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School-based Participation in Drama and Other Extracurricular Activities as a Protective Factor Against Depression in Adolescents

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2006

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Abstract

School-based Participation in Drama and Other Extracurricular Activities as a Protective Factor Against Depression in Adolescents

By Erica Hazra

Adolescence is a period of biological, cognitive, emotional, and social development that can be difficult and stressful. Depression is a key indicator of maladaptation among adolescents and has significant public health consequences. Seventy percent of respondents to the National Longitudinal Study of Adolescent Health (Add Health) reported participating in at least one school-based extracurricular activity. These activities have great potential to facilitate youth development and growth-promoting opportunities. Participation in drama, in particular, has been shown to increase self-confidence, enhance self-expression, and improve social skills among mostly marginalized youth. Evidence suggests that students may benefit in these three areas, which in turn benefit mood and depressive symptoms.

The goal of this thesis is to evaluate whether or not participating in drama, as compared to other school-based activities, had a protective effect on depression among adolescents in the U.S., using Add Health data. The research hypotheses were that there would be lower odds of incident depression at Wave II among those who, at Wave I, participated in 1) drama only than among those who did not participate in any clubs at all; 2) any extracurricular activities than among those who did not participate in any clubs; 3) drama only than among those who participated in one non-drama club; 4) two or more clubs than those who participated in only one club; and 5) two or more clubs, including drama, than those who participated in two or more non-drama clubs.

After controlling for sex, age, race, and family income, logistic regression found that club/drama participation during Wave I had no significant effect on incidence of depression in Wave II. While the model demonstrated a good fit for the data (Hosmer-Lemeshow $\chi^2_{df=8}=9.596$, p-value = 0.2945) and was statistically significant overall ($\chi^2_{df=16}=38.79$, p-value = 0.0012), there were no statistically significant differences among the different participation categories and odds of developing depression. Therefore, none of the hypotheses can be supported.

Adolescents should have ample opportunity to participate in drama and other extracurricular activities that may protect against depression by boosting self-esteem and social-connectedness. There is a preponderance of research on sports participation and its effects on depression and other positive health outcomes. It is important that adolescents who don't have a proclivity for sports have opportunity to participate in suitable activities that offer similar benefits. Further research would help policy makers and school administrators determine whether investment in drama is justified and sufficient.

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BACKGROUND/LITERATURE REVIEW

Adolescent Depression

Depression is a "prototypical, multifactorial disorder that profoundly affects individuals' emotions, thoughts, sense of self, behaviors, interpersonal relations, physical functioning, biological processes, work productivity, and overall life satisfaction" (1). According to the World Health Organization, depression is the leading cause of years lost due to disability among both men and women in high- and low-/middle-income countries and the third leading cause of burden of disease worldwide (2).

Depression is a key indicator of maladaptation among adolescents (3). Adolescence is a period of significant biological, cognitive, emotional, and social development and can, therefore, be difficult and stressful. During the transition from childhood to adulthood, youth begin to take on more responsibility and autonomy; explore their sexuality; spend increased time with friends, and are thus subject to more peer pressure; and develop a sense of self and personal identity. While most adolescents are able to make this transition without considerable challenges, some do experience depression and indicators of maladaptation (1).

Data from nationally-representative surveys provide estimates of the prevalence of depression among adolescents in the United States. According to the National Health and Nutrition Examination Survey (NHANES), administered from 2001 to 2004, 2.5% of youth aged 8 to 11 and 4.8% of youths aged 12 to 15 had 12-month DSM-IV-defined major depression or dysthymia (chronic mild depression) without severe impairment; and 1.8% of youth aged 8 to 11 and 3.9% of youths aged 12 to 15 had 12-month DSM-IV-defined major depression or dysthymia with severe impairment (defined by two intermediate ratings or one severe rating on the six impairment questions regarding

personal distress and social or academic difficulties) (4). Results from the National Survey on Drug Use and Health (NSDUH) show that in 2010, 8.0% of the population aged 12 to 17 (1.9 million youths) had DSM-IV-defined major depressive disorders (MDE) during the past year; 5.6% of the population aged 12 to 17 (1.3 million youths) had MDE in the past year with severe impairment (5).

Prospective longitudinal and cross-sectional studies have shown that rates of depression (self-reported depressive symptoms and diagnosed clinical levels) are generally low in children and increase in adolescence to levels comparable to those observed among adults. Lifetime prevalence rates of depression among pre-adolescent, school-aged children are less than 3% (2). In contrast, according to the National Comorbidity Survey-Adolescent Supplement (NCS-A), the lifetime prevalence rates of DSM-IV major depressive disorder or dysthymia are 8.4%, 12.6%, and 15.4% among youth who are 13 to 14, 15 to 16, and 17 to 18 years of age, respectively (6). Similarly, the lifetime prevalence of major depression for 18- to 29-year-olds in the NCS was 16.6% (1).

Due to the multifactorial nature of depression, there is no single etiological framework (physiological, cognitive, environmental, etc.) that provides a complete explanation for the development of depression during adolescence. Therefore, many risk factors and vulnerabilities must be examined simultaneously, in order to provide a comprehensive understanding of the etiology of depression (1).

Stressful or negative life events often trigger depressive episodes. Research has shown that almost all individuals with a depressive disorder will have experienced at least one significant negative life event in the month preceding onset of depression (7). Longitudinal studies have shown that stressful events precede the initial occurrence,

recurrence, or exacerbation of depression. However, the stress-depression relationship has also been found to be bidirectional; due to personality characteristics or behaviors, those who are depressed often create additional stressful circumstances or events for themselves, which in turn, further exacerbate depression (7). The stress-depression relationship also fits with the two other depression trends: rising levels of depression throughout adolescence and girls experiencing more depression than boys. The number of uncontrollable negative life events experienced begins to dramatically increase after age 13 and girls experience a significantly greater increase in stressors after age 13 than boys (7). Both of these increasing trajectories in stressors, beginning around puberty, potentially explain the increase in depressive symptoms, as well as the sex difference in depression, that arises in this same developmental period. However, this is not to say that everyone who experiences negative life events will develop depression; only 20 to 50% of those who experience severe, major negative life events develop clinical depression. Negative life events are not necessary to cause depression, nor are they sufficient without underlying vulnerability (7).

Socioeconomic status (SES) has been demonstrated to be a risk factor associated with depression among both adults and adolescents (8, 9). The likelihood of depression among those in the lowest socioeconomic groups is roughly twice that of those in the highest socioeconomic groups, even when considering differences in definitions and measurement (8). According to the Family Stress Model (9), low SES contributes to a greater number of stressful events for a family, which affect the emotions and behaviors of caretakers. Distressed caretakers may lack warmth, be more irritable, or lack the ability to provide their children with enough attention, which in turn contribute to the stress of children and adolescents and, thus, poorer mental health outcomes. Adolescents with poor

mental health are also vulnerable to early life events, such as teenage pregnancies, leaving the parental home early or severing ties with parents, and entering into early cohabitation or marriage. These early life events then compound the stress and negative health consequences of poor mental health (9).

Female gender is another risk factor for depression. Twice as many adult women are depressed as men (1), and studies have shown that this difference emerges during adolescence after the ages of 12 to 13. About 25 to 40% of adolescent girls have high levels of depressed mood compared to 20 to 35% of adolescent boys (1). Pubertal development and timing have also been associated with the sex difference in depression. The divergence was found to occur at Tanner Stage III (scale of physical development), which was a better predictor of depression than age alone (10). Additionally, girls who start puberty earlier than their peers are more likely than others to become depressed (1).

Utilizing data from the NCS-A, Merikangas et al. (11) found that mood disorders (which included major depressive disorder or dysthymia) were more prevalent among females compared to males, and among Hispanic adolescents compared to non-Hispanic white adolescents. The NCS-A did not find parental poverty level or urbanicity to be associated with any class of mental disorder (mood, anxiety, behavior, substance abuse, etc.); however, it did find that adolescents whose parents were not college graduates were at increased risk for all classes of mental disorder (11).

Research has found that depression is “moderately heritable”; one of the strongest predictors of youth depression is having a parent with history of major depression (7). Research has also shown that both depressive symptoms and certain etiological risk factors for depression (for example, a predisposition towards experiencing negative events) are heritable in adolescence and throughout adulthood, but not in childhood (7).

Depression has been found to be significantly associated with anxiety disorders and conduct/oppositional defiant disorder. Children and early-adolescents have been found to be more likely to have comorbid separation anxiety disorder with depression, whereas older adolescents are more likely to exhibit comorbid eating disorders and substance abuse issues with depression (1).

Adolescent depression has significant public health consequences as it may disrupt the transition into adulthood, affecting social, academic, interpersonal, occupational, and economic success (9, 1). Research has shown that most people experience their first depressive symptoms during adolescence and that youth depression generally precedes adult depression. Depression is also recurrent and chronic. Approximately 50% of individuals diagnosed with depression experience a recurrence within 2 years, and more than 80% experience a recurrence within 5 to 7 years. Those who have had more than 3 depressive episodes are especially likely to have another recurrence, and time to the next recurrence decreases with each recurrence (2). This highlights a need for greater emphasis on prevention and early intervention for youth, rather than simply focusing on treatment (1, 6).

Using the National Longitudinal Survey of Adolescent Health (Add Health), Wickrama et al. (9) found that adolescents with consistently high depressive symptoms exhibited the greatest increase in health problems through young adulthood These included increases in sexually transmitted diseases, asthma, diabetes, and physical limitations, and decreased perceived general health (9).

Adolescent depression has been found to impede young adult self-esteem and social status attainment (9). In a 10-year prospective cohort study, Wickrama et al. found that adolescents who experienced a higher level of depression at the initial assessment

showed lower levels of young adult social status attainment (completion of primary, secondary, and college education; engagement in full-time employment; pursuing an advanced degree; having a place of residence; and engagement in a stable intimate relationship) than adolescents who experienced a lower level of depression, regardless of changes after adolescence. Adolescents who experienced greater rates of increase in depressive symptoms during adolescence showed lower levels of young adult social attainment. A decline in depressive symptoms during adolescence conversely corresponded to higher levels of young adult social status attainment. These associations were not moderated by gender (9).

Adolescent Participation in Drama and Other Extracurricular Activities

According to Mahoney et al., 75% of 14-year-olds participate in structured extracurricular activities (12) and 70% of the respondents to Add Health reported participating in at least one school-based extracurricular activity (13). Given that so many adolescents participate in at least one school-based extracurricular activity, it is important to understand the effects of this participation on adolescent development.

Research has shown that positive youth development and growth is related to opportunities in 4 key areas: 1) they help youth learn physical, intellectual, psychological, emotional, and social skills; 2) they provide warm and nurturing relationships; 3) they facilitate social integration and belonging; and 4) they provide adult guidance and physical and psychological safety (14). Quality extracurricular activities have been shown to provide such growth-facilitating opportunities.

During adolescence, participation in activities that lack structure and have little or no adult supervision has been linked to antisocial behavior and other negative effects

(12). Therefore, school-based extracurricular activities are particularly beneficial because they provide a structured environment within which youth can explore their self-identity, challenge themselves, discover preferences and talents, express creativity, and experience achievements and success. Being a member of a group exposes individuals to certain norms and values. Early exposure to these norms and values and the influence of a peer group has great potential in shaping an adolescent's identity and developmental pathway (13). Not only can participation shape adolescent growth, but research has also found that adolescent extracurricular activities are linked to adult educational attainment, occupation, and income.

Participation in extracurricular activities also provides adolescents with the opportunity to gain social capital by developing their support network of friends and adults. The regimented structure of the school day does not provide as much opportunity to personally bond with peers who share similar interests or with adults who can provide more personal mentoring or coaching (14).

All participation in not equal, however. Adolescent outcomes depend not only on the context of the particular activity, but also on the intensity and duration of participation (15). Furthermore, the relationships between participation and adolescent outcomes are often moderated by factors such as socioeconomic status and sex. For example, males who participate in team sports are more likely to report higher rates of drinking and driving after drinking when compared to males who do not participate in team sports, although the opposite is true for females (16). Girls are more likely to participate more in fine and performing arts and academic clubs, whereas boys are more likely to participate in sports (17, 18). Girls are also more likely to participate in individual sports (dancing, gymnastics, etc.), whereas boys are more likely to participate in team sports (17, 18).

Research has also found that modest participation (10 hours per week) and participation in a number of different activities predicted better outcomes (e.g., greater school attachment, higher GPA, greater likelihood of college attendance, greater self-esteem, greater social-connectedness, and lower depressive symptoms) than over-participating (20+ hours per week) or participating in only one activity, although participation in one activity was better than participation in none (19, 20).

Art has long been viewed as being therapeutic; it can provide an emotional outlet and be used for positive self-expression (21). The arts can also have public health benefits. For example, adolescent participation in the performing arts has been shown to help young people resist drugs; manage stress and difficult emotions; learn about sexual health; understand appropriate physical contact; experience excitement, satisfaction, and fun; and address social exclusion through community integration (21). However, although there is evidence of the benefits of participation in the arts for health, this evidence is inadequately documented and tested.

A systematic review conducted by Daykin et al. (21) on performing arts interventions with children and adolescents between the ages of 11 to 18 that were published between 1994 and 2004 revealed only nine quantitative papers and six qualitative papers. All of the studies reviewed utilized drama interventions, highlighting a need to evaluate other performance arts, such as dance and instrumental and vocal music. Despite the heterogeneity of the studies, in terms of research design and premise, four key areas of impact were discovered: peer interaction, social skills, and empowerment; knowledge, attitude, and risk in relation to HIV/AIDS; sexual health; and alcohol, tobacco and illegal drug use. The seven studies relating to peer interaction, social skills, and empowerment generally found that participation in drama increased self-confidence,

enhanced self-expression, and improved social skills among mostly marginalized or "at-risk" youth. Evidence suggests that students may benefit in these three areas, which in turn benefit mood and depressive symptoms, simply by participating in any form of drama/theatre, including as a school activity (and not necessarily drama that is a directed or prescribed "intervention" program) (21).

There has been a significant amount of work published using the Add Health dataset. However, use of the dataset to explore extracurricular activities and depression has centered mainly on sports participation. The specific question of how participation in drama, as compared to participation in other activities, affects adolescent depression has not yet been examined. The Add Health dataset has several strengths which make it desirable in answering this question in comparison to other similar studies: it is a nationally-representative sample of the US; it contains not only robust socioeconomic and demographic data, but also robust data on school, family, and personal factors not found in other datasets; and it is longitudinal and can thus offer insight into causation where cross-sectional studies are limited (13). A systematic review of school-based extracurricular activities and adolescent outcomes shows that most studies thus far have been cross-sectional (13).

The goal of this thesis is to evaluate whether or not participating in drama has a protective effect on developing depression among adolescents in the U.S. using data from the National Longitudinal Survey of Adolescent Health (Add Health). This thesis will also evaluate whether participation in drama fits the pattern revealed in previous research, as mentioned above – that participation in one activity is better than participation in no activity, but participation in more than one activity is better than participation in only one activity.

Hypotheses

1. There will be lower odds of incident depression at Wave II among adolescents who participated in drama only at Wave I than among those who did not participate in any clubs at all.
2. There will be lower odds of incident depression at Wave II among adolescents who participated in any extracurricular activities at Wave I than among those who did not participate in any extracurricular activities.
3. There will be lower odds of incident depression at Wave II among adolescents who participated in drama only at Wave I than among those who participated in one non-drama club.
4. There will be lower odds of incident depression at Wave II among adolescents who participated in two or more clubs at Wave I than those who participated in only one club.
5. There will be lower odds of incident depression at Wave II among adolescents who participated in two or more clubs, including drama, at Wave I than those who participated in two or more non-drama clubs.

METHODS

Sample and Procedure

This study analyzed data from Add Health, a longitudinal study of a school-based, nationally-representative sample of adolescents in grades 7 to 12 in the United States during the 1994 to 1995 school-year. Participants in Add Health were followed through adolescence and into adulthood during four waves between 1994 and 2008 (22). The current study used data from the public-use dataset for Waves I and II.

Wave I of the study was conducted from September 1994 to December 1995 and included both in-school and in-home surveys. A stratified sample of 80 high schools (schools with an 11th grade and more than 30 students) was randomly selected from the Quality Education Database (QED) with probability proportional to size. Schools were stratified by region, urbanicity, school type (public, private, parochial), ethnic mix, and size. Each high school also identified its largest feeder school (a school that includes 7th grade and sends its students to that high school upon graduation). A total of 134 schools (79% of the schools contacted), representing 80 communities, agreed to take part in the study (22).

The in-school questionnaire was administered to over 90,000 students from September 1994 until April 1995. The survey was administered at each school on a single day, within one class period. A random sample of students was then chosen for the 90-minute in-home interview from a sample that included all students who were either on school rosters or had completed in-school questionnaires (students who had not participated in the in-school survey were still eligible for the in-home survey). Students were stratified by grade and sex and about 17 students were randomly chosen from each stratum to yield a total of approximately 200 students from each pair of schools and

12,105 students all together. In addition to this core sample, supplemental samples were drawn based on ethnicity (Cuban, Puerto Rican, and Chinese), genetic relatedness to siblings (twins, full- and half-siblings, and unrelated adolescents living in the same household, referred to as the 'genetic sample'), adoption status, disability, and black adolescents with highly educated parents. The total number of students who participated in the in-home interview of Wave I was 20,745 (22).

Wave II included in-home interviews of adolescents who were in grades 7 through 11 during Wave I (as well as 12th graders who were part of the genetic or adopted samples) and took place between April and August of 1996. A total of 14,738 adolescents participated in Wave II. The in-home surveys for both Waves I and II were conducted using audio-computer assisted self interview (ACASI) technology on laptop computers, in order to minimize reporting bias on sensitive questions regarding health status and risky behaviors (22).

The public-use dataset for Waves I and II consists of half of the core sample, chosen at random, and half of the over-sample of African-American adolescents with a parent who has a college degree. There are 6,504 respondents included from Wave I and 4,834 respondents included from Wave II (22). This study included 4067 respondents from the public-use dataset, those who both had no depression in Wave I and answered items on extracurricular activity participation. Analysis of these data was approved by the Emory University Institutional Review Board.

Measures

Dependent Variable

The primary dependent variable for this study was depression. Depressive symptoms were measured in Add Health using a modified version of the Center for Epidemiological Studies-Depression Scale (CES-D). This “Feelings Scale” was administered as section 10 of the in-home interview during both Waves I and II. Prior research has shown that the CES-D scale, originally developed to assess depressive symptoms in adults, is acceptable for use with adolescent populations (23). The Add Health scale adapted the CES-D scale by dropping two original CES-D items (“My sleep was restless” and “I had crying spells”); adding a new item (“I felt that life was not worth living”); and rephrasing two items (“I felt that everything I did was an effort” and “I could not get 'going'”) (24). Table 1 shows both the CES-D scale and Add health Feelings Scale. Questions on sleep and crying were asked as part of the “General Health” portion of the in-home interview. Item scores on the Feelings Scale assessed depressive symptoms experienced in the past week and ranged from 0 to 3 (0 = never or rarely; 1 = sometimes; 2 = a lot of the time; 3 = most of the time or all of the time; 6 = refused; 8 = don't know; 9 = not applicable) (25). Item scores were summed to form a composite score ranging from 0 to 57; four items were positively worded and were reverse-coded prior to summation. In this study, internal consistency (Cronbach's α) for the Feelings Scale was 0.87 for Wave I and 0.88 for Wave II. A dichotomous depression variable was created with scores of 24 or greater in females and 22 or greater in males indicating depressed mood. These cut-points have been used in previous Add Health studies and are from analyses that maximized the sensitivity and specificity of the CES-D for predicting major depressive disorder as defined by DSM-III criteria (26, 28). Incident depression in Wave

II was defined by a female having a score less than 24 in Wave I and greater than or equal to 24 in Wave II and by a male having a score less than 22 in Wave I and greater than or equal to 22 in Wave II.

Independent Variable

The primary independent variable for this study was participation in drama and other clubs. During the in-school portion of Wave I, students were given a list of clubs, organizations, and teams found at many schools and asked to darken the oval next to any of them that they are participating in this year or plan on participating in later in the school year. A variable for participation was created with the following categories: participation in no clubs, activities, or teams; participation in one non-drama activity; participation in multiple non-drama activities; participation in drama and other activities; and participation in drama only. These categories were chosen to examine not just the effects of participating in drama, but also to examine the effects of participating in more than one activity. Students who had marked any of the listed clubs, but had also marked the statement, "If you do not participate in any clubs, organizations, or teams at school, fill in this oval," were omitted from the creation of the participation variable as errors.

Covariates

Independent demographic variables that were associated with both depression and participation in clubs were included in the multivariate models. These covariates may act as confounders or mediators in the relationship between club participation and depression and included sex, age, race/ethnicity, and family income level. Gender was dummy-

coded, with 0 being male and 1 being female (referent group). Age was calculated by subtracting the date of birth from the date of the interview and was then made into an ordinal variable with age groups 11-13 (referent), 14-15, 16-17, 18-19, and 20-21 (28). Race was based on the adolescents' self-report and categories were Hispanic, African-American, Asian/Pacific Islander, Native American, Other, and White (referent). Family income level was measured in $1,000 increments and made into an ordinal variable with levels $0-$21,999 (referent), $22,000-$39,999, $40,000-$59,999, and $60,000-$999,000) (28).

Statistical Analyses

All statistical analyses were carried out using SAS (version 9.4, SAS Institute Inc.) and SAS-Callable SUDAAN (version 11.0.1, RTI International), in order to correct for complex sampling design effects and unequal probability of selection and obtain unbiased parameter and variance estimates. Grand sample weights from Wave II were used because the analyses contained data from both Waves I and II (29).

Univariate analyses were conducted to examine the distribution, central tendencies, and frequency missing of the variables. Bivariate analyses were conducted using χ^2 tests to examine the relationships between participation and the covariates. Logistic regression and the likelihood ratio chunk test was used to test for interaction between participation and the covariates (participation*sex, participation*age, participation*race, and participation*income).

Logistic regression was used to examine whether club/drama participation could be a protective factor against the development of depression. Logistic regression has been used previously with Add Health data to study sports participation and depression (28).

Three multivariate models were used with depression in Wave II, given no depression in Wave I (i.e., incidence of depression in Wave II), as the dependent variable. All three models controlled for sex, age, race, and family income. Model 1 tested Hypotheses 1 and 2 and used 'No participation in any club' as the referent group for odds ratios. Model 2 tested Hypotheses 3 and 4 and used 'Participation in one non-drama club' as the referent group. Finally, Model 3 tested Hypothesis 5 and used 'Participation in multiple non-drama clubs' as the referent group. Statistical significance of the logistic regression models was established using the Wald χ^2 statistic and model fit was assessed using the Hosmer-Lemeshow χ^2 goodness-of-fit statistic. In all aforementioned statistical analyses, significance was determined by an alpha level of 0.05 (95% confidence limits).

RESULTS

Preliminary Analyses

Table 2 shows the results from all univariate analyses for students without depression in Wave I. Most students participated in more than one club, organization, or team. Only 562 (13.82%) students participated in no extracurricular activities; 924 (22.72%) participated in one non-drama club; 2257 (55.50%) participated in multiple non-drama clubs; 304 (7.47%) participated in drama and other clubs; and 20 (0.49%) participated in drama only. Of the 4380 students who answered the question on depression, 252 (5.75%) had incident depression in Wave II.

Tables 3 shows results from the bivariate analyses - the relationships between club/drama participation and the covariates, among those with no depression in Wave I. Sex, age, race, and family income were all significantly associated with club/drama participation and therefore all included in the logistic regression models. No club participation was associated with female sex, 16-17 years of age, and lower family income. Participation in one non-drama club was associated with male sex, 16-17 years of age, and lower family income. Participation in multiple non-drama clubs was associated with female sex, 16-17 years of age, and higher family income. Participation in drama and other clubs was associated with female sex, 14-15 years of age, and higher family income. Finally, participation in drama only was associated with female sex, 14-

17 years of age, and higher family income.

Tests of Hypotheses

Table 4 shows the logistic regression results for incidence of depression in Wave II with 'no participation in any club' as the referent group. The likelihood ratio chunk test was not significant ($\chi^2_{df=4} = 5.248$, p-value = 0.2628) and none of the interaction terms became significant during backwards elimination; therefore, no interaction terms were included in the logistic regression models.

Hypotheses 1 and 2 were tested in Model 1 (Table 4). This model was statistically significant (χ^2 (16 df) = 38.79; p-value = 0.0012) and a good fit for the data (χ^2 (8 df) = 9.596; p-value = 0.2945). Hypothesis 1 proposed that there would be lower odds of developing depression at Wave II among adolescents who participated in drama only compared to those who did not participate in any club. In Model 1, after controlling for the covariates, the odds of developing depression among adolescents who participated in drama only were 2.398 (95% CI: 0.258-22.282); this was not a significant difference.

Hypothesis 2 proposed that there would be lower odds of developing depression at Wave II among adolescents who participated in any extracurricular activities at Wave I than among those who did not participate in any extracurricular activities. Table 4: Model 1, shows that, after controlling for the covariates, the odds for developing depression in all participation groups did not differ significantly from the odds in the group that did not participate. The lowest odds ratio was for those participating in one non-drama club whose odds ratio was 0.845 (95% CI 0.422-1.691).

Hypotheses 3 and 4 were tested in Model 2 (Table 5). This model was statistically significant (χ^2 (16 df) = 38.79; p-value = 0.0012) and a good fit for the data (χ^2 (8 df) =

9.596; p-value = 0.2945). Hypothesis 3 proposed that adolescents who participated in drama only would have lower odds of developing depression at Wave II than those who participated in only one non-drama club. In Model 2 (Table 5), after controlling for the covariates, the odds of developing depression among adolescents who participated in drama only were 2.840 (95% CI: 0.312-25.806); this was not a significant difference.

Hypothesis 4 proposed that adolescents who participated in multiple clubs (testing with and without drama separately) would have lower odds of developing depression at Wave II than those who participated in only one club. In Model 2 (Table 5), after controlling for the covariates, the odds for developing depression in all participation groups did not differ significantly from the odds in the group that only participated in one non-drama club. Those who did not participate in any club had the lowest odds ratio, at 1.184 (95% CI: 0.591-2.370).

Finally, Hypothesis 5 proposed that adolescents who participated in drama and other clubs would have lower odds of developing depression at Wave II than those who participated in multiple non-drama clubs. Table 6 shows the logistic regression results for incidence of depression in Wave II with 'participation in multiple non-drama clubs' as the referent group. In Model 3 (Table 6), after controlling for the covariates, the odds of developing depression among adolescents who participated in drama and other clubs did not significantly differ from those among adolescents who participated in multiple non-drama clubs. The odds ratio was 0.856 (95% CI: 0.399-1.836).

While the models demonstrated a good fit for the data (Hosmer-Lemeshow $\chi^2_{df=8}$=9.596, p-value = 0.2945) and were overall statistically significant ($\chi^2_{df=16}$=38.79, p-value = 0.0012), there were no statistically significant differences among the different participation categories with regard to the odds of developing depression. There were,

however, statistically significant differences in the other four categories (sex, age, race, and family income) with regard to the odds of developing depression. Male gender was shown to have a protective effect; the odds ratio was 0.603 (95% CI: 0.403-0.904). The odds of incident depression increased with age; the odds ratio for 16 to 17 year-olds was 2.009 (95% CI: 1.100-3.670) and for 18 to 19 year-olds was 2.769 (95% CI: 1.026-7.474). Asians had significantly higher odds of developing depression than other race groups; the odds ratio was 2.887 (95% CI: 1.248-6.679). Finally, there was a protective effect on those in the second highest and highest family income levels. The odds ratio for a family income of $22,000 to $39,999 was 0.529 (95% CI: 0.306-0.914) and for a family income of $60,000 to $999,000 was 0.314 (95% CI: 0.170-0.580).

DISCUSSION

The aim of this study was to examine the associations between club/drama participation and depression using longitudinal data from a nationally-representative study of adolescents. Prior research suggests that participating in multiple extracurricular activities has a protective effect on developing depression as compared to participating in no or only one extracurricular activity (13, 30-32). However, in this study, participating in any extracurricular activities (at time = Wave I) had no significant association with incidence of depression four to twenty-three months later (at time = Wave II). Therefore, we cannot conclude that participating in extracurricular activities, with or without drama or drama by itself, is protective against the onset of new depression in adolescents.

These findings may be due to the fact that all extracurricular activities, besides, drama, were conflated in the study. It has been hypothesized that participation in activities leads to psychological well-being through validation of sense of self, improved self-esteem, increased social-connectedness, and other mediators (12-14). However, the effects of all extracurricular activities are not equal as they do not share the same characteristics (physical vs academic, daily vs monthly, high turnover vs sustained involvement, student-mentor relationships, etc). Some may even have negative effects due to peer pressure, pressure to succeed, and other factors (13). To better understand the effects of extracurricular participation it would be necessary to qualitatively group activities and account for individual, peer, school, family, and neighborhood contexts.

Strengths and Limitations

Strengths of this study include the fact that it had a large, nationally-representative sample size, was longitudinal in design, and allowed for the examination of drama in particular where most studies in the past have grouped drama with other performing arts or non-sport extracurricular activities. However, a number of limitations of the study limit implications and generalization of the findings. First, using a large, national study was also a limitation. The sample of students who participated in drama, and especially drama only, was fairly small. Loss to follow-up and non-response further limited the sample, which may have impacted the lack of significant results in the longitudinal analyses. In addition, this study could not take into account the school's resources, quality of programming, and other structural or operational variables that may affect adolescent depression and desire to participate.

There were also measurement limitations. Since the study was administered as a questionnaire and all measures were self-reported, it was vulnerable to response bias. Findings from a self-reported measure of depression may not generalize to clinical depression. With regard to the activity measure in general, there was no way to take breadth and duration of activity into account when measuring participation in extracurricular activities. The question asked students to, “Darken the oval next to any of them that you are participating in this year, or that you plan to participate in later in the school year.” Some students may have selected only those clubs in which they were heavily active, whereas other students may have been less discerning. Students may also

have chosen clubs that they later never joined or failed to report clubs they did not yet know about. With regard to the drama measure in particular, students who selected 'drama' could not distinguish whether they were performers or involved in the technical crew. These two groups may have different characteristics with different effects on depression.

The time frame presented other limitations. Wave I was conducted over a year-and-a-half (September 1994 to December 1995) and Wave II was conducted from April to August 1996. These time-frames include summer months when students are not necessarily benefiting from the effects of participating in structured activity, both academic and extracurricular, or daily socialization. The month in which a student responded to the questionnaire may have a significant effect on their recorded depressive symptoms and social-connectedness. There was also a wide range of time from Wave I to Wave II; some students responded to the Wave II questionnaire in as little as four months and for others it was as long as twenty-three months. Due to variability in breadth and duration of participation over time, there is no way to discern between lasting and immediate effects of participation.

Future Directions

This study utilized the limited public-use data from Add Health. For future analysis the full data-set should be utilized in order to obtain a larger sample of drama participants. This study also looked at depression as a dichotomous variable; however, the effects of club/drama participation on the mitigation of depressive symptoms is also valuable information and can be used to direct prevention/intervention/treatment. Thus, future research using the continuous measure would also be of value.

The Add Health dataset provides a unique breadth of data that may be used to establish associations between many different types of extracurricular activities (e.g. other performing arts, fine arts, volunteer/community service) and outcomes such as risky behaviors, academic achievement, and physical and mental (e.g. depression, anxiety) well-being. All of these issues and associations are worthy of future exploration.

Prior research suggests that greater self-esteem and social-connectedness reduce the risks of depression and that participation in extracurricular activities is associated with increased self-esteem and social-connectedness (13, 27, 32-34). Participation in school activities may function to boost students' self-esteem and prosocial skills by providing the means to explore one's self-identity and interests and an environment for greater socialization than in the classroom. Conversely, enervating depressive symptoms may lower students' motivation and desire to participate in school activities and socialize. In this case, those who choose to participate are already less likely to be experiencing depressive symptoms. If the former is true, then encouraging students to participate in extracurricular activities may be an effective intervention against depression. The Add Health dataset includes information on self-esteem, perceived social-connectedness, peer networks, family support, and other social data, all of which may be tested as mediators of the activity-depression relationship.

There is a preponderance of research on sports participation and its effects on depression and other positive health outcomes. This may justify directing limited funds more heavily towards sports; however, it is important that adolescents who don't have a proclivity for sports have opportunity to participate in suitable activities that offer similar benefits. Further research would help policy makers and school administrators in determining whether investment in drama is justified/should be amplified.

WORKS CITED

1. Hankin BL. Adolescent depression: Description, causes, and interventions. Epilepsy & Behavior 2006;8(1):102-14.
2. Organization WH. The Global Burden of Disease: 2004 Update. Geneva: World Health Organization, 2008.
3. Ge X, Lorenz FO, Conger RD, et al. Trajectories of stressful life events and depressive symptoms during adolescence. Developmental Psychology 1994;30(4):467-83.
4. Merikangas KR, He JP, Brody D, et al. Prevalence and Treatment of Mental Disorders Among US Children in the 2001–2004 NHANES. Pediatrics 2010;125(1):75-81.
5. Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: Mental Health Findings, NSDUH Series H-42, HHS Publication No. (SMA) 11-4667. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2012.
6. Merikangas KR, He JP, Burstein M, et al. Lifetime Prevalence of Mental Disorders in U.S. Adolescents: Results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). Journal of the American Academy of Child & Adolescent Psychiatry 2010;49(10):980-9.
7. Hankin BL and Abramson LY. Development of gender differences in depression: Description and possible explanations. Annals of Medicine 1999;31:372–379.
8. Fortenberry JD. Socioeconomic status, schools, and adolescent depression: Progress in the social epidemiology of adolescent health. Journal of Pediatrics

2003;143:427-9.

9. Wickrama KA, Conger RD, Lorenz FO, Jung T. Family antecedents and consequences of trajectories of depressive symptoms from adolescence to young adulthood: a life course investigation. Journal of Health and Social Behavior 2008;49(4):468–483.

10. Angold A, Costello EJ, Worthman CM. Puberty and depression: the roles of age, pubertal status and pubertal timing. Psychological medicine 1998;28(01):51-61.

11. Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K, Swendsen J. Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry. 2010;49(10):980- 989.

12. Mahoney, J. L., Schweder, A. E., & Stattin, H. (2002). Structured after-school activities as a moderator of depressed mood for adolescents with detached relations to their parents. Journal of Community Psychology, 30, 69-86.

13. Feldman AF and Matjasko JL. The Role of School-Based Extracurricular Activities in Adolescent Development: A Comprehensive Review and Future Directions. Review of Educational Research 2005;75(2): 159-210.

14. Metsäpelto RL and Pulkkinen L. Socioemotional Behavior and School Achievement in Relation to Extracurricular Activity Participation in Middle Childhood. Scandinavian Journal of Educational Research 2011;56(2): 167-182.

15. Denault AS, Poulin F, and Pedersen S. Intensity of participation in organized youth activities during the high school years: Longitudinal associations with adjustment. Applied Developmental Science 2009;13, 74–87.

16. Mays D and Thompson NJ. Alcohol risk behaviors and sports participation among high-school students: An analysis of 2005 Youth Risk Behavior Surveillance Data. Journal of Adolescent Health 2009;44(1):87-89.

17. Bohnert A M, & Garber J. Prospective relations between organized activity participation and psychopathology during adolescence. Journal of Abnormal Child Psychology 2007;35:1021–1033.

18. Fredricks JA and Eccles JS. Developmental benefits of extracurricular involvement: Do peer characteristics mediate the link between activities and youth outcomes? Journal of Youth and Adolescence 2005;6:507–520.

19. Randall E and Bohnert A. Organized activity involvement, depressive symptoms, and social adjustment in adolescents: Ethnicity and socioeconomic status as moderators. Journal of Youth and Adolescence 2009;38:1187–1198.

20. Barber, B. L., Stone, M. R., & Eccles, J. S. (2005). Adolescent participation in organised activities. In K. A. Moore, & L. H. Lippman (Eds.), What do children need to flourish? Conceptualisation and measuring indicators of positive development (pp. 133–146). New York: Springer Science þ Business Media Inc.

21. Daykin N, Orme J, Evans D, Salmon D, McEachran M, & Brain S. The impact of participation in performing arts on adolescent health and behavior: a systematic review of the literature. Journal of Health Psychology 2008;13:251–264.

22. Harris KM, Forey F, Tabor J, Bearman PS, Jones, J, & Udry R. (2003). The National Longitudinal Study of Adolescent Health: Research Design. Retrieved September 1, 2014, from http://www.cpc.unc.edu/projects/addhealth/design.

23. Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. Journal of Youth and Adolescence 1991;20(2):149-

66.

24. Radloff LS. The CES-D Scale. Applied Psychological Measurement 1977;1(3):385-401.

25. Harris KM, Forey F, Tabor J, Bearman PS, Jones J, & Udry R. (2003). The National Longitudinal Study of Adolescent Health: Codebooks. Retrieved September 2013, from http://www.cpc.unc.edu/projects/addhealth/codebooks.

26. Goodman E, Slap B, and Huang B. The Public Health Impact of Socioeconomic Status on Adolescent Depression and Obesity. American Journal of Public Health 2003;93:1844-1850.

27. Moon, S. S. and U. Rao. Youth-family, youth-school relationship, and depression. Child and Adolescent Social Work Journal 2010;27: 115-131.

28. Babiss, L. A. and J. E. Gangwisch. Sports participation as a protective factor against depression and suicidal ideation in adolescents as mediated by self-esteem and social support. Journal of Developmental and Behavioral Pediatrics 2009;30: 376.

29. Chantala, K. Guidelines for Analyzing Add Health Data. Retrieved September 1, 2014 from http://www.cpc.unc.edu/projects/addhealth/data/guides/wt-guidelines.pdf.

30. Harrison PA and Narayan G. Differences in Behavior, Psychological Factors, and Environmental Factors Associated with Participation in School Sports and Other Activities in Adolescence. Journal of School Health 2003;73: 113–120.

31. Bartko WT and Eccles J. Adolescent Participation in Structured and Unstructured Activities: A Person-Oriented Analysis. Journal of Youth and Adolescence 2003;32(4): 233-241.

32. Farb AF and Matjasko JL. Recent advances in research on school-based extracurricular activities and adolescent development. Developmental Review 2012;32(1): 1-48.

33. Armstrong S and Oomen-Early J. Social Connectedness, Self-Esteem, and Depression Symptomatology Among Collegiate Athletes Versus Nonathletes. Journal of American College Health 2009;57(5): 521-526.

34. Resnick MD, Bearman PS, Blum RW. Protecting adolescents from harm: Findings from the National Longitudinal Study on adolescent health. Journal of the American Medical Association 1997;278:823-32.

TABLES

Table 1. Depressive Symptoms Scale Construction

CES-D Scale	Add Health Feelings Scale
During the past week:	How often was each of the following things true during the past week?
1. I was bothered by things that usually don't bother me.	1. You were bothered by things that usually don't bother you.
2. I did not feel like eating; my appetite was poor.	2. You didn't feel like eating, your appetite was poor.
3. I felt that I could not shake off the blues even with help from my family and friends.	3. You felt that you could not shake off the blues, even with help from your family and your friends.
4. I felt that I was just as good as other people.	4. You felt that you were just as good as other people.
5. I had trouble keeping my mind on what I was doing.	5. You had trouble keeping your mind on what you were doing.
6. I felt depressed.	6. You felt depressed.
7. I felt that everything I did was an effort.	7. You felt that you were too tired to do things.
8. I felt hopeful about the future.	8. You felt hopeful about the future.
9. I thought my life had been a failure.	9. You thought your life had been a failure.
10. I felt fearful.	10. You felt fearful.
11. My sleep was restless.	
12. I was happy.	11. You were happy.
13. I talked less than usual.	12. You talked less than usual.
14. I felt lonely.	13. You felt lonely.
15. People were unfriendly.	14. People were unfriendly to you.
16. I enjoyed life.	15. You enjoyed life.
17. I had crying spells.	
18. I felt sad.	16. You felt sad.
19. I felt that people disliked me.	17. You felt that people disliked you.
20. I could not get "going".	18. It was hard to get started doing things.
	19. You felt life was not worth living.

Table 2: Univariate Descriptive Statistics on Add Health Subjects With No Depression in Wave I for Club/Drama Participation and Covariates			
	n	**%**	**Frequency missing**
Sex	5890		0
Male	2894	49.13	
Female	2996	50.87	
Age (Wave I)	5890		0
11-13	980	16.64	
14-15	1908	32.39	
16-17	2095	35.57	
18-19	883	14.99	
20-21	24	0.41	
Race	5886		4
Hispanic	644	10.94	
African-American	1424	24.19	
Asian	205	3.48	
Native American	112	1.90	
Other	49	0.83	
White	3452	58.65	
Family Income (Wave I)	4482		1408
$0 - $21,999	1058	23.61	
$22,000 - $39,999	1107	24.70	
$40,000 - $59,999	1092	24.36	
$60,000 - $999,000	1225	27.33	
Club Participation (Wave I)	4067		1823
No participation in any club	562	13.82	
Participation in one non-drama club	924	22.72	
Participation in multiple non-drama clubs	2257	55.5	
Participation in drama and other club(s)	304	7.47	
Participation in drama club only	20	0.49	
Incident Depression, dichotomous (Wave II)	4380		1510
No (males ≤ 21, females ≤ 23)	4128	94.25	
Yes (males ≥ 22, females ≥ 24)	252	5.75	

Table 3. Relationships between Club/Drama Participation and Covariates Among Those with No Depression in Wave I						
n (%)	**Club Participation (Wave I)**					**χ^2 (p)**
	No Clubs	**One Non-drama Club**	**Multiple Non-drama Clubs**	**Drama and Other Club(s)**	**Drama Only**	
Sex, n (%)						
Male	279 (49.64)	488 (52.81)	1050 (46.52)	83 (27.30)	8 (40.00)	62.07 (<0.0001)
Female	283 (50.36)	436 (47.19)	1207 (53.48)	221 (72.70)	12 (60.00)	
Age (Wave I), n (%)						
11-13	76 (13.52)	152 (16.45)	422 (18.70)	56 (18.42)	3 (15.00)	35.04 (0.0039)
14-15	162 (28.83)	298 (32.25)	772 (34.20)	116 (38.16)	8 (40.00)	
16-17	221 (39.32)	339 (36.69)	788 (34.91)	99 (32.57)	8 (40.00)	
18-19	102 (18.15)	134 (14.50)	274 (12.14)	33 (10.86)	1 (5.00)	
20-21	1 (0.18)	1 (0.11)	1 (0.04)	0 (0.00)	0 (0.00)	
Race, n (%)						
Hispanic	79 (14.08)	85 (9.20)	172 (7.62)	19 (6.25)	3 (15.00)	43.54 (0.0017)
African-American	116 (20.68)	244 (26.41)	592 (26.23)	76 (25.00)	4 (20.00)	
Asian	26 (4.63)	26 (2.81)	77 (3.41)	7 (2.30)	0 (0.00)	
Native American	8 (1.43)	14 (1.52)	43 (1.91)	5 (1.64)	1 (5.00)	
Other	5 (0.89)	7 (0.76)	19 (0.84)	3 (0.99)	1 (5.00)	
White	327 (58.29)	548 (59.31)	1354 (59.99)	194 (63.82)	11 (55.00)	
Family Income (Wave I), n (%)						
$0 - $21,999	125 (29.69)	196 (27.22)	331 (18.94)	35 (14.23)	3 (20.00)	106.14 (<0.0001)
$22,000 - $39,999	122 (28.98)	188 (26.11)	411 (23.51)	34 (13.82)	5 (33.33)	
$40,000 - $59,999	105 (24.94)	166 (23.06)	472 (27.00)	73 (29.67)	1 (6.67)	
$60,000 - $999,000	69 (16.39)	170 (23.61)	534 (30.55)	104 (42.28)	6 (40.00)	

Table 4. Odd Ratios (95%CI) for Incidence of Depression in Wave II with 'No participation in any club' as Referent Group	
	Model 1
Club Participation separated by Drama (Wave I)	
No participation in any club	1.000
Participation in one non-drama club	0.845 (0.422-1.691)
Participation in multiple non-drama clubs	1.212 (0.671-2.190)
Participation in drama and other club(s)	1.038 (0.420-2.563)
Participation in drama club only	2.398 (0.258-22.282)
Sex, n (%)	
Male	**0.603 (0.403-0.904)***
Female	1.000
Age (Wave I), n (%)	
11-13	1.000
14-15	1.685 (0.926-3.067)
16-17	**2.009 (1.100-3.670)***
18-19	**2.769 (1.026-7.474)***
Race, n (%)	
Hispanic	0.974 (0.486-1.952)
African-American	0.652 (0.380-1.121)
Asian	**2.887 (1.248-6.679)***
Native American	1.138 (0.341-3.797)
Other	2.291 (0.635-8.269)
White	1.000
Family Income (Wave I)	
$0 - $21,999	1.000
$22,000 - $39,999	**0.529 (0.306-0.914)***
$40,000 - $59,999	0.716 (0.432-1.187)
$60,000 - $999,000	**0.314 (0.170-0.580)***
Overall Model Significance	χ^2 (16 df) = 38.79 p-value = 0.0012
Hosmer-Lemeshow Test	χ^2 (8 df) = 9.596 p-value = 0.2945
*** = p < 0.05**	

Table 5. Odd Ratios (95%CI) for Incidence of Depression in Wave II with 'Participation in one non-drama club' as Referent Group	
	Model 2
Club Participation separated by Drama (Wave I)	
No participation in any club	1.184 (0.591-2.370)
Participation in one non-drama club	1.000
Participation in multiple non-drama clubs	1.435 (0.854-2.410)
Participation in drama and other club(s)	1.229 (0.522-2.894)
Participation in drama club only	2.840 (0.312-25.806)
Sex, n (%)	
Male	**0.603 (0.403-0.904)***
Female	1.000
Age (Wave I), n (%)	
11-13	1.000
14-15	1.685 (0.926-3.067)
16-17	**2.009 (1.100-3.670)***
18-19	**2.769 (1.026-7.474)***
Race, n (%)	
Hispanic	0.974 (0.486-1.952)
African-American	0.652 (0.380-1.121)
Asian	**2.887 (1.248-6.679)***
Native American	1.138 (0.341-3.797)
Other	2.291 (0.635-8.269)
White	1.000
Family Income (Wave I)	
$0 - $21,999	1.000
$22,000 - $39,999	**0.529 (0.306-0.914)***
$40,000 - $59,999	0.716 (0.432-1.187)
$60,000 - $999,000	**0.314 (0.170-0.580)***
Overall Model Significance	χ^2 (16 df) = 38.79 p-value = 0.0012
Hosmer-Lemeshow Test	χ^2 (8 df) = 9.596 p-value = 0.2945
*** = p < 0.05**	

Table 6. Odd Ratios (95%CI) for Incidence of Depression in Wave II with 'Participation in multiple non-drama clubs' as Referent Group	
	Model 3
Club Participation separated by Drama (Wave I)	
No participation in any club	0.825 (0.457-1.491)
Participation in one non-drama club	0.697 (0.415-1.170)
Participation in multiple non-drama clubs	1.000
Participation in drama and other club(s)	0.856 (0.399-1.836)
Participation in drama club only	1.979 (0.225-17.393)
Sex, n (%)	
Male	**0.603 (0.403-0.904)***
Female	1.000
Age (Wave I), n (%)	
11-13	1.000
14-15	1.685 (0.926-3.067)
16-17	**2.009 (1.100-3.670)***
18-19	**2.769 (1.026-7.474)***
Race, n (%)	
Hispanic	0.974 (0.486-1.952)
African-American	0.652 (0.380-1.121)
Asian	**2.887 (1.248-6.679)***
Native American	1.138 (0.341-3.797)
Other	2.291 (0.635-8.269)
White	1.000
Family Income (Wave I)	
$0 - $21,999	1.000
$22,000 - $39,999	**0.529 (0.306-0.914)***
$40,000 - $59,999	0.716 (0.432-1.187)
$60,000 - $999,000	**0.314 (0.170-0.580)***
Overall Model Significance	χ^2 (16 df) = 38.79 p-value = 0.0012
Hosmer-Lemeshow Test	χ^2 (8 df) = 9.596 p-value = 0.2945
*** = p < 0.05**	

BIBLIOGRAPHY

Angold A, Costello EJ, Worthman CM. Puberty and depression: the roles of age, pubertal status and pubertal timing. Psychological medicine 1998;28(01):51-61.

Armstrong S and Oomen-Early J. Social Connectedness, Self-Esteem, and Depression Symptomatology Among Collegiate Athletes Versus Nonathletes. Journal of American College Health 2009;57(5): 521-526.

Babiss, L. A. and J. E. Gangwisch. Sports participation as a protective factor against depression and suicidal ideation in adolescents as mediated by self-esteem and social support. Journal of Developmental and Behavioral Pediatrics 2009;30: 376.

Barber, B. L., Stone, M. R., & Eccles, J. S. (2005). Adolescent participation in organised activities. In K. A. Moore, & L. H. Lippman (Eds.), What do children need to flourish? Conceptualisation and measuring indicators of positive development (pp. 133–146). New York: Springer Science þ Business Media Inc.

Bartko WT and Eccles J. Adolescent Participation in Structured and Unstructured Activities: A Person-Oriented Analysis. Journal of Youth and Adolescence 2003;32(4): 233-241.

Bohnert A M, & Garber J. Prospective relations between organized activity participation and psychopathology during adolescence. Journal of Abnormal Child Psychology 2007;35:1021–1033.

Chantala, K. Guidelines for Analyzing Add Health Data. Retrieved September 1, 2014 from http://www.cpc.unc.edu/projects/addhealth/data/guides/wt-guidelines.pdf.

Daykin N, Orme J, Evans D, Salmon D, McEachran M, & Brain S. The impact of participation in performing arts on adolescent health and behavior: a systematic

review of the literature. Journal of Health Psychology 2008;13:251–264.

Denault AS, Poulin F, and Pedersen S. Intensity of participation in organized youth activities during the high school years: Longitudinal associations with adjustment. Applied Developmental Science 2009;13, 74–87.

Farb AF and Matjasko JL. Recent advances in research on school-based extracurricular activities and adolescent development. Developmental Review 2012;32(1): 1-48.

Feldman AF and Matjasko JL. The Role of School-Based Extracurricular Activities in Adolescent Development: A Comprehensive Review and Future Directions. Review of Educational Research 2005;75(2): 159-210.

Fortenberry JD. Socioeconomic status, schools, and adolescent depression: Progress in the social epidemiology of adolescent health. Journal of Pediatrics 2003;143:427-9.

Fredricks JA and Eccles JS. Developmental benefits of extracurricular involvement: Do peer characteristics mediate the link between activities and youth outcomes? Journal of Youth and Adolescence 2005;6:507–520.

Ge X, Lorenz FO, Conger RD, et al. Trajectories of stressful life events and depressive symptoms during adolescence. Developmental Psychology 1994;30(4):467-83.

Goodman E, Slap B, and Huang B. The Public Health Impact of Socioeconomic Status on Adolescent Depression and Obesity. American Journal of Public Health 2003;93:1844-1850.

Hankin BL and Abramson LY. Development of gender differences in depression: Description and possible explanations. Annals of Medicine 1999;31:372–379.

Hankin BL. Adolescent depression: Description, causes, and interventions. Epilepsy &

Behavior 2006;8(1):102-14.

Harris KM, Forey F, Tabor J, Bearman PS, Jones J, & Udry R. (2003). The National Longitudinal Study of Adolescent Health: Codebooks. Retrieved September 2013, from http://www.cpc.unc.edu/projects/addhealth/codebooks.

Harris KM, Forey F, Tabor J, Bearman PS, Jones, J, & Udry R. (2003). The National Longitudinal Study of Adolescent Health: Research Design. Retrieved September 1, 2014, from http://www.cpc.unc.edu/projects/addhealth/design.

Harrison PA and Narayan G. Differences in Behavior, Psychological Factors, and Environmental Factors Associated with Participation in School Sports and Other Activities in Adolescence. Journal of School Health 2003;73: 113–120.

Mahoney, J. L., Schweder, A. E., & Stattin, H. (2002). Structured after-school activities as a moderator of depressed mood for adolescents with detached relations to their parents. Journal of Community Psychology, 30, 69-86.

Mays D and Thompson NJ. Alcohol risk behaviors and sports participation among high-school students: An analysis of 2005 Youth Risk Behavior Surveillance Data. Journal of Adolescent Health 2009;44(1):87-89.

Merikangas KR, He JP, Brody D, et al. Prevalence and Treatment of Mental Disorders Among US Children in the 2001–2004 NHANES. Pediatrics 2010;125(1):75-81.

Merikangas KR, He JP, Burstein M, et al. Lifetime Prevalence of Mental Disorders in U.S. Adolescents: Results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). Journal of the American Academy of Child & Adolescent Psychiatry 2010;49(10):980-9.

Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C,

Georgiades K, Swendsen J. Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry. 2010;49(10):980- 989.

Metsäpelto RL and Pulkkinen L. Socioemotional Behavior and School Achievement in Relation to Extracurricular Activity Participation in Middle Childhood. Scandinavian Journal of Educational Research 2011;56(2): 167-182.

Moon, S. S. and U. Rao. Youth-family, youth-school relationship, and depression. Child and Adolescent Social Work Journal 2010;27: 115-131.

Organization WH. The Global Burden of Disease: 2004 Update. Geneva: World Health Organization, 2008.

Radloff LS. The CES-D Scale. Applied Psychological Measurement 1977;1(3):385-401.

Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. Journal of Youth and Adolescence 1991;20(2):149-66.

Randall E and Bohnert A. Organized activity involvement, depressive symptoms, and social adjustment in adolescents: Ethnicity and socioeconomic status as moderators. Journal of Youth and Adolescence 2009;38:1187–1198.

Resnick MD, Bearman PS, Blum RW. Protecting adolescents from harm: Findings from the National Longitudinal Study on adolescent health. Journal of the American Medical Association 1997;278:823-32.

Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: Mental Health Findings, NSDUH

Series H-42, HHS Publication No. (SMA) 11-4667. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2012.

Wickrama KA, Conger RD, Lorenz FO, Jung T. Family antecedents and consequences of trajectories of depressive symptoms from adolescence to young adulthood: a life course investigation. Journal of Health and Social Behavior 2008;49(4):468–483.