Research article

Associations between exposure to childhood bullying and abuse and adulthood outcomes in a representative national U.S. sample

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ABSTRACT

Background: Negative childhood experiences are associated with poor health and psychosocial outcomes throughout one's lifespan.
Objective: We examined associations between childhood bullying and maltreatment and several adulthood outcomes: psychological distress, functional impairment, generalized fear, and physician-diagnosed mental and physical health ailments. The potential mediating role of recent negative life events was also explored.
Participants and Setting: Data were collected through web-based surveys of a U.S. representative national sample of adults.
Methods: At Wave 1 (N = 3,598), participants reported exposure to negative childhood experiences; at Wave 2 (N = 3,497), physician-diagnosed mental and physical health ailments were provided; at Wave 3 (N = 2,906), participants reported exposure to recent negative life events and psychosocial outcomes.
Results: Of the sample, 26.29% (weighted *n* = 946) reported childhood bullying, 15.02% (weighted *n* = 540) reported physical abuse, 15.56% (weighted *n* = 560) reported witnessing parental violence, 11.42% (weighted *n* = 411) reported sexual abuse, and 8.64% (weighted *n* = 311) reported parental neglect. Respondents who reported bullying, physical abuse, or sexual abuse during childhood reported greater distress, functional impairment, and fear of the future in adulthood, as mediated through recent negative life events, compared to those who did not (ßs: 0.04–.06). Those reporting bullying, neglect, physical abuse, or sexual abuse in childhood reported more mental health ailments in adulthood (IRRs: 1.44–1.66) compared to those who did not. Those reporting bullying or sexual abuse in childhood reported more physical health ailments in adulthood (IRRs: 1.25–1.39).
Conclusions: Specific negative childhood experiences have unique links with poor outcomes in adulthood. Recent negative life events partially mediate these associations.

1. Introduction

Negative childhood experiences have been linked to a range of negative physical health and psychological outcomes throughout

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one's lifespan (Read & Bentall, 2012). The seminal Adverse Childhood Experiences (ACE) study explored childhood abuse, childhood household dysfunction, and adulthood health outcomes, finding a graded, positive relationship between the number of categories of ACEs to which one was exposed and subsequent negative adulthood physical and mental health outcomes (Felitti et al., 1998). Yet the association between specific types of maltreatment and physical and mental health outcomes was not delineated. Prior research indicates that specific types of maltreatment (e.g., parental verbal abuse, sexual abuse, and witnessing domestic violence) negatively impact precise brain regions (e.g., auditory, visual, and somatosensory cortex; Teicher & Samson, 2016), suggesting specific maltreatment types have different patterns of associations with sensory systems and neural pathways involved in the aversive experience. Establishing a clearer picture of these differences may provide insight into the association between childhood adversity and subsequent health outcomes.

1.1. Key types of childhood maltreatment

Past research has identified multiple types of maltreatment that are prevalent in childhood for people across the globe, with a strong focus on abuse and neglect (Stoltenborgh, Bakermans-Kranenburg, Alink, & IJzendoorn, 2015). Childhood physical abuse is the intentional use of physical force against a child that may result in harm for a child's development, health, or survival (Norman et al., 2012). Prior work has linked child physical abuse to adverse adult mental health outcomes including anxiety, disordered eating, mood and substance use disorders, posttraumatic stress disorder, schizophrenia, and specific phobias (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013; Cougle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2010). Child physical abuse is also associated with greater risks for cancer, diabetes, hypertension, and respiratory disease (Goodwin & Wamboldt, 2011; Springer, Sheridan, Kuo, & Carnes, 2007; Stein et al., 2010).

Child sexual abuse (CSA) is broadly defined as an unwanted sexual experience that can include exposure to sexual media, overt verbal advances, unwanted touching, or penetration (Noll, Shenk, & Putnam, 2009). CSA has been associated with higher risks for disruptive behavior and personality disorders, as well as major depression, suicidal ideation, and illicit drug dependence in adulthood (Carr et al., 2013; Fergusson, McLeod, & Horwood, 2013). Individuals who have been sexually abused in childhood also experience greater rates of cardiopulmonary symptoms, chronic fatigue syndrome, fibromyalgia, gastrointestinal problems, obesity, and pain disorders in adulthood (Borsini, Hepgul, Mondelli, Chalder, & Pariante, 2014; Irish, Kobayashi, & Delahanty, 2010).

Parental neglect is a caregiver's failure to provide for the development of a child in domains such as emotional needs, education, health, and safe living conditions (Stoltenborgh et al., 2015). Individuals neglected in childhood are significantly more likely to develop anxiety, conduct, depressive, eating, mood, and personality disorders compared to their non-neglected counterparts (Carr et al., 2013; Norman et al., 2012). Neglected individuals are also more likely to display suicidal behavior and have higher risks for sexually transmitted infections (STIs), vision problems, and diminished oral health (Norman et al., 2012; Widom, Czaja, Bentley, & Johnson, 2012).

Another widely studied form of childhood maltreatment is witnessing intimate partner violence (IPV), or verbal and/or physical violence between romantic partners. Witnessing IPV between one's parents in childhood has been linked to greater depressive symptoms and alcohol-use problems in adulthood (Maker, Kemmelmeier, & Peterson, 1998; Russell, Springer, & Greenfield, 2010; Smith, Elwyn, Ireland, & Thornberry, 2010). Furthermore, childhood exposure to parental IPV has been linked to increased risk of underimmunization, engaging in health-compromising behaviors, and impairment in brain regions critical for vision (Bair-Merritt, Blackstone, & Feudtner, 2006; Choi, Jeong, Polcari, Rohan, & Teicher, 2012).

Despite not typically being addressed as a form of maltreatment, childhood bullying is another prevalent and important adverse experience reported by nearly 20% of youth as estimated by a nationally representative sample in the 2013 Youth Risk Behavioral Survey (Kann et al., 2014). Bullying is a chronic, intentionally harmful, aggressive behavior that tends to reflect the existence of a power imbalance in which a more powerful person or group attacks a less powerful one (Nansel et al., 2001). The imbalance of power involved in bullying can be physical or psychological, and can include verbal (e.g., name-calling), physical (e.g., hitting), and psychological (e.g., spreading rumors) actions. Childhood bullying has been linked to adverse mental health outcomes including greater risks for suicide, agoraphobia, depression, psychotic disorder, schizophrenia, schizoaffective disorder, and panic disorder (Copeland, Wolke, Angold, & Costello, 2013; Sourander et al., 2015; Varese et al., 2012). Bullying has also been linked to health problems including increased risk for serious illness, self-reported illness, contagion risk, perceived poor health, and slow illness recovery (Takizawa, Maughan, & Arseneault, 2014; Wolke, Copeland, Angold, & Costello, 2013). Despite these findings, bullying has yet to be directly juxtaposed with other specific maltreatment types (e.g., physical abuse, sexual abuse, neglect) to examine its unique and independent association with long-term mental and physical health outcomes.

1.2. Additional psychosocial outcomes

In addition to mental and physical health outcomes, prior research has linked early life stress to several psychosocial outcomes in adulthood, including functional impairment, generalized fear or worry, and psychological distress. Functional impairment is broadly characterized by difficulties in mental or physical health that interfere with one's ability to function in social and work life domains. Multiple early life stressors, including bullying, parental neglect, sexual abuse, and exposure to parental IPV, have all been individually linked to greater functional impairment (Cloitre, Miranda, Stovall-McClough, & Han, 2005; Gil et al., 2009; Henning, Leitenberg, Coffey, Turner, & Bennett, 1996; Klomek et al., 2011). Generalized fear or worry refers to the notion that experiencing a negative event may shatter individuals' sense of security and may render them more likely to anticipate and experience fear about future negative events (Janoff-Bulman & Frieze, 1983). Consequently, exposure to adverse experiences in childhood may increase

one's tendency to agonize broadly about unfavorable occurrences, as demonstrated by research showing associations between childhood adversity and attentional bias towards threats, greater daily worry, and worry instability (Arbel, Schacter, Kazmierski, Daspe, & Margolin, 2018; Briggs-Gowan et al., 2015). Despite these findings, fear of the future has not been addressed as a critical outcome in studies of child maltreatment. This is an important oversight given the evidence linking this fear with the development of stress and trauma-related health problems (Brosschot, Gerin, & Thayer, 2006; Holman et al., 2008; Kubzansky et al., 1997).

Finally, psychological distress in adulthood – a constellation of symptom dimensions such as anxiety, depression, and somatization – has been associated with childhood exposure to parental IPV and both physical and sexual abuse (Cloitre et al., 2005; Henning et al., 1996; Strine et al., 2012). However, bullying has not yet been juxtaposed with other specific forms of childhood maltreatment to examine its associations with distress and other psychosocial outcomes.

1.3. Recent negative life events: A key mediator?

Negative childhood experiences have been correlated with various adverse events in adulthood, such as increased risks of arrest conviction, incarceration, lower socioeconomic resources in adulthood, poverty, and unemployment (Liu et al., 2013; Matthews, Jennings, Lee, & Pardini, 2017; Mersky, Topitzes, & Reynolds, 2012; Roos et al., 2016). Research has further suggested that events occurring more recently have the potential to be as, or even more, strongly associated with mental health outcomes than those that occurred more distantly (Riese et al., 2014; Suh, Diener, & Fujita, 1996). For example, Riese et al. (2014) found that recent stressful life events occurring in the past six months had a greater impact than distant events on levels of neuroticism, a significant predictor of both mental and physical health problems. Indeed, childhood maltreatment may be associated with recent negative life events (NLEs) that are in turn linked with adult outcomes – that is, recent events may mediate the child maltreatment connection with adult outcomes. A comprehensive approach that explores this issue would strengthen our understanding of the role recent NLEs may play in linking child maltreatment with adult well-being.

1.4. The present study

Although prior work has demonstrated that negative childhood experiences are associated with deleterious outcomes in adulthood, several gaps persist in the literature. For example, as noted earlier, the ACE study captured associations between cumulative exposure to childhood abuse, household dysfunction, and adulthood health outcomes (Felitti et al., 1998). However, by focusing on a cumulative count of adverse experiences, the ACE study did not link specific types of childhood experiences with health outcomes; nor did it assess exposure to childhood bullying. Further, few studies have examined adult adversity as a potential mediator linking childhood maltreatment and adult psychosocial outcomes, while also assessing bullying as a type of childhood adversity. Finally, few studies have utilized representative national samples.

The goal of the present study was to address these limitations by juxtaposing bullying with specific types of negative childhood experiences to examine their unique and independent associations with several key psychosocial outcomes in adulthood, including distress, functional impairment, and generalized fear of the future, as well as to examine the potential role of recent NLEs as a mediator of these outcomes. This study also sought to investigate the potential links between specific types of negative childhood experiences and the number of doctor-diagnosed mental and physical health ailments experienced in adulthood. These associations were explored in a large U.S. representative national sample of adults that was followed for several years. The use of a representative sample allows for the rigorous consideration of demographic characteristics such as gender and socioeconomic status, which previous research has demonstrated as important in understanding variability in outcomes associated with adverse childhood experiences (McLaughlin et al., 2016). We hypothesized that bullying, as well as other types of childhood maltreatment, would be significantly associated with poorer adult psychosocial outcomes as mediated by recent NLEs, even after adjusting for the other types of childhood maltreatment. Similarly, we hypothesized that childhood bullying and maltreatment would be associated with greater mental and physical health ailments in adulthood.

2. Methods

2.1. Overview and participants

The sample used for the present analyses was drawn from an ongoing study of American's reactions to the 2013 Boston Marathon bombings (N = 4,675) that was drawn from the GfK KnowledgePanel.[1] (Data from this initial survey are not relevant to the present analyses and are presented elsewhere (see Holman, Garfin, & Silver, 2014). The GfK KnowledgePanel uses address-based random sampling to recruit individuals who are at least 18 years old within households into an online panel where they complete several surveys a month in exchange for free Internet access or compensation for households that are already web-enabled. Upon joining the GfK panel, respondents provide demographic information, including age, education, ethnicity, gender, and income. Participants were followed for several years, with all initial panelists recontacted several more times unless they requested otherwise. For the set of analyses reported in this paper, Wave 1 was collected between October 17 - November 17, 2013 (N = 3,598; 81.2% participation;

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[1] Representative samples were collected from Boston (n = 846) and New York (n = 941) metropolitan areas and the remainder of the U.S. (n = 2,888). Oversamples were collected to test hypotheses relevant to the initial survey.

77.0% retention from initial sample). At Wave 2 (collected in early 2015), physical and mental health data were provided by GfK on 4,213 participants. [GfK collected these data between January 5, 2013 - December 29, 2014 as part of its ongoing panel updates.] Wave 3 was collected April 29 - June 26, 2015 (N = 3,341; 78.1% participation; 71.5% retention from initial sample).[2] Of those respondents who completed Wave 1 and thus provided critical data regarding exposure to childhood maltreatment for the results reported herein, 3,497 had health data provided at Wave 2 and 2,906 completed Wave 3.

Data were collected via anonymous Internet-based surveys. Panelists were sent an e-mail with a brief introduction inviting them to complete a survey designed by our research team. During follow-up surveys, participants who had withdrawn from the GfK panel, but agreed to be contacted for additional assessments, were surveyed either online or by returning a hard copy of the survey by mail. Email reminders, postcards, and phone calls were used to encourage participation among those who did not initially respond to the survey invitation. All procedures were approved by the Institutional Review Board at the University of California, Irvine.

2.2. Measures

2.2.1. Assessment of negative childhood experiences

At Wave 1, a Lifetime Stress Exposure Inventory (Blum, Silver, & Poulin, 2014; Seery, Holman, & Silver, 2010) was used to assess potentially negative life events and the timing at which these events occurred. Five items specifically asked about childhood maltreatment: being bullied, being physically abused, being neglected by parent(s), witnessing violence between one's parents, and being sexually abused. Items were first prompted by the following question: "Have any of the following happened to you over your lifetime?" Each was then followed by a brief description of the experience: *bullied* - "was bullied as a child"; *physical abuse* - "being physically harmed as a child (hit hard enough to leave a bruise or mark, kicked, burned, etc.)"; *sexual abuse* - "had someone touch or feel private areas of your body or touched/felt another's private areas under force or threat" or "had sexual relations under force or threat"; *neglect* - "were neglected (as a child) by your parent(s)"; *witnessed parental violence* - "witnessed violence between your parents as a child." Exposure to each of these five types of childhood maltreatment prior to age 18 was coded dichotomously: 0 = maltreatment did not occur, 1 = maltreatment did occur.

2.2.2. Exposure to recent negative life events (NLEs)

At Wave 3, respondents completed a follow-up survey that asked about exposure to 33 NLEs that might have occurred in the prior year. These events included experiences such as: "suffered a serious accident or injury," "suffered a serious illness," "lost someone close to you due to homicide" "got divorced yourself," and "lived a dangerous housing and neighborhood" (see Blum et al., 2014; Seery et al., 2010). Each event exposure was coded 0 (did not occur) or 1 (occurred). Items were summed to create a cumulative number of recent negative events experienced. The frequency of recent adverse events ranged from 0 to 19 (M = 2.02, SD = 1.83).

2.2.3. Global distress

An abbreviated 9-item version of the Brief Symptom Inventory (BSI-18; Derogatis, 2001) was used to measure global distress at Wave 3. Respondents indicated their level of distress over the past 7 days (including the day of completion) along three dimensions: anxiety, depression, and somatization with endpoints 0 (not at all) to 4 (extremely). The items demonstrated very good internal reliability in the present sample (α = .81). Responses ranged from 0 to 36, with higher scores signaling more distress (M = 3.69, SD = 5.17).

2.2.4. Generalized fear of the future

At Wave 3, eight items modified from prior research (Holman et al., 2008; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002; Thompson, Holman, & Silver, 2019) assessed fear and worry about the possibility of a) a terrorist attack, b) a natural disaster, c) violence (shootings, stabbings, or physical assault), and d) financial stress or strain (i.e., difficulty paying for basic needs). Respondents indicated how often in the past week they had fears or worries that each of these events would personally affect them in the future ("I worry that a natural disaster will personally affect me or someone in my family in the future"; "How often in the past week have you had fears about the possibility of a natural disaster affecting your community?"), with endpoints 1 (never) to 5 (all of the time). Reliability was very good (α = .88). Range = 8 to 40; higher scores indicate greater fear of the future (M = 16.13, SD = 6.07).

2.2.5. Functional impairment

Four items from the MOS Short-Form Health Survey, SF-36 (Ware & Sherbourne, 1992), a reliable and well-validated scale, were used to assess functional impairment at Wave 3. Respondents were asked whether their emotional or physical health had interfered with their social- or work-related functioning in the prior week with endpoints 1 (none of the time) to 5 (all of the time). Reliability for this scale was very good (α = .86). Range = 4 to 20; higher scores reflect more impairment (M = 5.95, SD = 3.05).

2.2.6. Physician-diagnosed mental and physical health ailments

GfK collected respondents' health data using questions adapted from the Centers for Disease Control's National Center for Health Statistics annual National Health Interview Survey (U.S. Department of Health & Human Services & National Center for Health

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[2] An additional wave of data was collected April 18, 2014 - May 6, 2014; data from that wave are not relevant to the present analyses and are not discussed.
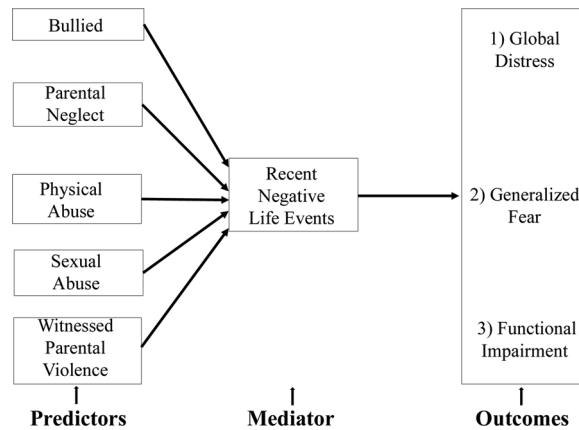
Fig. 1. Path diagram of structural equation models examining effects of negative childhood experiences on psychosocial outcomes.
Note: Separate SEM's were constructed for each psychosocial outcome (global distress, generalized fear of the future, and functional impairment) and the following covariates were included in each model: age, education, ethnicity, gender, and income.

Statistics, 2000). Respondents were asked to indicate their lifetime history of physician-diagnosed mental health problems, with prompts for anxiety disorders and depression, and 33 physical health problems (e.g., cardiovascular, endocrine, gastrointestinal) (see Holman & Silver, 2011). Range for mental health problems = 0 to 2 (none, either anxiety or depression, both anxiety and depression; $M = 0.30$, $SD = 0.63$); number of physical health ailments range = 0 to 16, ($M = 1.66$, $SD = 2.05$).

2.2.7. Covariates

Several demographic indicators were gathered from participants and used as covariates including age, education, ethnicity, gender, and income.

2.3. Data analysis

All analyses were conducted in STATA, version 14 (StataCorp). In the first analyses, three separate structural equation models (one for each dependent variable/adulthood outcome: psychological distress, generalized fear of the future, functional impairment) were constructed to examine associations between the five negative childhood experiences (i.e., bullying, physical abuse, sexual abuse, parental neglect, witnessing parental violence) and each subsequent adult outcome; exposure to recent NLEs was included as a potential mediator. Several empirically and theoretically important covariates (i.e., age, education, ethnicity, gender, income) were included. Variables for the three psychosocial outcomes and the two continuous demographic variables (e.g., age, income) were standardized. Fig. 1 provides a conceptual overview to illustrate how the three structural equation models were conducted. Path analyses were conducted using the generalized structural equation modeling program (GSEM) in STATA 14. Path analysis incorporates multiple equations simultaneously, and is a parsimonious method to test hypothesized indirect and direct effects while reducing Type 1 error (Kline, 2005). Because there were limited missing data on each variable, row mean calculations were used for individuals who responded to more than 75% of the items on a given scale. Listwise deletion was used elsewhere as no single item exceeded more than 5% missing within each wave.

Conceptually, the classic mediation model (Baron & Kenny, 1986) method and SEM method for testing mediation are identical; however, the SEM method is recommended over the Baron and Kenny method when testing for complementary mediation (i.e., with both mediated and direct effects in the same direction) (Zhao, Lynch, & Chen, 2010) because it allows for the investigation of mediation in a more parsimonious manner that minimizes Type 1 error. All necessary steps for testing mediation according to the classic mediation model were conducted, but only direct and indirect effects are presented in Table 2. Results from additional mediation steps can be found in Tables S1 and S2 (Supplement). STATA 14's GSEM program allows for the inclusion of survey sampling weights, as needed for deriving population-based estimates from representative samples. Given that sampling weights already correct for standard errors, we did not use the bootstrapping method common in testing mediation in structural equation modeling as its performance in such situations is unclear (Bollen, Tueller, & Oberski, 2013). Indirect and total effects were calculated using the "nlcom" STATA command with the following equations:

Indirect effects: nlcom _b[DV:mediator] * _b[mediator:IV]
Total effects: nlcom _b[DV:IV] + _b[DV:mediator]*_b[mediator:IV].

The association between negative childhood experiences and the number of doctor-diagnosed mental and physical health ailments in adulthood was then analyzed using two Poisson regressions (one for each dependent variable). Poisson regressions are used to examine count variable data that deviate from a normal distribution (Coxe, West, & Aiken, 2009). Variables were entered using a hierarchical variable entry strategy in conceptually-meaningful blocks, with demographic indicators entered first and the five types of negative childhood experiences entered second. The two continuous demographic indicators (e.g., age, income) were standardized. (Note: exposure to recent NLEs was not examined as a mediator since it was collected *after* assessments of physical and mental health

Table 1
Weighted mean scores of psychosocial and health outcomes by negative childhood experiences[a].

	Global Distress (n = 2,901) M (SD)	Generalized Fear (n = 2,900) M (SD)	Functional Impairment (n = 2,898) M (SD)	Mental Health (n = 3,497) M (SD)	Physical Health (n = 3,497) M (SD)
Bullying					
Yes	5.36 (6.21)	17.78 (6.49)	6.75 (3.58)	0.48 (0.74)	2.00 (2.25)
No	3.15 (4.75)	15.29 (5.75)	5.69 (2.82)	0.24 (0.56)	1.53 (1.94)
Physical abuse					
Yes	5.88 (6.15)	18.99 (6.49)	7.36 (3.80)	0.58 (0.79)	2.35 (2.35)
No	3.33 (4.95)	15.38 (5.79)	5.71 (2.83)	0.25 (0.58)	1.54 (1.95)
Parental neglect					
Yes	6.29 (7.05)	18.44 (5.95)	7.85 (4.37)	0.62 (0.82)	2.45 (2.41)
No	3.48 (4.97)	15.69 (6.00)	5.79 (2.85)	0.27 (0.60)	1.58 (1.99)
Sexual abuse					
Yes	6.32 (6.64)	18.71 (6.54)	7.76 (4.30)	0.64 (0.77)	2.47 (2.49)
No	3.40 (4.96)	15.59 (5.90)	5.75 (2.80)	0.26 (0.59)	1.55 (1.94)
Witnessed parental violence					
Yes	5.63 (6.42)	19.09 (6.63)	7.11 (3.89)	0.47 (0.71)	2.01 (2.10)
No	3.39 (4.90)	15.37 (5.74)	5.75 (2.83)	0.27 (0.60)	1.59 (2.02)

[a] Ns are unweighted and vary due to attrition over time.

ailments).

Wave-specific weights were constructed that accounted for initial sampling design (including oversampling in New York and Boston) and attrition over time and ensure national representativeness at each wave, strengthening population-based inferences. At each wave, weights were stratified to the benchmarks from the most recent American Community Survey of the U.S. Department of Commerce and U.S. Census Bureau (2012). Weights were computed using the method of iterative proportional fitting (commonly referred to as raking) along the following dimensions: age (18–24, 25–34, 35–44, 45–54, 55–64, 65+), gender, race-ethnicity (Hispanic, non-Hispanic Black, non-Hispanic White, non-Hispanic other), education (less than high school, some college, Bachelor's degree or higher), annual income (under $24,999, $25,000–$49,999, $50,000–$74,999, $75,000–$99,999, $100,000+), and Internet access (yes, no). When sample sizes permitted, variables were crossed (e.g., age and gender) so that joint distributions could be used to adjust weights. As needed, categories of weighting variables were collapsed to increase samples of available respondents and avoid the creation of extreme weights (Silver et al., 2002).

3. Results

The final weighted sample was 52.37% female, ranged in age from 18 to 93 ($M = 46.81$, $SD = 16.73$), and was 68.5% White (non-Hispanic), 10.94% Black/African American, 13.46% Hispanic, and 7.09% other ethnicities (non-Hispanic) as shown in Table S3 (supplement). Almost 60% had at least some college education, nearly 60% had an annual household income of $50,000 or more, and 78.5% had internet access. At least one recent NLE was reported by 80.83% of the sample. One or more mental health diagnoses were reported by 20.11% of the sample and one or more physical health diagnoses were reported by 59.40% of the sample. Of the sample, 26.29% reported being bullied as a child (weighted $n = 946$), 15.02% reported childhood physical abuse (weighted $n = 540$), and 15.56% reported witnessing parental violence as a child (weighted $n = 560$). Furthermore, 11.42% reported childhood sexual abuse (weighted $n = 411$) and 8.64% reported parental neglect as a child (weighted $n = 311$). Table 1 shows the differences in the total means of the psychosocial and health outcomes for people reporting the different forms of childhood maltreatment and those not reporting maltreatment. Lastly, childhood bullying (ß = 0.23, $p < .001$), physical abuse (ß = 0.25, $p = .001$), and sexual abuse (ß = 0.33, $p < .001$) were all associated with greater recent negative life events, while parental neglect (ß = -0.05, $p = .590$) and witnessing parental violence (ß = 0.12, $p = .129$) were not (see Table S1).

3.1. Global distress

Several demographic characteristics were associated with global distress. Respondents who were older in age (ß = -0.09, $p = .003$) and who reported a higher annual income (ß = -0.10, $p = .001$) also reported less distress. Compared to Whites, those who identified as other, non-Hispanic ethnicity reported greater distress (ß = 0.34, $p = .025$). Respondents who experienced a greater number of recent NLEs reported, on average, higher levels of distress (ß = 0.17, $p < .001$). Table 2 displays the direct and indirect effects of negative childhood experiences on global distress. In the covariate-adjusted SEM models, bullying was the only negative childhood experience to have a significant direct effect on global distress. However, bullying, physical abuse, and sexual abuse in childhood all exhibited significant indirect effects on global distress through recent NLEs, indicating that their relationships with global distress are mediated by recent NLEs.

Table 2

Structural equation model examining direct and indirect[a] effects of negative childhood experiences on outcomes (N = 2,906).

	Distress[b]		Generalized Fear[b]		Functional Impairment[b]	
	ß(95% CI)	P	ß(95% CI)	p	ß(95% CI)	p
Bullying-Direct	**0.20 (0.05, 0.34)**	**.006**	**0.18 (0.05, 0.31)**	**.005**	0.07 (−0.07, 0.22)	.341
Physical Abuse-Direct	0.10 (−0.10, 0.30)	.339	0.19 (−0.01, 0.38)	.064	0.13 (−0.09, 0.36)	.240
Parental Neglect-Direct	0.30 (−0.02, 0.61)	.063	0.08 (−0.16, 0.31)	.528	**0.40 (0.06, 0.73)**	**.023**
Sexual Abuse-Direct	0.22 (−0.04, 0.48)	.090	0.07 (−0.12, 0.27)	.464	**0.33 (0.04, 0.62)**	**.026**
Witnessed Parental Violence-Direct	0.14 (−0.06, 0.34)	.163	**0.31 (0.13, 0.50)**	**.001**	0.12 (−0.09, 0.33)	.271
Bullying-Indirect	**0.04 (0.02, 0.06)**	**< .001**	**0.05 (0.02, 0.07)**	**.001**	**0.04 (0.02, 0.06)**	**< .001**
Physical Abuse-Indirect	**0.04 (0.02, 0.07)**	**.002**	**0.05 (0.02, 0.08)**	**.001**	**0.04 (0.02, 0.07)**	**.001**
Parental Neglect-Indirect	−0.01 (-0.04, 0.02)	.583	−0.01 (−0.05, 0.03)	.587	−0.01 (−0.04, 0.02)	.584
Sexual Abuse-Indirect	**0.06 (0.03, 0.09)**	**< .001**	**0.06 (0.03, 0.10)**	**< .001**	**0.06 (0.03, 0.09)**	**< .001**
Witnessed Parental Violence-Indirect	0.02 (−0.01, 0.05)	.136	0.02 (−0.01, 0.05)	.130	0.02 (−0.01, 0.05)	.134
Model Statistics (AIC, BIC)	(18,098.34; 18,235.75)		(17,721.02.; 17,858.43)		(17,905.95; 18,043.37)	

[a] Indirect effects represent mediation through recent negative life events (NLEs).

[b] The following covariates were controlled for in each analysis: age, education, ethnicity, gender, and income.

3.2. Generalized fear of the future

Several demographic variables were associated with generalized fear of the future. Respondents with a Bachelor's degree or higher (ß= -0.41, p = .001) reported less fear compared to those without a high school diploma; Hispanic respondents reported greater fear compared to Whites on average (ß= 0.34, p = .001); women reported more fear compared to men (ß= 0.17, p = .003); and respondents with a higher income reported less fear (ß= -0.08, p = .007). Finally, experiencing a greater number of recent NLEs was associated with greater fear of the future (ß= 0.19, p < .001). As shown in Table 2, childhood bullying and witnessing parental violence exhibited direct effects on generalized fear, after controlling for covariates. Experiencing bullying, physical abuse, and sexual abuse in childhood also exhibited significant indirect effects on fear of the future through recent negative events.

3.3. Functional impairment

Several demographic variables were associated with functional impairment. On average, those with some college education (ß= -0.34, p = .040) reported less functional impairment compared to those without a high school diploma; higher income was associated with less impairment (ß= -0.12, p < .001). Respondents reporting more recent NLEs also reported poorer functioning (ß= 0.17, p < .001). Controlling for covariates, Table 2 shows that childhood parental neglect and sexual abuse had direct effects on functional impairment. Bullying, physical abuse, and sexual abuse in childhood exhibited indirect effects on functional impairment through recent NLEs.

3.4. Physician-diagnosed mental and physical health ailments

Table 3 presents results of the Poisson regression models for adult mental and physical health ailments. Respondents who reported childhood bullying, parental neglect, physical abuse, and sexual abuse indicated a greater number of mental health ailments, on average, compared to those who did not report these experiences. Respondents who reported being bullied and sexually abused in childhood reported a greater number of physical health ailments, on average, compared to those who did not report these experiences.

4. Discussion

This study provides insights about the associations between different types of negative childhood experiences and adult psychosocial outcomes using a large representative sample of Americans. These findings partially support our first hypothesis and expand previous work that found direct associations between childhood experiences and psychosocial outcomes (Briggs-Gowan et al., 2015; Cloitre et al., 2005; Klomek et al., 2011; Richmond, Elliott, Pierce, Aspelmeier, & Alexander, 2009), but also highlight a significant link between childhood experiences and exposure to recent negative life events. Our second hypothesis was also partly confirmed as our results support prior work demonstrating the important link between exposure to childhood adversity and increases in adult physical and mental health ailments (Carr et al., 2013; Felitti et al., 1998; Takizawa et al., 2014).

Childhood bullying, physical abuse, and sexual abuse were directly associated with reporting significantly more recent NLEs, and each exhibited indirect effects on psychosocial outcomes (distress, generalized fear, functional impairment) through recent negative events. It may be the case that these specific experiences differ from other negative childhood experiences as they may involve physical injury or bodily pain, serving as a persistent reminder of the event for an individual in a way that differs from parental neglect or witnessing parental violence. Indeed, past research has linked childhood bullying, physical abuse and sexual abuse with greater somatization (Brown, Schrag, & Trimble, 2005; McGee et al., 2011), while other work has suggested that parental neglect and

Table 3

Poisson regression model examining the relationships between negative childhood experiences and physician-diagnosed mental and physical health ailments (N = 3497).

| | Mental Health | | | | Physical Health | | | |
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
Variables	IRR(95% CI)	p	IRR(95% CI)	p	IRR(95% CI)	p	IRR(95% CI)	P
Demographics								
Female gender[a]	**1.48(1.19, 1.83)**	**< .001**	**1.45(1.17, 1.79)**	**.001**	1.04(0.94, 1.16)	.440	1.05(0.94, 1.16)	.378
Age[b]	1.01(0.91, 1.12)	.882	1.01(0.91, 1.12)	.847	**1.82(1.72, 1.91)**	**< .001**	**1.84(1.75, 1.93)**	**< .001**
Income[b]	**0.75(0.66, 0.86)**	**< .001**	**0.81(0.71, 0.92)**	**.001**	**0.90(0.85, 0.96)**	**.001**	**0.93(0.88, 0.99)**	**.016**
Ethnicity[c]								
African American/Black	0.71(0.48, 1.05)	.085	**0.64(0.45, 0.90)**	**.011**	1.05(0.86, 1.28)	.605	0.97(0.80, 1.19)	.780
Other, non Hispanic	0.76(0.51, 1.14)	.181	0.81(0.53, 1.24)	.336	0.86(0.71, 1.04)	.122	0.88(0.73, 1.06)	.175
Hispanic/Latino	0.73(0.49, 1.09)	.120	**0.64(0.44, 0.95)**	**.027**	1.08(0.88, 1.34)	.460	1.02(0.83, 1.26)	.819
Education[d]								
High school Diploma	0.71(0.49, 1.02)	.064	0.75(0.53, 1.05)	.099	1.01(0.80, 1.29)	.908	1.00(0.79, 1.27)	.980
Some college	0.82(0.57, 1.18)	.290	0.81(0.57, 1.13)	.218	1.06(0.83, 1.36)	.641	1.03(0.81, 1.31)	.789
Bachelor's degree or higher	**0.64(0.44, 0.94)**	**.022**	**0.66(0.46, 0.95)**	**.025**	0.96(0.74, 1.23)	.722	0.93(0.73, 1.19)	.581
Childhood experiences[e]								
Bullied	_	_	**1.57(1.26, 1.95)**	**< .001**	_	_	**1.25(1.09, 1.43)**	**.001**
Physical abuse	_	_	**1.48(1.11, 1.97)**	**.008**	_	_	1.16(0.99, 1.37)	.064
Parental neglect	_	_	**1.44(1.07, 1.94)**	**.016**	_	_	1.17(0.96, 1.41)	.119
Witnessed parental violence	_	_	1.06(0.81, 1.37)	.681	_	_	1.01(0.86, 1.20)	.855
Sexual abuse	_	_	**1.66(1.31, 2.09)**	**< .001**	_	_	**1.39(1.19, 1.62)**	**< .001**
Constant	0.32(0.22, 0.45)	< .001	0.25(0.17, 0.39)	< .001	1.44(1.14, 1.81)	.002	1.27(1.02, 1.59)	.035
Model Statistics	Wald's χ^2 (9) = 55.21, p < .001		Wald's χ^2 (14) = 228.99, p < .001		Wald's χ^2 (9) = 638.96, p < .001		Wald's χ^2 (14) = 780.57, p < .001	

[a] Female = 1; male = 0.

[b] Used as continuous variable.

[c] Reference group = White.

[d] Reference group = less than a high school diploma.

[e] No negative childhood experience = 0; At least one negative childhood experience = 1.

witnessing parental violence are not associated with somatization (Brown et al., 2005).

Findings also demonstrate the important link between childhood maltreatment and adulthood mental and physical health outcomes. In alignment with prior work by Vachon, Krueger, Rogosch, and Cicchetti (2015), childhood bullying, parental neglect, physical abuse, and sexual abuse were associated with reporting a greater number of mental health ailments. However, results contradict one finding from the same study that found witnessing parental violence was associated with poorer mental health. Importantly, our sample was representative of the adult U.S. population, rather than a sample of low-income children (Vachon et al., 2015), which likely has important, specific effects on findings. It is possible that individuals from more financially privileged backgrounds – a group represented in our sample but not Vachon et al. (2015) – may experience a greater range of protective factors that can help buffer them from developing psychopathology in response to childhood adversity, while their less privileged counterparts have fewer potential buffers available.

Our findings regarding physical health outcomes support prior work suggesting that being bullied and experiencing sexual abuse during childhood are associated with increased risk for physical health problems (Irish et al., 2010; Wolke et al., 2013). Yet our findings diverge from other work demonstrating that other forms of maltreatment are also associated with adult physical health (Bair-Merritt et al., 2006; Springer et al., 2007), perhaps because samples reported in other work were not representative of the adult population (Bair-Merritt et al., 2006) or did not account for multiple types of negative childhood adversities (Springer et al., 2007). Findings highlight the importance of considering the relative contribution of each type of maltreatment, particularly because many of these events are likely to co-occur (Brown, Rienks, McCrae, & Watamura, 2019). Our results suggest that when comparing among types of childhood maltreatment, being bullied or sexually abused demonstrate the most potent repercussions.

Finally, as researchers and healthcare providers seek to better understand adverse childhood experiences, the present study highlights the alarmingly high frequency with which these experiences occur in the U.S. While causal claims cannot be inferred, findings contribute to a growing body of work demonstrating that adverse childhood experiences are linked to higher rates of distress, impaired functioning, and health ailments in adulthood. The financial cost of childhood victimization represents one of the most significant public health issues in the U.S. (Anda et al., 2006), and our study may have important implications for helping reduce these costs.

Strengthening primary and secondary efforts to prevent bullying and child maltreatment and mitigate the negative impacts they may have by supporting exposed children are two potential strategies for reducing the public health impact of child maltreatment. Moreover, through the promotion of healthier coping and treatment habits in response to early life stress, we may help minimize the chances that people will experience later life adversity in multiple ways. For example, decreasing the number of distressed and functionally impaired individuals as a result of negative childhood experiences may increase the number of people who are able to work regularly, contributing to decreases in unemployment, socioeconomic disadvantage, and incarceration (Matthews et al., 2017; Roos et al., 2016). Ultimately, this may reduce the burden on the criminal justice, healthcare, and welfare systems.

Our findings also highlight a need to investigate the role of recent negative events in understanding adult outcomes to gather a more complete picture of factors that contribute to psychosocial impairment. Health professionals who provide clinical and medical services may use this information for screening and treatment decision making in assessing potential risks for overall well-being. For example, variables such as distress and functional impairment are significant indicators for clinicians attempting to diagnose patients with mental ailments and are included in the diagnostic criteria for several types of psychopathology. If we can clearly identify how early experiences make individuals more susceptible to greater negative events throughout the life course and are linked to poor functioning, it may help healthcare providers better address the repercussions of early life stressors before they result in more severe psychopathology.

4.1. Alternative explanation

It is possible that some events in our recent life events measure were confounded with our outcomes. For example, a serious injury (e.g., broken leg) may be viewed as an event that inevitably produces functional impairment. If so, the confounding between the recent event and outcomes might explain the event's associations with greater distress and impaired functioning, rather than the recent event serving as a mediator. To address this possibility, we removed two items from our recent NLEs measure that might serve as confounds with adulthood outcomes ("suffered a serious accident or injury" and "suffered a serious illness") and replicated our analyses. After doing so, all results were essentially identical to our initial analyses, suggesting that the potential confounding between these variables did not influence our results.

In addition, it is important to note that all three of the adult psychosocial outcomes (global distress, generalized fear, and functional impairment) were measured with regard to the past 7 days, while the recent NLEs were captured over the course of the prior year. Therefore, we believe that recent events reported are not likely to be confounded with the psychosocial outcomes measured.

4.2. Limitations

Nonetheless, while we were able to assess a variety of negative experiences over the lifetime and assess several key outcomes in a representative sample of U.S. adults, some limitations exist. First, recent NLEs were used as an aggregate measure to mediate the associations between childhood maltreatment and psychosocial outcomes. It is possible that specific NLEs experienced as an adult may explain these associations better than others (e.g., domestic violence vs. natural disaster). Moreover, respondents' self-reports of childhood experiences rely on retrospective recall that is potentially subject to bias (Baldwin, Reuben, Newbury, & Danese, 2019). Although we tried to minimize social desirability through the administration of anonymous, confidential online surveys, we cannot rule out that respondents might have underreported negative child experiences, the experience of recent NLEs, and poor psychosocial outcomes. Our bullying measure did not distinguish between subtypes of bullying (cyber, physical, or verbal) or the setting in which it occurred (e.g., juvenile corrections vs. school). Additionally, respondents were not asked when in their childhood the maltreatment experiences occurred or whether they were chronic or severe. This information would help tease apart the mechanisms by which child maltreatment affects adult outcomes. Finally, negative experiences occurring during sensitive developmental periods in childhood may contribute to more adverse outcomes than events not taking place during these periods (Dunn, McLaughlin, Slopen, Rosand, & Smoller, 2013; Teicher & Samson, 2016) and consequently may play a role in later associations with adult outcomes.

4.3. Future directions

Despite these limitations, our findings provide several opportunities for future research. Further attempts should be made to better understand, at a more-fine grained level, how the developmental time periods (e.g., early childhood, adolescence) during which these negative experiences occur may be differentially associated with adulthood outcomes. Future inquiry might also examine the nuances between types of early life stress (e.g., physical vs. psychological bullying; emotional vs. physical neglect) in their subsequent association with adult biopsychosocial outcomes, and the unique mechanisms that explain these associations. For example, research could examine *specific* recent events as mediators linking specific types of childhood experiences with adult outcomes. Lastly, future work should also explore frequently co-occurring childhood maltreatment types and how different combinations may be associated with specific patterns of health and psychosocial outcomes in adulthood.

Overall, negative childhood experiences have been linked to many adverse outcomes throughout the lifespan. The current study provides evidence for the association between specific childhood experiences and poor health and psychosocial outcomes in adulthood. Experiencing adversity early in life may portend a cycle of subsequent trauma exposures throughout the lifespan, with ramifications for physical and mental health.

Acknowledgement

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.chiabu.2019.104048.

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