfield & Marks, 2010a). All of these negative psychological states are, in turn, linked to worse physiological and health outcomes, such as higher levels of inflammation and increased risk of cardiovascular disease in MIDUS and other samples of healthy adults (Friedman, Singer, & Hayney, 2007; Kubzanksy & Kawachi, 2000; Pressman & Cohen, 2005; Ryff, Singer, & Love, 2004; Schrepf, Markon, & Lutgendorf, 2014).

Moderators: Social Relationships

Although early life adversity increases one's risk for poor health in adulthood, not everyone who experiences adversity in childhood gets sick. Recent research has focused on identifying protective factors that help to buffer against the health risk of early life adversity. We review two types of buffers that research using MIDUS, as well as other samples, has identified: (1) social relationships and (2) individual psychological traits that help people to cope with adversity. See Figure 1.

A large body of literature highlights the role that positive social relationships and support can play in fostering good health outcomes (see Cohen, 2004; Uchino, Cacioppo, & Kiecolt-Glaser, 1996 for reviews). For children who experience adversity, one type of social relationship that has the potential to play an especially important role in protecting health down the line is a positive and supportive family environment. In particular, research has focused on nurturant parenting, especially from mothers. Nurturing parents who are warm and sensitive have been shown to provide a variety of educational and psychological advantages to children who experience adversity (see Luthar, 2006; Masten, 2001 for reviews). For example, having nurturant parents helps children to feel that the world is a safe place and helps them to develop adaptive emotion-regulation strategies (see Cassidy & Shaver, 2008; Repetti, Taylor, & Seeman, 2002 for reviews). Building on the work highlighting such psychological benefits, a number of studies have investigated the role that nurturant parenting can play in protecting the health of those who experience adversity in early life.

With its national sample and depth and breadth of psychosocial variables, in addition to biological and health data, MIDUS is especially well positioned to help researchers identify what social relationship factors buffer against the deleterious health

implications of early life adversity. Accordingly, researchers have used MIDUS data to explore family relationships—and especially, relationships with parents—as one pathway to resilience in the wake of early life adversities such as lower early life SES and physical and emotional abuse in childhood. With regard to early life SES, one study using MIDUS data investigated whether parental nurturance might play a role in protecting the health of those who grew up in lower SES environments (Miller, Lachman, Chen, Gruenewald, Karlamangla, & Seeman, 2011). These authors used participants from the MIDUS biomarker sample, a subset of over a thousand MIDUS participants who travelled to a General Clinical Research Center for an overnight visit and from whom biomarker data were collected. Consistent with previous research, participants' childhood SES (here, their parents' level of educational attainment) was related to participants' metabolic syndrome symptoms. As noted above, this is a cluster of symptoms (abdominal obesity, as well as elevated blood pressure, elevated triglycerides, elevated fasting glucose, and low high-density lipoprotein levels; Cornier et al., 2008), that is associated with risk for developing cardiovascular disease, type 2 diabetes, and all-cause mortality (Cornier et al., 2008; Ford, 2005; Lakka et al., 2002). However, this association was moderated by participants' relationships with their parents. Although people whose parents had lower levels of educational attainment had a higher number of metabolic syndrome symptoms overall, this effect was less pronounced among those who reported that their mothers had been more nurturing (e.g., understood their problems and worries, gave them attention when they needed it). Indeed, among those with the most nurturing mothers, there was no relationship between early life SES and metabolic syndrome. Such a buffering effect did not emerge for paternal nurturance, which the authors suggest may result from the adults

in MIDUS largely being of a generation when mothers, rather than fathers, were largely responsible for childrearing.

These findings are consistent with other non-MIDUS data showing that positive relationships with family members can protect children from the negative physiological correlates of early life SES. For example, in samples of middle school children and healthy adults from the community, maternal warmth has been found to protect children who grew up in lower SES environments against higher levels of allostatic load and pro-inflammatory profiles that would typically be characteristic of this group (Chen, Miller, Kobor, & Cole, 2011; Evans, Kim, Ting, Tesher, & Shannis, 2007). Experimental evidence lends support to the idea that better relationships with parents play a causal role in protecting children biologically when they experience adversity. Among a sample of African Americans in the rural southern United States who were largely from lower SES families, those who were randomly assigned to a parenting intervention that taught nurturant-involved parenting skills had children who displayed lower levels of low-grade inflammation 8 years later compared to those who were in a control group (Miller, Brody, Yu, & Chen, 2014).

Positive parental relationships during childhood can buffer against the negative health consequences of emotional and physical abuse in childhood as well. In a study using MIDUS participants, Schafer, Morton, and Ferraro (2014) found that, although people who had been abused in childhood had worse self-reported health, more frequent physical symptoms, and a higher number of chronic conditions in adulthood, this relationship was attenuated when they also rated their relationship with both parents as being “good,” “very good” or “excellent” overall when they were growing up. The

authors suggest that these findings may emerge because the children who had positive relationships with their parents are able to use those relationships as a foundation to forgive or reconcile with their parents as they grow older.

These results are consistent with other non-MIDUS research showing that, although having a harsh relationship with one parent is typically associated with declines in self-rated health over time among adolescents, this relationship is attenuated among adolescents (i.e., 7th graders who were part of a larger study on economic hardship and health) who have a warm relationship with the other parent (Schofield, Conger, Gonzales, & Merrick, 2016). A similar pattern emerges with physiological outcomes. Research using adult participants in the Coronary Artery Risk Development in Young Adults (CARDIA) study further shows that abuse in childhood predicts levels of allostatic load among people whose parents were less warm and affectionate, but not among those whose parents were more warm and affectionate (Carroll et al., 2013). Again, experimental evidence suggests that improving parenting can play a causal role in ameliorating the physiological outcomes of children who have experienced mistreatment. For example, teaching parenting skills to foster parents results in greater declines in daily cortisol levels among children who have been mistreated (Fisher, Gunnar, Chamberlain, & Reid, 2000). Thus, across multiple types of early life adversity, positive relationships with one's parents consistently emerge as a protective factor for physiological and health outcomes across the lifecourse.

Although the MIDUS research on relationships that can buffer children against childhood adversity has focused on parental relationships, some additional studies use other data to show that a wider range of types of social connection, including those with

peers, adults outside the home, or the community more broadly, can have a similarly protective effect. For example, one study of African American youth in the rural southern U.S. has shown that emotional support—defined broadly as a composite of emotional support from parents, peers, and other adult mentors—can buffer against the physiological correlates of childhood socioeconomic adversity (Brody, Lei, Chen, & Miller, 2014). Specifically, these authors examined allostatic load levels at age 19 as a function of changes in neighborhood poverty across adolescence. Allostatic load was higher among individuals who lived in progressively poorer neighborhoods throughout their adolescence, relative to those who lived in neighborhoods with consistent levels of poverty or who shifted from neighborhoods with higher poverty to neighborhoods with lower poverty. However, even among those who lived in progressively poorer neighborhoods, emotional support played a buffering role. Increasing neighborhood poverty from childhood to adolescence was associated with greater allostatic load among those who had lower levels of emotional support from parents, peers and other mentors, but not among those who had higher levels of emotional support. In addition, another study found that supportive role models, or adult figures whom the children admires and wishes to emulate or whom the child sees as providing support, can protect lower SES children against poor physiological outcomes (Chen, Lee, Cavey, & Ho, 2013). Specifically, among children who do not have supportive role models, lower SES (family savings) predicted higher levels of the pro-inflammatory cytokine IL-6. However, when lower SES children identified a supportive role model, their IL-6 levels were comparable to those of their higher SES counterparts.

Similarly, neighborhood social relationships can also protect the health of children who experience adversity. Specifically, the social capital of the community in which a child lives—for example, the extent to which parents and their children can trust others in the community and are integrated into the community—can buffer against the effects of childhood adversity. Another study, again using data other than MIDUS, found that children in families with lower incomes were more likely to smoke and had a higher BMI when they lived in communities with lower levels of social capital, which was defined here as a less cohesive community, a community where adults were less likely to intervene to protect children, and a community where children had less supportive relationships with adults. However, among children living in communities with high social capital, having lower family income did not increase the likelihood of the child smoking or having a high BMI (Evans & Kutcher, 2011). Similarly, research suggests that children whose families live in poverty are more likely to smoke if they live in communities where people do not know each other, where parents are not involved in school and community organizations, and where children are not involved in athletics. However, the link between poverty and smoking is weaker among children who live in communities that did have such resources (Thorlindsson, Valdimarsdottir, & Hrafn, 2012). Finally, research using a non-MIDUS community sample shows that that social trust, or the belief that others in the community are reliable, reduces metabolic risk among adults who grew up in lower SES circumstances (Hostinar, Ross, Chen, & Miller, 2016).

Moderators: Individual Psychological Traits

The majority of research on factors that protect against the negative health consequences of early life adversity has focused on relational factors. This includes research on this topic using MIDUS data. However, a smaller literature has begun to highlight the role that individual psychological traits, such as beliefs or strategies for coping with adversity, might also play in protecting the health of those who have experienced adversity in childhood. One example of such an individual trait that has received particular attention is a coping strategy known as "shift-and-persist" (Chen & Miller, 2012). This set of beliefs, which involves both (1) shifting or accepting stressors and as a result, adjusting the self to the environment and (2) persisting or enduring and finding meaning or optimism despite adversity, has been found to protect the health of lower SES children. Below, we review research from MIDUS and other samples that highlights the protective role of shift-and-persist beliefs, along with research other individual traits that might also protect the health of those who experienced early life adversity.

Shift-and Persist Coping Strategies

Across multiple studies, Chen and colleagues (Chen, Strunk, Trethewey, Schreier, Maharaj, & Miller, 2011; Chen & Miller, 2012) have identified shift-and-persist coping strategies as protective for the health of lower SES children. The theory underlying these findings relies on the understanding that lower SES environments tend to have particular characteristics. Thus, the traits that allow children to cope effectively with the stressors that they are likely to encounter in such environments will be most effective at promoting resilience. Lower SES environments tend to be characterized by frequent, recurring, uncontrollable stressors (Brady & Matthews, 2002). Lower SES families also often face

many competing demands and have limited material resources to deal with them. They are also likely to live in neighborhoods with higher rates of violence (Buka, Stichick, Birdthistle, & Earls, 2001). In such environments, where it is often not possible to influence or change the situation, it can be beneficial to shift, or adjust oneself to the stressors. This can entail cognitive reappraisal of stressful situations or the use of other self-regulation strategies that involve changing one's interpretation of or response to the situation. At the same time, shifting does not entail giving up or losing hope for the future. Consistent with the trauma resilience literature showing that meaning and optimism can help people adapt to difficult experiences (Bonanno, 2004; Dunkel Schetter & Dolbier, 2011), the shift-and-persist model suggests that, in addition to shifting, it is adaptive to persist, or maintain a focus on long-term goals by finding meaning in life and maintaining optimism about the future.

Research using samples of children from the community and adults from MIDUS supports the idea that shift-and-persist strategies are physiologically protective for people from lower SES backgrounds. For example, shift-and-persist strategies have been shown to protect healthy lower SES children against a higher body mass index and higher levels of inflammation, and lower SES children with asthma against heightened asthma-relevant inflammatory markers (Chen, Strunk, Trethewey, Schreier, Maharaj, & Miller, 2011; Chen, McLean, & Miller, 2015; Kallem et al., 2013). The same protective effect does not emerge for higher SES children. In addition, research using MIDUS participants found that, among those who grew up lower in SES circumstances, there was a significant 2-way interaction of shift by persist in predicting allostatic load. In contrast, no such interaction emerged among those who grew up high in SES (Chen et al., 2012).

Other Individual Characteristics

There is relatively little research on other individual-level characteristics besides shift-and-persist strategies that might protect people who have experienced *early* life adversity in particular. However, a number of studies using data from MIDUS show that other individual psychological characteristics might protect the health of those who are lower SES *in adulthood*. For example, among lower SES adults in MIDUS, a higher sense of control is linked to better self-rated health, fewer acute symptoms and functional limitations, as well as to lower morality rates (Lachman & Weaver, 1998; Turiano et al., 2014). In addition, higher psychological well-being buffers individuals with lower levels of educational attainment against high levels of IL-6 (Morozink, Friedman, Coe, & Ryff, 2010; see Boylan, Coe, & Ryff, this volume). These characteristics, such as sense of control and psychological well-being, might be similarly protective for people who experience adversity in early. We explore such possibilities in more detail in the Future Directions section below.

Future Directions and Conclusions

The research reviewed in this chapter highlights what research has already shown promotes resilience in terms of adult health among people who experience adversity in early life. This chapter also shows that there are many potentially fruitful areas for future research. We conclude by outlining additional questions that could be explored. Given that MIDUS is a large national sample that tracks a range of psychosocial and biological measures over time, it is especially well-suited to studying questions about how early life adversity shapes the outcomes of diverse groups of people over time. Potential future research questions include: (1) the investigation of additional traits that are likely to

protect children experiencing adversity; (2) investigation of how buffers against the negative health effects of early life adversity might affect people differently, depending on their social or cultural backgrounds or on genetic factors; (3) investigating how multiple psychosocial buffers of early life adversity might work together to protect health; and (4) tracking individuals who have experienced early life adversity to assess health trajectories over time.

Other Protective Characteristics

As noted above, there are additional psychological traits that might protect the health of people who have experienced adversity in early life but whose potential buffering effects have not yet been tested. Two examples are sense of control and psychological well-being. With respect to sense of control, while this construct has not been linked to better health among people experiencing early life adversity, a number of studies using data from MIDUS show that sense of control can be protective for those who are lower SES in adulthood. For example, personal mastery, or the view that one has the ability to achieve one's goals, attenuates the relationship between income and self-rated health and acute symptoms (e.g., backaches, sleep difficulties; Lachman & Weaver, 1998). Perceived constraints, or the view that obstacles beyond one's control interfere with one's ability to achieve goals, play a similar role. Lack of perceived constraints buffers low-income individuals against the functional limitations (e.g., health limiting ability to carry groceries or walk more than a mile) that are typically associated with adversity (Lachman & Weaver, 1998). Similarly, although people with lower levels of educational attainment are likely to die younger, research using MIDUS data shows that a strong sense of control buffers against this effect of lower levels of educational

attainment on mortality (Turiano et al., 2014). Future research or other samples might test whether people who have experienced adversity in early life but who have a high sense of control in adulthood also have better health.

Another individual psychological trait that is likely to protect the health of those who experienced adversity in early life is psychological well-being, which generally encompasses a variety of positive psychological states or the lack of negative psychological states. This can be measured in a variety of different ways, including lack of depression or negative affect, happiness or positive affect (hedonic well-being), or meaning in life and self-realization (eudaimonic well-being; Ryan & Deci, 2001; Ryff, 1989; Ryff & Keyes, 1995). While, again, no research that we are aware of has specifically explored whether psychological well-being protects against early life adversity in particular, there is evidence that it can buffer against adversity in adulthood. Using MIDUS, Morozink and colleagues found that lack of depression, positive affect, environmental mastery, positive relations with others, purpose in life, and self-acceptance all buffered individuals with lower levels of educational attainment against high levels of IL-6 (Morozink, Friedman, Coe, & Ryff, 2010; see Boylan, Coe, & Ryff, this volume). In fact, in many cases, the individuals with less education who had high levels of psychological well-being had levels of IL-6 that were comparable to those with more education. Future research with MIDUS or other samples could test whether people who have experienced adversity in early life but who have a high psychological well-being in adulthood also have better health.

Role of Demographic and Genetic Factors

Future research could also explore the ways that demographic and genetic factors influence the interaction between early life adversity and psychosocial buffers in determining adults' health. With respect to demographic characteristics, there are a number of differences that might emerge depending on gender, racial group membership, and the country in which one lives. Turning first to gender, previous research using MIDUS data has found that the relationships between early life adversity and adult health often differ between men and women (see Lee, Ryff, & Coe, this volume). For example, among women, but not men, the link between childhood socioeconomic disadvantage and cardiovascular risk in adulthood is explained by having children at a younger age (Lee & Ryff, 2016). Thus, having higher levels of support in raising children might protect the health of women, in particular, when they have experienced adversity as children. Future research could investigate this idea in MIDUS by testing whether the relationship between childhood socioeconomic disadvantage and cardiovascular risk in adulthood is attenuated among women who receive assistance that might help them care or provide for their children (e.g., financial or unpaid assistance from parents or in-laws).

With respect to race, some research has compared the effect of similar experiences of childhood adversity on adult health outcomes in African Americans and Whites (see Slopen et al., 2010 for an example with MIDUS). However, less research has compared whether the factors that buffer African Americans and other people of color are the same ones that do so for Whites. For example, connections in the community can protect the health of those who experience adversity in childhood (Evans & Kutcher, 2011; Thorlindsson, Valdimarsdottir, & Hrafn, 2012), and Black churches are often an especially strong source of community for African Americans (McRae, Carey, &

Anderson-Scott, 1998). Thus, religion or connection to a church community might be especially protective of the health of African Americans who experience early life adversity.

With respect to national culture, the Midlife in Japan (MIDJA) study, which includes many of the same psychosocial and biomarker measures as MIDUS in a sample of adults in the Tokyo metropolitan area, offers opportunities for research comparing the role of early life adversity in adult health across multiple cultures. Although the majority of the research conducted on the relationship between early life adversity and adult health has used Western samples, evidence suggests that similar relationships emerge in East Asian populations (see Fry, McCoy, Swales, 2012 for a review). Additional research using MIDUS and MIDJA could explore whether the psychosocial factors that attenuate these relationships in the U.S. also do so in Japan.

Finally, comparisons using samples of twins and siblings in MIDUS might help to understand the role that genetic factors play in the health of people who experience adversity in early life. Previous research with these samples in MIDUS suggests that genetic effects on health may be greater in some circumstances (e.g., among people who have lower levels of education or income; Hamdi, Krueger, & South, 2015; Johnson & Krueger, 2005; but see also Krieger, Chen, Coull, & Selby, 2005; van den Berg, Doblhammer, & Christensen, 2009; van den Berg, Doblhamer-Reiter, & Christensen, 2011), but that genetics factors play less of a role in determining health outcomes among other groups of people (e.g., among people who have high levels of control; Johnson & Krueger, 2005). It is possible that early life adversity exacerbates genetic effects on

health but that buffers such as strong social relationships reduce the role that genetics play in health, even among those who have grown up in adverse circumstances.

Joint Role of Multiple Psychosocial Buffers

Research on factors that protect the health of people who have experienced early life adversity has primarily studied one factor at a time. However, in reality, multiple buffers may occur simultaneously and work in concert with each other. The existing literature offers some evidence of such effects. For example, in a sample of healthy 13-16-year-olds, Chen and colleagues (Chen, Lee, Cavey, & Ho, 2013) found that among lower SES children, having a role model was linked to lower levels of IL-6, and this relationship was partly explained by these children also engaging in shift-and-persist coping strategies. Thus, it seems that relationships with role models may help children to develop shift-and-persist coping strategies, which, in turn, protect their health, despite their lower socioeconomic status. Research with MIDUS participants has not examined how multiple buffers might work simultaneously to protect the health of those who experienced early life adversity. However, there is some evidence from this sample that having a combination of multiple psychosocial resources (i.e., control beliefs, social support, and engagement in physical exercise) is related to better cognitive performance, and SES disparities in cognition are mitigated among those who have more of these resources. (Agrigoroaei & Lachman, 2011).

There are at least four possible hypotheses about how multiple psychosocial factors might work together to protect the health of those who experienced adversity in early life. First, it is possible that one psychosocial buffer might mediate the relationship between another buffer and health among children who experience adversity. Chen and

colleagues' (2013) findings that role models give rise to shift-and-persist strategies that then protect children's health is an example of such a relationship. Second, it is possible that psychosocial buffers have an additive relationship. For example, as in Agrigoroaei and Lachman's (2011) study, the combination of buffers such as sense of control, social support, and engaging in physical exercise might be protective. A third possibility it that buffers have a multiplicative effects. For example, strong family relationships and high levels of social capital might each enhance the protective role that the other plays if children who are close to their parents receive an especially strong health benefit from their parents' ties to the community. A final possibility is that once a child who is experiencing adversity has one protective factor, having another makes a negligible difference. MIDUS would be a particularly useful sample in which to test such hypotheses, due to its comprehensive set of such measures.

Longitudinal Assessments of People who Experienced Early Life Adversity

A final area that could be pursued further involves tracking people over time to assess trajectories of early life adversity as individuals age. Most research that has studied psychosocial buffers against early life adversity has looked at physiological measures, such as such as inflammation, metabolic syndrome, and allostatic load, that indicate risk for chronic diseases of aging down the line. Continuing to track these participants over time could allow researchers to investigate whether these individuals are later diagnosed with chronic diseases such as cardiovascular disease or diabetes or whether they have higher mortality rates, all outcomes for which markers such as inflammation, metabolic syndrome, and allostatic load indicate risk (Ford, 2005; Karlamangla, Singer, & Seeman, 2006; Ross, 1999). Future research might track, for example, whether people who have

experienced adversity in early life but who also have the psychosocial buffers reviewed in the present chapter, are less likely to be diagnosed with chronic diseases of aging or have lower rates of mortality. These clinical effects might, for example, begin to emerge as individuals transition to old age. With respect to MIDUS in particular, continuing to follow these participants as they age would allow researchers to test more hypotheses about the psychosocial buffers of early life adversity on outcomes such as clinical diagnoses and mortality. Such an approach would allow researchers to understand more about how persistent the effects of early life adversity are across time and whether they have long-term effects that reach to the ends of individuals' lives.

Conclusion

In sum, although a large body of research shows that most people who experience adversity in early life have worse health as adults, some who experience such adversity are resilient. Because it assesses such a range of psychosocial factors, in addition to biological outcomes, MIDUS has shed light on what might protect these individuals' health. Specifically, research using MIDUS data suggests that social relationships both in and outside of the family, as well as individual psychological characteristics, such as positive coping strategies and psychological well-being, may protect the health of children experiencing adversity. Future research can help to not only deepen our understanding of what helps children to live healthy lives despite adversity but also be used to help promote better health for all.

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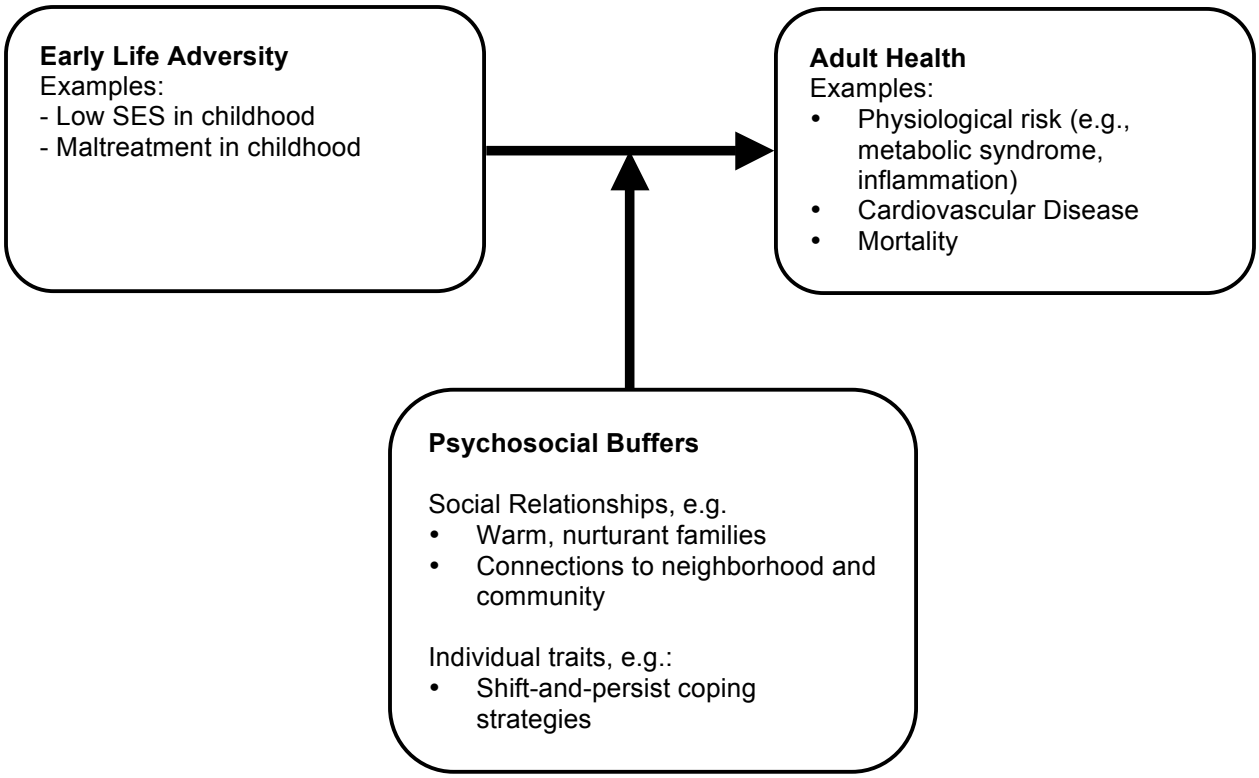

Figure 1. Effect of early life adversity on adult health is moderated by social relationships and by individual traits, such as adaptive coping strategies.