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I, Lauren A Bartsch, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Health Education.

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The Impact of Self-Concept on Adolescent Alcohol Use and Suicidal Behaviors

Student's name: **Lauren A Bartsch**

This work and its defense approved by:

Committee chair: Keith King, Ph.D.

Committee member: Ashley Merianos, Ph.D.

Committee member: Rebecca Vidourek, Ph.D.

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The Impact of Self-Concept on Adolescent Alcohol Use and Suicidal Behaviors

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by

Lauren A. Bartsch

M.S. University of Cincinnati, 2013

B.S. Capital University, 2011

Committee Chair: Keith A. King, Ph.D., MCHES

Committee Members: Rebecca A. Vidourek, Ph.D., CHES

Ashley L. Merianos, Ph.D., CHES

Abstract

AN ABSTRACT OF THE DISSERTATION FOR THE DOCTOR OF PHILOSOPHY DEGREE IN HEALTH PROMOTION AND EDUCATION, PRESENTED ON MARCH 11, 2016 AT THE UNIVERSITY OF CINCINNATI, CINCINNATI, OH

TITLE: The Impact of Self-Concept on Adolescent Alcohol Use and Suicidal Behaviors

DOCTORAL COMMITTEE MEMBERS: Dr. Keith A. King (chair), Dr. Rebeca A. Vidourek, and Dr. Ashley L. Merianos

This dissertation consists of two studies. Study one examined the impact of self-concept on alcohol use based on sex, race, and grade level among youth. Study two examined the impact of self-concept on suicidal ideation and suicide attempts based on sex, race, and grade level among youth.

Study One Abstract

Adolescent alcohol use is a major public health problem in the United States. While prevention efforts are common, alcohol still remains the most commonly used and abused substance among today's youth. Few studies have examined the relationship between specific components of mental health (i.e. self-concept) and alcohol use, particularly across the varying developmental years. The primary aim of this study was to investigate the impact of self-concept on recent alcohol use (past 30 days) and recent binge drinking (five or more alcoholic beverages on one occasion) across three developmental ages. This study employed secondary data analysis using the National Longitudinal Study on Adolescent to Adult Health (Add Health). All participants were in grades 7-12 (N = 6,504) and completed the computer assisted in-home interview. A total of 17.3% of youth reported recent alcohol use and 11.3% reported recent binge drinking. Overall, recent alcohol use and recent binge drinking increased with increased grade

levels. Youth who were male and white were also more likely than their counterparts for recent alcohol use and recent binge drinking. Youth with low self-concept were at increased odds for recent alcohol use. This held true regardless of sex, race and grade. Youth with low self-concept were at increased odds for recent binge drinking among male and female students, white students, and students in grades 7-8 and grades 11-12. Students in grades 7-8 with low self-concept had the highest odds ratios for recent alcohol use and recent binge drinking in comparison to students in grades 9-10 or 11-12 with low self-concept. Results of this study underscore the importance for health educators and preventionists to consider the impact of self-concept on youth substance use at differing grade levels when developing substance abuse prevention efforts.

Study Two Abstract

Youth suicide is in the top leading causes of death among adolescents and remains an important public health issue for health professionals today. Although much research has examined mental health risk factors for suicide like depression and other mental health disorders, few have examined a more intrapersonal form of mental health, an individual's overall self-concept. The primary aim of this study was to investigate the impact of self-concept on suicidal ideation and suicide attempts across three grade levels. A secondary data analysis was conducted using the National Longitudinal Study on Adolescent to Adult Health (Add Health). All participants were in grades 7-12 (N = 6,504) and completed a computer assisted in-home interview. A total of 12.8% of youth reported suicidal ideation and 3.5% reported attempting suicide in the past 12 months. Overall, suicidal ideation increased with age whereas suicide attempts were consistent among the three groups. Female youth were significantly more likely

than male youth to experience both suicidal ideation and suicide attempts. Youth with a low self-concept were at increased odds for suicidal ideation and suicide attempts regardless of sex, race, or grade. Interestingly, the impact of self-concept on suicidal ideation noticeably increased with increased grade level. Odds ratios for suicidal ideation show those with low self-concept were 2.8 (at $7^{th}/8^{th}$ grade), 3.5 ($9^{th}/10^{th}$ grade), and 4.4 ($11^{th}/12^{th}$ grade). The impact of self-concept on suicide attempts did not increase but rather remained consistently high among the three age groups. Future research is needed to explain reasons for the pronounced impact of self-concept on suicidal ideation with progressing age. Results from this study support the need for incorporating self-concept into suicide prevention efforts for youth

Acknowledgements

I would first like to express my deepest gratitude to Dr. Keith King for his constant support and invaluable guidance throughout the entire dissertation process and my time as a graduate student at the University of Cincinnati. I am truly grateful for his wisdom, patience, and encouragement to be a better student, teacher, and researcher during my graduate years. I would also like to thank Dr. Rebecca Vidourek for her continued support and expertise. I am grateful for the knowledge and direction she has given to me throughout my course work and dissertation process. Further, I would like to thank Dr. Ashley Merianos for her ongoing kindness and positivity, and for lending her expertise to my dissertation work. I greatly appreciate her support and willingness to help throughout the entire dissertation year. I am truly indebted to these individuals and grateful to have such a supportive team to prepare me for the completion of this study and a career in health education. Finally, I would like to thank my family and friends for their unwavering patience and support throughout my years of education.

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Study One: Impact of Self-Concept on Alcohol Use among Youth

INTRODUCTION

Alcohol is the most commonly used and abused drug among youth in the United States (Centers for Disease Control and Prevention, [CDC], 2015). Youth alcohol use has been linked to numerous problems including: unintentional injuries, homicide, suicide, impaired judgment, serious injuries, increased risk for physical and sexual abuse, legal and educational problems (involvement in the juvenile justice system and school dropout), social problems, and and abnormal brain development (Kaminer & Winters, 2011; National Institute for Alcohol Abuse and Alcoholism [NIAAA], 2015). In addition, underage alcohol consumption is responsible for nearly 4,400 deaths each year, including motor vehicle crashes, homicides, injuries, and suicides (CDC, 2013). Early onset of alcohol use has been linked to drinking and driving, injuries and traffic crashes, truancy, risky sexual behavior, and subsequent drug use and drug dependence in late adolescent and young adult years (Bradshaw, Waasdorp, Goldweber, & Johnson, 2013; Corte & Szalacha, 2010; Hawkins, Catalano, & Miller, 1997; Komro, Tobler, Maldonado-Molina, & Perry, 2010). The most recent Youth Risk Behavior Surveillance Survey (YRBS) revealed that although youth alcohol use has slightly decreased, it is still the most commonly used substance, with two out of three (66.2%) youth having ever tried alcohol, one out of three (34.9%) having currently drank alcohol (past 30 days), and one in five (20.8%) having currently binge drank (had more than five drinks in a row) (CDC, 2014). Further, there are distinct differences in alcohol use between sex, age, and race/ethnicity. In 2013, the National Survey on Drug Use and Health (NSDUH) found that while current alcohol use was similar among males and females aged 12-17 years, 11.2% and 11.9% respectively, it varied greatly among age groups with 2.1% of 12-13 year olds currently drinking, 9.5% of 14-15 year olds currently drinking, and 22.7% of 16-17 year olds currently drinking (Substance Abuse and Mental Health Services

Administration [SAMHSA], 2014). Lastly, both the YRBS and the NSDUH found significant differences in youth current alcohol use across race/ethnicities, with the highest percentage of use among Hispanic and white adolescents.

Risk and Protective Factors for Adolescent Alcohol Use

Influences to substance use have been established at several social-ecological levels (i.e. public policy (macro), community, interpersonal and intrapersonal) (NIDA, 2003). The lack of enforcement of policies, high access and availability, and poverty have been found to be associated with higher rates substance use among members in that community (Flewelling et al., 2013; NIDA, 2003; Search Institute, 2004). Interpersonal factors associated with higher rates of youth alcohol use include negative school experiences and relationships with teachers, unhealthy peer selection and peer networks, alcohol use in family history, and weak feelings of attachment and connectedness to family (Bertrand, 2013; Corte & Zucker, 2008; Peterson, Buser, & Westburg, 2010; Vaughn, Kratz, D'Argent, 2011; Wang, Hipp, Butts, Jose, and Lakon, 2015). The National Institutes of Health (2014) reports that one of the primary reasons adolescents choose to first use alcohol and other substances comes as a result of an attempt to "fit in" and connect with their peers. Interpersonal qualities, such as positive feelings of attachment and connectedness to family, schools, and communities are imperative to the development of healthy psychological functioning among youth. Healthy psychological functioning includes the formation of self-identity, self-esteem, and self-concept, factors critical to youth alcohol use (Rosenberg, Schooler, & Schoenbach, 1989).

Specifically regarding self-concept, the formation of a strong and realistic self-concept is considered a major developmental task of adolescence, and failure of this self-concept development can result in maladaptive behavior (Corte & Zucker, 2008). Researchers have

asserted that a vulnerable self-concept may directly predict early onset of alcohol use (Corte & Zucker, 2008; Dudovitz, Li, & Chung, 2013; Lee et al., 2015). A low behavioral self-concept (identifying oneself as a risk-taker or rebel) in youth is considered a risk factor for future general and high-risk drinking (Dudovitz, Li, & Chung, 2013). A state of low self-concept can include poor identity formation, which has been linked to a higher risk of substance abuse, and personal identity securement (Rose & Bond, 2008; Schwartz et al., 2010).

Study Purpose

While previous research has shown the effectiveness of self-concept interventions in helping youth to take part in positive health behaviors (Dalgas-Pelish, 2006; Donnelly, Young, Pearson, Penhollow, & Hernandez, 2008; O'Mara, Marsh, Craven, and Debus, 2006), there are gaps in the current literature regarding the specific role of self-concept as a protective factor against youth alcohol use and whether this role differs based on sex, race, and grade. Throughout adolescence, youth experience various changes socially, emotionally, physically, and cognitively in three specific developmental stages; early adolescence; middle adolescence; and late adolescence (American Academy of Child and Adolescent Psychiatry [AACAP], 2008). Therefore, understanding the link between self-concept and alcohol use at different developmental and grade levels is critical to developing more effective prevention efforts. The purpose of this study was to examine the relationship between self-concept and alcohol use among youth. A secondary aim was to examine the whether the impact of self-concept on alcohol use differs based on sex, race and grade level. The following research questions were analyzed:

1) What percent of youth have been involved in recent alcohol use and recent binge drinking?

2) What percent of youth report having a high or low self-concept?
3) To what extent does self-concept differ based on sex, race, and grade?
4) To what extent does recent alcohol use and binge drinking differ based on sex, race, grade, and self-concept?
5) Does the impact of self-concept on recent alcohol use and recent binge drinking differ based on sex, race, and grade?

METHODS

Participants

This study utilized secondary data from Wave I of the school-based National Longitudinal Study on Adolescent to Adult Health (Add Health) initiated in 1994 and provided by the Institute for Social Research at the University of Michigan. Participants consisted of a nationally representative sample of adolescents in grades 7-12 in the United States in 1994-95. A total of 90,118 students completed the in-school survey and 20,745 participated in the in-home interviews. From a sampling frame of over 26,000, 80 high schools were selected and 52 were eligible and agreed to participate. By using systematic sampling and implicit stratification, the selected schools were sorted to be representative of the United States in terms of region, urbanicity, school size, school type, and percent white. Eligible schools included those with an 11^{th} grade and a minimum of 30 students enrolled and feeder schools, those that included a 7^{th} grade and sent graduates to the high school.

Instrumentation

The Add Health data is the largest, most comprehensive longitudinal survey of adolescents and consisted of four waves of data collected over the course of more than 14 years

from September 1994 to February 2009. Designed by a team of multidisciplinary investigators from the social, behavioral, and biomedical sciences nationwide, Add Health aimed to help explain the causes of adolescent health and health behavior and the effects of these health behaviors on health and achievement outcomes in adult life through longitudinal follow-ups. For more specific details on the Add Health data, please refer to Harris et al. (2009).

For the present study, survey questions from the Wave I in-home interview were used and the dependent variables measured recent alcohol use and recent binge drinking behaviors. Recent alcohol use was measured with the survey question, "During the past 12 months, on how many days did you drink alcohol?". Response options included the following: "1 = every day or almost every day", "2 = 3 to 5 days a week", "3 = 1 or 2 days a week", "4 = 2 or 3 days a month", "5 = once a month or less (3-12 times in the past 12 months)", "6 = 1 or 2 days in the past 12 months", "6 = never", and "97 = legitimate skip [never had a drink]." Using response options, recent alcohol use was dichotomized into yes/no by operationalizing "recent use" as two or more days a month creating answers 1-4 as "yes" and 5-7, and 97 as "no." Recent binge drinking was measured with the question, "Over the past 12 months, on how many days did you drink five or more drinks in a row?" Response options included the following: "1 = every day or almost every day", "2 = 3 to 5 days a week", "3 = 1 or 2 days a week", "4 = 2 or 3 days a month", "5 = once a month or less (3-12 times in the past 12 months)", "6 = 1 or 2 days in the past 12 months", "6 = never" and "97 = legitimate skip [never had a drink]." Recent binge drinking was dichotomized into yes/no by operationalizing "recent binge drinking" as two or more days a month" and recoding response options 1-4 as "yes" and 5-7, plus 97 as "no."

Independent variables included sex, grade, race/ethnicity and self-concept. Biological sex was recorded as "1 =male" and "2 = female" and further recoded as "0 = male" and "1 =

female." Grade was measured with the question, "What grade are you in?" Response options included the following: "7 = 7th grade", "8 = 8th grade", "9 = 9th grade", "10 = 10th grade", "11 = 11th grade", "12 = 12th grade." Grade was recoded and trichotimized with the following recoded response options: "0 = 7th and 8th grade, 1 = 9th and 10th grade, and 2 = 11th and 12th grade. Race was identified by the question, "What is your race?" Response options included the following: "White," "Black or African American," "American Indian," "Asian or Pacific Islander," and "Other." For the purpose of this study, a single race variable was created and coded with two levels: "White" and "Non-white."

Self-concept was measured with six items using a five-point Likert-type scale with "1 = strongly agree", "2 = agree", "3 = neither agree nor disagree", "4 = disagree" and "5 = strongly agree." Items included "You have a lot of good qualities," "You are physical fit," "You have a lot to be proud of," "You like yourself just the way you are," "You feel like you are doing everything right," and "You feel socially accepted." A self-concept score was generated by creating a composite score from the six items and then dichotomized using the median split for a high/low score.

Procedures

The present study was deemed non-human subjects research by the University of Cincinnati Institutional Review Board (IRB) as analyses used secondary data that was de-identified. The original Add Health study first obtained parental consent actively (by requiring a signature indicated permission was granted) and passively (assumption that parent granted permission unless form was returned with a signature that indicated otherwise) by sending a list to all students' names in the school directory. To protect the identities and answers of all respondents, a rigorous security system was used in data collection wherein participants were

given identification numbers that linked their questionnaires across waves of the study, but were never used in data distribution. Wave I consisted of two parts for students, an in-school questionnaire and an in-home interview.

First, 145 schools and 90,118 students completed the 45-minute in-school questionnaire. Second, an in-home interview was conducted using the self-administered Computer-Assisted Personal Interview (CAPI)/Audio Computer-Assisted Self Interview (ACASI). Students in grades 7-12 who completed the in-school survey were sampled to also participate in the in-home interview. Written parental consent was obtained from parents/guardians and and written participant was obtained from adolescents. A total of 20,745 adolescents completed the interviews. In-home interviews for Wave I were conducted between April and December 1995. The same interview was given to all students, and lasted around 1-2 hours depending on respondent's age and experiences. Most interviews were conducted in the respondents' homes. To protect confidentiality, all data were recorded on laptop computers and no paper surveys were used. For less sensitive topics, the interviewer read the questions aloud and entered the respondent's answers. Questions more sensitive in nature were asked during the self-administration portion of the interview, wherein the respondent listened through earphones to pre-recorded questions and entered the answers directly. In addition to maintaining data security, this minimized the potential for interviewer or parental influence.

Data Analysis

All data was analyzed using the SPSS statistical software package (Version 23.0). Descriptive statistics including frequency distributions, means, standard deviations, and ranges were used to describe the demographic variables and background characteristics including sex, grade, race, involvement in recent alcohol use and involvement in recent binge drinking.

Univariate logistic regression was performed to test for significant differences in recent alcohol use and binge drinking based on sex, race, grade, and self-concept. Self-Concept was dichotomized into two levels: high self-concept and low self-concept, based on the median split. Univariate logistic regression was also performed to determine odds ratios for the impact of self-concept on recent alcohol use and recent binge drinking based on sex, race and grade level. The significance level was established at 0.05.

RESULTS

A total of 6,504 youth in grades 7-12 nationwide completed the in-home survey in the public use database. Of these youth, 48.4% were male, 51.6% were female, 62.3% were white and 37.7% were non-white. Grade level was trichotomized and evenly distributed with 31.1% in 7th and 8th grade, 35.5% in 9th and 10th grade, and 33.4% in 11th and 12th grade. Regarding alcohol use, 17.3% of youth reported recent alcohol use and 11.3% reported recent binge drinking (drinking five or more alcoholic beverages on one occasion). Regarding self-concept, 31.8% had a low self-concept and 68.2% had a high self-concept (Table 1).

Involvement in Recent Alcohol Use and Recent Binge Drinking by Sex, Race, Grade and Self-Concept

Males were significantly more likely than females to participate in recent alcohol use (OR = 1.454, 95% CI = [1.278, 1.655], $p < .001$) and recent binge drinking (OR = 1.896, 95% CI = [1.618, 2.221], $p < .001$) (Table 2). With regards to race, white youth were more likely than non-white youth to participate in recent alcohol use (OR = 1.584, 95% CI = [1.377, 1.822], $p < .001$) and recent binge drinking (OR = 1.731, 95% CI = [1.458, 2.055], $p < .001$). Across age groups, older students were significantly more likely than younger students to participate in

recent alcohol use and recent binge drinking. More specifically, 11th and 12th grade students were significantly more likely than 7th and 8th grade students to participate in recent alcohol use (OR = 4.360, 95% CI = [3.595, 5.289], $p < .001$) and recent binge drinking (OR = 3.869; 95% CI = [3.074, 4.869]; $p < .001$). Likewise, 9th and 10th grade students were significantly more likely than 7th and 8th grade students to participate in recent alcohol use (OR = 2.469, 95% CI = [2.012, 3.016], $p < .001$) and recent binge drinking (OR = 2.158, 95% CI = [1.695, 2.747], $p < .001$)

Regarding self-concept, youth with a low self-concept were significantly more likely than youth with a high self-concept to participate in recent alcohol use (OR = 1.598, 95% CI = [1.399, 1.824], $p < .001$) and recent binge drinking (OR = 1.519, 95% CI = [1.297, 1.780], $p < .001$).

Recent Alcohol Use and Recent Binge Drinking by Self-Concept based on Sex, Race and Grade

Logistic regression analyses were performed to determine the impact of self-concept on recent alcohol use and recent binge drinking based on sex, race and grade. Compared to males with a high concept, males with a low self-concept were 1.5 times more likely to participate in recent alcohol use (OR = 1.481, 95% CI = [1.227, 1.788], $p < .001$) and 1.6 times more likely to participate in recent binge drinking (OR = 1.670, 95% CI = [1.353, 2.060], $p < .001$) (Table 3). Compared to females with a high self-concept, females with a low self-concept were 1.9 times more likely to have participate in recent alcohol use (OR = 1.921, 95% CI = [1.584, 2.330], $p < .001$) and 1.6 times more likely to participate in recent binge drinking (OR = 1.615; 95% CI = [1.259, 2.072], $p < .001$).

Regarding race, non-white youth with a low self-concept were 1.4 times more likely than non-white youth with a high self-concept to participate in recent alcohol use (OR = 1.434, 95% CI = [1.122, 1.833], $p < .001$), while white youth with a low self-concept were 1.6 times more

likely than white youth with a high self-concept to participate in recent alcohol use (OR = 1.639, 95% CI = [1.398, 1.922], $p < .001$) (Table 4). Concerning recent binge drinking, non-white youth with a low self-concept did not significantly differ from non-white youth with a high self-concept. However, white youth with a low self-concept were 1.6 times more likely than white youth with a high self-concept to participate in recent binge drinking (OR = 1.626, 95% CI = [1.351, 1.959], $p < .001$).

Results also showed significant effects of self-concept on recent alcohol use and recent binge drinking for the different grade levels. More specifically, 7th and 8th grade students with a low self-concept were more than twice as likely as 7th and 8th grade students with a high self-esteem to participate in recent alcohol use (OR = 2.016, 95% CI = [1.426, 2.851], $p < .001$) and recent binge drinking (OR = 2.135, 95% CI = [1.415, 3.220], $p < .001$) (Table 5). Students in 9th and 10th grade with a low self-concept were 1.5 times more likely than students in 9th and 10th grade with a high self-concept to participate in recent alcohol use (OR = 1.557, 95% CI = [1.234, 1.949], $p < .001$). However, recent binge drinking did not differ significantly between students in 9th and 10th grade with a low self-esteem and students in 9th and 10th grade with a high self-esteem. Analyses from the oldest age group, 11th and 12th grade, revealed that students in 11th and 12th grade with a low self-concept were 1.3 times more likely than students in 11th and 12th grade with a high self-concept to participate in recent alcohol use (OR = 1.309, 95% CI = [1.069, 1.602], $p = .009$) and recent binge drinking (OR = 1.360, 95% CI = [1.077, 1.717]), $p = 0.10$.

DISCUSSION

The findings from this study revealed that 17.3% of youth had participated in recent alcohol use and 11.3% had participated in recent binge drinking. While these statistics are lower than

current reports, the sizeable percent of involvement in alcohol use remains concerning since the early onset of alcohol use has been linked to numerous deleterious consequences (CDC, 2013; Kaminer & Winters, 2011; NIAAA, 2015).

Large scale research studies are divided on the differences of drinking patterns between male and female youth, with some studies showing higher rates in males and some studies showing little to no difference (CDC, 2013; Johnston et al., 2016). The present study found specific differences between males and females in both recent alcohol use and recent binge drinking, with a more pronounced difference especially for binge drinking. These results do align with other studies suggesting that males are more likely to be involved in alcohol use than females (Buu et al., 2014). Fully understanding the gender differences in early onset and prolonged alcohol use is vital to the creation of prevention programming for youth. Adolescence consists of several physical, social, and emotional changes, and males and females may be experiencing these changes at different times and in different ways, therefore resulting in different responses (CDC, 2015b). Boys often are involved in more externalizing behaviors (i.e. substance use) and disinhibition (Burk et al., 2011; Geçkil & Dündar, 2011). Also, specific gender roles and socialization expectations have been linked with higher rates of drinking in males (Schulte, Ramo, & Brown, 2009). This study supports such research and suggests that prevention efforts should include some programming efforts specific to males and females by addressing socialization and gender roles (i.e. masculinity, nurturance) (Schulte, Ramo & Brown, 2009).

In alignment with current research, white youth were more likely than non-white youth to have participated in both recent alcohol use and recent binge drinking. Previous research has shown white youth to report higher drinking rates than African American youth, however

Hispanic youth have the highest reported rates of use today (CDC, 2014). Future research should continue to examine reasons for alcohol use among racial and ethnic groups (Shrestha & Heisler, 2011).

The significant differences of drinking habits across grade levels were also shown in this study. The present study found that older youth, in grades 9-12, were more likely to drink than 7th and 8th grade youth for both recent alcohol use. Similarly, trends in binge drinking increased by grade level. These findings support previous research that older adolescents engage in more alcohol use than younger youth, and that alcohol use trajectories predict an increase in use with age (Bolland et al., 2016; Burdzovic-Andreas & Jackson, 2015). Such findings suggest the need for prevention programming that is structured as a dynamic process to address age-related changes that occur during adolescence (Abadi, Shamblen, Thompson, Collins, & Johnson, 2011). Specifically, early interventions should be delivered to youth prior to 7th and 8th grade in order to more effectively impact youth before their high school transition, as a clear shift in drinking patterns occurs at this time.

The main focus and significance of this study was on the role of self-concept in youth alcohol use. Previous studies have examined the changes in alcohol use from middle school to high school ages, but few have taken into consideration the impact that self-concept can have on youth, particularly between developmental age groups (Burdzovic-Andreas & Jackson, 2015) as well as gender and race differences. Results from this study indicated that youth with a low self-concept were at elevated risk for participation in recent alcohol use and recent binge drinking. This matches previous research that low self-concept is a predictor of general drinking and binge drinking (Dudovitz, Li, & Chung, 2013). Prior research has revealed that self-concept is a pivotal building block for human development, and that the formation of self-concept is a major

developmental task of adolescence (Block, 2011; Corte & Zucker, 2008). As adolescence is a period involving many transitions and changes, youth are vulnerable and at risk for negative healthy behaviors (Sloboda Glantz, & Tartar, 2012). It is important that alcohol use prevention programs consider seek to integrate psychological strengthening and positive self-concept development components for youth.

Further analyses in this study were conducted to investigate sex differences in the impact of self-concept on youth alcohol use. Both males and females who had low self-concept were more likely than their counterparts to participate in recent alcohol use and recent binge drinking. Those who suffer from mental health problems or psychological distress often self-medicate with substance abuse (Ford & Schroeder, 2009; Sullivan et al., 2006). Unlike recent alcohol use, results for recent binge drinking indicated similar odds for low and high self-concept youth. Future studies should investigate the relationship between alcohol use and self-concept as it relates to males and females.

Results from this study also found that self-concept impacted recent alcohol use for both white and non-white youth. Those with low self-esteem were at higher odds for recent alcohol use. Interestingly, self-concept did not significantly impact recent binge drinking for non-white youth but did significantly impact recent binge drinking for white youth. Little research has investigated the complex relationship existent among these variables. Future research is needed to more thoroughly examine racial and ethnic differences in the the role of self-concept on substance use as associations have been made between ethnic identity exploration and negative mental health outcomes, which could negatively impact alcohol use (Markstrom, Whitesell, & Galliher, 2011; Torres & Ong, 2010; Umaña-Taylor & Updegraff, 2007).

Levels of self-concept were found to be significantly associated with increased odds for drinking at the three varying grade levels. Having a low self-concept in 7th and 8th grade more than doubled the odds for recent alcohol use and recent binge drinking. For 9th and 10th grade youth, similar but less apparent results were found. Youth in this age group with a low self-concept were more likely to participate in recent alcohol use than those with a high self-concept, but no significant difference was found in recent binge drinking based on self-concept. Youth in 11th and 12th grade with a low self-concept were more likely to participate in both recent alcohol use and recent binge drinking. The odds ratios were far less pronounced than those for students in 7th and 8th grade. These results are comparable to a previous study that found having a self-concept comprised of few positive and many negative self-schemas predicted an earlier onset of drinking in youth (Corte & Zucker, 2008).

Based on the findings from the present study, it appears that self-concept has a much larger effect on alcohol use among those in junior high school than those in high school. As youth age, there are various other factors that impact decision making and health behavior. Adolescence is a time of extreme transitions and change, including pressured social situations and specific neurocognitive development (Dalgas-Pelish, 2006; Pokhrel et al., 2013; Sloboda, Glantz & Tartar, 2011). Especially relevant is that during middle adolescence, or years in middle school, youth come face to face with the struggle of finding their identity and role confusion (AACAP, 2015). Perhaps other factors begin interacting with or replacing self-concept as the key drivers of youth alcohol use, as youth move into high school. Further examination into reasons for this difference is warranted. As research expands on youth alcohol use, programs should work to combine practices that help build a positive self-concept in earlier adolescent years.

Limitations

Limitations to this study should be noted. Due to self-reporting in the Add Health study, results are subject to response bias. Youth may have responded in socially desirable ways. Additionally, participants were delimited to students in grades 7-12. Since this study was cross-sectional in nature, causal relationships could not be determined. Finally, data was collected in 1994. Therefore, caution should be taken when generalizing results to youth nationwide today.

Conclusion and Recommendations

The present study found that youth with a low self-concept were at increased risk for both recent alcohol use and recent binge drinking. Of particular importance was the pronounced impact that self-concept had on alcohol use for the youngest students, those in the 7^{th} or 8^{th} grade. Such findings support the continued need for alcohol prevention initiatives to begin early and to include a combination of health education and positive psychological development. Additional research is needed to further investigate the relationship between self-concept and alcohol use in youth.

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Table 1. Demographic and background variables.

Demographic Variable	*n*	%
Sex		
Female	3,356	51.6
Male	3,147	48.4
Age		
7th and 8th grade	1,971	31.1
9th and 10th grade	2,251	35.5
11th and 12th grade	2,115	33.4
Race		
White	4,038	62.3
Non-White	2,447	37.7
Self-Concept		
High Self-Concept	4,408	68.2
Low Self-Concept	2,059	31.8
Recent Alcohol Use		
No	5,365	82.7
Yes	1,124	17.3
Recent Binge Drinking		
No	5,758	88.7
Yes	730	11.3

Note: N = 6,504

Table 2. Odds Ratios for Recent Alcohol Use and Recent Binge Drinking by Sex, Race, Grade Level and Self-Concept in Youth

Item	Recent Alcohol Use					Recent Binge Drinking				
	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*
Sex										
Female[a]	2,858 (85.3)	494 (14.7)				3,074 (91.8)	275 (8.2)	1.0		
Male	2,506 (79.9)	630 (20.1)	1.454	(1.278, 1.655)	<.001	2,683 (85.5)	455 (14.5)	1.896	(1.618, 2.221)	<.001
Race										
Non-White[a]	2,110 (86.6)	327 (13.4)				2,242 (91.9)	197 (8.1)	1.0		
White	3,238 (80.3)	795 (19.7)	1.584	(1.377, 1.822)	<.001	3,498 (86.8)	532 (13.2)	1.731	(1.458, 2.055)	<.001
Grade Level										
7th and 8th grade[a]	1,817 (92.4)	149 (7.6)	1.0			1,866 (94.9)	101 (5.1)	1.0		
9th and 10th grade	1,867 (83.2)	378 (16.8)	2.469	(2.012, 3.016)	<.001	2,012 (89.5)	235 (10.5)	2.158	(1.695, 2.747)	<.001
11th and 12th grade	1,555 (73.7)	556 (17.1)	4.360	(3.595, 5.289)	<.001	1,743 (82.7)	365 (17.3)	3.869	(3.074, 4.869)	<.001
Self-Concept										
High[a]	3,731 (84.9)	666 (15.1)	1.0			3,965 (90.1)	435 (9.9)	1.0		
Low	1,599 (77.8)	456 (22.2)	1.598	(1.399, 1.824)	<.001	1,758 (85.7)	293 (14.3)	1.519	(1.297, 1.780)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded.

Table 3. Odds Ratios for Recent Alcohol Use and Recent Binge Drinking based on Self-Concept among Male and Female Youth

Recent Alcohol Use										
	Males					Females				
Item	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,856 (81.6)	419 (18.4)	1.0			1,875 (88.4)	247 (11.6)	1.0		
Low	631 (74.9)	211 (25.1)	1.481	(1.227, 1.788)	<.001	968 (79.8)	245 (20.2)	1.921	(1.584, 2.330)	<.001

Binge Drinking										
	Males					Females				
	Did Not Binge Use in Past Month *n* (%)	Binge Used in Past Month *n* (%)	OR	(95% CI)	*p*	Did Not Binge Use in Past Month *n* (%)	Binge Used in Past Month *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,987 (87.3)	290 (12.7)	1.0			1,978 (93.2)	145 (6.8)	1.0		
Low	677 (80.4)	165 (19.6)	1.670	(1.353, 2.060)	<.001	1,081 (89.4)	128 (10.6)	1.615	(1.259, 2.072)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded

Table 4. Odds Ratios for Recent Alcohol Use and Recent Binge Drinking based on Self-Concept among Youth by Race

Recent Alcohol Use										
	Non-White					White				
Item	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*	Did Not Use in Past Month *n* (%)	Used in Past Month *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,506 (87.8)	209 (12.2)	1.0			2.215 (83.0)	455 (17.0)	1.0		
Low	588 (83.4)	117 (16.6)	1.434	(1.122, 1.833)	.005	1,007 (74.8)	339 (25.2)	1.639	(1.398, 1.922)	<.001

Binge Drinking										
	Non-White					White				
	Did Not Binge Use in Past Month *n* (%)	Binge Used in Past Month *n* (%)	OR	(95% CI)	*p*	Did Not Binge Use in Past Month *n* (%)	Binge Used in Past Month *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,585 (92.3)	133 (7.7)	1.0			2.369 (88.7)	301 (11.3)	1.0		
Low	641 (91.1)	63 (8.9)	1.171	(0.856, 1.603)	.326	1,113 (82.9)	230 (17.1)	1.626	(1.351, 1.959)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded

Table 5. Odds Ratios for Recent Alcohol Use and Recent Binge Drinking based on Self-Concept among Youth by Grade Level

Recent Alcohol Use															
	7th and 8th Grade					9th and 10th Grade					11th and 12th Grade				
Item	**Did Not Use in Past Month *n* (%)**	**Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Use in Past Month *n* (%)**	**Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Use in Past Month *n* (%)**	**Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***
Self-Concept															
High[a]	1,376 (93.8)	91 (6.2)	1.0			1,222 (85.5)	208 (14.5)	1.0			1.055 (75.4)	345 (24.6)	1.0		
Low	435 (88.2)	58 (11.8)	2.016	(1.426, 2.851)	<.001	634 (79.1)	168 (20.9)	1.557	(1.243, 1.949)	.000	493 (70.0)	211 (30.0)	1.309	(1.069, 1.602)	.009

Binge Drinking															
	7th and 8th Grade					9th and 10th Grade					11th and 12th Grade				
	Did Not Binge Use in Past Month *n* (%)	**Binge Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Binge Use in Past Month *n* (%)**	**Binge Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Binge Use in Past Month *n* (%)**	**Binge Used in Past Month *n* (%)**	**OR**	**(95% CI)**	***p***
Self-Concept															
High[a]	1,409 (95.9)	60 (4.1)	1.0			1,294 (90.4)	138 (9.6)	1.0			1,178 (84.1)	222 (15.9)	1.0		
Low	451 (91.7)	41 (8.3)	2.135	(1.415, 3.220)	.000	707 (88.2)	95 (11.8)	1.260	(0.995, 1.662)	.102	558 (79.6)	143 (20.4)	1.360	(1.077, 1.717)	.010

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded

Study 2: Impact of Self-Concept on Suicidal Ideation and Suicide Attempts among Youth

INTRODUCTION

Adolescent suicide is a significant public health concern as it is the second leading cause of death among ages 15-19 (Centers for Disease Control, [CDC], 2015a). Public health professionals should also make note of warning signs for suicide as more teens survive suicide attempts than complete them (CDC, 2015b). In fact, adolescent suicide results in approximately 4,600 lives lost each year, but approximately 34 times as many youth (157,000) between the ages of 10-24 receive medical attention for self-directed violence (SDV) at emergency departments around the United States (CDC, 2015b). Forms of SDV can include non-suicidal intentional self-harm, fatal and non-fatal suicidal behavior, and suicidal ideation (thinking about, considering, or planning to attempt suicide) due to its association with SDV (CDC, 2011; CDC, 2015c). The most recent Youth Risk Behavior Survey (YRBS) revealed that in the past year one in three (29.9%) youth felt sad or hopeless almost every day for two weeks in a row, nearly one in five (17%) seriously considered attempting suicide, approximately one in ten (13%) made a suicide plan and 8% attempted suicide (CDC, 2013b).

Research indicates differences in prevalence based on sex and age. Recent statistics demonstrate that twice as many females compared to males feel sad or hopeless (39.1% and 20.8%, respectively), seriously considered attempting suicide (22.4% and 11.6%, respectively), and attempting suicide (10.6% and 5.4%, respectively) (CDC, 2013b). Concerning grade levels, 9th and 10th grade girls reported higher rates of suicidal ideation than 11th and 12th grade girls, and 11th grade boys reported higher suicidal ideation than boys in any other grade (CDC, 2013b). Based on such differences found in the literature, it is critical to analyze the factors associated with these suicidal ideation and suicide attempts.

Risk and Protective Factors for Adolescent Suicidal Behaviors

Risk factors for suicidal behaviors can be found at the varying system levels – environmental, social, and individual (Crepeau-Hobson, Leech, 2014; Kokkevi, Rotsika, Arapaki, & Richardson, 2012; WHO, 2012; Wolfe, Foxwell, & Kennard, 2014). Specific individual risk factors are especially of significance since 90% of youth who die by suicide have mental health disorders (National Alliance on Mental Illness [NAMI], n.d.). Individual risk factors for mental health disorders and suicide include poor communication skills, cognitive or emotional immaturity, loneliness, feelings of hopelessness, low self-esteem, and poor self-concept (King & Vidourek, 2012; WHO, 2012).

Self-concept is described as the perception or evaluation of oneself in terms of personal attributes and various roles and includes identify formations or non-judgmental descriptions, both of which are crucial building blocks to healthy development (Block, 2011; Blyth & Traeger, 2001; Dudovitz, Li, & Chung, 2013; King, 1997). Positive evaluations of the self are significantly correlated to reduced suicidal ideation (Abel, Sewell, Martin, Bailey-Davidson, & Fox, 2012). The strongest changes in self-concept occur during adolescence, as this time of growth includes significant cognitive and physical changes (Erol & Orth, 2011; National Research Council and Institute of Medicine, 2007). Self-concept and self-esteem can be promoted or damaged during adolescence as a result of stressful social situations when youth are making comparisons with others to create their own identity (Rosenberg, Schooler, & Schoenbach, 1989). This time period in youth provides a prime opportunity for both risky and potentially problematic behavioral developments.

Study Purpose

Previous research has identified an inverse relationship between self-concept and risky health behaviors in general populations (Abel, et al., 2012; Boden, Fergusson, & Horwood, 2008; Bos, et al., 2010; Corte & Zucker, 2008; George & van den Berg, 2012). However, there are current gaps in the literature addressing the impact of self-concept on suicide, and how this relationship may differ based on sex, race, and grade. The primary aim of this study was therefore to investigate the relationship between self-concept and suicidal ideation and suicide attempts among youth. A secondary aim of this study was to examine whether the impact of self-concept on suicidal ideation and suicide attempts differed based on sex, race and grade. Findings may provide insight to further enhance future prevention strategies aimed at reducing suicidal ideation and suicide attempts. More specifically, the following research questions were analyzed:

1. What percent of youth report suicidal ideation and attempted suicide during the past 12 months?
2. What percent of youth have a high/low self-concept?
3. To what extent does self-concept differ based on sex, race, and grade?
4. To what extent does suicidal ideation and suicide attempts differ based on sex, race, grade, and self-concept?
5. Does the impact of self-concept on suicidal ideation and suicide attempts differ based on sex, race, and grade?

METHODS

Participants

The current study used secondary data from Wave I of the National Longitudinal Study on Adolescent to Adult Health (Add Health), initiated in 1994 and provided by the Institute for

Social Research at the University of Michigan. Participants consisted of a nationally representative sample of adolescents in grades 7-12 in the United States in 1994-95. A total of 90,118 students completed the in-school survey and 20,745 participated in the in-home interviews. From a sampling frame of over 26,000, 80 high schools were selected and 52 were eligible and agreed to participate. By using systematic sampling and implicit stratification, the selected schools were representative of the United States in terms of region, urbanicity, school size, school type, and percent white. Eligible schools included those with an 11^{th} grade, a minimum of 30 students enrolled, and feeder schools – those that included a 7^{th} grade and sent graduates to the high school.

Instrumentation

Consisting of four waves and spanning more than 14 years from September 1994 to February 2009, the Add Health data is the largest, most comprehensive longitudinal survey of adolescents. Add Health was designed by a team of multidisciplinary investigators from the social, behavioral, and biomedical sciences nationwide, and aimed to help explain the causes of adolescent health and health behavior and the effects of these health behaviors on health and achievement outcomes in adult life through longitudinal follow-ups. A detailed description of AddHealth can be found in the publication by Harris et al. (2009).

For this study, survey questions from the Wave I in home interview were used and the dependent variables measure suicidal ideation and suicide attempts. Suicidal ideation was measured with the interview question "During the past 12 months, did you ever seriously think about committing suicide?" Response options included: "0 – no" and "1 – yes." Suicide attempts were measured with the interview question "During the past 12 months, how many times did you actually attempt suicide?" Response options included the following: "0 – 0 times," "1 – 1 time,"

"2 – 2 or 3 times," "3 – 4 or 5 times," and "4 – 6 or more times." For the purpose of this study, suicide attempts was recoded into "yes" (i.e., 1 time or more) and "no," (i.e., 0 times).

Independent variables included sex, grade, race/ethnicity and self-concept. Biological sex was recorded as "1 – male" and "2 – female," and further recoded into "0 – male" and "1 – female." Grade was recorded with the question "What grade are you in?" Possible responses included: "7 – 7th grade," "8 – 8th grade," "9 – 9th grade," "10 – 10th grade," "11 – 11th grade," "12 – 12th grade." Grade was then trichotomized into 7th and 8th, 9th and 10th, and 11th and 12th grades. Race was identified by the question "What is your race?" Responses included the following: "white," "Black or African American," "American Indian," "Asian or Pacific Islander," "Other." For the purpose of this study, a single race variable was generated and recoded into "White" and "Non-white."

Self-concept was measured with six items using a five-point Likert type scale with "1 – strongly agree", "2 – agree," "3 – neither agree nor disagree," "4 – disagree" and "5 – strongly agree." Items included "You have a lot of good qualities," "You are physically fit," "You have a lot to be proud of," "You like yourself just the way you are," "You feel like you are doing everything right," and "You feel socially accepted." A self-concept score was generated by creating a composite score from the six items and then using the median split for a high/low score: high self-concept and low self-concept, based on median split.

Procedures

The University of Cincinnati Institutional Review Board (IRB) classified this study as non-human subjects research and therefore the study was exempt from review. This study used secondary data that was de-identified. Add Health first obtained parental consent actively (by requiring a signature indicated permission was granted) and passively (assumption that parent

granted permission unless form was returned with a signature that indicated otherwise) by sending a list to all students' names in the school directory. To protect the identities and answers of all respondents, a rigorous security system was used in data collection wherein participants were given identification numbers that link their questionnaires across waves of the study, but are never used in data distribution. Wave I consisted of two parts for students, an in school questionnaire and an in home interview.

First, 145 schools and 90,118 students completed the 45-minute in school questionnaire. Second, an in-home interview was conducted using the self-administered Computer-Assisted Personal Interview (CAPI)/Audio Computer-Assisted Self Interview (ACASI). Students in grades 7-12 from the roster and pool of participants who completed the in-school survey were sampled to also participate in the home interview. Written parental consent was obtained from parents/guardians and adolescents. A total of 20,745 adolescents completed the interviews. In-home interviews for Wave I were conducted between April and December 1995. The same interview was given to all students, and lasted around 1-2 hours depending on respondent's age and experiences. Most interviews were conducted in the respondents' homes. To protect confidentiality, all data were recorded on laptop computers and no paper surveys were used. For less sensitive topics, the interviewer read the questions aloud and entered the respondent's answers. Questions more sensitive in nature were asked during the self-administration portion of the interview, wherein the respondent listened through earphones to pre-recorded questions and entered the answers directly. In addition to maintaining data security, this minimized the potential for interviewer or parental influence.

Data Analysis

All data was analyzed using the SPSS statistical software package (Version 23.0). Descriptive statistics including frequency distributions, means, medians, and ranges were performed for the demographic variables (i.e., sex, race, and grade) and suicidal ideation and suicide attempts. To investigate differences among sex, race, and grade, univariate logistic regression analyses were performed. Self-concept was dichotomized into two levels: high self-concept and low self-concept, based on median split. Univariate logistic regression was performed to determine odds ratios for the impact of low self-concept on overall suicidal ideation and suicide attempts based on sex, race, and grade. A significance level of 0.05 was used.

RESULTS

Participants in this study, who completed an in-home interview, included a total of 6,504 youth in grades 7-12 nationwide. This sample of adolescents consisted of 48.4% males, 51.6% females, 62.3% white youth and 37.7% non-white youth. Grade was trichotomized and results revealed a relatively even distribution with 31.1% in 7^{th} and 8^{th} grade, 35.5% in 9^{th} and 10^{th} grade, and 33.4% in 11^{th} and 12^{th} grade. Altogether, 12.8% of youth reported having seriously thought about attempting suicide in the past 12 months and 3.5% reported actually attempting suicide in the past 12 months. Results also indicated that 31.8% of youth had a low self-concept and 68.2% had a high self-concept (Table 1).

Youth Involvement in Suicidal Behaviors based on Sex, Race, Grade and Self-Concept

Females were significantly more likely than males to have seriously thought about attempting suicide (OR = 1.701, 95% CI = [1.463, 1.979], $p < .001$) and to have attempted suicide (OR = 2.202, 95% CI = [1.656, 2.929], $p < .001$) (Table 2). Unlike sex, no statistically

significant differences were found between races for suicidal ideation or suicide attempts. Across age groups, older students were significantly more likely than younger students to experience suicidal ideation but not to have attempted suicide. Specifically, youth in grades 9 and 10 were significantly more likely to experience suicidal ideation than youth in grades 7 and 8 (OR = 1.364, 95% CI = [1.130, 1.647], $p < .001$). Likewise, youth in grades 11 and 12 were significantly more likely to experience suicidal ideation than youth in grades 7 and 8 (OR = 1.337, 95% CI = [1.104, 1.619], $p < .001$). Concerning self-concept, youth with a low self-concept were 3.5 times more likely to experience both suicidal ideation (OR = 3.595; 95% CI = [3.092, 4.180]; $p < .001$) and to have attempted suicide than youth with a high self-concept (OR = 3.502, 95% CI = [2.673, 4.589], $p < .001$) (Table 2).

Suicidal Ideation and Suicide Attempts by Self-Concept based on Sex, Race, and Grade

Logistic regression analyses were performed to determine the impact of self-concept on suicidal ideation and suicide attempts based on sex, race, and grade. Males with a low self-concept were approximately three times more likely than males with a high self-concept to have seriously considered attempting suicide (OR = 3.770, 95% CI = [2.958, 4.804], $p < .001$) and to have attempted suicide (OR = 3.519, 95% CI = [2.181, 5.679], $p < .001$) (Table 3). Similarly, females with a low self-concept were approximately three times more likely than females with a high self-concept to have seriously considered attempting suicide (OR = 3.276, 95% CI = [2.700, 3.760], $p < .001$) and to have attempted suicide (OR = 3.177, 95% CI = [2.286, 4.417], $p < .001$).

Interestingly, race was not significant for suicidal ideation and attempt. However, based on self-concept, significant differences were observed among race. Results indicated that non-white youth with a low self-concept youth were three times more likely than non-white youth with a high self-concept to have seriously considered attempting suicide (OR = 3.071, 95% CI =

[2.390, 3.946], $p < .001$) and to have attempted suicide (OR = 3.123, 95% CI = [2.047, 4.766], $p < .001$) (Table 4). In addition, white youth with a low self-concept were almost four times more likely than white youth with a high self-concept to have seriously considered attempting suicide (OR = 3.912, 95% CI = [3.235, 4.729], $p < .001$) and to have attempted suicide (OR = 3.834, 95% CI = [2.690, 5.465], $p < .001$).

Results also indicated significant effects of a low self-concept on suicidal ideation and suicide attempts based on grade levels. More specifically, 7th and 8th grade youth with a low self-concept were twice as likely as 7th and 8th grade youth with a high self-concept to have seriously considered attempting suicide (OR = 2.836, 95% CI = [2.104, 3.821], $p < .001$) (Table 4). Similar to suicidal ideation, 7th and 8th grade youth with a low self-concept were more than 3.5 times than 7th and 8th grade youth with a high self-concept to have attempted suicide (OR = 3.644, 95% CI = [2.244, 5.916], $p < .001$). Results also indicated that 9th and 10th grade youth with a low self-concept were 3.5 times more likely than 9th and 10th grade youth with a high self-concept to have seriously considered attempting suicide (OR = 3.513, 95% CI = [2.735, 4.513], $p < .001$) and 3.6 times more likely to have attempted suicide (OR = 3.639, 95% CI = [2.321, 5.704], $p < .001$). Analyses for the oldest age group, 11th and 12th grade, revealed that youth in 11th and 12th grade with a low self-concept were 4.4 times more likely to seriously consider attempting suicide than youth in 11th and 12th grade with a high self-concept (OR = 4.440, 95% CI = [3.414, 5.774], $p < .001$) and 3.4 times more likely to have attempted suicide (OR = 3.409, 95% CI = [2.055, 5.653], $p < .001$).

DISCUSSION

Results from this study revealed 12.8% of youth reported having suicidal ideation and 3.5% reported having attempted suicide in the past 12 months. These results are lower than national statistics today and help to illustrate the increase in youth suicidal ideation and attempts over the last few decades with suicide now becoming the third leading cause of death among adolescents age 10-14 and the second leading cause of death among youth age 15-24 (CDC, 2013a).

Research has consistently demonstrated that females tend to think about and attempt suicide more often than males, yet males tend to complete suicide more often (CDC, 2013b; Hamilton & Klimes-Dougan, 2015; Hacker, Suglia, Fried, Rappaport, & Cabral, 2006). The present study found similar results with girls significantly more likely than boys to seriously consider attempting suicide and attempt suicide. There may be under-reporting of suicidal ideation and sucide attempts among males. In a comprehensive literature review of suicide prevention initiatives, Hamilton and Klimnes-Dougan (2015) found that males seem to be more reluctant to disclosing psychological distress and suicidal thoughts than females. Although girls may be more open to communicating their feelings, this may also mean they are admitting to more suicidal thoughts and behaviors than boys, even if boys are experiencing the same suicidal thoughts. In fact, one study did find that although females reported more depressive symptoms than males, both reported similar levels of subjective impairment in various categories (i.e., social, occupational) (Piccinelli & Wilkinson, 2000). Confirming findings from previous studies, these results add to the literature and suggest a need for future studies that provide more reasons for such gender differences.

Results from this research found no significant difference in suicidal ideation and suicide attempts between white and non-white youth. The most recent YRBS also found similar rates

between for white and black youth. Future research should continue to investigate the differences among races and ethnicities as minorities have been and continue to significantly increase across the US each year (Shrestha & Heisler, 2011).

In alignment with current research suggesting an increase in suicidal behaviors around age 15, results from this study found that youth in 9th and 10th grade reported higher rates of suicidal ideation and suicide attempts than their 7th and 8th grade and 11th and 12th grade counterparts (CDC, 2015d; Glenn & Nock, 2014). The high school transition is marked by elevated levels of social and academic pressures, and opportunities for identity seeking or role redefinition by seeking potential peer groups in which to belong (Benner, 2011; Roeser et al., 1999). As youth enter the high school environment, it is important that prevention programs are in place to help youth effectively cope with potential stressors arising with the transitions of adolescent development.

The primary focus of this study was to examine the relationship between self-concept and suicidal ideation and suicide attempts among youth. The significant differences in high and low self-concept were revealed in the results. Youth who had a low self-concept were more than three times more likely to experience suicidal ideation and suicide attempts. These findings coincide with research that suggests psychological distress stemming from psychiatric variables (i.e. feelings of hopelessness, depression, anxiety) and psychosocial variables (i.e. stressful situations) as predictors of suicidal behaviors (CDC, 2015b; Glenn & Nock, 2014; Gould, Greenberg, Velting, & Shaffer, 2003). Self-concept literature indicates that adolescents with a low self-concept subsequently show more symptoms of anxiety and depression, both of which are highly pivotal in the development of self-harmful behaviors and suicide (Bos et al., 2009;

WHO, 2012). Self-concept plays an important role in youth development and decision making (King, 1997) and therefore should be included in suicide prevention efforts for youth.

While research demonstrates females are at increased risk to attempt suicide, males more often complete suicide, likely due to the fact that females tend to use less lethal methods (i.e., poisoning) for suicide attempts whereas males use more lethal means (i.e., firearms) (CDC, 2013b; CDC, 2015d; Hamilton & Klimes-Dougan, 2015; Hacker, et al., 2006). This study found similar results regarding suicide attempts, but employed further analysis with a self-concept variable to address this issue. Results indicated that males experienced a slightly more pronounced impact of low self-concept on suicidal ideation and suicide attempts than did females. Perhaps gender differences in suicidality can be explained by gender socialization and adopt self-destructive behaviors matching gender roles (Boyd et al., 2015). For instance, given the stigma associated with nonfatal suicidal behavior for men (Canetto, 1991), males with a low self-concept may have reached a more critical point wherein they feel as though they cannot seek help, but rather must resort to the lethal methods. These results align with previous research that revealed boys experienced a more pronounced negative effect of mental health problems on their overall well-being than did girls, even though girls reported higher rates of mental health problems (Derdikman-Eiron, et al., 2011). Future research should use the results from this study, particularly the outcomes of psychological correlates such as self-concept when creating effective prevention programming for male and female youth. Specifically, preventions should acknowledge the fact that males may be less likely than females to actively involve themselves in suicide prevention programs, and create programming that is indirectly related to suicide prevention, such as mental health promotion and building connectedness.

Additional analysis revealed significant differences based on self-concept, suicide and race. Both race groups with a low self-concept were significantly more likely than their high self-concept counterparts to experience suicidal ideation and suicide attempts. Regardless of race, prevention initiatives should concentrate on adolescent identity formation as a key component to reducing suicidal ideation and suicide attempts.

For youth at all ages, those with a low self-concept were significantly more likely to both seriously consider suicide and attempt suicide in the past year. Interestingly, the oldest age group with a low self-concept revealed a higher odds ratio for suicidal ideation than that of the two younger age groups. These results add to the suicide prevention field as most research identifies risk and protective factors for youth as a whole, with very little distinguishing factors throughout development. Conversely, the youngest age group had a higher odds ratio for suicide attempts than the two older age groups. These findings support long standing research on the different characteristics of youth throughout adolescent years. Specifically, the American Academy of Child and Adolescent Psychiatry [AACAP] (2008) describe the stages of adolescence and their characteristics as such: early adolescents (age 11-13) are moodier, mostly interested in the present, and limit-testing while older youth (age 14-18) as contemplative about the meaning of life, having a poor self-concept, and a drive for independence. Using these descriptions, it is logical to see that cognitive and emotional characteristics of suicide attempts, the extreme nature of the act and an immediate way to solve problems, are seen more drastically in younger youth. Conversely, as older youth contemplate their life's purpose in combination with having a low self-concept and expectations that arrive with desired independence, it is reasonable that these cognitive and emotional qualities are more often linked to spending time considering and thinking about suicide (suicidal ideations) rather than actually attempting. Outcomes of this

study in combined with information on adolescent development are crucial to the creation and implementation of suicide prevention programs for youth.

Results from the present study show that self-concept has a large effect on suicidal behaviors among youth. Specifically, self-concept is influential to suicidal ideations in older youth and suicide attempts in younger youth. Adolescence is a time of extreme transitions and change, including pressured social situations and specific neurocognitive development (Dalgas-Pelish, 2006; Pokhrel et al., 2013; Sloboda, Glantz & Tartar, 2011). Therefore, to help prevent suicide, early signs of self-harming behaviors, such as suicidal ideation, should be included in prevention tactics, especially for youth as they mature. Self-concept and self-esteem can be promoted or damaged during adolescence as a result of stressful social situations where youth are making comparisons with others to create their own identity (Rosenberg, Schooler, & Schoenbach, 1989). To aid youth through these transition, prevention should begin early, continue through the high school transition, and include psychosocial development and skill building activities of the self-concept, such as self-esteem and resilience (George & van den Berg, 2012; Miller et al., 2013; WHO, 2016; Zimmerman, 2013) to foster a positive self-concept.

Limitations

Several limitations to this study should be addressed. First, this study was cross-sectional and therefore causal relationships cannot be determined. Second, this study employed secondary data that was self-reported and over-reporting or under-reporting could have occurred. It is also possible that youth responded in socially desirable ways. Third, the study's participants were limited to grades 7-12. Finally, data was collected in 1994, and therefore caution should be taken when generalizing results to youth nationwide today.

Conclusion and Recommendations

The findings from the study should be considered when developing and implementing suicide prevention messages for adolescents. Especially important is the change in the effect of self-concept on suicidal ideations and suicide attempts youth mature. These findings support the need for suicide prevention to begin early, continue throughout high school years, and blend health education with mental health promotion in adolescents. In fact, according to the 2012 National Strategy for Suicide Prevention, creating supporting environments that promote healthy and empowered individuals and includes families and communities is the number one strategic direction (SAMHSA, 2012). Research is needed to more thoroughly understand the relationship between self-concept and suicidal behaviors among youth.

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Table 1. Demographic and background variables.

Demographic Variable	*n*	%
Sex		
Female	3,147	51.6
Male	3,356	48.4
Age		
7th and 8th grade	1,971	31.1
9th and 10th grade	2,251	35.5
11th and 12th grade	2,115	33.4
Race		
White	4,038	62.3
Non-White	2,447	37.7
Self-Concept		
High Self-Concept	4,408	68.2
Low Self-Concept	2,059	31.8
Suicidal Ideation		
No	5,614	87.1
Yes	821	12.8
Suicide Attempts		
No	6,270	96.4
Yes	230	3.5

Note: N = 6,504

Table 2. Odds Ratios for Suicidal Ideation and Suicide Attempts by Sex, Race, Grade, and Self-Concept in Youth

Item	Suicidal Ideation					Suicide Attempts				
	Did Not Seriously Consider Committing Suicide *n* (%)	Did Seriously Consider Committing Suicide *n* (%)	OR	(95% CI)	*p*	Did Not Attempt Suicide *n* (%)	Did Attempt Suicide *n* (%)	OR	(95% CI)	*p*
Sex										
Male[a]	2,800 (90.2)	303 (9.8)				3,076 (97.8)	70 (2.2)	1.0		
Female	2,814 (84.5)	518 (15.5)	1.701	(1.463, 1.979)	<.001	3.193 (95.2)	160 (4.8)	2.202	(1.656, 2.929)	<.001
Race										
Non-White[a]	2,125 (88.0)	290 (12.0)				2,353 (96.3)	91 (3.7)			
White	3.473 (86.7)	531 (13.3)	1.120	(0.961, 1.306)	.154	3.898 (96.6)	139 (3.4)	.922	(0.704, 1.207)	.580
Grade Level										
7th and 8th grade[a]	1,745 (89.5)	204 (10.5)	1.0			1,899 (96.5)	69 (3.5)	1.0		
9th and 10th grade	1,925 (86.2)	307 (13.8)	1.364	(1.130, 1.647)	.001	2,163 (96.1)	88 (3.9)	1.120	(0.812, 1.544)	.490
11th and 12th grade	1,817 (86.5)	284 (13.5)	1.337	(1.104, 1.619)	.003	2,048 (96.9)	66 (3.1)	.887	(.887, .629)	.493
Self-Concept										
High[a]	4,037 (92.2)	342 (7.8)	1.0			4,316 (98.0)	90 (2.0)	1.0		
Low	1,563 (76.7)	476 (23.3)	3.595	(3.092, 4.180)	<.001	1,917 (93.2)	140 (6.8)	3.502	(2.673, 4.589)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded.

Table 3. Odds Ratios for Suicidal Ideation and Suicide Attempts based on Self-Concept among Male and Female Youth

Suicidal Ideation										
	Males					Females				
Item	Did Not Seriously Consider Committing Suicide *n* (%)	Did Seriously Consider Committing Suicide *n* (%)	OR	(95% CI)	*p*	Did Not Seriously Consider Committing Suicide *n* (%)	Did Seriously Consider Committing Suicide *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	2,122 (93.9)	138 (6.1)	1.0			1,915 (90.4)	204 (9.6)	1.0		
Low	669 (80.3)	164 (19.7)	3.770	(2.958, 4.804)	<.001	894 (74.1)	312 (25.9)	3.276	(2.700, 3.76)	<.001

Suicide Attempts										
	Males					Females				
	Did Not Attempt Suicide *n* (%)	Did Attempt Suicide *n* (%)	OR	(95% CI)	*p*	Did Not Attempt Suicide *n* (%)	Did Attempt Suicide *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	2,252 (98.6)	31 (1.4)	1.0			2,064 (97.2)	59 (2.8)	1.0		
Low	805 (95.4)	39 (4.6)	3.519	(2.181, 5.679)	<.001	1,112 (91.7)	101 (8.3)	3.177	(2.286, 4.417)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded

Table 4. Odds Ratios for Suicidal Ideation and Suicide Attempts based on Self-Concept among Youth by Race

Suicidal Ideation										
	Non-White					White				
Item	Did Not Seriously Consider Committing Suicide *n* (%)	Did Seriously Consider Committing Suicide *n* (%)	OR	(95% CI)	*p*	Did Not Seriously Consider Committing Suicide *n* (%)	Did Seriously Consider Committing Suicide *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,570 (91.9)	139 (8.1)	1.0			2,455 (92.4)	203 (7.6)	1.0		
Low	548 (78.6)	149 (21.4)	3.071	(2.390, 3.946)	<.001	1.011 (75.6)	327 (24.4)	3.912	(3.235, 4.729)	<.001

Suicide Attempts										
	Non-White					White				
	Did Not Attempt Suicide *n* (%)	Did Attempt Suicide *n* (%)	OR	(95% CI)	*p*	Did Not Attempt Suicide *n* (%)	Did Attempt Suicide *n* (%)	OR	(95% CI)	*p*
Self-Concept										
High[a]	1,680 (97.6)	41 (2.4)	1.0			2,624 (98.2)	49 (1.8)	1.0		
Low	656 (92.9)	50 (7.1)	3.123	(2.047, 4.766)	<.001	1.257 (93.3)	90 (6.7)	3.834	(2.690, 5.465)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values excluded

Table 5. Odds Ratios for Recent Alcohol Use and Recent Binge Drinking based on Self-Concept among Youth by Grade Level

Suicidal Ideation															
	7th and 8th Grade					9th and 10th Grade					11th and 12th Grade				
Item	**Did Not Seriously Consider Suicide *n* (%)**	**Did Seriously Consider Suicide *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Seriously Consider Suicide *n* (%)**	**Did Seriously Consider Suicide *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Seriously Consider Suicide *n* (%)**	**Did Seriously Consider Suicide *n* (%)**	**OR**	**(95% CI)**	***p***
Self-Concept															
High[a]	1,348 (92.4)	111 (7.6)	1.0			1,311 (91.9)	116 (8.1)	1.0			1.294 (92.7)	102 (7.3)	1.0		
Low	394 (81.1)	92 (18.9)	2.836	(2.104, 3.821)	<.001	608 (76.3)	189 (23.7)	3.513	(2.735, 4.513)	<.001	520 (74.1)	182 (25.9)	4.440	(3.414, 5.775)	<.001

Suicide Attempts															
	7th and 8th Grade					9th and 10th Grade					11th and 12th Grade				
	Did Not Attempt Suicide *n* (%)	**Did Attempt Suicide *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Attempt Suicide *n* (%)**	**Did Attempt Suicide *n* (%)**	**OR**	**(95% CI)**	***p***	**Did Not Attempt Suicide *n* (%)**	**Did Attempt Suicide *n* (%)**	**OR**	**(95% CI)**	***p***
Self-Concept															
High[a]	1,437 (97.8)	32 (2.2)	1.0			1,404 (97.9)	30 (2.1)	1.0			1,378 (98.2)	25 (1.8)	1.0		
Low	456 (92.5)	37 (7.5)	3.644	(2.244, 5.916)	<.001	746 (92.8)	58 (7.2)	3.639	(2.321, 5.704)	<.001	663 (94.2)	41 (5.8)	3.409	(2.055, 5.653)	<.001

Note. [a] Indicates Referent; $N = 6{,}504$; All categories do not total 6,504 due to missing data; Percents refer to valid percents; Missing values exclude