

Extracurricular activities, child and caregiver mental health and parental aggravation—a national cross-sectional study

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**Title: Extracurricular activities, child and caregiver mental health and parental aggravation—a national cross-sectional study**

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**Abstract:**

**Objective:** Expanding access to extracurricular activities (EA) may help address the growing mental health needs of children and caregivers. Evidence supports that EA may benefit child mental health, but few studies explore whether this association is influenced by child and EA factors. Further, the impact of EA on caregivers remains unknown.

**Methods:** We conducted a secondary analysis of the 2019 National Survey of Children's Health (NSCH), a nationally representative sample of children and their caregivers. We used responses from caregivers of children aged 6-17. Weighted logistic regressions tested associations between EA and 1) child anxiety and/or depression diagnosis, 2) caregiver mental health and 3) parental aggravation, controlling for child, family, and neighborhood-level covariates. Interaction terms tested whether associations were moderated by child age, sex, and presence of physical, developmental, or behavioral condition. Sub-analyses explored whether results varied by EA number and type.

**Results:** Weighted sample included 21,259 children. There were disparities in which children were engaged in EA. EA participation was associated with lower odds of a 1) child being diagnosed with anxiety and/or depression; 2) caregiver reporting "fair/poor" mental health, and 3) caregiver reporting "usually/always" experiencing parental aggravation. Child age, sex, EA number and type, but not health condition, influenced the relationship between EA and child anxiety and/or depression diagnosis.

**Conclusions:** Access to EA is associated with child mental health and family functioning. Further studies should assess causality and specific mechanisms of action.

**What's New:** We examine potential moderating factors (age, sex, health conditions, activity number and type) in the association between extracurriculars and child mental health. It is the first study to explore the association between extracurriculars and caregiver mental health and parental aggravation.

### **Introduction:**

It is critical to address the mental health needs of children and caregivers. One in six United States (U.S.) youth aged 6-17 and one in five U.S. adults experience a mental health disorder annually.<sup>1</sup> Estimates during the COVID-19 pandemic suggest an increase in symptoms of mental distress among children and adult caregivers.<sup>2,3</sup> Given this mental health crisis, it is important to explore whether expanding existing programming can improve the mental health of children and their caregivers.

Increasing access to extracurricular activities (EA) for children may be such an opportunity. We define EA as “academic or non-academic activities... that occur outside of classroom time, are not part of the curriculum, do not involve a grade or academic credit, and participation is optional.”<sup>4,5</sup> EA participation is associated with increased pro-social behavior and improved school engagement and achievement.<sup>5-7</sup> EA participation, including summertime experiences, are also linked with positive mental health outcomes including lower rates of anxiety and depression.<sup>8-11</sup> However, much of the focus has been limited to sports, tailored EA programs, and child subpopulations (e.g. socially at risk, specific health condition).<sup>9-13</sup> If we are to consider EA as a potential mental health prevention or intervention effort, it is important to better understand the relationship between EA participation and child mental health, which groups of children would most benefit, and the types of EA that would be valuable to expand.

Adolescent girls and children with chronic conditions have higher rates of depression than younger children, boys, and children without a chronic condition.<sup>14,15</sup> Yet, most children aged 6-12 who play a team sport quit by age 11.<sup>16</sup> Further, girls and children with chronic health conditions or developmental disabilities are less likely to participate in EA.<sup>16</sup> Therefore, it is important to explore whether the relationship between EA and mental health varies by a child's age, sex, the presence of a health condition, or by the number and type of EA.

Child EA participation may also be an opportunity to impact the wellbeing and parenting experience of caregivers, which has yet to be documented. Poor parent mental health and parental aggravation are associated with poor health outcomes in children.<sup>17-19</sup> The limited research on parents and EA has concentrated on parenting attitudes toward their child's EA participation.<sup>20</sup> Child EA participation may reduce caregiver stress by offering childcare support; expanding social support and social networks through interactions with other parents, coaches, and instructors; and improving the mental and behavioral health of their child.

However, access to EA is inequitable. Lack of financial and social capital, reduced resources (e.g. available caregivers, transportation), and differences in school-based EA access likely contribute to disparities in EA participation across child and family demographics and neighborhood features.<sup>21-23</sup> In recent years there has been a decline in youth sports participation, and now 3 in 10 children who previously played before the pandemic are no longer interested in restarting.<sup>16</sup> There were further restrictions in EA availability due to the COVID-19 pandemic.<sup>16,24</sup> Financial barriers to participation are becoming more palpable as more schools charge for EAs and as a result of budget constraints in Parks and Recreation Departments.<sup>25,26</sup>

Increasing investment and access to EA could be a relatively low-cost and sustainable strategy to enhance family relationships and wellbeing. Therefore, we aimed to assess whether

child EA participation was associated with child and parent mental health and experience of parental aggravation using secondary data analyses. We also examined whether these relationships vary by child and EA characteristics to better identify the population who may most benefit from EAs and the EA types with the greatest potential to improve child health.

## **Methods:**

### Data Source

We obtained data from the 2019 National Survey of Children's Health (NSCH), a nationally representative sample of parents/caregivers of noninstitutionalized children ages 0-17.<sup>27</sup> The NSCH over-sampled children with special health care needs. In 2019, a total of 29,433 surveys were completed and the response rate was 42%, which is consistent with prior years. We restricted the sample to school-aged children (6-17 years old) who were asked about EA. This study was determined to be exempt from review by our institutional review board.

### Measures

#### *Primary Independent Variable: Organized EA*

The NSCH asked parents whether their child participated in (1) sports teams or lessons, (2) clubs or organizations, (3) any other organized activities or lessons, or (4) community or volunteer work after school or on the weekends within the past 12 months. "Other organized activities or lessons" included music, dance, language, or other arts. Parents could select more than one category. Based on their responses, we created a dichotomous variable for child participation in any organized EA within the prior 12 months, as well as indicators for each of the activity types. Finally, we created a variable for the number of EA types, ranging from none to four or more. Participation in any EA was the main independent variable. Sensitivity analyses

with subcategories of EA explored whether all EA types have a similar relationship with child anxiety and depression diagnoses.

*Dependent Variables: Child Anxiety and Depression Diagnoses*

The NSCH gave caregiver respondents a list of health conditions and asked if their child was ever diagnosed with any of the listed conditions by a doctor or other health care provider. The list included two items that separately asked about anxiety problems or depression. We created an indicator variable for whether the child was diagnosed with anxiety and/or depression. We focused on anxiety and depression due to their increasing and high prevalence and prior studies suggesting EAs may be beneficial for children with internalizing symptoms.<sup>9-13</sup>

*Dependent Variables: Caregiver Mental Health*

The NSCH asked caregiver respondents, “In general, how is your mental or emotional health?” Response options included “excellent,” “very good,” “good,” “fair,” and “poor.” We created a single caregiver mental health measure by including only the self-reported mental health responses from the first caregiver interviewed. We dichotomized the measure between the response options of “good” and “fair.” As robustness checks, we developed separate female versus male caregiver mental health measures (for same sex caregivers, only caregiver one was included) and a variable with both the self and proxy reported mental health responses.

*Dependent Variables: Parental Aggravation*

The NSCH measured parental aggravation using an adapted Aggravation in Parenting Scale (APS). Parents were asked how often during the past month they have felt (1) their child was much harder to care for than most children his or her age, (2) their child does things that really bothered them a lot, and (3) angry with their child. For each of the three questions, the response options were “never,” “rarely,” “sometimes,” “usually,” or “always.” The shortened

APS with these three items were included in multiple national surveys.<sup>28,29</sup> Cronbach's alpha for the three items was 0.93 in this study sample. We created a binary variable for parental aggravation with equal weighting of the three items based on prior literature and the NSCH manual.<sup>19,28,29</sup> We defined parents as experiencing parental aggravation within the past month if parents reported "usually" or "always" to any of the three APS questions.

### *Moderators*

We included caregiver's report of their child's sex, age in years, and presence of a behavioral, developmental, or physical health condition as potential moderators. The NSCH presented respondents with a list of health conditions and asked caregivers whether a doctor or other health care provider ever diagnosed their child with any of the listed conditions. The conditions fell into three groups: behavioral (attention deficit/hyperactivity disorder, behavioral or conduct problems), developmental (developmental delay, autism spectrum disorder, intellectual disability, speech or other language disorder, learning disability), and physical (arthritis, asthma, cerebral palsy, diabetes, epilepsy, heart condition, and headaches). We classified behavioral conditions as a moderator since children with behavioral concerns may have behavioral challenges in EAs. This may attenuate the relationship between EA and anxiety/depression diagnosis. We created a single indicator variable for whether the caregiver endorsed that their child had any behavioral, developmental, or physical condition since there was a high degree of correlation for a child having another health condition if they endorsed at least one condition. A sensitivity check confirmed the results were similar when each sub-category was included separately in the model.

### *Covariates*



We selected child, family, and neighborhood-level covariates for their potential to influence both our primary independent and dependent variables. Child-level covariates included a race/ethnicity variable (Non-Latinx Asian/Pacific Islander, Black, Multiracial/Native American, White, and Latinx any race). Race, a social construct, was used as a marker of structural and interpersonal racism. We included separate indicator variables for whether the child was born in the U.S and whether the child was adequately and continuously insured for the prior 12 months. Family-level covariates included the highest level of parental education in the household (less than high school, high school graduate/GED, some college, college graduate or more), household family structure (2 biologic/adoptive parents who are married, 2 biologic/adoptive parents who are not married, 2 parents with 1 non-biologic parent, single mom, single dad, grandparent or other non-parent caregiver), categorical number of children in the household variable (1, 2, 3, 4 or more children), and household income variable (0-99% federal poverty limit, 100-199%, 200-300%, 400% or greater). Of note, the household family structure variable does not consider caregivers outside the respondents' household. Neighborhood-level covariates included whether litter/garbage on the street or sidewalk, poorly kept or rundown housing, or vandalism were reported in the neighborhood, the number of reported neighborhood amenities including (1) sidewalks or walking paths, (2) park or playground, (3) recreation or community center or boys' and girls' club, and (4) library or bookmobile (coded as a count variable from none to four or more), and whether parents definitely or somewhat agreed that their child was safe in their neighborhood.

### Analyses

We obtained frequencies, weighted percentages, and weighted sample means to capture national estimates for the variables of interest. We used chi-square and t-tests to assess bivariate

associations between those children who did and did not participate in EA over the past 12 months to assist with identification of children who were under-represented in EA participation.

We used NSCH survey weighted and adjusted multiple logistic regressions to test associations between EA participation and the mental health of the child and caregiver as well as the parents' experience of parental aggravation. In the initial models, the potential moderators (child sex, age, presence of a health condition) were included as covariates without interaction terms. Afterward, we included interaction terms for the three potential moderators in separate models to test whether the relationship between EA participation and child anxiety/depression varied by the moderators. Sub analyses evaluated whether results varied by the EA number or type. Per Linktest, models were well calibrated. We used post estimation margins commands to obtain predictive probabilities and STATA 17.0 software for all analyses.

#### Missing Data

The NSCH imputed missing values for child sex, race/ethnicity, and total family income. Following imputation, all variables examined for this study had less than 3% missing. Therefore, we used complete case analysis.

### **Results**

#### Descriptive Statistics

Our sample included 21,259 children aged 6-17, which represented 72% of the total NSCH sample. A majority (82%) of the children participated in at least one EA in the last 12 months. The percentage of children who were ever diagnosed with anxiety and/or depression was 13% and 6%, respectively. This represents an increase in prevalence from 2016 NSCH data, when the percentage of children aged 3-17 with anxiety and depression were 7% and 3%, respectively.<sup>30</sup> A sizeable number of children were living with a behavioral (16%),

developmental (15%), or physical (22%) condition. Overall, the percent of children living with parents who report “often” or “always” feeling aggravated from parenting or having “fair” or “poor” mental/emotional health was relatively low in this sample at 6% and 5%, respectively. Table 1 displays the weighted descriptive statistics.

### Bivariate Statistics

In comparing children who do and do not participate in EA, there were significant differences across all dependent variables and covariates except for child health insurance. Black and Latinx children and those with a health condition were less likely to participate in EA compared to White children and those without a health condition. Children living in households without two biological or adoptive parents were less likely to participate in EA compared to children living with two biological or adoptive parents. Children living in households with incomes 200% of the federal poverty limit or less were also less likely participate in EA compared to children living in wealthier households. Children of parents with self-reported “fair/poor” mental health or those who were “often/always” experiencing parental aggravation were less likely to be involved in EA compared to children of parents with self-reported “excellent/very good/good” mental health or those who “never/rarely” experienced parental aggravation. Finally, children who participate in EA were less likely to live in an unsafe neighborhood compared to those who do not participate.

### Regression Analyses

#### *Child Anxiety/Depression Diagnoses: Participation in Any EA*

First, we examined the association between any EA participation and child diagnosis of anxiety and/or depression. Participating in any EA was associated with lower odds of a child being diagnosed with anxiety and/or depression in the weighted and adjusted model without

interaction terms (Table 2, Figure 1). Once interaction terms were added, EA participation interacted with child sex ( $p=0.03$ ). The predicted probability of being diagnosed with anxiety and/or depression was 12% in boys and girls who did not participate in EA, 11% in girls who participate in EA, and 7% in boys who participated in EA with covariates held at their means. The association between EA and child anxiety and/or depression was not moderated by child age or the presence of another chronic health condition.

#### *Child Anxiety/Depression Diagnoses: Number of EA Types*

Participating in a greater number of EA types was associated with lower odds of a child being diagnosed with anxiety and/or depression compared to not participating in any activities in the adjusted and weighted model without interaction terms (Table 2, Figure 1). The effect was stronger in boys once interaction terms were added. The predicted probability of being diagnosed with anxiety and/or depression was 12%, 10%, 7%, 6%, 4% for boys participating in none, one, two, three, four activity types, respectively. In girls, the predicted probabilities were 12%, 12%, 11%, 10%, 9%. There was a marginally significant interaction between age with three or more activity types. There was no significant interaction between EA number and presence of another chronic health condition.

#### *Child Anxiety/Depression Diagnoses: EA Types*

With regards to EA type, sub-analyses revealed that participating in sports, clubs, or volunteering was associated with lower odds of a child being diagnosed with anxiety and/or depression whereas lesson participation was not ( $p=0.29$ ), after controlling for covariates (Table 2, Figure 1). The effect was stronger among adolescents compared to younger children for sports, clubs and volunteering and among males compared to females for clubs and volunteering

(Figure 2 & Appendix Table B). There was not a significant interaction between EA type and the presence of another chronic health condition.

#### *Caregiver Mental Health*

Child EA participation was associated with lower odds of a caregiver self-reporting “fair/poor” mental health, controlling for covariates (Table 2). The predicted probability of the caregiver reporting “fair/poor” mental health was 3% when their child did not participate in EA compared to 2% when they did participate (Appendix Figure A). As a robustness check, the model was run separately for caregiver mental health using the maternal self-report, paternal self-report, combined self and co-partner report of the mother’s mental health, and combined self and co-partner report of the father’s mental health. All variations except the combined paternal self and co-partner report ( $p=0.078$ ) showed a significant association between EA and caregiver mental health.

#### *Parental Aggravation*

Similarly, child EA participation was associated with lower odds of parental aggravation after controlling for covariates (Table 2). The predicted probability of the caregiver reporting “usually/always” experiencing parental aggravation was 6% when their child did not participate in EA compared to 3% when they did participate (Appendix Figure 3).

#### **Discussion:**

We found four notable findings based on a nationally representative sample of caregivers reporting on EA participation, mental health, and family functioning. First, child EA participation was associated with positive child and parental mental health and parenting experiences. Second, we found a dose-response relationship, with decreasing odds of children being diagnosed with anxiety and/or depression associated with participating in more activity

types. Third, children participating in sports, clubs, and volunteering were less likely to be diagnosed with anxiety and/or depression, but this was not seen for children involved in lessons. Lastly, the association between EA and a child being diagnosed with anxiety and/or depression appears to be the strongest for boys and adolescents compared to girls and younger children. The relationship between EA participation and a reduced odds of anxiety/depression diagnoses persisted regardless of whether a child had a physical, developmental, or behavioral health condition.

There are likely multiple mechanisms through which EAs improve child mental health including supportive adult relationships with the EA leader(s), reduced recreational screen-based activities, and development of self-regulatory skills.<sup>31-33</sup> The reason for the lack of association between lesson participation and anxiety/depression diagnoses is not clear. It may be that lessons do not foster the same degree of social support as other EA types. Lessons may include activities such as tutoring that may indicate the child is struggling academically and thus, lessons may not be as protective against mood symptoms compared to the other EA types. Further, lessons may confer larger financial burdens on families resulting in greater caregiver stress.

We also noted substantial disparities in which children participated in EA. Children who do not participate in EA were more likely to have a health condition and be Black or Latinx. They were less likely to live with both biologic or adoptive parents or with a parent with at least a high school degree. They were also more likely to live in a low-income household and in an unsafe neighborhood. These same groups are less likely to access mental health services and are disproportionately exposed to adverse childhood experiences and other life stressors that may increase their risk of mental illness.<sup>34-36</sup> Achieving more equitable access to EA might be an

important strategy for reducing disparities in child and caregiver mental health and parenting experiences.

This study is limited by the cross-sectional study design, so causal inference is not possible. In particular, we cannot rule out the possibility of reverse causality. For example, children with anxiety and/or depression may choose not to participate in EA or caregivers with poor mental health or strained relationships with their children may face barriers to accessing EA. Yet, adolescent participation in team sports is associated with positive young adult mental health outcomes later supporting that EA participation may precede the mental health effects.<sup>37</sup> For children to be diagnosed with anxiety and/or depression they must have access to a clinician capable of making such a diagnosis and a caregiver must reliably report it. Caregivers may not want to accurately report their mental health and experience of parenting aggravation due to stigma. However, we believe these limitations would bias our results toward the null hypothesis. Further EA characterization would have been helpful such as how many hours per week and the exact activity to better understand the impact of lessons. Lastly, children who did and did not participate in EAs appear different across multiple demographic characteristics. Although we controlled for these covariates, unmeasured confounding is possible.

Despite these limitations, these findings have important implications for caregivers, pediatricians, and child health advocates. It is important to consider population-based prevention and intervention mental health strategies as we face the growing mental health crisis. Although improving access to quality mental health services remains important, we should also investigate ways to leverage existing programming to benefit children and their families. This study adds to the cumulating evidence that EA may have positive mental health benefits for children and suggests that EA may support the entire family unit to improve child and caregiver wellbeing

and family functioning. Further studies can evaluate causality and mechanisms of action. Moreover, we propose that local governments, schools, and community based organizations should develop intentional and thoughtful strategic plans to increase funding and access to quality and inclusive EA programming through school, Parks and Recreation Department, and community-based organization partnerships that offer opportunities for all children to participate in EA, regardless of background or other health conditions.<sup>38</sup> COVID-19 relief funding is one potential resource to offset costs and make EA programming free for families. Pay-to-participate policies at schools are financial barriers for some families that may be contributing to EA participation disparities, regardless of whether waivers are offered.<sup>39</sup> Beyond making EA participation financially accessible, it is also critical to consider and evaluate engagement strategies to better connect services to hard-to-reach families and ensure the services meet the needs and interests of those being served. Improving access and participation in EA is even more important in the current COVID-19 pandemic era, given the deleterious impact of extended social isolation on child social, developmental, and mental wellbeing.

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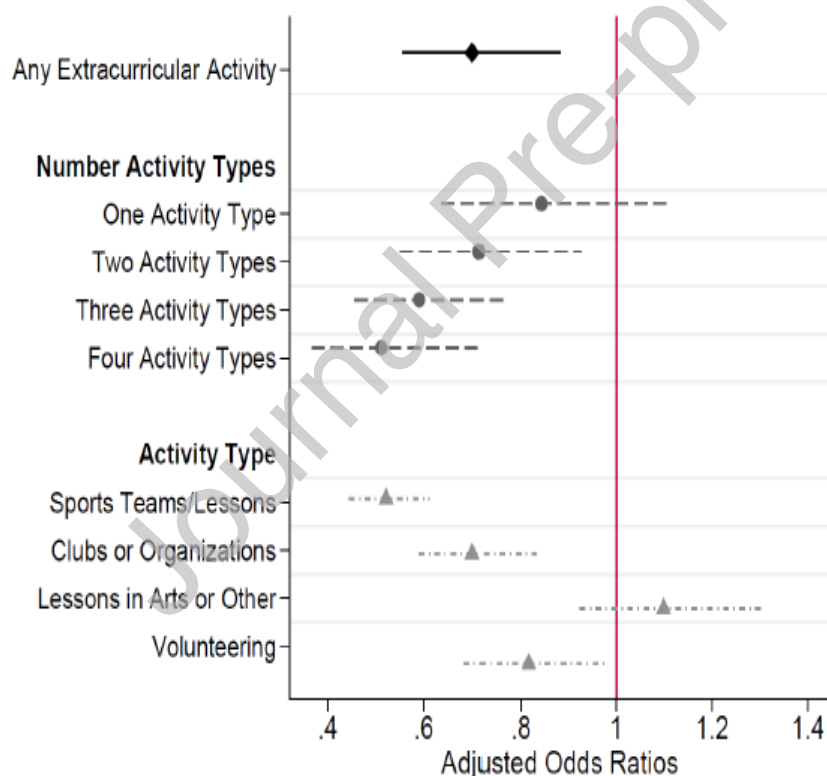
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**Figure 1.** Logistic regression adjusted odds ratios for children with anxiety/depression diagnoses based on their participation in extracurricular activities.

**Figure 2.** Predicted probability of child being diagnosed with anxiety and/or depression by sex and age in years for each activity type (sports, clubs, lessons, volunteering). In some cases, the lines with predicted probabilities overlapped.

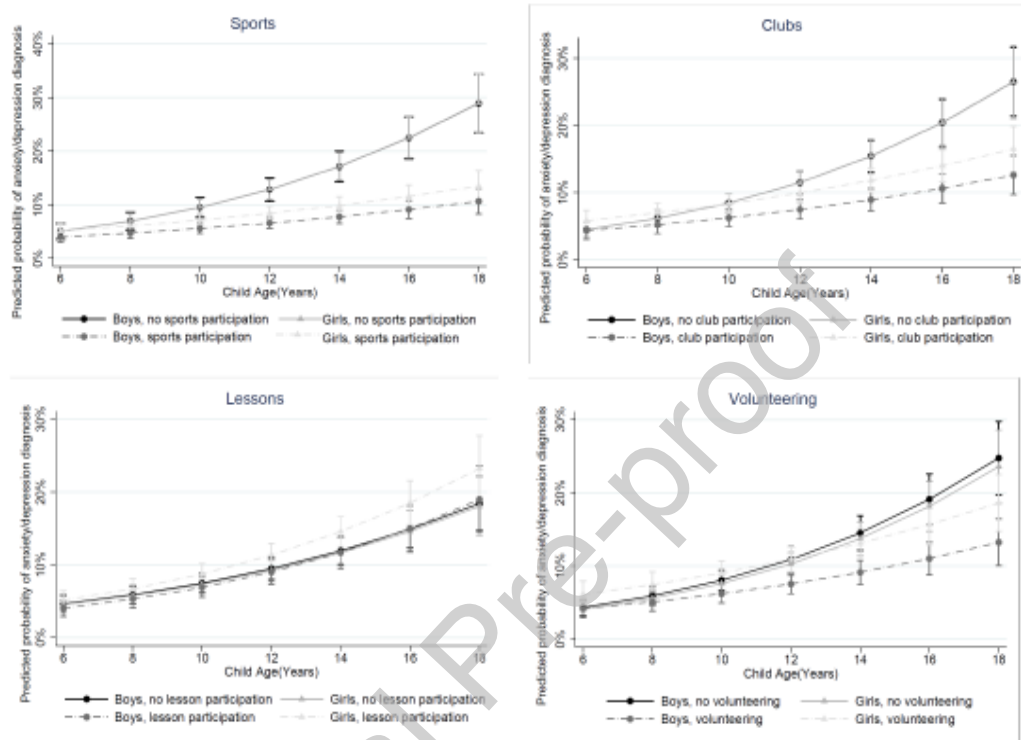


Table 1. Sample Characteristics for Children Ages 6-17 from the 2019 National Survey of Children's Health and Bivariate Statistics for Children Who Did and Did Not Participate in Extracurricular Activities			
	n (weighted %)	No Extracurricular Activities n (weighted %)	One or More Extracurricular Activity Types n (weighted %)
	<b>n=21259</b>	<b>n=2723</b>	<b>n=18536</b>
<b>Independent Variable</b>			
Extracurricular activity types			
<b>None</b>	2723 (18%)		
<b>One</b>	3991 (22%)		
<b>Two</b>	5082 (23%)		
<b>Three</b>	5557 (22%)		
<b>Four or more</b>	3906 (15%)		
<b>Dependent Variables</b>			
Child ever being diagnosed with anxiety/depression			
<b>Anxiety and/or depression</b>	3647 (14%)	658(18%)	2989(14%)
Parental mental health			
<b>Fair or poor</b>	1004(5%)	256(8%)	748(4%)
Parental aggravation			
<b>Usually or always</b>	1207 (6%)	337(10%)	870(5%)
<b>Moderators</b>			
<b>Age m(SD)</b>	12.1(3.4)	11.8(3.7)	12.2(3.4)
Sex			
<b>Female</b>	10249 (49%)	1118(43%)	9131(50%)
Behavioral condition			
<b>Yes</b>	3964 (16%)	848(24%)	3116(15%)
Developmental condition			
<b>Yes</b>	3376 (15%)	742(22%)	2634(13%)
Physical condition			
<b>Yes</b>	4859 (22%)	707(23%)	4152(21%)
Health condition (behavioral, developmental, physical combined)			
<b>Yes</b>	8640(37%)	1407(42%)	7233(36%)
<b>Covariates</b>			
Child health insurance			
<b>Lack of insurance</b>	10164(36%)	968(34%)	6581(36%)
Race & ethnicity			
<b>Asian/Pacific Islander</b>	1,103 (5%)	134(6%)	969(5%)
<b>Black, non-Hispanic</b>	1420 (14%)	277(17%)	1143(13%)
<b>Hispanic</b>	2501 (26%)	470(34%)	2031(24%)
<b>White, non-Hispanic</b>	14784 (50%)	1643(39%)	13141(52%)
<b>Multi-racial non-Hispanic/Native American</b>	1451 (6%)	199(5%)	1252(6%)

Parent nativity			
Born in US	16424 (67%)	1859(57%)	14565(69%)
Not born in US	3389 (26%)	484(30%)	2905(25%)
Not living with biologic parent	1202 (8%)	304(13%)	898(7%)
Parental education			
Less than high school	535 (1%)	206(20%)	329(9%)
High school degree or GED	2850 (19%)	771(33%)	2079(16%)
Some college or technical school	5107 (22%)	936(27%)	4171(21%)
College degree or higher	12767 (48%)	810(20%)	11957(54%)
Family structure			
2 Parent, both biologic/adoptive & married	13244 (59%)	1094(40%)	12150(62%)
2 Parent, both biologic/adoptive not married	946 (6%)	182(8%)	764(6%)
2 Parent, 1 or more not biologic/adoptive	1630 (8%)	267(12%)	1363(7%)
Single mom	3145 (17%)	632(24%)	2513(16%)
Single dad	948(5%)	186(6%)	762(4%)
Grandparent or other	926(6%)	249(10%)	677(5%)
No. kids in household			
1 child	9042 (26%)	1244(28%)	7798(26%)
2 children	8109 (39%)	889(33%)	7220(40%)
3 children	2836 (23%)	381(23%)	2455(23%)
4+ children	1272 (12%)	209(16%)	2063(11%)
% of federal poverty limit			
0-99%	2318 (18%)	666(34%)	1652(15%)
100-199%	3462 (21%)	732(29%)	2730(20%)
200-399%	6700 (29%)	802(24%)	5898(30%)
400+%	8779 (31%)	523(13%)	8256(35%)
No. neighborhood amenities			
0	2685 (11%)	410(14%)	2275(10%)
1	2407 (12%)	400(18%)	2007(11%)
2	3672 (17%)	517(19%)	3155(17%)
3	4517 (22%)	538(22%)	3979(23%)
4	7381 (38%)	694(28%)	6687(40%)
No. neighborhood detracting elements			
0	16112 (73%)	2263(86%)	16840(90%)
1 or more	4628 (27%)	295(14%)	1342(10%)
Neighborhood safety			
Unsafe	720(6%)	176(8%)	544(5%)

No. = number. Percentages are column percentages. Due to rounding, the percentages may not add up to 100%.

**Table 2 Adjusted Odds Ratios for Multivariate Regression Results for Child Anxiety and/or Depression Diagnosis, Caregiver “Fair/Poor” Mental Health, and “Usually/Always” Experiencing Parental Aggravation on the Child Participating in Any, Number of Types, and Types of Extracurricular Activity (EA)**

	Child Anxiety and/or Depression						Caregiver "Fair/Poor" Mental Health	"Usually/ Always" Parental Aggravation
	Any EA n=20,065	# of EA Types n=20,065	Sports n=19,881	Clubs n=19,787	Lessons n=19,778	Volunteering n=19,803	Any EA n=20,153	Any EA n=20,129
Independent Variable	AOR (95% CI)							
<b>Any EA</b>								
No EA participation	Reference						Reference	Reference
Any EA participation	0.70 (0.56, 0.88)						0.60 (0.43, 0.83)	0.44 (0.32, 0.61)
<b>Number of EA Types</b>								
None		Reference						
One		0.84 (0.64, 1.12)						
Two		0.71 (0.55, 0.93)						
Three		0.59 (0.46, 0.77)						
Four or more		0.51 (0.37, 0.71)						
<b>EA Type</b>								
Sports			0.52 (0.44, 0.61)					
Clubs				0.70 (0.59, 0.83)				
Lessons					1.10 (0.92, 1.31)			
Volunteering						0.82 (0.68, 0.98)		

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EA = extracurricular activity, AOR = adjusted odds ratio, CI = confidence interval

All multivariate regression analyses were fully adjusted with covariates shown in Table 1 and survey weighted. Interaction terms were not included in these analyses. Complete regression results for covariates and interaction terms can be found in the Appendix.

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