## ABSTRACT

YANZ, AINSLEY RAYE. Exploration of Extracurricular Activity Participation as a Moderating Factor Between Childhood Maltreatment and Adolescent Mental Health. (Under the direction of Dr. Aura Mishra).

Childhood maltreatment is a well-established risk factor for adverse mental health outcomes, including depression and anxiety. While research has highlighted the protective role of extracurricular activities in fostering resilience and socioemotional development, limited studies have examined their moderating effect on the relationship between childhood maltreatment and adolescent mental health. This study explores whether participation in extracurricular activities buffers the negative impact of childhood maltreatment on adolescent anxiety and depression. Using data from the Future of Families and Child Well-Being Study (FFCWS), linear regression and moderation analyses were conducted on a sample of adolescents (n = 3,434). Results indicate that childhood maltreatment significantly predicts both anxiety and depression, though the effect sizes are small. While extracurricular activity participation is associated with lower depression and anxiety scores, it does not significantly moderate the relationship between childhood maltreatment and mental health outcomes. These findings suggest that while extracurricular engagement may provide general benefits for adolescent mental health, it does not directly buffer the effects of childhood maltreatment. Future research should explore additional protective factors, such as social support and coping strategies, to better understand pathways to resilience in maltreated youth.

# Exploration of Extracurricular Activity Participation as a Moderating Factor Between Childhood Maltreatment and Adolescent Mental Health.

by
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# CHAPTER 1

## Introduction

### *Prevalence & Impact of Childhood Maltreatment*

Childhood maltreatment is a significant public health concern, affecting approximately 1 in 7 children annually in the United States (U.S. Department of Health & Human Services, 2020). This broad category includes physical, sexual, and psychological abuse, neglect, and exposure to intimate partner violence (Mandela et al., 2002). However, maltreatment is not equally distributed across the population. Minority groups, particularly African American and Hispanic children, experience disproportionate rates of abuse and neglect (Sedlak et al., 2010; Toth et al., 2009). Socioeconomic disparities which more frequently affect these communities further heighten the risk of maltreatment (Maguire-Jack & Font, 2017; Putnam-Hornstein et al., 2013).

### *Mental Health Consequences of Maltreatment in Adolescence*

The link between childhood maltreatment and adverse mental health outcomes is well-established, with a robust body of research demonstrating elevated rates of depression and anxiety among maltreated youth (Baldwin et al., 2023, Gardner et al., 2019, Li et al., 2016, Nelson et al., 2017). Adolescents who have experienced maltreatment, particularly emotional abuse and neglect, are significantly more likely to report symptoms of depression and anxiety than their non-maltreated peers (Chapman et al., 2004; Fergusson et al., 2008; Humphreys et al., 2020; Liu, 2017). These mental health challenges are especially concerning during adolescence, a developmental period in which emotional and social vulnerability is heightened (Gibb et al., 2001).

### *Differential Impact of Maltreatment Types on Mental Health*

While all forms of maltreatment increase risk for poor mental health, the type and severity of maltreatment can affect outcomes differently. For example, psychological abuse and neglect have been found to have stronger associations with depressive symptoms than other forms of maltreatment (Baldwin et al., 2019; Humphreys et al., 2020). Recognizing these distinctions is critical to identifying high-risk youth and tailoring interventions effectively.

### *The Protective Role of Extracurricular Activities*

Despite the well-documented risks associated with childhood maltreatment, protective factors can help mitigate these adverse effects. Participation in extracurricular activities has emerged as one such factor, with evidence linking it to enhanced resilience, socioemotional development, and academic achievement among adolescents (Andermo et al., 2020; Boelens et al., 2022; Breistol et al., 2017; Haskett et al., 2006; Kwak et al., 2017, 2018; Oberle et al., 2019; Ruvalcaba et al., 2017). The specific outcomes of participation often depend on the type of activity. For instance, academic and mentoring activities are associated with improved academic performance and prosocial behavior (Eccles & Barber, 1999; Stearns & Glennie, 2010), while the effects of sports are mixed, being linked to both positive mental health outcomes and increased risky behavior (Abruzzo et al., 2016; Eccles et al., 2003; Fredericks et al., 2006; Larson et al., 2006; Wiersma et al., 2000).

### *The Present Study*

Although extracurricular activities have demonstrated general benefits for youth development, their specific role in buffering the mental health consequences of childhood maltreatment remains underexplored. This study investigates whether participation in extracurricular activities moderates the relationship between childhood maltreatment and symptoms of anxiety and

depression during adolescence. It is hypothesized that maltreated adolescents will report higher levels of anxiety and depression, but those who engage in extracurricular activities will exhibit lower levels of these symptoms, indicating a potential moderating, protective effect.

## Method

### *Data*

The data utilized in this analysis are drawn from the Future of Families and Child Well-Being Study (FFCWS), a longitudinal study conducted through a collaboration between Princeton University's Bendheim-Thoman Center for Research on Child and Family Wellbeing and the Columbia Population Research Center. The FFCWS employs a stratified, multistage sampling design and includes 4,898 children born in large U.S. cities between 1998 and 2000. The study intentionally oversampled births to unmarried parents, thereby increasing the representation of families from low socioeconomic backgrounds and racial and ethnic minority groups. Baseline interviews with mothers and fathers were conducted shortly after the birth of the focal child, either in person at the hospital or via telephone. Follow-up interviews with the parents and primary caregivers were conducted when the children were approximately 1, 3, 5, 9, 15, and 22 years old. In addition, focal children were interviewed directly at ages 9, 15, and 22.

### *Participants*

The original FFCWS cohort consisted of 4,898 participants. For the present analysis, demographic data were drawn from the baseline and Year 15 (Y15) waves (n = 3,434). The racial and ethnic composition of the sample was as follows: 17.2% identified as White, 46.6% as Black/African American, 23.7% as Hispanic/Latino, 5.1% as multiracial, and 2.5% as "Other". The gender distribution was approximately even, with 52.2% of participants assigned female at birth and 48.8% assigned male at birth. Socioeconomic status was assessed using parent

educational attainment. Among respondents, 17.7% had less than a high school diploma, 19.7% held a high school diploma, 43.8% had attended some college or technical school, and 18.8% had obtained a college degree.

### *Measures*

*Maltreatment.* Childhood maltreatment was assessed using items from the Conflict Tactics Scale: Parent-Child Version (CTSPC) (Straus et al., 1998), a widely used and validated instrument for measuring maltreatment. Data was collected from the primary caregiver (PCG) at Year 1, 3, 5, 9, and 15, and from the focal child at Years 9 and 15. The CTSPC includes subscales measuring physical and psychological maltreatment, as well as neglect. Respondents were asked how frequently, in the past year, certain behaviors occurred, including: "hit him/her on the bottom with something like a belt, hairbrush, a stick or some other hard object" (physical maltreatment), "shouted, yelled, or screamed at the child" (psychological maltreatment), and "had to leave the child home alone, even when [they] thought some adult should be with him/her" (neglect). Response options were: "this has never happened," "yes, but not in the past year," "once," "twice," "3–5 times," "6–10 times," "11–20 times," and "more than 20 times". These were recoded as follows: true missing = not in wave, missing, refused, don't know, or N/A; 0 = "this has never happened" or "yes, but not in the past year"; 1 = once; 2 = twice; 4 = 3–5 times; 8 = 6–10 times; 15 = 11–20 times; and 20 = more than 20 times. Five items from each maltreatment domain were then summed to create composite scores for physical maltreatment, psychological maltreatment, and neglect, with higher scores indicating greater frequency of exposure. The CTSPC has demonstrated good psychometric properties in prior research, with internal consistency estimates ranging from acceptable to high across subscales ($\alpha$ = .63–.88) and strong construct validity supported by its associations with various externalizing and internalizing

outcomes in children and adolescents (Straus et al., 1998; Taylor et al., 2010). In the current sample, internal consistency reliability was acceptable across waves and informants, with Cronbach's alphas for the composite maltreatment score ranging from .70 to .85.

*Mental Health.* Adolescent mental health was assessed using self-report data provided by the focal child during the Year 15 interview. Symptoms of anxiety and depression were measured using six items from the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2001) and four items from the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Both scales asked participants to report how they had been feeling over the past four weeks. Sample items included "I feel nervous or shaky inside" (BSI-18; anxiety) and "I feel depressed" (CES-D; depression). Response options were presented on a 4-point Likert scale: "strongly agree," "somewhat agree," "somewhat disagree," and "strongly disagree". Responses were reverse-coded such that higher scores indicated greater symptom severity: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, and 4 = strongly agree. Separate composite scores were created for anxiety and depression by summing responses across the items. Both scales demonstrated acceptable internal consistency in the current sample ($\alpha = .80$ for anxiety; $\alpha = .82$ for depression), consistent with prior research supporting the reliability and validity of the BSI-18 and CES-D in adolescent populations (Derogatis, 2001; Radloff, 1977).

*Extracurricular Participation.* Extracurricular participation was assessed at Year 15 using six self-report items completed by the focal children. Respondents were asked how frequently they engaged in various types of extracurricular activities, including: sports or athletic teams, group performance activities (e.g., band, choir, theater), scouts or hobby clubs, school-based clubs or organizations, religious services, and/or volunteer or community service activities. For each activity type, adolescents reported the frequency of their participation using the following

response options: “never,” “less than once a month,” “at least once a month,” “once a week,” and “several times a week.” Responses were coded on a 5-point ordinal scale: 0 = never, 1 = less than once a month, 2 = at least once a month, 3 = once a week, and 4 = several times a week. To capture overall engagement in structured activities, responses across all six items were summed to create a composite extracurricular participation score, with higher scores indicating more frequent and broader involvement across activities. This approach has been commonly used in prior research to represent cumulative exposure to enriching, structured environments associated with positive youth development outcomes (Fredricks & Eccles, 2006; Mahoney et al., 2005).

*Sociodemographic Covariates.* Sociodemographic factors considered in the analysis included birth sex, self-reported race, and parental education. These covariates were chosen based on existing literature that suggests they may influence academic achievement and educational outcomes. Birth sex was coded as 0 for female and 1 for male, as sex differences in academic performance have been widely studied (Hyde, 2005; Mullis et al., 2016). Race was dummy coded with the following categories: *re1* = White only, non-Hispanic; *re2* = Black/African American only, non-Hispanic; *re3* = Hispanic/Latino; and *re4* = other, multiracial, non-Hispanic. Race was included due to documented disparities in educational achievement among different racial and ethnic groups (Ferguson, 2002; Lee & Bowen, 2006). Parental education was dummy coded with the following categories: *pedu1* = less than high school, *pedu2* = high school or equivalent, *pedu3* = some college or technical school, and *pedu4* = college or graduate education. Parental education has consistently been shown to be a strong predictor of a child's academic success, as it often influences the resources and support available for academic development (Davis-Kean, 2005; Engel, 2017). Additionally, parental education was selected as a

representation of socioeconomic status rather than income, as it has been shown to be more stable and reliable over time (Sirin, 2005).

### *Analytic Strategy*

All analyses in this study were conducted using SAS Software version 9.4. Descriptive statistics for the FFCWS sample are presented in Table 1.1. To examine the relationship between total childhood maltreatment and the presence of anxiety and depression symptoms during adolescence, two linear regression models were performed. Complex sampling features were accounted for by applying nationally representative weights based on PCG/child reports. A second set of linear regressions was conducted to explore whether participation in extracurricular activities moderates the relationship between childhood maltreatment and adolescent anxiety and depression symptoms. The moderator effect was assessed using the procedures outlined by Baron and Kenny (1986), which involved including maltreatment, extracurricular activity participation, and their interaction term in the regression model. The interaction term was incorporated as an additional predictor of mental health outcomes. Following Baron and Kenny's framework, a moderator effect was considered significant if the interaction term explained a statistically significant portion of the variance in the criterion variable.

## Results

### *Childhood Maltreatment & Adolescent Anxiety*

A linear regression analysis was performed to examine the relationship between several predictor variables and the dependent variable, total adolescent anxiety. A total of 4898 observations were read, with 1034 observations used in the analysis and 3864 observations excluded due to missing values. The model was statistically significant, $F(5,1028) = 2.40$, $p = 0.0358$, indicating that the predictors collectively explain a significant portion of the variance in adolescent anxiety. The R-

squared value of 0.0115 suggests that the model explains approximately 1.15% of the variance in the dependent variable, with an adjusted R-squared of 0.0067. The RMSE was 4.02, and the coefficient of variation was 37.11%. Regarding individual predictors, the intercept was found to be highly significant with an estimate of 10.27, $t = 21.39$, $p < .0001$. The total childhood maltreatment was also a significant predictor of adolescent anxiety, with an estimate of 0.0056, $t = 2.76$, and $p = 0.0059$. Race, sex and parent education were not significant predictors of adolescent anxiety.

***Extracurricular Activity Participation as a Moderator of Childhood Maltreatment & Adolescent Anxiety***

A moderation analysis was conducted to evaluate whether the interaction between total childhood maltreatment and total extracurricular activity participation predicted adolescent anxiety. The model included 3,432 observations, with 1,466 excluded due to missing data. The overall model was statistically significant, $F(3,3428) = 5.14$, $p = .0015$, indicating that the predictors collectively explained a small but significant portion of the variance in adolescent anxiety. The r-squared value was 0.0045, suggesting that the model accounted for 0.45% of the variance in adolescent anxiety. The adjusted r-squared was 0.0036, showing little improvement after accounting for the number of predictors. The intercept was significant ($b = 10.85$, $t(3428) = 58.27$, $p < .001$), indicating that the average adolescent anxiety score is approximately 10.85 when all predictors are at their baseline levels. The effect of childhood maltreatment on adolescent anxiety was not statistically significant ($b = 0.0027$, $t(3428) = 1.47$, $p = .142$). The effect of extracurricular activity participation was non-significant ($b = −0.0356$, $t(3428) = −1.77$, $p = .076$), suggesting that greater extracurricular activity participation is associated with lower adolescent anxiety. The interaction between childhood maltreatment and extracurricular activity

participation was not statistically significant (b = 0.000041, t(3428) = 0.20, p = .838), suggesting no evidence of moderation in this model. The results indicate that neither childhood maltreatment, extracurricular activity participation, nor their interaction significantly predict adolescent anxiety. Although the overall model was significant, the small effect size (r2 = 0.0045) suggests that these predictors explain only a small portion of the variance in adolescent anxiety.

***Childhood Maltreatment & Adolescent Depression***

A linear regression analysis was conducted to predict total adolescent depression based on total childhood maltreatment, birth sex, race, and parental education. The model included 1,034 observations, with 3,864 observations excluded due to missing values. The overall model was not statistically significant, F(5,1028) = 1.61, p = .156. The r-squared value was 0.0078, indicating that the predictors accounted for less than 1% of the variance in adolescent depression. The adjusted r-squared was 0.0029, reflecting small power after adjusting for the number of predictors. The intercept was significant (b = 6.51, t (1028) = 20.13, p < .001), suggesting that when all predictors are set to zero, the mean depression score is approximately 6.51. Among the predictors, childhood maltreatment was the only variable that significantly contributed to the model (b = 0.003, t (1028) = 2.18, p =.029), indicating a positive association between childhood maltreatment and adolescent depression. Other variables, including race and parental education, did not significantly predict adolescent depression. In summary, the regression model demonstrated limited predictive value for adolescent depression, with childhood maltreatment being the only statistically significant predictor.

***Extracurricular Activity Participation as a Moderator of Childhood Maltreatment & Adolescent Depression***

A moderation analysis was conducted to examine whether the interaction between childhood maltreatment and extracurricular activity participation predicted adolescent depression. The analysis included 3,432 observations, with 1,466 cases excluded due to missing data. The overall model was statistically significant, $F(3,3428) = 8.72$, $p < .0001$, indicating that the predictors collectively explained a small but significant portion of the variance in depression scores. The r-squared value was 0.0076, suggesting that the predictors accounted for 0.76% of the variance in adolescent depression. The adjusted r-squared was 0.0067, indicating a small adjustment for the number of predictors. The intercept was significant ($b = 6.61$, $t(3428) = 53.22$, $p < .001$), suggesting that the average adolescent depression score is approximately 6.61 when all predictors are at their baseline levels. The effect of childhood maltreatment on adolescent depression was statistically significant ($b = 0.0028$, $t(3428) = 2.33$, $p = .0196$), with a small positive effect ($\beta = 0.070$). Extracurricular activity participation was slightly non-significant ($b = -0.0254$, $t(3428) = -1.90$, $p = .058$), indicating that higher extracurricular activity participation is associated with lower adolescent depression. The interaction between childhood maltreatment and extracurricular activity participation was not statistically significant ($b = -0.00015$, $t(3428) = -1.08$, $p = .280$), suggesting no evidence of moderation. The results indicate that childhood maltreatment is positively associated with adolescent depression, while extracurricular activity participation shows a small trend toward a negative association. However, the interaction between childhood maltreatment and extracurricular activity participation was not significant, suggesting that the relationship between childhood maltreatment and adolescent depression is not moderated by extracurricular activity participation. Despite the statistical significance of the

overall model, the r-squared value suggests that the predictors explain a very small portion of the variance in depression scores.

## Discussion

### *The Present Study*

The relationships between childhood maltreatment, extracurricular activity participation, and adolescent mental health outcomes, specifically anxiety and depression were explored. Contributing to previously mixed findings, this study highlights the complexity of these relationships and the need for further research to better understand the factors contributing to adolescent mental health in individuals with experiences of childhood maltreatment.

### *Childhood Maltreatment and Adolescent Anxiety*

The results demonstrated that childhood maltreatment significantly predicted adolescent anxiety, even after controlling for demographic variables such as birth sex, race and parental education. However, the effect size was small, with childhood maltreatment explaining just 1.15% of the variance in anxiety scores. This finding aligns with previous research suggesting that childhood maltreatment is a significant risk factor for adolescent anxiety, though the modest effect size emphasizes the importance of other potential contributing factors. Interestingly, race and parental education did not significantly predict adolescent anxiety, suggesting that these variables may play a less direct role in adolescent anxiety or may interact with other factors not examined in these analyses.

### *Moderation of Childhood Maltreatment and Adolescent Anxiety*

The moderation analysis revealed no significant interaction between childhood maltreatment and extracurricular activity participation in predicting adolescent anxiety. While extracurricular activity participation showed a trend toward reducing anxiety, the effect was not statistically

significant. This suggests that while extracurricular activities may have general mental health benefits, they do not appear to buffer the relationship between childhood maltreatment and anxiety. Given the small effect size of the overall model (0.45% of variance explained), it would be useful to explore other potential moderators, such as social support or coping strategies, in future studies.

### *Childhood Maltreatment and Adolescent Depression*

Childhood maltreatment is a significant predictor of adolescent depression in both linear and moderation analyses. The positive association between childhood maltreatment and adolescent depression supports existing literature that identifies early adversity as a critical factor in depressive symptoms. However, the amount of variance explained was small, suggesting that other factors contribute substantially to depression in adolescents. Other demographic variables, including race and parental education, were not significant predictors, indicating that these factors might not directly influence depression or may contribute through more complex pathways.

### *Moderation of Childhood Maltreatment and Adolescent Depression*

Similar to the findings for anxiety, the interaction between childhood maltreatment and extracurricular activity participation was not significant in predicting adolescent depression. However, extracurricular activity participation showed a marginal trend toward a protective effect, with higher participation associated with lower depression scores. These results suggest that while extracurricular activities may provide some general benefit to adolescent mental health, they do not appear to specifically moderate the impact of childhood maltreatment on adolescent depression.

### *Implications and Future Directions*

The findings highlight the lasting impact of childhood maltreatment on adolescent mental health, particularly for anxiety and depression. However, the small effect sizes suggest that additional factors likely play a critical role. Other factors such as genetics, family dynamics, peer relationships, and access to mental health resources would be useful to examine in future studies. The lack of significant moderation by extracurricular activity participation highlights the need to explore other potential protective factors or interventions that might mitigate the adverse effects of maltreatment. Future research should explore more complex models, including longitudinal designs that can capture the developmental trajectory of mental health outcomes following childhood maltreatment. Additionally, examining the quality and type of extracurricular activities may provide insights into their potential as a protective factor. For clinical practice, these findings emphasize the importance of early identification and targeted interventions for adolescents who have experienced maltreatment, while highlighting the need for approaches that address a broader array of risk and protective factors.

### *Conclusion*

Overall, this study highlights the small but significant impact of childhood maltreatment on adolescent mental health. While extracurricular activity participation appears beneficial, it does not moderate the relationship between maltreatment and mental health outcomes. These findings point to the need for continued research to better understand the pathways through which childhood adversity impacts mental health and to develop effective interventions for vulnerable populations. Due to previous mixed findings on the value of extracurricular activity as a moderator, these findings contribute to our understanding of protective factors for vulnerable populations.

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# TABLES

## Table 1.1

*Sociodemographic & Other Variable Characteristics*

| Factor | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Dependent Variables | | | | | |
| Adolescent Anxiety | 3437 | 10.81 | 3.92 | 4 | 24 |
| Adolescent Depression | 3437 | 6.55 | 2.62 | 1 | 16 |
| Independent Variable | | | | | |
| Total Childhood Maltreatment | 4271 | 70.77 | 0.40 | 0 | 377 |
| Moderating Variables | | | | | |
| Total Extracurricular Activity Participation | 3438 | 7.49 | 5.10 | 0 | 24 |
| Race | | | | | |
| White, non-Hispanic | 2675 | 0 | 0 | 0 | 0 |
| Black/African American | 2675 | 1.20 | 0.98 | 0 | 2 |
| Hispanic/Latino | 2675 | 0.91 | 1.38 | 0 | 3 |
| Other/Multiracial, Non-Hispanic | 2675 | 0.39 | 1.19 | 0 | 4 |
| Parent Education | | | | | |
| Less than HS | 2925 | 0 | 0 | 0 | 0 |
| HS or Equivalent | 2925 | 0.48 | 0.85 | 0 | 2 |
| Some College/Technical School | 2925 | 1.60 | 1.50 | 0 | 3 |
| College/Graduate | 2925 | 0.91 | 1.68 | 0 | 4 |

## Table 1.2

*Moderation Analysis for Anxiety*

| Predictor | B | SE | t | p | | Semi-Partial R-squared | Partial R-squared |
|---|---|---|---|---|---|---|---|
| Intercept | 10.85 | 0.186 | 58.27 | <.001 | 0 | - | - |
| Childhood Maltreatment | 0.00267 | 0.00182 | 1.47 | 0.142 | 0.044 | 0.00063 | 0.00063 |
| Extracurricular Activity Participation | -0.03560 | 0.02007 | -1.77 | 0.076 | -0.046 | 0.00091 | 0.00092 |
| Interaction | 0.000041 | 0.000203 | 0.20 | 0.838 | 0.007 | 0.00001 | 0.00001 |

**Note.** R2= 0.0045, F(3,3428)=5.14, p=.0015. B = unstandardized coefficient; SE = standard error; β = standardized coefficient.

## Table 1.3

*Moderation Analysis for Depression*

| Predictor | B | SE | t | p | | Semi-Partial R-squared | Partial R-squared |
|---|---|---|---|---|---|---|---|
| Intercept | 6.60652 | 0.12414 | 53.22 | <.001 | 0 | - | - |
| Childhood Maltreatment | 0.00283 | 0.00121 | 2.33 | 0.020 | 0.070 | 0.00158 | 0.00159 |
| Extracurricular Activity Participation | -0.02536 | 0.01338 | -1.90 | 0.058 | -0.049 | 0.00104 | 0.00105 |
| Interaction | -0.000146 | 0.000135 | -1.08 | 0.280 | -0.038 | 0.00034 | 0.00034 |

**Note.** R2= 0.0076, F(3,3428) = 8.72, p<.0001. B = unstandardized coefficient; SE = standard error; β = standardized coefficient.