

# Relationship of Adverse Family Experiences to Resilience and School Engagement Among Vermont Youth

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## Abstract

**Introduction** Adverse childhood experiences (ACEs) are associated with a range of health outcomes and risk behaviors. In 2011–2012, the National Survey of Children’s Health (NSCH) included questions about adverse family experiences (AFE). AFE survey questions are similar to ACE questions, except there are no questions about emotional/physical/sexual trauma, and questions are asked of parents rather than children. Although the relationship between ACEs and work/school absenteeism has been studied, the relationships between AFEs of school-aged children, school performance, and buffering behaviors have not been explored in depth.

**Disclaimer** The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention, the Vermont Department of Health, or the Vermont Department of Mental Health.

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**Methods** We examined AFEs and measures of resilience and school engagement among 1330 Vermont children (6–17 years) included in the NSCH, using descriptive, bivariate, and multivariable analyses.

**Results** The most prevalent AFEs were divorce/separation of parents; family income hardship; substance use problems; and mental illness, suicidality, or severe depression. Adjusting for sex, age, special health care needs, poverty level, and maternal physical/mental-emotional health status, children who had three or more AFEs had lower odds of completing all required homework [adjusted odds ratio (AOR) 3.3, 95% confidence interval (CI) 1.7–6.3] and higher odds of failing to exhibit resilience (AOR 2.1, 95% CI 1.2–3.8), compared to children having no AFEs.

**Discussion** Children with three or more AFEs had difficulty engaging in school and completing homework, though poor outcomes were buffered when children showed resilience. Parents, school-based mental health professionals, and teachers could help identify children who may be less resilient and have difficulties completing homework assignments. Preventive approaches to children’s emotional

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problems (e.g., promoting family health, using family-based approaches to treat emotional/behavioral problems) could be applied in schools and communities to foster resilience and improve school engagement of children.

**Keywords** National Survey of Children's Health · Adverse childhood experiences · Family-based approach · Resilience · School engagement

### Abbreviations

MCHB Maternal and Health Child Bureau  
 NSCH 2011–2012 National Survey of Children's Health  
 ACEs Adverse childhood experiences  
 AFEs Adverse family experiences

### Significance

*What is already known on this subject?* ACEs such as divorce/separation of parents; death or incarceration of a parent; witnessing domestic violence; being a victim of abuse; living with a parent who was mentally ill, suicidal, or who had substance use problems have been found to be associated with children's behavioral, mental, and physical health outcomes and risk behaviors.

*What this study adds?* Adjusting for sex, age, special health care needs, poverty level, and maternal physical/mental-emotional health status, children who had three or more AFEs had lower odds of completing required homework (AOR 3.3, 95% CI 1.7–6.3) and higher odds of failing to exhibit resilience (AOR 2.1, 95% CI 1.2–3.8), compared to children who had no AFEs. Resilience moderated the effect of AFEs.

### Introduction

The relationships of childhood abuse and household dysfunction, with risky behaviors and negative health outcomes in adulthood have been explored for the past two decades. Adverse childhood experiences (ACEs) have been found to be associated with a wide range of health outcomes and risk behaviors, including substance use, a myriad of chronic diseases, depression, suicide, premature death, and poor work/school performance (Anda et al. 1999, 2002; Bethell et al. 2014; Brown et al. 2009; Campbell et al. 2015; Chapman et al. 2004; Dube et al. 2001, 2003; Felitti 2009; Felitti et al. 1998; Liu et al. 2013). ACEs include divorce/separation of parents; death or incarceration of a parent; witnessing domestic violence; being a victim of emotional, physical, or sexual abuse; living with a parent who was clinically depressed, mentally ill or suicidal; and living with a parent who had substance use problems (Felitti et al. 1998). Studies

have shown that these types of experiences are common, often co-occurring and interrelated (Anda 2006). Further, ACE research indicates that there is a graded relationship between the cumulative number of adverse experiences and prevalence and severity of health outcomes and risk factors (Felitti et al. 1998).

Adverse family experience (AFE) questions are similar to ACE questions, but differ in two important ways: there are no questions about emotional, physical, or sexual trauma; and questions are asked of the parent rather than the subject child. AFEs include socioeconomic hardship; divorce/separation, death, and/or incarceration of parents/guardians; parents/guardians with alcohol/drug problems, and/or who were mentally ill, suicidal, and/or severely depressed; experiencing or witnessing domestic violence and/or neighborhood violence.

Studies of the relationship between ACEs and absenteeism at school and educational attainment are sparse (Anda et al. 2004; Liu et al. 2013). Bethell et al. conducted an extensive analysis of the National Survey of Children's Health (NSCH) data on the prevalence of AFEs among U.S. children and the relationship of AFEs with special health needs, chronic health conditions, receipt of family-centered medical care, measures of school success, resilience, and factors at the individual, family and neighborhood level that may mitigate or protect against the effects of adverse experiences (Bethell et al. 2014). Specifically, the authors found that, compared to children with no AFEs, children with two or more AFEs were more likely to repeat a grade in school and had lower odds of school engagement (Bethell et al. 2014). However, these outcomes were not as pronounced for children who were able to demonstrate resilience (Bethell et al. 2014).

Children who fail to engage in school and fail to complete a high school education are at risk for under- or unemployment, living in poverty, incarceration, divorce or separation, early childbearing, and poor health (Koball et al. 2011; Morsy and Rothstein 2015). Children with AFEs may be at particularly high risk (Anda et al. 2004; Liu et al. 2013). Given that the relationship between AFEs of school-aged children and their school performance and buffering behaviors has not been explored in depth at a state level where the population is not racially diverse, in this analysis we examined associations between AFEs and early indicators of school success and resilience using data from the Vermont subsample of the NSCH.

### Methods

The NSCH is a national cross-sectional survey of children aged < 18 years of age sponsored by the Maternal and Child Health Bureau (2013). The NSCH collects information from

parent/guardian respondents on children's physical and mental health status; health care access and quality of health care; and contextual information on families, schools, and neighborhoods (Blumberg et al. 2009). The National Center for Health Statistics at the Centers for Disease Control and Prevention oversees sampling and administration of the survey using the State and Local Area Integrated Telephone Survey sampling mechanism (Blumberg et al. 2009). The Vermont subsample of the NSCH contains information on 1856 children (weighted population size 126,393) (Maternal and Child Health Bureau (2013)). The weighted data yield prevalence estimates for non-institutionalized children and are valid for state-to-state, regional, and national comparisons (Blumberg et al. 2009).

We analyzed the 2011–2012 NSCH using a subpopulation of children ages 6–17 years, among whom information on AFEs, residential mobility, school engagement, and resilience was collected ( $n = 1330$ ) from parent/guardian respondents. Children < 6 years old were excluded from analysis, because school engagement is not collected among this subpopulation and resilience is measured differently. This research was conducted in accordance with prevailing ethical principles using publically available data.

School engagement is measured according to whether the child (1) cares about doing well in school, and (2) completes all required homework, during the previous month (Data Resource Center for Child and Adolescent Health 2013). Resilience is one of four components of the flourishing construct, and is measured by a single question: Does the child stay calm and in control when faced with a challenge (Data Resource Center for Child and Adolescent Health 2013)? Respondents used a 5-point Likert scale (never, rarely, sometimes, usually, always) to characterize question responses in both constructs. Responses were reclassified into never/rarely/sometimes and usually/always.

The primary independent variables were AFEs, which were assessed through a modified version of certain ACE questions intended to capture psychosocial risk factors: socioeconomic hardship; divorce/separation of parents; death or incarceration of a parent; witness to domestic violence; victim of violence/witness to neighborhood violence; lived with someone who was mentally ill, suicidal, severely depressed, or who had alcohol/drug problems; and had been treated or judged unfairly because of race/ethnicity (Data Resource Center for Child and Adolescent Health 2013). AFE questions were asked using a dichotomous “yes/no” response option, except for socioeconomic hardship and discrimination which used a 4-point Likert scale (very often, somewhat often, rarely, never). For these questions, a response of *somewhat often* or *very often* was coded as an AFE. To determine the AFE grouping of no AFEs, one–two AFEs, and three or more AFEs, we used a logical distribution of

the number of AFEs and the threshold at which changes in outcomes occurred.

Other explanatory and potentially confounding variables included in the analysis were selected based on prior research and whether they were plausibly associated with the outcome variables: sex, age, race/ethnicity, and special health care need of child, and household characteristics (family structure, household poverty level, residential mobility, maternal education level, and maternal physical and mental-emotional health). Age was reclassified into two levels: ages 6–11 years and ages 12–17 years. Special health care need was determined by the NSCH Children with Special Health Care Needs Screener (Data Resource Center for Child and Adolescent Health 2013). Responses to the five items in the screener classified children as having or not having a special health care need. Family structure was characterized by the number of parents/parent figures present in the household (one, two, or other family type) and the relationships of parents or other adults in the household (biological, adoptive, stepparent, or other family structure) (Data Resource Center for Child and Adolescent Health 2013). Household poverty was a two-level variable created from the survey's imputed family income variable based on the federal poverty level for children in Vermont: 0–299% of the federal poverty level, or  $\geq 300\%$  of the federal poverty level (Blumberg et al. 2009, Data Resource Center for Child and Adolescent Health 2013). Residential mobility, an important stressor not deemed an adverse event, was measured by the question, “How many times has the child ever moved to a new address?” (Data Resource Center for Child and Adolescent Health 2013). The variable was reclassified by category: no lifetime moves, one to three lifetime moves, or four or more lifetime moves. To determine the number of moves per category, we used a logical distribution of the number of lifetime moves by balancing the number of responses and the threshold at which changes in outcomes occurred. Maternal education was reclassified into two levels: high school or less than high school, and more than a high school education. Maternal physical and mental health was based on a composite variable summarizing the mother's self-rated general health status and her mental and emotional health status (Data Resource Center for Child and Adolescent Health 2013). Responses were classified into excellent/very good or not excellent/not very good.

We created and recoded variables using SAS version 9.4 (SAS Institute, Cary, NC). Analyses were carried out using SAS-callable SUDAAN version 10 (RTI International, Research Triangle Park, NC) to appropriately subset the population, weight estimates, and adjust for the survey's complex sampling design (Blumberg et al. 2009). We estimated the prevalence and 95% confidence intervals (CI) of children whose parents reported whether the child was engaged in school and resilient, and whether the child had

experienced any of nine AFEs or had more than four lifetime residential moves. We calculated crude and adjusted odds ratios (ORs) and 95% CI to examine associations between school engagement and resilience, the presence of three or more AFEs, residential mobility, and other potentially confounding explanatory variables. Chi square tests were used to assess the strength of association. We also constructed multivariable logistic regression models to examine associations between overall school engagement and resilience and the type and number of AFEs, while controlling for individual, family, and household characteristics (Kleinbaum and Klein 2005). Children whose parents reported that their child *usually/always* was engaged in school or *usually/always* demonstrated elements of resilience served

as the referent groups. Potential confounders (explanatory variables) retained in all final adjusted models were: child's sex, age, presence of special health care need, household poverty level, and maternal physical and mental-emotional health status. We examined explanatory variables for multicollinearity using standard diagnostic methods and found the degree of multicollinearity was small (tolerance values ranged from 0.912 to 0.995, variance inflation factors ranged from 1.005 to 1.096, and condition indices ranged from 21.6 to 21.7) (Belsley et al. 1980).

**Table 1** Characteristics of Vermont children and youth 6–17 years of age (n = 1330) with AFEs, by number of AFEs—National Survey of Children's Health, 2011–2012

| Characteristic   | Number in survey population <sup>a</sup> | Estimated weighted population <sup>b</sup> | 0 AFEs<br>n <sup>a</sup> = 711<br>N <sup>b</sup> = 40,137<br>% (95% CI) | 1–2 AFEs<br>n <sup>a</sup> = 468<br>N <sup>b</sup> = 32,973<br>% (5% CI) | 3+ AFEs<br>n <sup>a</sup> = 151<br>N <sup>b</sup> = 12,730<br>% (95% CI) |
|--|--|--|---|--|--|
| Total  | 1330                                     | 85,840                                     | 46.8 (43.3, 50.3)   | 38.4 (35.0, 42.0)  | 14.8 (12.2, 17.9)  |
| Sex  |  |  |   |  |  |
| Male   | 695                                      | 41,508                                     | 46.2 (41.4, 51.1)   | 39.4 (34.6, 44.5)  | 14.3 (10.8, 18.8)  |
| Female   | 633                                      | 44,254                                     | 47.2 (42.2, 52.3)   | 37.5 (32.7, 42.6)  | 15.3 (11.6, 19.9)  |
| Age group (years)  |  |  |   |  |  |
| 6–11   | 575                                      | 38,607                                     | 50.0 (44.6, 55.4)   | 34.4 (29.4, 39.7)  | 15.6 (11.5, 20.9)  |
| 12–17  | 755                                      | 47,233                                     | 44.1 (39.6, 48.7)   | 41.7 (37.1, 46.5)  | 14.2 (11.0, 18.1)  |
| Special health care need                                     |  |  |   |  |  |
| Yes  | 343                                      | 22,561                                     | 33.9 (27.8, 40.5)   | 37.6 (30.9, 44.7)  | 28.6 (22.0, 36.2)  |
| No   | 987                                      | 63,279                                     | 51.4 (47.3, 55.4)   | 38.7 (34.7, 42.9)  | 9.9 (7.5, 13.0)  |
| Family structure   |  |  |   |  |  |
| Two-parent, biological/adoptive                              | 930                                      | 52,820                                     | 71.7 (67.9, 75.3)   | 24.1 (20.8, 27.8)  | 4.2 (2.5, 7.0)   |
| Two-parent, step   | 117                                      | 9627                                       | 4.7 (2.3, 9.5)  | 58.2 (46.3, 69.2)  | 37.1 (26.4, 49.3)  |
| Single mother, father absent                                 | 186                                      | 15,763                                     | 7.1 (3.5, 13.9)   | 65.6 (56.1, 74.0)  | 27.3 (19.7, 36.5)  |
| Other family type  | 91                                       | 7120                                       | 9.1 (3.5, 21.8)   | 54.0 (40.1, 67.2)  | 36.9 (24.6, 51.3)  |
| Household FPL  |  |  |   |  |  |
| < 300%   | 577                                      | 40,982                                     | 31.5 (27.0, 36.4)   | 44.7 (39.3, 50.1)  | 23.9 (19.3, 29.2)  |
| ≥ 300%   | 753                                      | 44,858                                     | 60.7 (56.0, 65.3)   | 32.7 (28.4, 37.3)  | 6.6 (4.3, 9.9)   |
| Residential mobility   |  |  |   |  |  |
| Four + lifetime moves  | 177                                      | 15,231                                     | 28.6 (20.1, 37.6)   | 39.4 (30.6, 48.9)  | 32.0 (23.8, 41.6)  |
| One–three lifetime moves                                     | 653                                      | 44,663                                     | 45.3 (40.4, 50.3)   | 41.0 (36.1, 46.2)  | 13.7 (10.2, 18.1)  |
| No lifetime moves  | 491                                      | 25,218                                     | 60.2 (54.4, 65.8)   | 32.8 (27.6, 38.5)  | 6.9 (4.1, 11.5)  |
| Highest maternal education level attained                    |  |  |   |  |  |
| ≤ High school  | 245                                      | 15,977                                     | 40.7 (33.2, 48.8)   | 40.0 (32.2, 48.4)  | 19.3 (13.2, 27.2)  |
| > High school  | 994                                      | 62,557                                     | 52.1 (47.9, 56.2)   | 36.4 (32.5, 40.6)  | 11.5 (8.8, 14.9)   |
| Mother's overall physical and mental-emotional health status |  |  |   |  |  |
| One or both NOT excellent or very good                       | 407                                      | 27,138                                     | 34.3 (28.7, 40.4)   | 42.2 (35.9, 48.8)  | 23.5 (17.9, 30.1)  |
| Both excellent or very good                                  | 837                                      | 51,713                                     | 58.1 (53.6, 62.5)   | 34.3 (30.1, 38.8)  | 7.5 (5.3, 10.6)  |

AFE adverse family experience, CI confidence interval, FPL federal poverty level

<sup>a</sup>Unweighted number of surveyed population

<sup>b</sup>Weighted number of population

## Results

Table 1 shows the characteristics of 1330 Vermont children ages 6–17 years in the study population, by number of AFEs. Table 2 shows the outcomes of school engagement and resilience, by the number of AFEs. Children with one-two AFEs had the highest prevalence of sometimes/rarely/never being engaged in school and showing resilience. Children with three or more AFEs had the lowest prevalence of usually/always being engaged in school and showing resilience.

Figure 1 depicts the cross-classification frequencies of AFE domains. The most prevalent AFEs among Vermont children were: living in a household in which they experienced divorce or separation of their parents; family income hardship; family members who had substance use problems; and family members who were mentally ill, suicidal, or severely depressed. One in six Vermont children ages 6–17 years had moved four or more times since birth (data not shown). Disparities were observed depending on the characteristic and type of AFE. For example, children ages 6–11 versus ages 12–17 years were more likely to live in a household where it was hard to get by on family income ( $p=0.0008$ ); children with special health care needs versus no special health care needs, and children who lived in a household where the family income was  $<300\%$  of the federal poverty level versus  $\geq 300\%$  of the federal poverty level were  $2\times$ – $3\times$  more likely to experience all but two AFE types [i.e., death of a parent/guardian ( $p>0.05$ ) and unfair treatment/judgement ( $p>0.05$ )]. Mother's physical/

mental-emotional health was associated with five AFE types: [family hardship ( $p<0.0001$ ), divorce/separation ( $p=0.0002$ ), domestic violence ( $p=0.0017$ ), neighborhood violence ( $p=0.0005$ ), and mental illness/suicide/severe depression ( $p=0.0001$ )]. In addition, completing all required homework and resilience were associated with five AFE types: divorce/separation of parents [homework ( $p=0.0059$ ), resilience ( $p<0.0001$ )], domestic violence [homework ( $p=0.0025$ ), resilience ( $p=0.0068$ )], neighborhood violence [homework ( $p=0.0105$ ), resilience ( $p=0.0002$ )], households with family members who had substance use problems [homework ( $p=0.0043$ ), resilience ( $p=0.0073$ )], and households with family members who were mentally ill/suicidal/severely depressed [homework ( $p=0.0142$ ), resilience ( $p<0.0009$ )] (Supplemental Table 1; data not shown).

Table 3 presents the adjusted ORs for exposure to AFEs and effects on school engagement and resilience. After adjusting for sex, age, special health care need, poverty level, and maternal physical/mental-emotional health status, children who had three or more versus no AFEs or one–two AFEs versus no AFEs had greater odds of not completing all required homework ( $\geq 3$  vs. 0: AOR 3.3, 95% CI 1.7–6.3; 1–2 vs. 0: AOR 1.9, 95% CI 1.1–3.3); children who had three or more AFEs versus no AFEs or one–two AFEs versus no AFEs also had higher odds of not exhibiting resilience ( $\geq 3$  vs. 0: AOR 2.1, 95% CI 1.2–3.8; 1–2 vs. 0: AOR 1.8, 95% CI 1.3–2.6). When controlling for resilience in addition to sex, age, special health care need, poverty level, and maternal physical/mental-emotional

**Table 2** Percent of Vermont children and youth 6–17 years of age ( $n=1330$ ) with AFEs engaged in school and resilient, by number of AFEs—National Survey of Children's Health, 2011–2012

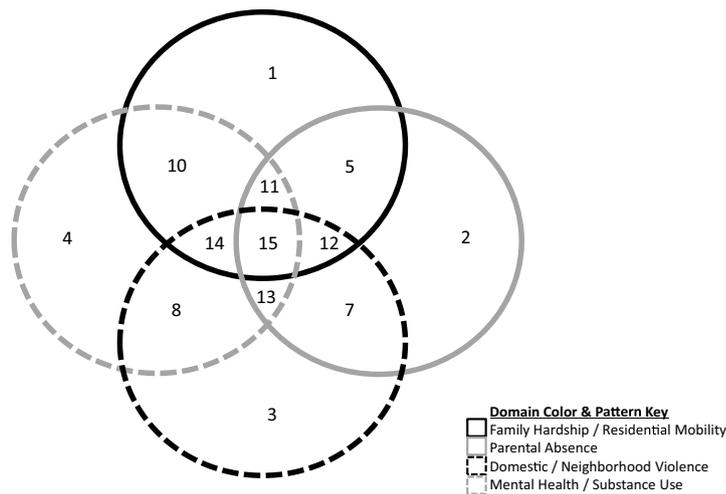
| Characteristic                                | Number in survey population <sup>a</sup> | Estimated weighted population <sup>b</sup> | 0 AFEs<br>$n^a=711$<br>$N^b=40,137$<br>% (95% CI) | 1–2 AFEs<br>$n^a=468$<br>$N^b=32,973$<br>% (95% CI) | 3+ AFEs<br>$n^a=151$<br>$N^b=12,730$<br>% (95% CI) |
|---|--|--|---|---|--|
| <b>School engagement composite</b>            |  |  |   |   |  |
| Sometimes/rarely/never                        | 245                                      | 16,877                                     | 33.2 (26.0–41.4)                                  | 43.1 (34.8–51.8)                                    | 23.7 (17.0–32.1)                                   |
| Usually/always                                | 1082                                     | 68,831                                     | 50.0 (46.1–53.9)                                  | 37.3 (33.6–41.3)                                    | 12.7 (9.9–16.1)                                    |
| <b>Cares about doing well in school</b>       |  |  |   |   |  |
| Sometimes/rarely/never                        | 180                                      | 11,876                                     | 35.7 (27.0–45.5)                                  | 41.7 (32.1–52.0)                                    | 22.6 (14.0–32.6)                                   |
| Usually/always                                | 1147                                     | 73,832                                     | 48.4 (44.7–52.2)                                  | 38.0 (34.3–41.8)                                    | 13.6 (10.9–16.9)                                   |
| <b>Does all required homework</b>             |  |  |   |   |  |
| Sometimes/rarely/never                        | 163                                      | 11,259                                     | 26.0 (18.6–35.1)                                  | 45.5 (35.3–56.0)                                    | 28.6 (19.9–39.2)                                   |
| Usually/always                                | 1155                                     | 74,096                                     | 49.8 (46.0–53.6)                                  | 37.4 (33.8–41.2)                                    | 12.8 (10.1–16.0)                                   |
| <b>Resilience (stays calm and in control)</b> |  |  |   |   |  |
| Sometimes/rarely/never                        | 401                                      | 29,277                                     | 30.5 (25.2–36.3)                                  | 44.7 (38.2–51.3)                                    | 24.9 (19.2–31.6)                                   |
| Usually/always                                | 928                                      | 56,549                                     | 55.2 (50.9–59.4)                                  | 35.2 (31.2–39.4)                                    | 9.6 (7.2–12.7)                                     |

AFE adverse family experience, CI confidence interval

<sup>a</sup>Unweighted number of surveyed population

<sup>b</sup>Weighted number of population

**Fig. 1** Cross-classification frequencies of Vermont children with adverse family experiences (AFEs) and residential mobility (n = 1321)



| Figure 1 Legend   |                                      |                                |                                |                             |   |   |
|---|--------------------------------------|--------------------------------|--------------------------------|-----------------------------|---|---|
| Figure Key  | Domains                              |                                |                                |                             | No. of children in Vermont sample with AFEs | No. of children in Vermont population with AFEs |
| <b>Single AFE Domains</b>   |                                      |                                |                                |                             |   |   |
| 1   | Family Hardship/Residential Mobility |                                |                                |                             | 157   | 10,346  |
| 2   | Parental Absence                     |                                |                                |                             | 126   | 9,893   |
| 3   | Domestic/Neighborhood Violence       |                                |                                |                             | 19  | 876   |
| 4   | Mental Health/Substance Use          |                                |                                |                             | 75  | 4,053   |
| <b>Two AFE Domains</b>  |                                      |                                |                                |                             |   |   |
| 5   | Family Hardship/Residential Mobility | Parental Absence               |                                |                             | 65  | 5,619   |
| 6   | Parental Absence                     | Mental Health/Substance Use    |                                |                             | 44  | 3,654   |
| 7   | Parental Absence                     | Domestic/Neighborhood Violence |                                |                             | 7   | 628   |
| 8   | Domestic/Neighborhood Violence       | Mental Health/Substance Use    |                                |                             | 7   | 416   |
| 9   | Family Hardship/Residential Mobility | Domestic/Neighborhood Violence |                                |                             | 11  | 1,115   |
| 10  | Family Hardship/Residential Mobility | Mental Health/Substance Use    |                                |                             | 26  | 1,353   |
| <b>Three AFE Domains</b>  |                                      |                                |                                |                             |   |   |
| 11  | Family Hardship/Residential Mobility | Parental Absence               | Mental Health/Substance Use    |                             | 41  | 3,926   |
| 12  | Family Hardship/Residential Mobility | Parental Absence               | Domestic/Neighborhood Violence |                             | 13  | 1,557   |
| 13  | Parental Absence                     | Domestic/Neighborhood Violence | Mental Health/Substance Use    |                             | 23  | 1,623   |
| 14  | Family Hardship/Residential Mobility | Domestic/Neighborhood Violence | Mental Health/Substance Use    |                             | 6   | 268   |
| <b>All Four AFE Domains</b>   |                                      |                                |                                |                             |   |   |
| 15  | Family Hardship/Residential Mobility | Parental Absence               | Domestic/Neighborhood Violence | Mental Health/Substance Use | 45  | 3,976   |
| Total population 85,112. Number of children who did not experience any AFEs, sample n = 656; population n = 35,789. Number of children who experienced 1 or more AFEs by domain: single domain, sample n=377, population n=25,168; 2 domains, sample n=160, population n=12,785; 3 domains, sample n=83, population n=7,374; all 4 domains, sample n=45, population n=3,976.                    |                                      |                                |                                |                             |   |   |
| For purposes of illustration, adverse family experiences were combined into domains relating to poverty (e.g., family hardship and residential mobility), experiences that may lead to the absence of a parent (e.g., death or divorce), experiences relating to violence in or outside of the household, and experiences relating to mental health or substance use of the parent or guardian. |                                      |                                |                                |                             |   |   |
| Note: Two dimensions of the Venn diagram cannot be observed: Parental Absence & Mental Health/Substance Use (Figure Key # 6) and Family Hardship/Residential Mobility & Domestic/Neighborhood Violence (Figure Key #9).   |                                      |                                |                                |                             |   |   |

**Table 3** Adjusted odds ratios of school engagement and resilience of Vermont children and youth ages 6–17 years (n=1330) with AFEs—National Survey of Children’s Health, 2011–2012

| Outcome   | AFE exposure | AOR      | 95% CI  |
|---|--------------|----------|---------|
| School engagement composite <sup>a</sup>                                  |              |          |         |
| Sometimes/rarely/never engaged (vs. usually/always engaged)               | 3 + AFEs     | 1.8      | 1.0–3.2 |
|   | 1–2 AFEs     | 1.5      | 0.9–2.3 |
|   | 0 AFEs       | Referent |         |
| Cares about doing well in school <sup>a</sup>                             |              |          |         |
| Sometimes/rarely/never cares (vs. usually/always cares)                   | 3 + AFEs     | 1.4      | 0.7–2.8 |
|   | 1–2 AFEs     | 1.2      | 0.7–2.0 |
|   | 0 AFEs       | Referent |         |
| Does all required homework <sup>a</sup>                                   |              |          |         |
| Sometimes/rarely/never does homework (vs. usually/always does homework)   | 3 + AFEs     | 3.3      | 1.7–6.3 |
|   | 1–2 AFEs     | 1.9      | 1.1–3.3 |
|   | 0 AFEs       | Referent |         |
| Resilience—stays calm and in control when facing a challenge <sup>a</sup> |              |          |         |
| Sometimes/rarely/never resilient (vs. usually/always resilient)           | 3 + AFEs     | 2.1      | 1.2–3.8 |
|   | 1–2 AFEs     | 1.8      | 1.3–2.6 |
|   | 0 AFEs       | Referent |         |
| Does all required homework, adjusting for resilience <sup>b</sup>         |              |          |         |
| Sometimes/rarely/never does homework (vs. usually/always does homework)   | 3 + AFEs     | 2.7      | 1.4–5.4 |
|   | 1–2 AFEs     | 1.6      | 0.9–2.8 |
|   | 0 AFEs       | Referent |         |

AFE adverse family experience, AOR adjusted odds ratio, CI confidence interval

<sup>a</sup>Model adjusted for child’s sex, age group, and special health care need, family’s poverty level, and maternal physical and mental-emotional health status

<sup>b</sup>Model adjusted for child’s sex, age group, and special health care need, family’s poverty level, maternal physical and mental-emotional health status, and resilience

health status, children who experienced three or more AFEs had improved odds of completing all required homework (AOR 2.7, 95% CI 1.4–5.4).

## Discussion

Our findings suggest that exposure to three or more AFEs—even after controlling for individual child, family, and household characteristics—is an important factor in a child’s ability to complete homework. Children who had problems with school engagement, but demonstrated resilience, improved their odds of completing their homework. Resilience is an important aspect of a child’s social-emotional development and has implications for academic performance, school completion, and, as demonstrated in the ACE Study, future employment and other health and social outcomes. Children are not born with or without resilience; resilience needs to be fostered. Resilience develops through a “combination of supportive relationships, adaptive skill-building, and positive experiences” (Center on the Developing Child at Harvard University). The application of approaches that promote supportive trauma-informed environments, help children develop emotional regulation skills and build on the protective factors that strengthen families

(parental resilience; social connections; knowledge of parenting and child development; concrete support in times of need) presents an opportunity for early intervention before poor social-emotional and educational outcomes play out (Harper Browne 2014).

Our study confirms a previous finding by Bethell and colleagues on the association of AFEs with school engagement and resilience of all school-age children in the NSCH (Bethell et al. 2014). Like Bethell et al., we observed a dose-response in which the worst outcomes were associated with a higher number of AFEs. Additionally, children who demonstrated resilience were able to be more engaged in school despite having been exposed to AFEs. The similarity and consistency in the findings of our two studies is striking even though we controlled for slightly different factors in modelling and evaluated school engagement differently. For example, in our study, we controlled for sex, age, special health care need, poverty level, and maternal physical/mental-emotional health status and looked at the possible associations with school engagement overall and the two components that comprise the construct. Bethell et al. controlled for race/ethnicity, sex, age, special health care need, and household income and assessed the association with school engagement, grade repetition, and missed school days. Our study also differed from Bethell et al. in

how we grouped the number of AFEs for analysis. In our study, we did not observe notable differences between children with one–two AFEs and grouped these two response levels together and chose three or more AFEs as the highest response level.

Walker and Walsh suggest how schools can help children who have experienced adverse experiences (2015). Outside of the family setting, schools may be the front line for identifying children exposed to AFEs or trauma. Workforce development for school personnel could include focused activities to increase knowledge about adverse experiences and their potential impact, and strategies to foster resilience and support students in school settings. Most school districts in Vermont, for example, have a formal relationship with their local mental health agency to provide school-based mental health (SBMH) and behavioral intervention services and supports. Addressing the mental health of students in school settings is more than providing treatment to students identified with emotional or behavioral disorders, it is about recognizing the links between social determinants of health, mental health, and school success. When SBMH services were initially designed in Vermont, the focus was on individualized interventions for students identified with emotional or behavioral disorders. Vermont's understanding of what schools and students need continues to broaden. School and SBMH partnerships can support wellness promotion and prevention efforts for the entire population of students, early intervention activities to protect students at-risk, and targeted interventions for students with identified emotional or behavioral disorders.

Vermont and other states across the U.S., for example, recognize that creating a positive school environment that is welcoming, supportive, and responsive to the needs of all students is essential in addressing the social and emotional needs of students—including the impact of AFEs—and ultimately to improve academic performance. Vermont's Agency of Education (AOE) implements Positive Behavioral Intervention & Supports (PBIS) to help schools form a proactive, school-wide, multi-tiered systems approach to improving social and academic competence for all students [U.S. Department of Education's Office of Special Education Programs (OSEP); Vermont Agency of Education, & UVM Center on Disability and Community Inclusion Collaboration]. While historically the focus has been to *help children be ready for school*, the goal of PBIS is to *help schools be ready for all children*. The Vermont Department of Mental Health partners with AOE to identify the role of SBMH within the PBIS tiered system, which provides increasing levels of support for children in the school setting (Schoenberg et al. 2012). At Tier 1, Universal Supports, SBMH personnel provide training and consultation for school staff (e.g., identifying risks for mental health problems, understanding the effects of trauma, and recognizing signs of

depression and other serious mental health risk factors). At Tier 2, Targeted Supports, SBMH implements targeted supports, such as, Check-in/Check-out and groups for children with shared stressors (e.g., families going through divorce or incarceration of a parent). SBMH can provide consultation on strategies to support students with early signs of behavioral and emotional needs. SBMH can link with students' families to support their engagement with schools, which is a critical component for students' academic success. For students at Tier 3 who need intensive support—many of whom are at-risk for AFEs—SBMH participate on educational support teams for individual students with identified needs, conduct functional behavior assessments, develop implementation plans for specific evidence-based interventions, and identify community services and supports that might benefit the student and family.

Adverse childhood events may present a common issue to bring together different sectors of the community to work towards preventive measures and interventions with families, schools, and communities. While longitudinal studies of adverse events may be necessary to fully tease apart the relationships between concurrent stressful life events, residential mobility, and confounding factors, cross-sectional data remain useful for informing public health, schools, and communities about the potential impact of AFEs on overall child health and school performance. Vermont is exploring new approaches for supporting communities to identify shared outcome measures for children and families, develop collaborative leadership among community systems and with the State, and design shared strategies for responding to the needs of Vermont's children and families. This approach requires a culture shift in how services are designed, delivered, and funded; how families are involved; and how outcomes are measured. If we hope to reduce or prevent exposures to adverse experiences, it may be necessary to have a long vision. Thus, a two-generation approach means it also is necessary to identify children and youth now who have multiple AFEs and apply strategies to build resilience and improve school engagement. This approach will not only benefit the social and health trajectory for these individuals, but is an investment in the next generation.

### Limitations and Strengths

This research has several limitations. These data are from a cross-sectional survey in which parent/guardian respondents were asked to remember whether their child ever had an adverse experience, and are subject to the possibility of both recall and detection bias. This bias could be more pronounced among older children, adopted children, and children in foster care. The AFE questions on the NSCH do not include questions relating to emotional, physical, or sexual abuse. Thus, the scope and overall prevalence of AFEs are

likely underestimated, resulting in conservatively lower outcomes.

Residual confounding also may be a consideration and limit our ability to fully explain the relationships between explanatory variables and outcomes. Poor school engagement and lack of resilience may be associated with other stressful life events not measured in the NSCH. Additionally, it is difficult to separate the specific contribution of AFEs and residential and school mobility to school success outcomes because of complex relationships between social disadvantage, housing conditions, and family or neighborhood characteristics.

In spite of the limitations, this study has several strengths. This study was based on a large nationally representative sample of children to examine associations between AFEs and school engagement and resilience. To our knowledge, this is the first study that has investigated both the association and degree of impact of AFEs on the key behaviors of school engagement and resilience within a state.

## Conclusions

Public health and mental health professionals are in positions to raise awareness that experiencing multiple AFEs is associated with poor school outcomes and, yet, may be buffered by fostering resilience. Additionally, parents, school-based mental health professionals, and teachers could use simple measures to identify children who may be less resilient and are having difficulties completing homework assignments. Practical approaches that promote family health, prevent the development of emotional problems, and treat emotional/behavioral problems using a family-based approach are available and could be applied in school or community settings.

## Compliance with Ethical Standards

**Conflicts of interest** The authors have indicated they have no conflicts of interest or financial relationships relevant to this article to disclose.

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