

Community Health Senior Honors Thesis

Family Dinners and Youth Risk Behavior among African-Americans

Osemwengie Enabulele

Student ID: 1130448

Osemwengie.Enabulele@tufts.edu

Community Health

Advisors: Shalini Tendulkar and Margie Skeer

A Senior Honors Thesis submitted in partial fulfillment of the requirements for the Bachelor of Arts in Community Health

Table of Contents

SPECIFIC AIMS AND HYPOTHESIS	2
STATEMENT OF SIGNIFICANCE	3
APPROACH	37
RESULTS	43
DISCUSSION	52
ACKNOWLEDGEMENTS	59
REFERENCES	59

SPECIFIC AIMS AND HYPOTHESIS

This senior thesis examines the relationship between family dinner frequency and duration and risk behaviors and outcomes among youth ages 8 to 16. More specifically, the aims are as follows:

Aim 1) To assess the relationship between family dinner frequency and duration and school performance, obesity-related outcomes, and nicotine use.

Hypothesis 1) Increased family diner frequency and duration is associated with reduced prevalence of poor school performance, obesity-related outcomes, and nicotine use, thus serving as a protective factor.

Aim 2) To assess whether youth race is a modifier of the relationship between family dinner frequency and duration and the prevalence of youth risk behaviors and outcomes.

Hypothesis 2) This relationship will be different for African American youth in comparison with youth in all other racial groups. More specifically, the protective effect of increased family dinner frequency and duration on school performance, obesity-related outcomes, and nicotine use prevalence will be attenuated in comparison with youth in all other racial groups. In other words, it will not be as protective a factor. The rationale for this hypothesis is that the experience of African-American youth differs in many ways from that of youth of other races.

Figure 1. Aim 1 illustrating the hypothesized relationship between family dinner frequency and duration and youth risk behaviors and outcomes

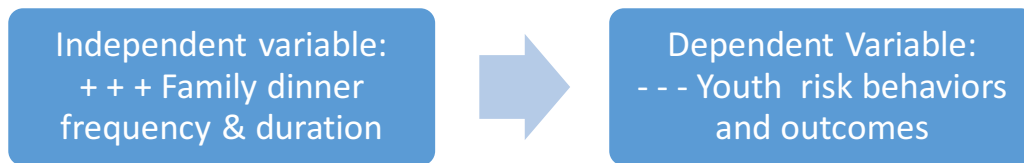
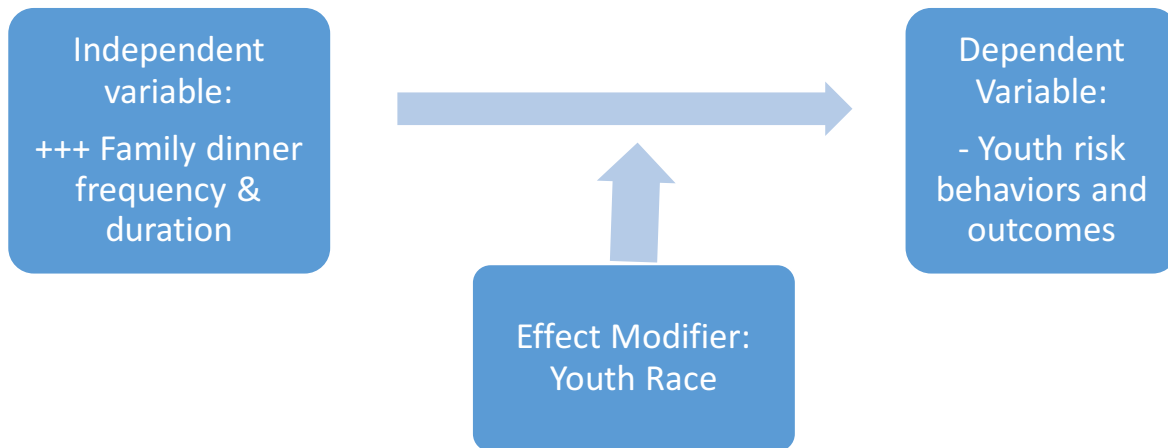


Figure 2. Aim 2 illustrating the hypothesized effect modification of youth race on the relationship between family dinner frequency and duration.



STATEMENT OF SIGNIFICANCE

For the purposes of this thesis, the term “African-American” will be used to refer to people who identify as Black who are of African or American origin living in the United States of America.

Youth is an important time during development in which behavioral patterns are established and unhealthy behaviors, or risk behaviors, are often established during this period and can persist into adulthood (CDC, 2016). Youth risk behavior is of great public health importance because at this age young people are beginning to establish lifelong healthy behaviors that can help them avoid preventable morbidities in adulthood; many of which are linked to risk behavior initiation in their youth (CDC, 2016). Risk behaviors such as nicotine use, and health (obesity) and educational outcomes (academic achievement) are all critical to address

(CDC, 2016). However, these behaviors and outcomes are preventable, making this developmental period an appropriate time to better understand and promote engagement in practices that can be protective for youth.

Racism and Discrimination

Despite declines in public support for negative racial attitudes in the United States, racism, in multiple forms, remains embedded in American society (Williams & Mohammed, 2013a). Racism is a potent psychosocial stressor that is characterized by social ostracism and blocked economic opportunity (Brondolo, Gallo, & Myers, 2009). The forms of racism include those at the institutional and cultural level. Institutional racism has resulted in the development of policies that reduce access to housing, neighborhood and educational equality, employment opportunities, and other important societal resources (Williams & Mohammed, 2013a). Cultural racism occurs at the individual and societal levels and negatively affects socioeconomic and health status through the manifestation of negative stereotypes and discrimination that are pathogenic and foster destructive psychological responses such as stereotype threat and internalized racism (Williams & Mohammed, 2013a). In fact, it has been found that at least 75% of blacks experience discrimination (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006). Further, a number of studies suggest that perceived racial discrimination is associated with poorer self-rated physical and mental health (Borrell et al., 2006). It has been suggested that people may cope with the stress of discrimination through adoption of coping strategies that involve unhealthy behaviors such as smoking and drinking (Jackson, Knight, & Rafferty, 2010). These behaviors may buffer the stress induced by racism through relief of anxiety and the generation of a sense of well-being (Borrell et al., 2006). The results of a study by (Borrell et al., 2006) illustrate that risk behaviors such as smoking and alcohol may be associated with reports

of discrimination. It has been proposed that perceived racial or ethnic discrimination is an aspect of racism that could serve as a psychological stressor with implications for health status and inequalities (Borrell et al., 2010). A number of systematic reviews have found associations between perceived racial discrimination and an array of adverse health consequences. For example, it has been found that reports of discrimination were significantly associated with smoking and heavy drinking among African-Americans (Borrell et al., 2010).

There is substantial research demonstrating that health outcomes are distributed unequally among diverse ethnic groups (Brondolo et al., 2009). For example, it has been found that the rates of hypertension and related complications are much higher among African-Americans than among whites and Asians (Mozaffarian et al., 2015). Another example is that of infant mortality in the United States as it has been found that the infant mortality rate for African-American women was nearly 2.4 times the rate for white women (“Infant Mortality | Maternal and Infant Health | Reproductive Health | CDC,” n.d.). However, specific pathways through which racism affects health have been explored. For example, lab studies have demonstrated the relationship between racism and psychophysiological reactivity, including cortisol, blood pressure, and heart rate responses (Brondolo et al., 2009). These patterns of reactivity have been linked to the development of stress-related disorders including hypertension and other cardiovascular diseases (Matthews et al., 2004). However, health can be affected through other pathways besides physiological responses. Additional literature illustrates consistent relationships between racism and engagement in risky health behaviors such as smoking and substance use (Choi, Harachi, Gillmore, & Catalano, 2006), less use of preventative services such as cholesterol screenings or mammography (Hausmann, Jeong, Bost, & Ibrahim, 2008), as well as nonadherence to medical regimens. Racism may also affect health through its

impact on health care. Specifically, its effect on the patient-provider relationship as there is evidence that physicians make differential estimates of risk for diseases, and spend less time planning and working with individuals from some racial groups (Benkert & Peters, 2005). This finding indirectly undermines efforts to promote healthy behavior. Racism and discrimination is a societal mechanism which must be considered when examining the unique effect modification of youth race on risk behavior engagement.

Obesity

In recent years, the prevalence and severity of obesity has increased greatly among both adults and youth (“Childhood Obesity Facts | Overweight & Obesity | CDC,” n.d.). Overweight status is defined by a body mass index (BMI) between 85th and 95th percentile (by age) while obesity is defined as a BMI that is greater than or equal to 95th percentile (by age) (Biro & Wien, 2010). The consequences of childhood obesity cannot be overlooked as it can result in a number of mortalities and morbidities in later years, which is cause for public health concern (Biro & Wien, 2010). According to the CDC, childhood obesity is a large problem in the United States as it puts kids at risk for poor health in the near and distant future (“Childhood Obesity Facts | Overweight & Obesity | CDC,” n.d.). Evidence of an increase in this problem lies in the fact that in 2001, 10.5% of children in the US were considered obese. However, that number has steadily increased since then and has reached 17% as of 2014 (“Childhood Obesity Facts | Overweight & Obesity | CDC,” n.d.).

There are number of factors contributing to the obesity epidemic facing today’s youth. The increasing prevalence of obesity among youth is due to interactions between genetic and environmental factors as well as other behavioral factors such as physical inactivity and poor

diet. Further, genes that invoke the storage of fatty tissue become maladaptive when the environment is conducive to inactivity. Specifically, environments that minimize opportunities for energy exhaustion and maximize energy intake opportunities (Chung & Leibel, 2008). This disproportionate level of energy intake could include increased consumption of snacks among youth. For example, in 1996, snacks contributed to 25% of total energy intake among youth. In addition, portion size may account for some the variability in energy intake (McConahy, Smiciklas-Wright, Mitchell, & Picciano, 2004). Another source of variable energy intake is fast food, as one study found that nearly one third of youth consumed fast food, and in those instances, a greater number of denser calories, in comparison with other food, is often consumed (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004). In contrast, there has been a lot of evidence citing that increased levels and frequency of physical activity are associated with a lower risk of obesity (Brown, Kelly, & Summerbell, 2007). However, with decreased levels of physical activity, often a result of environmental factors, comes increased levels of sedentary behaviors such as watching television (TV), playing video games, and using a computer. Unfortunately, about 60% of youth TV commercials are about food and watching TV promotes both decreased energy expenditure and increased food intake (Marshall, Biddle, Gorely, Cameron, & Murdey, 2004). Other environmental conditions, such as abuse, anxiety, depression, and stress can induce a change in eating patterns resulting in an increased risk for obesity (Vámosi, Heitmann, & Kyvik, 2010).

In the United States, obesity disproportionately affects those with limited socioeconomic resources. According to the literature, minority as well as low SES groups are disproportionately affected by obesity (Muennig, Lubetkin, Jia, & Franks, 2006). Stress has been associated with weight gain and obesity in both animals and humans (Björntorp, 2001). Chronic exposure to

stress can disrupt regulation of neuroendocrine-autonomic physiological pathways, which, in turn, contributes to the accumulation of excess body fat (Björntorp, 2001). Perceived racial discrimination, an important psychosocial stressor in the lives of African-American youth, has been associated with obesity and a lower waist-hip ratio in African-American women (Brondolo et al., 2009) (Chambers et al., 2004). Overall, many studies have found a positive association between perceived daily racism and the incidence of obesity, especially among African American women with consistent experiences of racism over time (Cozier et al., 2014). Lower SES is associated with a reduction in quality-adjusted life years which is mediated by other behavioral risk factors such as obesity, smoking, sedentary lifestyle, and alcohol (Muennig et al., 2006). However, what is most concerning about this epidemic is that obesity brings with it a host of co-morbidities that affect youth and worsening morbidities that plague adulthood (Deshmukh-Taskar et al., 2006). The likelihood of an obese youth becoming an obese adult increases with the age of the child regardless of how long the child has been obese (Deshmukh-Taskar et al., 2006). Therefore, childhood obesity as well as perceived daily racism are risk factors for adult obesity.

Obesity in adulthood is often considered part of a cluster of physiological changes referred to as metabolic syndrome. The reason for this is that abdominal obesity is commonly observed in individuals suffering from this condition (P. J. Anderson et al., 2001). Studies have also noted that the variables associated with metabolic syndrome are partially due to the increasing prevalence and severity of obesity and that being overweight or obese in childhood is most strongly associated with the adult variables associated with metabolic syndrome (Srinivasan, Myers, & Berenson, 2001). Many studies have also noted an increased risk of several cancers, cardiovascular disease, and type II diabetes with obesity. In regards to cancer

risk, a BMI increase of 5 in men was found to be associated with an increased risk for esophageal, thyroid, colon, and renal cancer. For women, it was associated with increased risk of postmenopausal breast cancer (Renehan, Tyson, Egger, Heller, & Zwahlen, 2008). As for those with coronary artery disease as well as type II diabetes, a rapid increase in BMI during their childhood was observed in a longitudinal study (Barker, Osmond, Kajantie, & Eriksson, 2009).

Cardiovascular disease is of particular concern among the population of interest due to the disproportionate rate at which African-Americans are afflicted by the condition. One's race is a strong risk factor for CVD, which includes heart disease and stroke (Mozaffarian et al., 2015). Unfortunately, CVD is the number 1 killer of Americans, yet mortality from this condition is disproportionate among racial and ethnic groups (Mozaffarian et al., 2015). For example, CVD death rates are 33% higher among African Americans than for the rest of the US population. Further, African Americans are nearly twice as likely to suffer a stroke and more likely to die from them in comparison with Whites. Finally, high blood pressure, one of the strongest risk factors for CVD is much more prevalent among minority groups in the US, especially African Americans (Mozaffarian et al., 2015).

It is clear that both the prevalence and severity of obesity has been on the rise in recent years and it most likely attributable to a combination of factors including genes, dietary patterns and intake, physical activity, perceived racism, and the environment. Childhood obesity puts an individual at risk for a number of co-morbidities in adulthood including metabolic syndrome, type II diabetes, adult obesity, and cancer. Ultimately, what fuels this epidemic are the increasing opportunities for energy intake coupled with limited energy expenditure (Biro & Wien, 2010). In addition to health outcomes, it is also important to examine educational outcomes among youth particularly given the strong relationship between educational achievement and health.

Nicotine Use

Much like obesity, nicotine use among youth is an epidemic. The gravity of this issue is captured by the CDC's assertion that if smoking continues at its current rate in the US, 5.6 million American youth (under 18) will die early from a smoking-related illness which is about 1 in every 13 youth aged 17 or younger ("CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use," n.d.). Addressing use among this demographic is vital to ending the nicotine epidemic in the United States because nicotine use habits are often established during adolescence. For example, approximately 9 out of 10 cigarette smokers try smoking by age 18 ("CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use," n.d.). Tobacco is often made more appealing to youth because products are flavored ("CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use," n.d.). Further, in 2014, a reported 73% of high school students and 56% of middle school students who reported tobacco use in the past 30 days admitted to using a flavored tobacco product in that time period ("CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use," n.d.). Tobacco products come in many forms which contain nicotine including smokeless tobacco, hookah, electronic cigarettes, and although cigarette smoking has declined among American youth in recent years, the use of some other products has increased (Singh, 2016). However, in 2015, 25.3% of high school students reported use of some type of tobacco product and 13% reported use of two or more tobacco products in the previous 30 days (Singh, 2016). It is clear that the use of other nicotine-containing products, such as e-cigarettes, is on the rise among youth. This is of concern because tobacco use and nicotine addiction begin during youth. In addition, nicotine exposure at that age can result in addiction, harm towards brain development, and sustained future tobacco use (Singh, 2016).

Nicotine use during youth can have a number of consequences and morbidities in adulthood. Tobacco use among American youth was thoroughly reviewed in the Surgeon General's 2012 report on preventing tobacco use among youth and adolescents (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). For the purposes of the review, youth are defined as those aged 11-25. By virtue of age and current stage of development, youth are highly social and experience environmental pressures to engage in tobacco use. For example, socioeconomic factors and level of educational attainment influence the development of youth tobacco habits in that youth at highest risk are those with lower levels of academic achievement (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). In addition, sufficient evidence was found to conclude that there is a causal relationship between peer group social influences and the initiation of maintenance of tobacco use among youth (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012).

The tobacco industry is not without blame when it comes to the tobacco epidemic among America's youth. In 2008 alone, tobacco companies spent \$9.94 billion on the marketing of cigarettes as well as \$547 million on the marketing of smokeless tobacco (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). In addition, these expenditures have become increasingly focused on reducing the price of tobacco products as they accounted for about 84% of cigarette marketing and more than 77% of smokeless tobacco product marketing in 2008 (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). Sufficient evidence has been found to conclude that there is a causal relationship between tobacco company promotional campaigns as well as depictions of smoking in movies and media and the initiation of tobacco use among youth (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012).

However, there even appears to be a disparity in how and which youth populations are being targeted by these promotional campaigns. According to the CDC, the promotion of certain tobacco products appear to be targeted to members of minority communities (C. O. on S. and Health, n.d.). It has been reported that marketing Hispanics and American Indians/Alaskan Natives includes the advertising and promotion of cigarette brands with names including Rio, Dorado, and American Spirit (C. O. on S. and Health, n.d.). As for Asian American communities, tobacco companies have sponsored Chinese and Vietnamese New Year festivals, have used billboard advertising in urban communities, and support Asian American business partnerships (C. O. on S. and Health, n.d.).

In particular, the tobacco industry has disproportionately targeted African-American communities with the promotion of menthol cigarettes. For example, a 2010 study on Boston tobacco retailer density near schools found that retailer density is higher in minority and low-income communities (Seidenberg, Caughey, Rees, & Connolly, 2010). This finding is particularly concerning because a higher density of retailers near schools has been found to increase smoking initiation among high school students (McCarthy et al., 2009). At the point of sale, it has been found that stores in African-American neighborhoods are more likely to sell to youth as a 2015 Washington, DC study found that sales to minors were more common in retailers closer to high schools in African American communities (Kirchner et al., 2015). According to the CDC, advertising strategies include campaigns that utilize urban culture and language to promote menthol cigarettes (C. O. on S. and Health, n.d.). Another strategy is the sponsoring of hip-hop bar nights by tobacco companies at which samples of menthol cigarettes are made available. Finally, individuals can be targeted through direct-mail promotions (C. O. on S. and Health, n.d.). Interestingly, the tobacco industry has supported and funded African

American organizations such as the NAACP, the United Negro College Fund, and others (Yerger & Malone, 2002). However, the industry's dedication to targeting African Americans through advertising is not without consequence as African Americans suffer the greatest burden of tobacco-related mortality of any racial group in the US (General, 1998). Further, a 2013 report by the FDA found that menthol cigarettes lead to increased smoking initiation among youth and adults, greater addiction, and decreased success in smoking cessation (Commissioner, n.d.). As a result, although smoking rates among African Americans are lower than national averages, they suffer disproportionately from preventable smoking-related chronic diseases (General, 1998).

The health consequences of tobacco use and nicotine intake among America's youth cannot be overlooked. The Surgeon General's report yielded a number of key health findings associated with tobacco exposure in adolescence. There is sufficient evidence to suggest that smoking contributes to future use of marijuana and other illicit drugs (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). Interestingly, there is a belief among youth that smoking is associated with weight loss. However, evidence suggests that smoking by youth is not associated with weight loss, contrary to popular belief (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). Physiologically, there sufficient evidence of a causal relationship between active smoking and reduced lung function as well as impaired lung growth during childhood (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). Further, there is a causal relationship between active smoking and wheezing, which, in some cases, is severe enough to be diagnosed as asthma in at risk youth populations (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012). As for adult co-morbidities, there is sufficient evidence of a causal relationship between smoking in adolescence and the development of early abdominal aortic atherosclerosis in young adults. In addition, there is evidence suggesting a relationship between youth tobacco use and

coronary artery atherosclerosis (N. C. for C. D. P. and H. P. (US) O. on S. and Health, 2012).

Both forms of atherosclerosis are strong risk factors for a heart attack and other cardiovascular issues (Mozaffarian et al., 2015).

Academic Achievement

In addition to these health risk behaviors, there is a strong link between youth academic achievement and their health status and engagement in risk behaviors (“CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use,” n.d.). According to the CDC, health-risk behaviors such as early sexual initiation, physical inactivity, and drug use are often associated with poor grades and lower educational achievement (“Data and Statistics | Health and Academics | Healthy Schools | CDC,” n.d.). More specifically, students with higher grades have been found to be less likely to engage in health-risk behaviors than their peers with lower grades and abstinence from health-risk behaviors is associated with higher grades in comparison with those who engage in such behaviors. Data from the 2009 National Youth Risk Behavior Survey (YRBS) illustrate that students with higher grades are less likely to have engaged in behaviors such as cigarette use, alcohol use, sexual activity, and being physically active at least 60 minutes per day on fewer than 5 days (“Data and Statistics | Health and Academics | Healthy Schools | CDC,” n.d.).

It is clear that, among youth, health-risk behaviors are inversely related to academic achievement. The influence of academic achievement on health-risk behaviors among youth places a large focus on the US schooling system and its potential for intervention. In 1997, a team from the Institute of Medicine of the National Academy of Sciences concluded: “Schooling is the only universal entitlement for children in the US, the committee believes that students, as

part of this entitlement, should receive health-related programs and resources necessary for them to derive maximum benefit from their education and enable them to become healthy, productive adults” (K-12, Allensworth, Lawson, Nicholson, & Wyche, 1997).

In a 2013 literature review, (Bradley & Greene, 2013) examined the association between youth risk behaviors and academic achievement. For tobacco use, an inverse association between use and academic achievement was reported. Specifically, it was found that tobacco users performed less well academically in comparison with their non-using peers and that cigarette users completed fewer years of education than nonusers (Georgiades & Boyle, 2007). Physical activity is an important, school-moderated, outcome that has protective effects against obesity. Therefore, an understanding of the relationship between academic achievement and physical activity can yield insight to obesity prevention programs. Findings on physical inactivity illustrate a positive association between the extent of physical activity and academic achievement. For example, there is evidence suggesting that moderate to vigorous physical activity is positively associated with higher GPAs among students (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010). In addition, it was found that being physically active at school is positively correlated with improved performance of specific cognitive tasks (“CDC | Physical Activity | Facts | Healthy Schools,” n.d.). Overall, the results of the review indicate statistically significant inverse relationships between health risk behaviors and academic achievement among school-aged youth. The results illustrate positive associations between six health risk behaviors (violence, tobacco use, alcohol and other drug use, sexual behaviors contributing to STDs, and inadequate physical activity) and poor academic outcomes (Bradley & Greene, 2013).

Although academic achievement has implications for youth risk behavior engagement, achievement may be affected by other factors, especially minority youth. A study on African

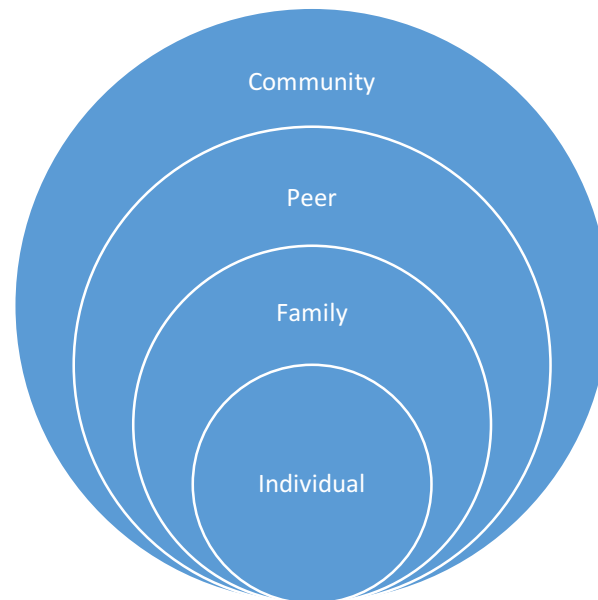
American youths' discrimination experiences and academic achievement found that their racial discrimination experiences were associated with a decrease in academic curiosity, persistence, and student self-reported grades (Neblett, Philip, Cogburn, & Sellers, 2006). However, it was also found that parental messages and behaviors concerning race may serve as protective factors for academic outcomes such as values and beliefs, which have been linked with academic performance and success (Neblett et al., 2006). Therefore, youth race may play an important role in moderating the effectiveness of academic achievement as a protective factor against youth risk behaviors.

The Socioecological Model

As described above, youth risk behavior has a number of influences at many levels including the environment (Bronfenbrenner, 1994). Youth development and behavior are inseparable from environmental influences. According to Bronfenbrenner, in order to best understand youth development, one must analyze the social-ecological system in which development occurs (Bronfenbrenner, 1994). According to this model, human growth and development occurs through complex interactions, termed proximal processes, between a person and their immediate environment. However, such interactions must take place at a regular frequency over an extended period of time in order to be effective (Bronfenbrenner, 1994). The effect of proximal processes on human development varies based on environmental characteristics such as social class or levels of parent-child interaction (Bronfenbrenner, 1994). The ecological system can be further broken down into smaller, more complex, subsystems which support human development. The systems range from the microsystem, which refers to the interactions between a person and their immediate environment, all the way up to the macrosystem which refers to cultural patterns such as customs and beliefs (Bronfenbrenner,

1994). The ecological environment for a developing human can be pictured as concentric circles expanding outwards in which each circle represents a “system”. Each system will be described from the innermost level to the outermost. The first level is the microsystem. The microsystem is composed of the developing person’s interpersonal interactions that occur in a face-to-face setting. It refers to the immediate environment and some examples are family, school, and peer group (Bronfenbrenner, 1994). The next level is the mesosystem which is made up of the connections and processes occurring between two microsystems such as between home and school. A mesosystem can be considered a system of microsystems. Finally, at the outermost level, is the macrosystem which is composed of all the other systems and refers to culturally established belief systems, knowledge, resources, and life-styles that are ingrained in the other systems (Bronfenbrenner, 1994). Bronfenbrenner’s socioecological model provides an excellent framework for the analysis of the risk and protective factors for youth risk behaviors and outcomes as well as any disparities that may exist among them. These factors will be organized from the individual level out as such: individual→family→peer→community.

Figure 3. Socioecological model representation of the levels of influence on youth risk behaviors. Risk and protective factors of youth risk behaviors and outcomes will be analyzed at each level.



Youth Risk Factors & Disparities

Individual Level Factors

At the individual level, a variety of factors influence an adolescent's likelihood of engaging in high risk behaviors. These include age, attitudes toward risk behavior, and associated neurological changes.

Despite the high cost and constant condemnation from adults for risk behaviors, adolescents (defined as those over 14 years) still engage in the behaviors (Tymula et al., 2012). Despite the experience that comes with age, adolescents are more likely to engage in high risk behaviors than younger children. For example, the highest rates of sexually transmitted disease and criminal behaviors occur among this age group (Tymula et al., 2012). As a result of higher

risk behavior rates, they face nearly double the risk of mortality and morbidity experienced by younger children (Tymula et al., 2012). Thus, age appears to be a risk factor for risk outcomes and behaviors among youth with the greatest burden being on those in adolescence.

Youth attitudes toward risk and risk behavior influence the likelihood of engagement in risky behavior and are important factors for consideration when analyzing individual level risk factors for risk behaviors and outcomes. Attitudes towards risk, attitudes toward ambiguity, sensitivity to potential losses and gains, and finally, impulsiveness, all influence likelihood of engaging in high risk behaviors. (Laurence Steinberg, 2008). According to (Tymula et al., 2012), the commonly observed pattern of increased risk taking among adolescents is not driven by an inherent preference for risk, but rather by an increased tolerance for unknown outcomes or probabilities. In other words, what distinguishes adolescents is their willingness to deal with and accept ambiguity or situations in which the likelihood of a detrimental or beneficial outcome is unknown (Tymula et al., 2012). Of course, other influences on decision making capacity play a role in the likelihood that an individual will engage in risky behaviors exist such as emotional and neurological development as well as social factors (Boyer, 2006). However, the effect of social and emotional factors have been found to have a more pronounced effect on adolescents (Laurence Steinberg, 2008). Differences in risk preferences translate into ‘risk-taking’ behavior among adolescents and youth have a high tolerance for consequential ambiguity which increases the likelihood of risk behaviors and outcomes (Tymula et al., 2012).

From a neuroscience perspective, there are individual biological factors that place youth at risk for risky behavior initiation. ‘Risk-taking’ behaviors increase between childhood and adolescence due to changes in the brain’s socio-emotional system during puberty (Laurence Steinberg, 2008). This change results in increased reward-seeking behaviors and is mainly

caused by a remodeling of the brain's dopaminergic system (Laurence Steinberg, 2008). The observed decline in 'risk-taking' once adulthood is reached can be attributed to changes in the brain's cognitive control system. Changes in this system translate to an improvement in an individual's capacity for self-regulation and impulse control (Laurence Steinberg, 2008). These observed changes in 'risk-taking' as an individual develops can be seen alongside structural and functional changes in the prefrontal cortex as well as its connections to other regions of the brain. These changes commonly occur at the same time as puberty though the time at which these changes occur varies from person to person. With that said, the general time of mid-adolescence can be characterized as a time of increased vulnerability to risky behaviors, thus, age and attitudes towards risk are key risk factors for engagement in risk behaviors in that adolescents (age 14 or greater) (Laurence Steinberg, 2008).

Family Level Factors

According to the Ecodevelopmental Theory, one cannot separate the behaviors and development of an adolescent from external factors such as family influence (Szapocznik & Coatsworth, 1999). As such, a variety of family level factors have been shown to increase youth risk taking behavior including parental style, family structure, and family socioeconomic status. Youth is a vital time period for the development and establishment of healthy behaviors and there have been numerous studies suggesting that the parent-youth relationship has a large impact on development and the prevention of youth risk behaviors (Fromme, 2006).

Parental style can influence the likelihood of youth engagement in risk behaviors. Parental style has been analyzed in two dimensions; the first is control and the second is acceptance (Baumrind, 1967). Further, parental style can be categorized based on the synthesis

of those two measures. For example, authoritarian parental styles are characterized by high levels of control and low levels of acceptance whereas a permissive style is categorized by low control and high acceptance (Baumrind, 1967) (Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001). Parents are a child's most important teachers and, as a result, they influence their child's behavior by establishing values, norms, and expectations (Newman, Harrison, Dashiff, & Davies, 2008). A review of studies from the past 20 years indicates that youth raised in authoritative households, characterized by high control and acceptance, demonstrate higher levels of protection against risk behavior engagement (Newman et al., 2008). Therefore, non-authoritative parental styles that are lacking in either control, acceptance, or both, are not as effective in the prevention of youth risk behaviors (Newman et al., 2008).

Other risk factors dealing with parental style include inconsistent discipline techniques, high levels of parent-child conflict, poor communication, as well as poor parental monitoring (Dishion & McMahon, 1998). For example, a more recent study by (Lakon et al., 2015) examined peer networks and aspects of parental supervision and behavior as they relate to adolescent smoking. The study revealed that adequate parental supervision was associated with youth choosing fewer friends that smoke, thus reducing peer influence (Lakon et al., 2015). It is clear that adolescent risk behavior can be a function of environment and that parental support is vital for healthy development and social competence in forming friendships (Rubin et al., 2004). Poor parental monitoring, which has been defined as supervision and communication between parents and adolescents (Stattin & Kerr, 2000), is a risk factor for adolescent delinquency as poorly monitored youth have been found to have a higher likelihood of engaging in risky behaviors such as smoking, drug use, and seeking out friends who also use drugs (L. Steinberg, Fletcher, & Darling, 1994). In addition to poor parental monitoring, poor parent-child

communication and low amounts of time together have also been found to be associated with elevated risk of delinquency in adolescence, particularly earlier engagement in substance use (A. R. Anderson & Henry, 1994).

Along with parental style, family structure can have an influence on the likelihood of youth risk behavior occurrence. For example, a study on parenting style and family structure and the behaviors of urban minority youth found that a more involved parenting style in general was associated with less delinquency and that boys as well as youth from single-parent homes are at an elevated risk of engaging in behaviors such as alcohol use, smoking, and aggressive behaviors (Griffin, Botvin, Scheier, Diaz, & Miller, 2000). Research on family structure has shown that youth from single-parent families engage in the highest rates of risk behaviors (Griffin et al., 2000). Reasons for this stem from the fact that single parents tend to have more financial constraints, fewer coping resources, and less support from another parent in comparison with two-parent homes. Family structure has been found to be strongly associated with parental warmth such that all family structure types display less parental warmth in comparison with households containing two parents (Tendulkar, Buka, Dunn, Subramanian, & Koenen, 2010). In 1980, 19% of children under age 18 in the US lived with single parents. However, the number has grown to 34 % which may increase the vulnerability of these adolescents (comments, 2014). However, there are certainly racial disparities along the lines of living in a single-parent home and as result, the risk of youth engaging in risky behaviors. Today, 55% of African-American children in the United States live in a single-parent household. This disparity becomes increasingly clear when looking at the rates for all children in the US as 27% of them live in a single-parent household (U. S. Census Bureau, n.d.). In addition, many single-parent black families live in urban environments, which has an impact on youth development. The section on

neighborhood level determinants below will explore this further. Interestingly, it has been shown that those living with a single-parent can have those risky outcomes buffered by a strong parent-child relationship (Mason, Cauce, Gonzales, & Hiraga, 1994).

Among youth, low SES is associated with a myriad of negative health outcomes such as higher rates of chronic and acute illness, vision and hearing problems, and injury (Koster et al., 2005). According to a literature review on the association between SES and youth risk behaviors, daily lifestyle behaviors associated with diet and physical activity were highly associated with SES in that low SES youth report poorer nutritional habits and less exercise than high SES youth (Hanson & Chen, 2007). Low SES youth were also found to be at an elevated risk for cigarette smoking as opposed to all substance use behaviors (Hanson & Chen, 2007). For physical activity, low SES youth, in comparison with high SES youth, may spend more time indoors as a result of local issues with safety and limited green spaces (Weir, Etelson, & Brand, 2006). In addition, low SES youth may spend their time at work to earn spending money or even contribute to the family income, thus having less time for physical activity (Hanson & Chen, 2007). For diet and nutrition, low SES youth may report poorer habits than high SES youth for a number of reasons. For instance, low SES families may not be able to afford healthy foods in addition to limited availability of fresh fruits and vegetables in low SES neighborhoods. In addition, low SES families may consume more fast foods due to the higher prevalence of fast food restaurants in low SES neighborhoods (Burdette & Whitaker, 2004). Parent modeling and attitudes, in addition to the experience of negative or stressful life events may lead low SES youth to be more likely to indulge in cigarette smoking in comparison with high SES youth (Hanson & Chen, 2007). These findings suggest that low SES is a risk factor for risk behaviors such as poor diet, lack of exercise, and cigarette smoking.

In the United States, there are certainly disparities in SES along the lines of race. According to the US Census Bureau, in 2015 19% of all children under 18 were living in poverty. However, in 2015 it was found that 32% of all African-American children under 18 were living in poverty (Bureau, n.d.). This disparity in SES puts African-American children at an even greater risk for risk behavior engagement.

Peer Level Factors

Publically and otherwise, peers are often blamed for the initiation of risk behaviors among youth with numerous studies illustrating that friends play an important role in influencing both beneficial and detrimental activities among youth (Berndt, 1999). In order to examine how peer influence can affect youth behavior, the mechanisms by which social factors promote adolescent engagement in high risk behaviors must first be examined. Theory illustrates that social influence takes place when people are continuously comparing themselves to others as a barometer for appropriate behavior (Petersen & Spiga, 1982). Youth in particular, are very susceptible to peer influence because they experience a great deal of physical changes as well as a myriad of social demands during youth (Petersen & Spiga, 1982). For example, it was found that growth of resistance occurs late in adolescence because, by that time, they have turned their psychosocial attention toward matters such as identity development and it is hypothesized that they may have developed the ability stand up to the influence of their friends (Laurence Steinberg & Monahan, 2007). However, social influence cannot operate without friendship selection occurring prior. It has been found that the degree of influence from peers is based on the nature of the friendship as well as the type of friendship (Cohen, 1983). If a friendship is homophilic, that is, there is shared attitude or behavior, then friendship selection will maintain

the behavior or attitude. On the other hand, if the friend has a different attitude or behavior such that the friendship is heterophilic, there may be an attitude or behavior change due to influence from one peer to the other (Cohen, 1983).

A study by (Maxwell, 2002) on the role of peer influence across adolescent risk behaviors found that a random same sex friend can influence a youth to change his or her risk activity engagement level. Interestingly, it was found that a respondent was nearly two times more likely to exhibit a risk behavior if their friend has performed the behavior prior. Another important finding of this study was that a friend's influence varies by the behavior being observed. Specifically, when looking at cigarette and marijuana smoking, usage among peers had a greater influence on behavior initiation among non-users than on behavior maintenance on users. As for alcohol and chewing tobacco use, the influence was found to occur bidirectionally. That is, peer pressure was able to influence both the initiation and termination of the risk behavior, suggesting that peers can offer protection in some instances (Maxwell, 2002).

A study on peer influence on risk taking found differences in risk orientation as a function of race. It was found that non-White youth demonstrated greater risk taking and risk preference than White youth, but White youth demonstrated more risky decision making than non-Whites (Gardner & Steinberg, 2005). For example, there is evidence suggesting that minority youth, especially African Americans, are more likely than White youth to engage in risky sexual behaviors and delinquent activities (R W Blum et al., 2000). However, when substance use is the behavior of interest, there is evidence suggesting that White youth take more risks compared to youth of other ethnicities. Specifically, White youth engage in more alcohol and tobacco use than youth non-White ethnic groups. It was also found that peer influence on risk orientation varied across ethnicities. Specifically, it was found that the effect of peer

presence was greater among non-White youth. There is some evidence suggesting that non-White youth may be more susceptible to the influence of peers when in risky situations (Gardner & Steinberg, 2005).

Community Level Factors

“Community” and “Neighborhood” will be used to refer to the levels of influence beyond that of Family and Peers.

The built environment of poor-urban neighborhoods poses a number of threats to a child’s wellbeing in development due to crime, drugs, and gangs (Duncan & Brooks-Gunn, 2000). There is literature supporting the notion that there is an association between neighborhood features and parenting which could have an indirect effect on youth risk behavior engagement. For example, it has been found that living in a poor or dangerous neighborhood diminished the positive association between caregiver social support and nurturing parenting among a group of economically disadvantaged African American mothers and their middle school children (Ceballo & McLoyd, 2002). The influence of neighborhood on youth risk behavior is not limited to its effect on parenting. According to studies from both Leventhal and Gorman-Smith in (Adolescence, 2011), the communities in which youth find themselves in can have important influences on their development for better or for worse (Adolescence, 2011). According to Leventhal, the reason community is such a vital level of influence is that it is a place for a myriad of social and peer interactions in which youth have access to institutional resources. It was found that living in a neighborhood with low SES confers risks to youth in the form of behavioral, social, and emotional problems, as well as risky behavior (Adolescence, 2011). However, Leventhal rightly noted that the factors that predispose children to their early living situations

cannot be overlooked and that the influence of neighborhood is minute in comparison with that of parent income and education level among other family influences (Adolescence, 2011).

There are three theoretical frameworks that may explain the nature of neighborhood influence. The first model, termed the institutional resources model, hypothesizes that youth are influenced by the quality, quantity, diversity, and affordability of neighborhood resources. Neighborhood resources include school, health services, recreational programs, and employment opportunities (Adolescence, 2011). The second proposed model claims that norms and collective efficacy are the source of influence. In other words, a neighborhood's collective ability to work together toward common goals and reinforce prosocial norms that can reduce threats to inhabitants such as violence and availability of illegal drugs (Adolescence, 2011). Studies have also found that adolescents' perceptions of neighborhood disorganization such as violence and drug activity were found to be associated with increased alcohol, tobacco, and marijuana use (Wilson, Syme, Boyce, Battistich, & Selvin, 2005), therefore, a norm of positive and constructive behaviors could combat against such a risk. Finally, the third model suggests that a poor neighborhood contributes to familial stress and economic struggle which can in turn have negative consequences on parental well-being, parenting capacity, and most importantly, youth outcomes (Adolescence, 2011).

It has been found that there are a number of contextual factors ties to community placement that are associated with risk behavior (Galea, Ahern, & Vlahov, 2003). Key contextual variables that may affect risk behavior include, social norms, neighborhood disadvantage, and social capital, which are all features dealing with the social environment, the physical environment, and availability of health and social resources (Galea et al., 2003). These contextual social factors have been identified as important determinants of risk behavior. Further,

other social factors may affect risk behaviors such as discrimination which may mediate the relation between contextual social factors and risk behavior engagement (Galea et al., 2003).

Youth Protective Factors & Disparities

Individual Level Factors

Key individual level protective factors against youth risk behaviors include age, self-esteem, self-efficacy, and emotional regulation. During early adolescence, a number of rapid psychological and physiological changes associated with puberty occur in addition to the social role transformation that occurs between middle school and high school. For many youth, this time period is accompanied by the beginning of risk behavior engagement (Rew & Horner, 2003). It is for this reason, that it is such a vital time to prevent the manifestation of unhealthy habits that, depending on the behavior, have the potential to persist into adulthood (Gutman, Sameroff, & Eccles, 2002). However, there are protective factors, which as explained by (Benard, 1991), are positive predispositions and influences in youth lives that can act as a buffer against these negative influences. Further, the more resources a youth has, the higher the likelihood that they are able to avoid risk behaviors and outcomes (Evans et al., 2004). Individual level protective factors were explored by (Wang, Hsu, Lin, Cheng, & Lee, 2010) and it was found that self-esteem, self-efficacy, and emotional regulation are key protective factors against youth risk behavior (Wang et al., 2010). Self-esteem can be understood as a subjective appraisal of the self that reflects how worthy or capable one views themselves to be. There is evidence suggesting that self-esteem is protective against youth substance use, teen pregnancy, and suicidal ideation (Bearman & Moody, 2004). Health self-efficacy is the belief in one's ability to successfully perform certain health behaviors across a number of situations. The relationship between self-efficacy and health behaviors is well supported by many studies (Chang et al.,

2006). Health self-efficacy has been found to moderate the negative effects of peer pressure on risk behavior. The protective factors dealing with control will therefore moderate the effect of risk factors on the prevalence of problem behaviors (Jessor et al., 2003). As for emotional regulation, evidence suggests that it has the strongest positive correlation with youth health (Oshio, Kaneko, Nagamine, & Nakaya, 2003). It has been found that male youth who aren't from two-parent families are at highest risk (Wallace et al., 2002). Emotional regulation is a component of self-regulation and good self-regulation is vital to coping with stress which may influence the initiation of risk behaviors. As a result, youth with good emotional regulation are better able to cope with stress and are less likely to succumb to peer pressure (Aspinwall & Taylor, 1997). However, in a study by (Buckner, Mezzacappa, & Beardslee, 2003) self-esteem and self-regulation skills were found to be more important than parental monitoring and the amount of emotional support received from the social support network in predicting youth behavioral problems (Buckner et al., 2003).

Tymula's findings that adolescents were at an increased risk for mortality and morbidity as a result of increased risk behavior engagement at this age due to increased tolerance for ambiguity (Tymula et al., 2012). Thus, age appears to be a protective factor against these risk behavior associated mortalities and morbidities, especially for both young children and older adults. There is even greater support for this finding in Steinberg, where it was found that changes in the prefrontal cortex and its connections to other regions of the brain put adolescents at a greater risk for 'risk-taking' (Laurence Steinberg, 2008). Thus, being significantly older than or younger than the age of adolescence seems to be a protective factor against risk behaviors and outcomes.

Family Level Protective Factors

There are parental level protective factors against youth risk behavior and outcomes including parental style and frequent family dinners. The findings of (Tymula et al., 2012) suggest that adolescent tolerance for ambiguity is the driving factor for the high prevalence of risk behaviors and outcomes among this population. However, it should be noted that when youth engage in risk behaviors it is seen more as curiosity than poor decision making. Therefore, the learning that occurs through such curiosity may continue throughout life. With this understanding in mind, parental styles that attempt to correct adolescent decision making in risky situations by providing them with a safe environment for learning through actions and consequences may be more effective than parental styles that rely strictly on prohibition (Tymula et al., 2012). The reason is that decisions made during adolescence shape future patterns of behavior in adulthood and help one understand what behaviors are acceptable and unacceptable in greater society (Tymula et al., 2012).

A review of a number of studies on the influence of parental style on youth development revealed that this influence is clear. It was found that youth raised in authoritative households consistently demonstrate fewer risk behaviors (Newman et al., 2008). An authoritative parental style is characterized by high levels of both control and acceptance and is consistently shown to be protective of youth risk behavior. In addition, there is evidence suggesting that parental styles associated with warmth, communication, and disciplinary practices predict mediators of risk behavior such as academic achievement and psychosocial adjustment (Newman et al., 2008). A number of studies indicate that children of authoritative parents with positive parent-child relationships, healthy open communication, and perceived parental support are less likely to engage in substance abuse and sexual risk behaviors (Newman et al., 2008). The benefit of such

a parenting style has been cited across a number of domains including five risk behaviors that the CDC deems highly threatening to adolescent health (Newman et al., 2008).

For youth, family meals with their parents, as evidence suggests, could also be protective against risky behaviors (Skeer & Ballard, 2013). However, the family meal is an often overlooked but important occurrence in youth development and has been shown to have many public health benefits on youth development. Recent risk factor research has indicated that feelings of disconnection from family is associated with detrimental youth health outcomes and behaviors such as substance use, sexual risk behaviors, delinquency, and disordered eating (Croll, Neumark-Sztainer, Story, & Ireland, 2002). Family connectedness has also been shown to be associated with a decrease in the likelihood of smoking, alcohol use, sexual activity, and violence among youth, suggesting its importance as a protective factor (Robert W. Blum & Ireland, 2004). Although the incidence of the traditional family dinner has decreased over the last decade, family dinners have been shown to be a highly protective factor affecting adolescents' likelihood to engage in risky behaviors (Putnam, 2000). Risk behaviors, for which family dinners have been shown to be protective of, include substance use (alcohol, tobacco, marijuana, and other drugs), aggressive and violent behaviors, poor school performance, sexual behaviors, mental health and eating disorders, and finally, obesity (Skeer & Ballard, 2013). Although most studies that investigate the aforementioned relationship have found associations between family meal frequency and their likelihood to engage in risk behaviors, it has been hypothesized that in addition to frequency, there are other aspects of family dinners which may have an impact on adolescent development. For example, meal duration and attendance are also factors that may affect how protective a measure family dinners are for adolescents yet they remain relatively unexplored (Skeer & Ballard, 2013).

There are numerous public health benefits for children who regularly eat dinners with their parents. For example, work done by CASA in the late 1990s provided evidence that eating dinners together as a family was associated with reduced risk of adolescent substance abuse such as drinking, smoking and other substance use (“The Importance of Family Dinners 2012 | CASAColumbia,” n.d.). Other evidence lies in studies that have found a consistent inverse relationship between family dinner frequency and all high-risk youth behaviors (Fulkerson et al., 2006). Family dinner frequency has been introduced as a protective factor that may reduce risk behavior prevalence among youth (Story & Neumark-Sztainer, 2005). It has been suggested that the relationship between family dinner frequency and youth development could be that it (family dinner) represents family connectedness. Further, the dynamics of the family dinnertime environment may yield high-quality parent-youth interactions (Fulkerson et al., 2006). These findings indicate that regular family dinners may be a way to maintain or even bolster family connectedness as well as ease the daily stress of today’s fast-paced lifestyle (Fiese et al., 2002). Frequent family dinners also impact youth risk behaviors through providing parents with a venue for monitoring their children’s activities through open daily communication. In addition, family dinners may also be a venue for parents to model their family values and show support for their children (Fulkerson et al., 2006).

It is not merely the act of eating dinner with family members that can confer a protective effect against risk behaviors and outcomes among youth, it is what occurs at the family dinner that may confer a protective effect for youth. There are a number of reasons for this phenomenon explained in a review by (Skeer & Ballard, 2013). Dinner time can provide a space for open and ongoing communication about the events of one’s day. As a result, parents can learn more about their child’s daily activities and concerns (Skeer & Ballard, 2013). Such an environment that is

conducive to open and honest communication allows for the growth of three aspects of the parent-child relationship. According to (Skeer & Ballard, 2013), parents talking with their children about their days facilitates a level of comfort which will enrich the communication, allowing for more difficult but important discussions. A level of trust can be established between a parent and child as a result of consistent family dinners because it is an opportunity for parents to display their interest in their children's lives which is a great form of social support for the child (Skeer & Ballard, 2013). Finally, daily interaction with children at meal time allows parents to discover any sudden abnormalities in their child's behavior, school performance, and attitudes which can be indicative of substance use or other risk behavior engagement (Skeer & Ballard, 2013). Thus, family dinner frequency *and* duration are important aspects of dinners that moderate its effectiveness in strengthening the parent-child relationship and preventing risk behaviors and outcomes among youth.

A more recent systematic review of the association between family meals and adolescent risk outcomes found that most studies report a significant association between family meals and youth risk outcomes (Goldfarb, Tarver, Locher, Preskitt, & Sen, 2015). A similar review on the effect of family meal frequency on psychosocial outcomes in youth found further support for the finding that frequent family meals are positively related to increased self-esteem and school success and inversely associated with alcohol and substance use among youth (Harrison et al., 2015). Another study on trends in family dinner frequency among youth found that eating meals, particularly dinner, with family members, are associated with lower levels of substance abuse and improved academic outcomes among youth (Walton et al., 2016). Unfortunately, it was also found that from 1996-2008 the frequency of family dinners has decreased among youth (Walton et al., 2016).

Peer Level Factors

Although peer pressure has often been implicated as the driving force behind risk behavior initiation among youth, it could have protective effects in some instances as well. According to Maxwell, a random same sex friend may influence youth risk behavior initiation (2002). However, the nature of this influence depends on the characteristics of the behavior. Specifically, it was found that for alcohol and chewing tobacco use, a peer can encourage one to either stop or start the behavior (Maxwell, 2002). This finding supports intervention strategies that focus on changing youth perceptions of social norms through reducing false consensus effect which is the belief that because a friend is engaging in a risk behavior, there must be many others who engage in this behavior, which serves to reduce the perception of risk (Maxwell, 2002). If youth overcome this false consensus and come to the understanding that a risk behavior's prevalence is low in reality, non-using peers attitudes may be viewed as more persuasive and legitimate (Maxwell, 2002). Furthermore, attention should be given to those from ethnic minority groups with an emphasis on increasing individual ability to resist peer influence (Gardner & Steinberg, 2005).

Community Level Factors

Along with the financial instability that accompanies single-parent homes in some cases comes placement in poor environments. Protective community level factors include higher neighborhood SES as well as a higher average level of educational attainment. Leventhal emphasized the influence of neighborhood characteristics of youth risk behavior. After controlling for youth family characteristics and other factors, there was still evidence of a connection between SES and risk behavior. Further, because SES is often a predictor of living situation, living in an affluent neighborhood in which the residents are college-educated is

associated with advantages for adolescents' academic achievement (Adolescence, 2011). Therefore, higher SES can be protective of youth risk behaviors by way of providing a means for living in more affluent neighborhoods. The "norms and collective efficacy" theoretical model of neighborhood influence suggests that a collective capacity for common goals and reinforcement of prosocial, which is defined as positive behavior that shows concern for others as well as constructive goals, norms and values (Adolescence, 2011). According to this model, the reinforcement of prosocial norms and values can be a protective factor for youth risk behaviors through a reduction in threats to residents such as violence or exposure to illegal substances (Adolescence, 2011).

Implications

The results of this literature review illustrate the many levels of influence that youth encounter which may bolster or reduce their likelihood of engaging in health risk-behaviors and experiencing risk outcomes such as nicotine intake, obesity, and poor academic achievement. Further, the literature suggests that these factors are all interrelated and have long-term consequences during youth, and later on in adulthood. Although the benefits of the family dinner has been explored on the basis of frequency, the implications of racial identity on the associations between the family dinners and risky youth behaviors has been relatively unexplored. Differences along the lines of age have been explored but analyses have yet to have been made about specific races in comparison with others. This research will assess the relationship between family dinner frequency and duration and school performance, obesity-related outcomes, and nicotine use. In addition, it will assess whether youth race is a modifier of the relationship between family dinner frequency and duration and the prevalence of youth risk behaviors and outcomes. Ultimately, this could set the stage for a larger scale study on this

relationship and if there is indeed a difference, what factors could be resulting in different outcomes for the population of interest. Further, this could illustrate how useful a public health tool family dinners are in preventing negative outcomes for youth. The results could be used to inform both families and public health leaders about the influence of the family dinner on youth risk behavior and the effect modification of racial identity on the relationship between family dinner frequency and duration and youth risk behaviors and outcomes, especially among African-American youth.

Gaps in the Literature

While literature exists on this topic, there are numerous limitations. First, there is limited information on the protectiveness of the family meal as it pertains to different racial backgrounds. Specifically, there has been a lack of research on the relationship between aspects of the family dinner and the prevalence of risk behaviors and outcomes among African-American youth. Second, many studies point to the protective benefit of family meal *frequency*, without addressing the other aspects of the family meal that may confer protective benefits such as duration. Methods for assessing these benefits include the administration of surveys on family dinners to participants followed by statistical analysis of survey results. Surveys address a greater range of topics such as feelings about mealtime, life perspectives, self-evaluation of family cohesiveness etc. It is proposed that these aspects are all associated with each other, however there has not been any deeper analysis on the role youth race plays in the relationship between family meal frequency and duration and youth risk behavior. While other aforementioned factors may contribute to behavioral outcomes for these youth, I seek to elucidate what role the family dinner frequency and duration may play. In order to address these gaps, this senior honors thesis seeks to: 1) Assess the relationship between family dinner frequency and duration and school

performance, obesity-related outcomes, and nicotine use; 2) Assess whether youth race is a modifier of the relationship between family dinner frequency and duration and the prevalence of youth risk behaviors and outcomes.

APPROACH

Data Source

I used data from the study, Understanding the Protective Mechanisms of Family Dinners: Psychometric Testing and Evaluation of the Family Dinner Index (FDI) developed by Dr. Margie Skeer, the principal investigator. The overarching goal is to assess the reliability and validity of the FDI using cognitive interviews and surveys administered to parents and children. The study design includes 15 cognitive interviews with parent-child dyads in order to make adjustments to the instrument followed by recruitment of 200 parent-child dyads to complete the parent and child versions of the FDI.

Participants (youth) filled out survey questions pertaining to different risk outcomes including, substance use, academic performance, and weight. This survey data is the data source for this thesis. The reliability and validity testing portion of the study, for which survey data was collected, is intended to evaluate the instrument's psychometric properties, and reduce each version of the FDI to the optimal length, create a scoring system for the measures. The survey data collection is intended to test the associations between family dinners and youth outcomes to establish criterion validity. However, data will be used for analytic purposes in this study.

Sample

The aim of the FDI study was to recruit a total of 200 parent-child dyads resulting in a total of 400 participants. However, for this study, only youth survey data was used and the 103 youth who had been recruited so far in the FDI study were used as the sample. I took part in the recruitment for this phase of the FDI study and was able to administer the survey to some of the participants. Participants were recruited from a range of settings such as the Floating Hospital for Children at Tufts Medical Center in Boston, schools, community centers, and other public settings. Participants were also recruited through online services such as Craigslist. Recruitment strata include diversity with respect to race/ethnicity, geographic location, child age, parental structure, and employment status. Inclusion criteria include parents who live with their children at least half of the time and it was required that children be between 8 and 16 years old.

Measures

Measures were obtained through self-report Qualtrics surveys. It was an online survey that participants could take on their cellphones, laptops, or any device capable of accessing the internet. There were three versions of the survey, for 8-12 years old youth, 13-16 year old youth, and parents. The 8-12 version contained 165 questions and the 13-16 version contained 170. The youth surveys begin with questions pertaining to participants' background information such as race, age, grade, and other languages. The following section contains questions about the participants eating behavior including family dinner frequency and duration. The survey continues with questions about the participant's family environment, how they handle situations, and risk behaviors such as tobacco use, alcohol, and marijuana.

Primary Dependent Variables

The primary outcomes of interest are assessed via a self-report survey on youth risk behavior and outcomes among children aged 8-16 as a function of family dinner duration and mean frequency. Specifically, the focus will be on three outcomes from the survey, academic performance, obesity, and nicotine use.

Academic performance is assessed in a self-report manner as participants answered the question: “What kind of grades do you get in school (most recently)?” Answer choices were on an ordinal scale which includes: Mostly A’s, A’s and B’s, Mostly B’s, B’s and C’s, Mostly C’s, C’s and D’s, Mostly D’s, D’s and F’s, and finally Mostly F’s. Participants are instructed to select one best answer for this survey question. The answers to the question were condensed such that those who selected “Mostly A’s or A’s and B’s” fall into the “A’s-B’s” category, those who selected “Mostly B’s” or “B’s and C’s” fall into the “B’s-C’s” category, those who selected “Mostly C’s” or “C’s and D’s” fall into the “C’s-D’s” category, and finally, those who selected “Mostly D’s” or “D’s and F’s” fall into “D’s-F’s” category.

Obesity, like academic performance was assessed in a self-report manner through one survey question. Although body mass index (BMI) is a common indicator of obesity, participant BMI was not calculated in the study due to height and weight not being recorded for every participant. However, participants are asked to answer the question: “How do you describe your weight?” Answer choices are on an ordinal scale including very underweight, slightly underweight, about the right weight, slightly overweight, and very underweight. As a result, this outcome cannot be operationalized as obesity, rather, it is a measure of being overweight due to the nature of the question participants were asked. However, as illustrated in the literature

review, overweight status is a precursor for obese status and its associated co-morbidities if behavioral patterns are left unchanged (P. J. Anderson et al., 2001). Its link to obesity status merits its investigation. The responses to the question were coded numerically such that 1 corresponds to “very underweight”, 2 corresponds to “slightly underweight” up to the number 5 which corresponds to very overweight.

Nicotine use was assessed through two survey questions: “Have you ever tried cigarette smoking, even one or two puffs?” This is a close-ended question and participants responded with either “yes” or “no” to this question. These answer choices were coded as 1 and 0 respectively. Vape use was also assessed through the question: “have you ever used an electronic vapor product?” and the participants choices were “yes”, “no”, or “not sure”. These answer choices were coded as the numbers 0, 1, and 2 respectively.

Primary Independent Variables

In addition, family dinner frequency and duration are the key variables. Family dinner frequency was assessed much like the other outcomes as participants are asked: “During a typical week during the school year, how many dinners do you eat with your parent?” Responses were on an ordinal scale ranging from 0 to 7 dinners a week. As for dinner duration, participants are asked: “About how many minutes do family dinners usually last (do not include the time it takes to make the meal or clean it up)?” Answer choices were 15 minutes or less, 30 minutes, 45 minutes, and an hour or more. Dinner duration was coded such that the number 15 corresponds with the response “15 minutes or less”, while 30 and 45 represent those exact dinner durations in minutes, and 60 corresponds to “an hour or more”. Dinner frequency was coded such that the reported number of dinners per week matched a numerical value 0-7.

Other Variables

For the purposes of this analysis, for the question “How would you describe your race?” participants who selected “Black or African American” were grouped into the African-American category and those who did not were grouped into the “non-African American” category which were then coded as “1” and “2” respectively. This was done with the thought that those who selected “Black or African American” on the survey are susceptible to experiential factors such as child grade, race, parental level of education, household income, and the experience of racism and discrimination, that covary on the basis of African American status.

IRB

I received IRB approval through the Tufts IRB to access the “Understanding the Protective Mechanisms of Family Dinners: Psychometric Testing and Evaluation of the Family Dinner Index” study on May 23, 2016. I was also granted access to this data by the Principal Investigator (Margie Skeer).

Analysis Plan

The survey data for 8-12 year olds and 13-16 year-olds was imported from the Qualtrics database in the form of a Microsoft excel spread sheet. A table including the demographic characteristics of the sample was generated using parental and child information from the survey database. The table includes data on the frequency of participants’ responses to survey questions pertaining to child age, grade, race, parental level of education, household income, mean number of dinners per week as well as family dinner duration. The data set was cleaned and organized such that only participants’ answers to questions pertinent to data analysis remained. A data dictionary was created in which all the questions and responses were defined as a single word or

number in the data set respectively. Answer choices to questions pertinent to the analysis were condensed and coded numerically.

Descriptive statistics including the minimum, maximum, mean, and participants' response count and percentages were calculated for all pertinent survey questions and arranged in a table in Microsoft excel. The response count data was used to conduct a univariate analysis of participant answers to questions pertaining to the variables of interest. The program being utilized for data analysis is R in conjunction with RStudio for Windows. The data sheet from excel was imported to RStudio where R coding software was used to generate the tables necessary for the chi-square calculation. This was followed by an analysis of the prevalence of the primary outcomes as a function of family dinner frequency through the creation of box plots in RStudio. This was followed with an analysis of the prevalence of the outcomes as a function of the four response choices for family dinner duration through the creation of stacked bar charts. The stacked bar charts and box plots revealed the need to further consolidate variables that had low counts in order to be able to carry out a Chi-Square test.

A chi-square test of independence was used because all of the variables being considered were categorical or if they were continuous, like dinner frequency, the data were collapsed into categories to allow for the chi-square test. In order to do so for the grades variable, those who received either Cs-Ds or Ds-Fs were grouped into a new category, "Cs-Fs". For the body weight variable, the categories were consolidated such that one could fall in the "underweight" category if they selected either very or slight underweight, if they selected about the right weight they remained in that group, and if they selected slightly or very overweight they were classified as overweight. For the dinner duration variable, those who selected "15 minutes or less" remained in the 15 category and the same was done for those selecting "30 minutes". However, those who

selected either “45 minutes” or “an hour or more” were grouped into the “45 minutes or more” category. Finally, dinner frequency was made into a categorical value by grouping responses as such that 1 represented those who has 0-2 dinners per week, 2 represented those who 3-5 dinners per week, and 3 represented those who 6-7 dinners per week. RStudio was used to assess how many participants had answered all of the questions pertinent to the analysis. Out of the 103 participants, 93 had answered all the relevant questions fully. As a result, only those 93 participants were used in the data analysis. Upon mapping out the level of variance of each outcome on the basis of family dinner frequency and duration, a chi-square test of independence was conducted to examine if the relation between dinner frequency and duration and body weight, grades, and nicotine use. The same chi-square test was carried out for those who were non-black and black in the sample to determine if there is a difference in this relationship on the basis of race. The resulting p-values were used to determine the likelihood of the risk outcomes and behaviors based on family dinner frequency and duration.

RESULTS

Table 1. Demographic characteristics of the sample. Data was obtained from both the 8-12 year old and 13-16 year old survey with the exception of parental education level and household income which were obtained from the parent survey (n=103 youth)

Characteristics	Total N (%)
Mean Age [SD] (min-max)	11.79 [2.] (8-16)
Child Grade	
1 st -6 th	41 (39.8%)

7th-12th 62 (60.2%)

Race/Ethnicity

American Indian or Alaskan Native 4 (3.9%)
Black or African American 58 (56.3%)
White 29 (28.2%)
Asian 1 (0.9%)
Other 11(10.7%)

Household Income (USD \$)

≤14,999 15 (14.6%)
15,000-49,999 28 (27.2 %)
≥50,000 35 (33.9%)
Not reported 12 (11.7%)

Parental Education

No high school degree 3 (2.9%)
High school degree 12 (11.7%)
GED 14 (13.6%)
Some college 19 (18.4%)
2 year degree 13 (12.6%)
4 year degree 15 (14.6%)
Masters level degree 12 (11.7%)
Doctorate level degree 1 (0.97%)
Not reported 2 (1.9%)

Vape Use

Yes 6 (5.8%)
No 89 (86.4%)

Not sure	1 (0.97%)
Not reported	7 (6.8%)

Cigarette Use

Yes	8 (7.8%)
No	90 (87.4%)
Not reported	5 (4.8%)

Body Weight

Very underweight	3 (2.9%)
Slightly underweight	8 (7.8%)
About the right weight	59 (57.3%)
Slightly overweight	29 (28.2%)
Very overweight	0
Not reported	4 (3.8%)

Grades

A's-B's	55 (53.4%)
B's-C's	38 (39.9%)
C's-D's	7 (6.8%)
D's-F's	2 (1.9%)
Not reported	1 (0.9%)

Family Dinners: Mean Number of Dinners/Week [SD] 4.16 [2.15]

Family Dinner Duration (minutes)

15 minutes or less	24 (23.3%)
30 minutes	52 (50.5%)
45 minutes	21(20.4%)

An hour or more

2 (1.9%)

Aim 1: To assess the relationship between family dinner frequency and duration and school performance, obesity-related outcomes, and nicotine use

Figure 4. Chi-Square Frequency Tables

Grades			
	A's-B's	B's-C's	C's-F's
Dinner Frequency			
0-2	16	6	0
3-5	21	18	5
6-7	15	11	1
Dinner Duration			
15 minutes or less	2	13	8
30 minutes	6	30	11
45 minutes or more	2	14	7

Body Weight			
	Underweight	About the right weight	Overweight
Dinner Frequency			
0-2	2	14	6
3-5	6	24	14
6-7	2	19	6
Dinner Duration			
15 minutes or less	2	13	8

30 minutes	6	30	11
45 minutes or more	2	14	7

Vape Use			
	Yes	No	Not Sure
Dinner Frequency			
0-2	3	18	1
3-5	1	43	0
6-7	1	26	0
Dinner Duration			
15 minutes or less	2	21	0
30 minutes	3	43	1
45 minutes or more	0	23	0

Cigarette Use		
	Yes	No
Dinner Frequency		
0-2	5	17
3-5	2	42
6-7	0	27
Dinner Duration		
15 minutes or less	3	20
30 minutes	4	43

45 minutes or more	0	23
--------------------	---	----

Table 2. Chi-Square P-values for each outcome as a function of dinner frequency and dinner duration significant p-values values (<.05) are bold

(n=93)

Outcome	Dinner Duration	Dinner Frequency
	p-value	p-value
Body Weight	0.8655	0.7462
Grades	0.4031	0.2112
Cigarette Use	0.2296	0.00653
Vape Use	0.5728	0.1173

The null hypothesis that the risk behaviors and outcomes are independent of family dinner frequency and duration among the entire sample has not been rejected with the exception of the relation between dinner frequency and cigarette use. The p-value indicates that increased family dinner frequency is associated with decreased cigarette use.

Aim 2: To assess whether youth race is a modifier of the relationship between family dinner frequency and duration and the prevalence of youth risk behaviors and outcomes.

Figure 5. Chi-Square Frequency tables comparing Black and Non-black frequencies

Grades						
	As-Bs		B's-Cs		C's-F's	
	Black	Non-Black	Black	Non-Black	Black	Non-Black
Dinner Frequency						
0-2	11	5	0	6	0	0

3-5	10	11	12	6	5	0
6-7	7	8	7	4	0	1
Dinner Duration						
15 minutes or less	10	4	3	4	2	0
30 minutes	12	17	7	9	2	0
45 minutes or more	6	3	9	3	1	1

Body Weight						
	Underweight		About the Right Weight		Overweight	
	Black	Non-Black	Black	Non-Black	Black	Non-Black
Dinner Frequency						
0-2	1	1	6	8	4	2
3-5	3	3	12	12	12	2
6-7	0	2	10	9	4	2
Dinner Duration						
15 minutes or less	2	0	7	6	6	2
30 minutes	2	4	12	18	7	4
45 minutes or more	0	2	9	5	7	0

Vape Use						
	Yes		No		Not Sure	
	Black	Non-Black	Black	Non-Black	Black	Non-Black
Dinner Frequency						
0-2	2	9	9	1	0	1
3-5	0	16	27	1	0	0
6-7	0	12	14	1	0	0
Dinner Duration						
15 minutes or less	1	1	14	7	0	0
30 minutes	1	2	20	23	0	1
45 minutes or more	0	0	16	7	0	0

Cigarette Use				
	Yes		No	
	Black	Non-Black	Black	Non-Black
Dinner Frequency				
0-2	1	4	10	7
3-5	0	2	27	15
6-7	0	0	14	13
Dinner Duration				
15 minutes or less	0	3	15	5
30 minutes	1	3	20	23

45 minutes or more	0	0	16	7
--------------------	---	---	----	---

Table 3. Chi-Square P-values for each outcome as a function of dinner frequency and dinner duration for those who are black versus those who are not black, significant p-values (<.05) are bold.

Outcome	Non-Black (n=41)		Black (n=52)	
	Dinner Duration	Dinner Frequency	Dinner Duration	Dinner Frequency
	p-value	p-value	p-value	p-value
Body Weight	0.4393	0.9688	0.6599	0.4959
Grades	0.2097	0.4669	0.333	0.003587
Cigarette	0.09312	0.03881	0.4712	0.1495
Vape	0.8306	0.5669	0.6034	0.02073

The null hypothesis that the outcomes are independent of dinner frequency and duration has been rejected for the relation between dinner frequency and cigarette use among non-blacks. The null hypothesis has also been rejected for the relation between dinner frequency and grades and vape use among blacks. The p-value for dinner frequency and cigarette use among non-blacks indicates that increased dinner frequency is associated with decreased cigarette use. Among black participants, the p-values indicate that increased dinner frequency is associated with higher grades and decreased vape use.

DISCUSSION

The results illustrate three key findings: (1) A high dinner frequency is related to a lower prevalence of cigarette use among youth in this sample. (2) dinner frequency is also related to higher grades and lower vape use among blacks, and (3) the outcomes appear to be independent of dinner duration for all sample types.

The finding related to dinner frequency and cigarette use is consistent with other findings in the literature. A systematic review on the effects of frequent family meals on psychosocial outcomes in adolescents and children found that frequent family meals were associated with better psychosocial outcomes (Harrison et al., 2015). A study on family meals and youth alcohol and tobacco consumption found that frequent family meals over a year were associated with reductions in alcohol and tobacco consumption among girls (White & Halliwell, 2011). Furthermore, the findings of another study on family meal frequency and youth high-risk behaviors including substance use revealed that the frequency of the family meal is a developmental asset and protective factor that may prevent such behaviors among youth (Fulkerson et al., 2006). Consistent with these studies, it was found that frequent family meals were inversely associated substance use and low grade point average (Harrison et al., 2015). Similarly, a study on the association between family dinner frequency and select problem behaviors among youth, including substance use, found that family meals are negatively associated with substance use (Sen, 2010). A similar study found that more frequent family meals were associated with a lower prevalence of specific health outcomes over time such as alcohol and tobacco consumption (Franko, Thompson, Affenito, Barton, & Striegel-Moore, 2008). A study by (Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004) came to a similar conclusion suggesting that frequent family meals was inversely associated with tobacco

use (Eisenberg et al., 2004). These findings are likely due to the type of interactions frequent family dinners confer between parents and youth. As (Skeer & Ballard, 2013) noted, daily interaction with children at meal time allows parents to discover any sudden abnormalities in their child's behavior, school performance, and attitudes which can be indicative of substance use or other risk behavior engagement (Skeer & Ballard, 2013).

Similarly, the findings related to dinner frequency's association with academic achievement and lower vape use for blacks were well supported in the literature, but not on the basis of race. A number of studies, such as the review by (Skeer & Ballard, 2013) explore the effect modification of gender on the relationship between meal frequency and youth risk behaviors. However, without the effect modification of race, it has been illustrated that a greater frequency of family meals is associated with lower odds of a low grade point average as well as cigarette use among youth (Eisenberg et al., 2004). Similarly, it has been found that frequent family meals is inversely associated with the commitment to learning among youth (Fulkerson et al., 2006). Finally, another study on the longitudinal associations between family meal patterns and youth substance use found that regular family meals may have a long-term protective association with the development of substance use, such as nicotine use. These findings are likely due to the role the family dinner serves as an augmentor of family connectedness, allowing for the teaching and learning of healthy behaviors (Harrison et al., 2015).

In contrast to the findings for dinner frequency, we were not able to find a protective effect for dinner duration unlike other studies (Skeer & Ballard, 2013) (Table 2,3). Similarly, a study on the sociodemographic characteristics associated meal frequency and duration found differences in meal duration by US nativity, race, and other demographics (Skeer et al., 2016). Although, differences in meal duration have been found, there are few studies that examine

youth risk behaviors as a function of meal duration. A larger scale study is necessary to truly assess the relationship between meal duration and youth risk behavior. It is likely this null finding is due to a variety of reasons including a small sample size, participants not answering the question, as well as the categorical nature of the survey response choices to the question on family dinner duration.

While these findings suggest that family dinners may serve as an important protective factor against various risk and outcomes among adolescents, particularly among African – American populations, it is important to consider barriers to engagement in family dinners particularly for African-Americans. For example, a study found that both parents’ and youths’ busy schedules are a common reason for less frequent family meals (Ritchie, Welk, Styne, Gerstein, & Crawford, 2005). In addition, it has been found that there is a disparity of family meal frequency across socioeconomic levels. According Neumark-Sztainer and others, lower socioeconomic status was found to be associated with lower family meal frequency (Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003). SES has been found to be associated with a considerable amount of negative outcomes, especially for African-Americans who are disproportionately burdened by lower SES in the United States. As found in the literature review, SES creates disparities in body weight, academic achievement, and cigarette and other drug use. It has also been found that food-insecure youth ate fewer family meals than those who were food-secure (Widome, Neumark-Sztainer, Hannan, Haines, & Story, 2009). Interestingly, from 1999-2010, there has been an observable decline in family meal frequency among youth from low SES and an increase frequency among youth from high and middle socioeconomic families (Neumark-Sztainer, Wall, Fulkerson, & Larson, 2013). Strategies to address this may include increasing public education on the possible benefits of family dinners as well as informing

people of what type of interactions dinner time can confer. For example, to reach families from a low SES, one could integrate the promotion of family dinners as a way to potentiate the parent-child relationship as well as child health into the healthcare delivered in community health centers that serve low income areas.

The effect of racism and discrimination on African-American youth must be considered when examining the effectiveness of interventions to improve youth health. Interventions in social policies and contexts can reduce racism and mitigate some of its pathogenic effects on minority youth and improve the health of stigmatized and racial and ethnic groups, which can in turn result in better outcomes for both parents and youth alike.

Overall, dinner frequency was found to be more related to risk outcomes and behaviors among youth than dinner duration. High dinner frequency was found to be significantly related to better grades and less vape use among African-Americans as well as cigarette use among non-African-Americans as well as the entire sample.

Limitations

We must acknowledge several limitations of this study. The data collection method for this study relied on self-report through survey questions in which youth participants could decline to answer a question if they felt necessary. As a result, participants with missing data were not utilized in the analysis leaving only 93 out of the original 103 available for use in data analysis. This could have a meaningful effect on the distribution of confounders as well as the level of variation among the outcomes of interest. Participants were administered questionnaires that required retrospective self-reports about prior risk behavior engagement. Such a data collection method is certainly susceptible to response bias, the tendency of participants to answer

questions in a misleading way due to a number of extrinsic and intrinsic factors. The accuracy of self-reports may be compromised because some risk behavior may be difficult to recall, while others may be so sensitive that participants do not want to report them. Further, youth may purposely underreport or overreport certain risk behaviors as a result of the belief that engaging in these behaviors is socially undesirable or desirable (Brener, Billy, & Grady, 2003). As a result, survey results should be interpreted while keeping likely biases in mind. Questionnaire format is also a possible reason for misreporting. Format problems such as survey content being unfamiliar to the participant, fatigue prior to or while they are responding to questions as the survey is over 150 questions, and poor recall of events that took place a long time ago.

In particular, self-reporting of nicotine use among youth is highly susceptible to underreporting because infrequent smoking episodes may make it difficult for them to describe their smoking pattern (Pokorski, Chen, & Bertholf, 1994). In addition, at such a young age, many may not define themselves as smokers (Pokorski et al., 1994). Situational factors that may result in underreporting of tobacco use include participant concerns with social desirability as well as a fear of punishment (Brener et al., 2003).

Academic achievement was also assessed through self-report methods. It has been found that self-reported grades are good reflections of actual grades for students with high ability with high grades (Kuncel, Credé, & Thomas, 2005). However, self-reported grades are much less likely to accurately represent the actual grades of students with lower levels of academic achievement (Kuncel et al., 2005). The accuracy of self-reported grades also appears to vary with minority status as it has been found that the accuracy of reported grades appeared to be lower on average than those of non-minority students (Kuncel et al., 2005). It has been found that participants could intentionally inflate their grades for two reasons: participants do not believe

what they were told by study administrators or they feel as though they would gain something by misreporting their grades such as pride or self-respect (Kuncel et al., 2005).

Generalizability or external validity of the sample is variable due to the demographic distribution of the sample. This is due to sample size and demographic variability. There is not a perfect representation of every race in the sample (Table 1) and, as a result, it is not highly generalizable to the population of large city. Due to the nature of the study, one can only infer associations but not causality. For example, on one hand, children who are concerned about weight status may be likely to avoid family dinners and, on the other hand, those who are already doing well in school could be more likely to eat dinners with their families. A moderator analysis was performed with youth race, specifically African American status, as a demographic moderator variable. As a result, it is possible that the observed effects are due to unexplored variables that are associated with African American status. Therefore, the true effect could be due to a number of other factors such as SES, parental education level, neighborhood placement, and level of perceived racism and discrimination as well as other experiential factors that covary on the basis of race.

Implications

More research is certainly needed in order to prove causality between family dinner frequency and duration and the risk outcomes and behaviors analyzed in the study. It should be noted that what fosters the association between family meals and youth risk behaviors remains relatively unknown. Continual research on the mechanisms by which family dinner frequency and duration affords youth protection against risk outcomes and behaviors is needed in order to clearly identify the practices that are protective against youth risk. In addition, research should

continue to explore the barriers that exist to having frequent family dinners, including those associated with SES and racism. However, there are not many risks associated with recommending that families make every effort to have family dinners often. Healthcare practitioners can play a large role in this effort by informing families of the potential effects of frequently having dinners together as a family. In addition, they should be sure to explore any obstacles that may hinder family dinners as well as develop potential strategies for their implementation.

At the societal level, racism and discrimination are still very much a part of the African-American youth experience in the United States. As a result, policies that seek to reduce institutional racism through improving neighborhood and educational quality as well as increase access to additional income, employment opportunities, and other necessary resources are capable of improving minority youth health. Youth health can also be improved through interventions capable of reducing levels of cultural racism at the individual level through addressing the values ingrained in such a culture. There are many possible levels intervention to address cultural racism such as the media and its associated images that may potentiate stereotypes, diversity training in medical care and other societal contexts, and increasing inter-group contact at the individual level (Williams & Mohammed, 2013b). The adverse consequences of racism on youth health can be mitigated through changes at the policy level that address social factors that influence and sustain risk behaviors. Further, racism is not a factor that easily controlled for in most studies, making the effect modification of youth race on the relationship between family dinners and youth risk behaviors a topic that merits further investigation.

ACKNOWLEDGEMENTS

Thesis Chair : Dr, Shalini Tendulkar, ScD

Thesis Reader: Dr, Margie Skeer, ScD , MPH, MS: Principal Investigator (FDI Study)

Analytic Support: Tania Alarcorn, Alexandra Kulinkina, and Andrea Acevedo

FDI Study Team: Kevin Hadar, Olohiere Ezomo, and Anna Strock

REFERENCES

Adolescence, I. of M. (US) and N. R. C. (US) C. on the S. of. (2011). *The Influence of Environment*. National Academies Press (US). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK53409/>

Anderson, A. R., & Henry, C. S. (1994). Family system characteristics and parental behaviors as predictors of adolescent substance use. *Adolescence*, 29(114), 405–420.

Anderson, P. J., Critchley, J. A., Chan, J. C., Cockram, C. S., Lee, Z. S., Thomas, G. N., & Tomlinson, B. (2001). Factor analysis of the metabolic syndrome: obesity vs insulin resistance as the central abnormality. *International Journal of Obesity and Related Metabolic Disorders: Journal of the International Association for the Study of Obesity*, 25(12), 1782–1788. <https://doi.org/10.1038/sj.ijo.0801837>

Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: self-regulation and proactive coping. *Psychological Bulletin*, 121(3), 417–436.

Barker, D. J. P., Osmond, C., Kajantie, E., & Eriksson, J. G. (2009). Growth and chronic disease: findings in the Helsinki Birth Cohort. *Annals of Human Biology*, 36(5), 445–458. <https://doi.org/10.1080/03014460902980295>

- Baumrind, D. (1967). Child care practices anteceding three patterns of preschool behavior. *Genetic Psychology Monographs*, 75(1), 43–88.
- Bearman, P. S., & Moody, J. (2004). Suicide and friendships among American adolescents. *American Journal of Public Health*, 94(1), 89–95.
- Benard, B. (1991). Fostering Resiliency in Kids: Protective Factors in the Family, School, and Community. Retrieved from <https://eric.ed.gov/?id=ED335781>
- Benkert, R., & Peters, R. M. (2005). African American Women's Coping with Health Care Prejudice. *Western Journal of Nursing Research*, 27(7), 863–889.
<https://doi.org/10.1177/0193945905278588>
- Berndt, T. J. (1999). Friends' influence on students' adjustment to school. *Educational Psychologist*, 34(1), 15–28.
- Biro, F. M., & Wien, M. (2010). Childhood obesity and adult morbidities. *The American Journal of Clinical Nutrition*, 91(5), 1499S–1505S. <https://doi.org/10.3945/ajcn.2010.28701B>
- Björntorp, P. (2001). Do stress reactions cause abdominal obesity and comorbidities? *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 2(2), 73–86.
- Blum, R W, Beuhring, T., Shew, M. L., Bearinger, L. H., Sieving, R. E., & Resnick, M. D. (2000). The effects of race/ethnicity, income, and family structure on adolescent risk behaviors. *American Journal of Public Health*, 90(12), 1879–1884.
- Blum, Robert W., & Ireland, M. (2004). Reducing risk, increasing protective factors: findings from the Caribbean Youth Health Survey. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 35(6), 493–500.
<https://doi.org/10.1016/j.jadohealth.2004.01.009>

- Borrell, L. N., Diez Roux, A. V., Jacobs, D. R., Shea, S., Jackson, S. A., Shrager, S., & Blumenthal, R. S. (2010). Perceived racial/ethnic discrimination, smoking and alcohol consumption in the Multi-Ethnic Study of Atherosclerosis (MESA). *Preventive Medicine, 51*(3–4), 307–312. <https://doi.org/10.1016/j.ypmed.2010.05.017>
- Borrell, L. N., Kiefe, C. I., Williams, D. R., Diez-Roux, A. V., & Gordon-Larsen, P. (2006). Self-reported health, perceived racial discrimination, and skin color in African Americans in the CARDIA study. *Social Science & Medicine (1982), 63*(6), 1415–1427. <https://doi.org/10.1016/j.socscimed.2006.04.008>
- Bowman, S. A., Gortmaker, S. L., Ebbeling, C. B., Pereira, M. A., & Ludwig, D. S. (2004). Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics, 113*(1 Pt 1), 112–118.
- Boyer, T. W. (2006). The development of risk-taking: A multi-perspective review. *Developmental Review, 26*(3), 291–345.
- Bradley, B. J., & Greene, A. C. (2013). Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 52*(5), 523–532. <https://doi.org/10.1016/j.jadohealth.2013.01.008>
- Brener, N. D., Billy, J. O. G., & Grady, W. R. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: evidence from the scientific literature. *Journal of Adolescent Health, 33*(6), 436–457. [https://doi.org/10.1016/S1054-139X\(03\)00052-1](https://doi.org/10.1016/S1054-139X(03)00052-1)

- Brondolo, E., Gallo, L. C., & Myers, H. F. (2009). Race, racism and health: disparities, mechanisms, and interventions. *Journal of Behavioral Medicine*, 32(1), 1.
<https://doi.org/10.1007/s10865-008-9190-3>
- Bronfenbrenner, U. (1994). Ecological models of human development. *Readings on the Development of Children*, 2, 37–43.
- Brown, T., Kelly, S., & Summerbell, C. (2007). Prevention of obesity: a review of interventions. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 8 Suppl 1, 127–130. <https://doi.org/10.1111/j.1467-789X.2007.00331.x>
- Buckner, J. C., Mezzacappa, E., & Beardslee, W. R. (2003). Characteristics of resilient youths living in poverty: the role of self-regulatory processes. *Development and Psychopathology*, 15(1), 139–162.
- Burdette, H. L., & Whitaker, R. C. (2004). Neighborhood playgrounds, fast food restaurants, and crime: relationships to overweight in low-income preschool children. *Preventive Medicine*, 38(1), 57–63.
- Bureau, U. C. (n.d.). Income and Poverty in the United States: 2015. Retrieved December 28, 2016, from <http://www.census.gov/data/tables/2016/demo/income-poverty/p60-256.html>
- CDC. (2016, June 9). Youth Risk Behaviors. Retrieved February 16, 2017, from <http://www.cdc.gov/features/yrbs/index.html>
- CDC | Physical Activity | Facts | Healthy Schools. (n.d.). Retrieved January 4, 2017, from <https://www.cdc.gov/healthyschools/physicalactivity/facts.htm>
- CDC - Fact Sheet - Youth and Tobacco Use - Smoking & Tobacco Use. (n.d.). Retrieved January 2, 2017, from

https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm

- Ceballo, R., & McLoyd, V. C. (2002). Social support and parenting in poor, dangerous neighborhoods. *Child Development, 73*(4), 1310–1321.
- Chambers, E. C., Tull, E. S., Fraser, H. S., Mutunhu, N. R., Sobers, N., & Niles, E. (2004). The relationship of internalized racism to body fat distribution and insulin resistance among African adolescent youth. *Journal of the National Medical Association, 96*(12), 1594–1598.
- Chang, F.-C., Lee, C.-M., Lai, H.-R., Chiang, J.-T., Lee, P.-H., & Chen, W.-J. (2006). Social influences and self-efficacy as predictors of youth smoking initiation and cessation: a 3-year longitudinal study of vocational high school students in Taiwan. *Addiction (Abingdon, England), 101*(11), 1645–1655. <https://doi.org/10.1111/j.1360-0443.2006.01607.x>
- Childhood Obesity Facts | Overweight & Obesity | CDC. (n.d.). Retrieved December 30, 2016, from <https://www.cdc.gov/obesity/data/childhood.html>
- Choi, Y., Harachi, T. W., Gillmore, M. R., & Catalano, R. F. (2006). Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *American Journal of Orthopsychiatry, 76*(1), 86–97. <https://doi.org/10.1037/0002-9432.76.1.86>
- Chung, W. K., & Leibel, R. L. (2008). Considerations regarding the genetics of obesity. *Obesity (Silver Spring, Md.), 16 Suppl 3*, S33-39. <https://doi.org/10.1038/oby.2008.514>
- Cohen, J. (1983). Commentary: The relationship between friendship selection and peer influence. *Friends in School, 163–174*.

- comments, G. L. (2014, December 22). Fewer than half of U.S. kids today live in a “traditional” family. Retrieved October 6, 2016, from <http://www.pewresearch.org/fact-tank/2014/12/22/less-than-half-of-u-s-kids-today-live-in-a-traditional-family/>
- Commissioner, O. of the. (n.d.). Peer Review of Scientific Information and Assessments - Completed Peer Reviews [WebContent]. Retrieved April 9, 2017, from <https://www.fda.gov/ScienceResearch/SpecialTopics/PeerReviewofScientificInformationandAssessments/ucm079120.htm>
- Cozier, Y. C., Yu, J., Coogan, P. F., Bethea, T. N., Rosenberg, L., & Palmer, J. R. (2014). Racism, Segregation, and Risk of Obesity in the Black Women’s Health Study. *American Journal of Epidemiology*, *179*(7), 875–883. <https://doi.org/10.1093/aje/kwu004>
- Croll, J., Neumark-Sztainer, D., Story, M., & Ireland, M. (2002). Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: relationship to gender and ethnicity. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *31*(2), 166–175.
- Data and Statistics | Health and Academics | Healthy Schools | CDC. (n.d.). Retrieved January 4, 2017, from https://www.cdc.gov/healthyschools/health_and_academics/data.htm
- Deshmukh-Taskar, P., Nicklas, T. A., Morales, M., Yang, S. J., Zakeri, I., & Berenson, G. S. (2006). Tracking of overweight status from childhood to young adulthood: the Bogalusa Heart Study. *European Journal of Clinical Nutrition*, *60*(1), 48–57. <https://doi.org/10.1038/sj.ejcn.1602266>
- Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: a conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, *1*(1), 61–75.

- Duncan, G. J., & Brooks-Gunn, J. (2000). Family poverty, welfare reform, and child development. *Child Development, 71*(1), 188–196.
- Eisenberg, M. E., Olson, R. E., Neumark-Sztainer, D., Story, M., & Bearinger, L. H. (2004). Correlations between family meals and psychosocial well-being among adolescents. *Archives of Pediatrics & Adolescent Medicine, 158*(8), 792–796.
<https://doi.org/10.1001/archpedi.158.8.792>
- Evans, A. E., Sanderson, M., Griffin, S. F., Reininger, B., Vincent, M. L., Parra-Medina, D., ... Taylor, D. (2004). An exploration of the relationship between youth assets and engagement in risky sexual behaviors. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 35*(5), 424.e21-30.
<https://doi.org/10.1016/j.jadohealth.2004.02.008>
- Fiese, B. H., Tomcho, T. J., Douglas, M., Josephs, K., Poltrock, S., & Baker, T. (2002). A review of 50 years of research on naturally occurring family routines and rituals: Cause for celebration? *Journal of Family Psychology, 16*(4), 381.
- Fox, C. K., Barr-Anderson, D., Neumark-Sztainer, D., & Wall, M. (2010). Physical activity and sports team participation: associations with academic outcomes in middle school and high school students. *The Journal of School Health, 80*(1), 31–37.
<https://doi.org/10.1111/j.1746-1561.2009.00454.x>
- Franko, D. L., Thompson, D., Affenito, S. G., Barton, B. A., & Striegel-Moore, R. H. (2008). What mediates the relationship between family meals and adolescent health issues. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association, 27*(2S), S109-117. [https://doi.org/10.1037/0278-6133.27.2\(Suppl.\).S109](https://doi.org/10.1037/0278-6133.27.2(Suppl.).S109)

- Fromme, K. (2006). Parenting and other influences on the alcohol use and emotional adjustment of children, adolescents, and emerging adults. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, 20(2), 138-139; discussion 140-142. <https://doi.org/10.1037/0893-164X.20.2.138>
- Fulkerson, J. A., Story, M., Mellin, A., Leffert, N., Neumark-Sztainer, D., & French, S. A. (2006). Family Dinner Meal Frequency and Adolescent Development: Relationships with Developmental Assets and High-Risk Behaviors. *Journal of Adolescent Health*, 39(3), 337–345. <https://doi.org/10.1016/j.jadohealth.2005.12.026>
- Galea, S., Ahern, J., & Vlahov, D. (2003). Contextual determinants of drug use risk behavior: A theoretic framework. *Journal of Urban Health*, 80(3), iii50-iii58. <https://doi.org/10.1093/jurban/jtg082>
- Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. *Developmental Psychology*, 41(4), 625–635. <https://doi.org/10.1037/0012-1649.41.4.625>
- General, U. S. P. H. S. O. of the S. (1998). Tobacco Use Among U.S. Racial/Ethnic Minority Groups - African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics: A Report of the Surgeon General [Official reports]. Retrieved April 9, 2017, from <https://profiles.nlm.nih.gov/nn/b/b/f/q>
- Georgiades, K., & Boyle, M. H. (2007). Adolescent tobacco and cannabis use: young adult outcomes from the Ontario Child Health Study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 48(7), 724–731. <https://doi.org/10.1111/j.1469-7610.2007.01740.x>

- Goldfarb, S. S., Tarver, W. L., Locher, J. L., Preskitt, J., & Sen, B. (2015). A systematic review of the association between family meals and adolescent risk outcomes. *Journal of Adolescence, 44*, 134–149. <https://doi.org/10.1016/j.adolescence.2015.07.008>
- Griffin, K. W., Botvin, G. J., Scheier, L. M., Diaz, T., & Miller, N. L. (2000). Parenting Practices as Predictors of Substance Use, Delinquency, and Aggression Among Urban Minority Youth: Moderating Effects of Family Structure and Gender. *Psychology of Addictive Behaviors : Journal of the Society of Psychologists in Addictive Behaviors, 14*(2), 174–184.
- Gutman, L. M., Sameroff, A. J., & Eccles, J. S. (2002). The Academic Achievement of African American Students During Early Adolescence: An Examination of Multiple Risk, Promotive, and Protective Factors. *American Journal of Community Psychology, 30*(3), 367–399. <https://doi.org/10.1023/A:1015389103911>
- Hanson, M. D., & Chen, E. (2007). Socioeconomic status and health behaviors in adolescence: a review of the literature. *Journal of Behavioral Medicine, 30*(3), 263–285. <https://doi.org/10.1007/s10865-007-9098-3>
- Harrison, M. E., Norris, M. L., Obeid, N., Fu, M., Weinstangel, H., & Sampson, M. (2015). Systematic review of the effects of family meal frequency on psychosocial outcomes in youth. *Canadian Family Physician, 61*(2), e96–e106.
- Hausmann, L. R., Jeong, K., Bost, J. E., & Ibrahim, S. A. (2008). Perceived discrimination in health care and use of preventive health services. *Journal of General Internal Medicine, 23*(10), 1679–1684.

- Health, C. O. on S. and. (n.d.). Smoking and Tobacco Use; Fact Sheet; Tobacco Industry Marketing. Retrieved April 9, 2017, from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/marketing/
- Health, N. C. for C. D. P. and H. P. (US) O. on S. and. (2012). *The Health Consequences of Tobacco Use Among Young People*. Centers for Disease Control and Prevention (US). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK99242/>
- Infant Mortality | Maternal and Infant Health | Reproductive Health | CDC. (n.d.). Retrieved May 2, 2017, from <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>
- Jackson, J. S., Knight, K. M., & Rafferty, J. A. (2010). Race and Unhealthy Behaviors: Chronic Stress, the HPA Axis, and Physical and Mental Health Disparities Over the Life Course. *American Journal of Public Health, 100*(5), 933–939. <https://doi.org/10.2105/AJPH.2008.143446>
- Jessor, R., Turbin, M. S., Costa, F. M., Dong, Q., Zhang, H., & Wang, C. (2003). Adolescent problem behavior in China and the United States: A cross-national study of psychosocial protective factors. *Journal of Research on Adolescence, 13*(3), 329–360.
- K-12, I. of M. (US) C. on C. S. H. P. in G., Allensworth, D., Lawson, E., Nicholson, L., & Wyche, J. (1997). *Evolution of School Health Programs*. National Academies Press (US). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK232693/>
- Kirchner, T. R., Villanti, A. C., Cantrell, J., Anesetti-Rothermel, A., Ganz, O., Conway, K. P., ... Abrams, D. B. (2015). Tobacco retail outlet advertising practices and proximity to schools, parks and public housing affect Synar underage sales violations in Washington,

DC. *Tobacco Control*, 24(e1), e52–e58. <https://doi.org/10.1136/tobaccocontrol-2013-051239>

Koster, A., Bosma, H., van Lenthe, F. J., Kempen, G. I. J. M., Mackenbach, J. P., & van Eijk, J. T. M. (2005). The role of psychosocial factors in explaining socio-economic differences in mobility decline in a chronically ill population: results from the GLOBE study. *Social Science & Medicine* (1982), 61(1), 123–132.

<https://doi.org/10.1016/j.socscimed.2004.11.045>

Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The Validity of Self-Reported Grade Point Averages, Class Ranks, and Test Scores: A Meta-Analysis and Review of the Literature. *Review of Educational Research*, 75(1), 63–82.

<https://doi.org/10.3102/00346543075001063>

Lakon, C. M., Wang, C., Butts, C. T., Jose, R., Timberlake, D. S., & Hipp, J. R. (2015). A Dynamic Model of Adolescent Friendship Networks, Parental Influences, and Smoking. *Journal of Youth and Adolescence*, 44(9), 1767–1786. <https://doi.org/10.1007/s10964-014-0187-7>

Marshall, S. J., Biddle, S. J. H., Gorely, T., Cameron, N., & Murdey, I. (2004). Relationships between media use, body fatness and physical activity in children and youth: A meta-analysis. *ResearchGate*, 28(10), 1238–46. <https://doi.org/10.1038/sj.ijo.0802706>

Mason, C. A., Cauce, A. M., Gonzales, N., & Hiraga, Y. (1994). Adolescent problem behavior: the effect of peers and the moderating role of father absence and the mother-child relationship. *American Journal of Community Psychology*, 22(6), 723–743.

Matthews, K. A., Katholi, C. R., McCreath, H., Whooley, M. A., Williams, D. R., Zhu, S., & Markovitz, J. H. (2004). Blood Pressure Reactivity to Psychological Stress Predicts

- Hypertension in the CARDIA Study. *Circulation*, 110(1), 74–78.
<https://doi.org/10.1161/01.CIR.0000133415.37578.E4>
- Maxwell, K. A. (2002). Friends: The role of peer influence across adolescent risk behaviors. *Journal of Youth and Adolescence*, 31(4), 267–277.
- McCarthy, W. J., Mistry, R., Lu, Y., Patel, M., Zheng, H., & Dietsch, B. (2009). Density of tobacco retailers near schools: effects on tobacco use among students. *American Journal of Public Health*, 99(11), 2006–2013. <https://doi.org/10.2105/AJPH.2008.145128>
- McConahy, K. L., Smiciklas-Wright, H., Mitchell, D. C., & Picciano, M. F. (2004). Portion size of common foods predicts energy intake among preschool-aged children. *Journal of the American Dietetic Association*, 104(6), 975–979.
<https://doi.org/10.1016/j.jada.2004.03.027>
- Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., ... Turner, M. B. (2015). Heart Disease and Stroke Statistics—2016 Update. *Circulation*, CIR.00000000000000350. <https://doi.org/10.1161/CIR.00000000000000350>
- Muennig, P., Lubetkin, E., Jia, H., & Franks, P. (2006). Gender and the Burden of Disease Attributable to Obesity. *American Journal of Public Health*, 96(9), 1662–1668.
<https://doi.org/10.2105/AJPH.2005.068874>
- Neblett, E. W., Philip, C. L., Cogburn, C. D., & Sellers, R. M. (2006). African American Adolescents' Discrimination Experiences and Academic Achievement: Racial Socialization as a Cultural Compensatory and Protective Factor. *Journal of Black Psychology*, 32(2), 199–218. <https://doi.org/10.1177/0095798406287072>
- Neumark-Sztainer, D., Hannan, P. J., Story, M., Croll, J., & Perry, C. (2003). Family meal patterns: associations with sociodemographic characteristics and improved dietary intake

- among adolescents. *Journal of the American Dietetic Association*, 103(3), 317–322.
<https://doi.org/10.1053/jada.2003.50048>
- Neumark-Sztainer, D., Wall, M., Fulkerson, J. A., & Larson, N. (2013). Changes in the frequency of family meals from 1999-2010 in the homes of adolescents: Trends by sociodemographic characteristics. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, 52(2), 201–206.
<https://doi.org/10.1016/j.jadohealth.2012.06.004>
- Newman, K., Harrison, L., Dashiff, C., & Davies, S. (2008). Relationships between parenting styles and risk behaviors in adolescent health: an integrative literature review. *Revista Latino-Americana De Enfermagem*, 16(1), 142–150.
- Oshio, A., Kaneko, H., Nagamine, S., & Nakaya, M. (2003). Construct validity of the Adolescent Resilience Scale. *Psychological Reports*, 93(3 Pt 2), 1217–1222.
<https://doi.org/10.2466/pr0.2003.93.3f.1217>
- Patock-Peckham, J. A., Cheong, J., Balhorn, M. E., & Nagoshi, C. T. (2001). A social learning perspective: a model of parenting styles, self-regulation, perceived drinking control, and alcohol use and problems. *Alcoholism, Clinical and Experimental Research*, 25(9), 1284–1292.
- Petersen, A. C., & Spiga, R. (1982). Adolescence and stress. *Handbook of Stress: Theoretical and Clinical Aspects*, 515–528.
- Pokorski, T. L., Chen, W. W., & Bertholf, R. L. (1994). Use of urine cotinine to validate smoking self-reports in U.S. Navy recruits. *Addictive Behaviors*, 19(4), 451–454.
- Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.

- Renehan, A. G., Tyson, M., Egger, M., Heller, R. F., & Zwahlen, M. (2008). Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. *Lancet (London, England)*, *371*(9612), 569–578.
[https://doi.org/10.1016/S0140-6736\(08\)60269-X](https://doi.org/10.1016/S0140-6736(08)60269-X)
- Rew, L., & Horner, S. D. (2003). Youth Resilience Framework for reducing health-risk behaviors in adolescents. *Journal of Pediatric Nursing*, *18*(6), 379–388.
- Ritchie, L. D., Welk, G., Styne, D., Gerstein, D. E., & Crawford, P. B. (2005). Family environment and pediatric overweight: what is a parent to do? *Journal of the American Dietetic Association*, *105*(5 Suppl 1), S70-79. <https://doi.org/10.1016/j.jada.2005.02.017>
- Rubin, K. H., Dwyer, K. M., Kim, A. H., Burgess, K. B., Booth-LaForce, C., & Rose-Krasnor, L. (2004). Attachment, Friendship, and Psychosocial Functioning in Early Adolescence. *The Journal of Early Adolescence*, *24*(4), 326–356.
<https://doi.org/10.1177/0272431604268530>
- Seidenberg, A. B., Caughey, R. W., Rees, V. W., & Connolly, G. N. (2010). Storefront cigarette advertising differs by community demographic profile. *American Journal of Health Promotion: AJHP*, *24*(6), e26-31. <https://doi.org/10.4278/ajhp.090618-QUAN-196>
- Sen, B. (2010). The relationship between frequency of family dinner and adolescent problem behaviors after adjusting for other family characteristics. *Journal of Adolescence*, *33*(1), 187–196. <https://doi.org/10.1016/j.adolescence.2009.03.011>
- Singh, T. (2016). Tobacco Use Among Middle and High School Students — United States, 2011–2015. *MMWR. Morbidity and Mortality Weekly Report*, *65*.
<https://doi.org/10.15585/mmwr.mm6514a1>

- Skeer, M. R., & Ballard, E. L. (2013). Are Family Meals as Good for Youth as We Think They Are? A Review of the Literature on Family Meals as They Pertain to Adolescent Risk Prevention. *Journal of Youth and Adolescence*, 42(7), 943–963.
<https://doi.org/10.1007/s10964-013-9963-z>
- Skeer, M. R., Yantsides, K. E., Eliasziw, M., Tracy, M. R., Carlton-Smith, A. R., & Spirito, A. (2016). Sociodemographic characteristics associated with frequency and duration of eating family meals: a cross-sectional analysis. *SpringerPlus*, 5(1).
<https://doi.org/10.1186/s40064-016-3739-3>
- Srinivasan, S. R., Myers, L., & Berenson, G. S. (2001). Rate of change in adiposity and its relationship to concomitant changes in cardiovascular risk variables among biracial (black-white) children and young adults: The Bogalusa Heart Study. *Metabolism: Clinical and Experimental*, 50(3), 299–305. <https://doi.org/10.1053/meta.2001.21019>
- Stattin, H., & Kerr, M. (2000). Parental monitoring: a reinterpretation. *Child Development*, 71(4), 1072–1085.
- Steinberg, L., Fletcher, A., & Darling, N. (1994). Parental monitoring and peer influences on adolescent substance use. *Pediatrics*, 93(6 Pt 2), 1060–1064.
- Steinberg, Laurence. (2008). A Social Neuroscience Perspective on Adolescent Risk-Taking. *Developmental Review : DR*, 28(1), 78–106. <https://doi.org/10.1016/j.dr.2007.08.002>
- Steinberg, Laurence, & Monahan, K. C. (2007). Age Differences in Resistance to Peer Influence. *Developmental Psychology*, 43(6), 1531–1543. <https://doi.org/10.1037/0012-1649.43.6.1531>
- Story, M., & Neumark-Sztainer, D. (2005). A perspective on family meals: do they matter? *Nutrition Today*, 40(6), 261–266.

- Szapocznik, J., & Coatsworth, J. D. (1999). An ecodevelopmental framework for organizing the influences on drug abuse: A developmental model of risk and protection. In M. D. Glantz & C. R. Hartel (Eds.), *Drug abuse: Origins & interventions*. (pp. 331–366). Washington: American Psychological Association. Retrieved from <http://content.apa.org/books/10341-014>
- Tendulkar, S. A., Buka, S., Dunn, E. C., Subramanian, S. v., & Koenen, K. C. (2010). A multilevel investigation of neighborhood effects on parental warmth. *Journal of Community Psychology, 38*(5), 557–573. <https://doi.org/10.1002/jcop.20381>
- The Importance of Family Dinners 2012 | CASAColumbia. (n.d.). Retrieved October 16, 2016, from <http://www.centeronaddiction.org/addiction-research/reports/importance-of-family-dinners-2012>
- Tymula, A., Rosenberg Belmaker, L. A., Roy, A. K., Ruderman, L., Manson, K., Glimcher, P. W., & Levy, I. (2012). Adolescents' risk-taking behavior is driven by tolerance to ambiguity. *Proceedings of the National Academy of Sciences of the United States of America, 109*(42), 17135–17140. <https://doi.org/10.1073/pnas.1207144109>
- U. S. Census Bureau, D. I. S. (n.d.). America's Families and Living Arrangements: 2016: Children (C table series). Retrieved December 28, 2016, from <http://www.census.gov/hhes/families/data/cps2016C.html>
- Vámosi, M., Heitmann, B. L., & Kyvik, K. O. (2010). The relation between an adverse psychological and social environment in childhood and the development of adult obesity: a systematic literature review. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity, 11*(3), 177–184. <https://doi.org/10.1111/j.1467-789X.2009.00645.x>

- Wallace, J. M., Bachman, J. G., O'Malley, P. M., Johnston, L. D., Schulenberg, J. E., & Cooper, S. M. (2002). Tobacco, alcohol, and illicit drug use: racial and ethnic differences among U.S. high school seniors, 1976-2000. *Public Health Reports (Washington, D.C.: 1974)*, *117 Suppl 1*, S67-75.
- Walton, K., Kleinman, K. P., Rifas-Shiman, S. L., Horton, N. J., Gillman, M. W., Field, A. E., ... Haines, J. (2016). Secular trends in family dinner frequency among adolescents. *BMC Research Notes*, *9*, 35. <https://doi.org/10.1186/s13104-016-1856-2>
- Wang, R.-H., Hsu, H.-Y., Lin, S.-Y., Cheng, C.-P., & Lee, S.-L. (2010). Risk behaviours among early adolescents: risk and protective factors. *Journal of Advanced Nursing*, *66*(2), 313–323. <https://doi.org/10.1111/j.1365-2648.2009.05159.x>
- Weir, L. A., Etelson, D., & Brand, D. A. (2006). Parents' perceptions of neighborhood safety and children's physical activity. *Preventive Medicine*, *43*(3), 212–217. <https://doi.org/10.1016/j.ypmed.2006.03.024>
- White, J., & Halliwell, E. (2011). Family Meal Frequency and Alcohol and Tobacco Use in Adolescence: Testing Reciprocal Effects. *The Journal of Early Adolescence*, *31*(5), 735–749. <https://doi.org/10.1177/0272431610373104>
- Widome, R., Neumark-Sztainer, D., Hannan, P. J., Haines, J., & Story, M. (2009). Eating when there is not enough to eat: eating behaviors and perceptions of food among food-insecure youths. *American Journal of Public Health*, *99*(5), 822–828. <https://doi.org/10.2105/AJPH.2008.139758>
- Williams, D. R., & Mohammed, S. A. (2013a). Racism and Health I: Pathways and Scientific Evidence. *The American Behavioral Scientist*, *57*(8). <https://doi.org/10.1177/0002764213487340>

Williams, D. R., & Mohammed, S. A. (2013b). Racism and Health II: A Needed Research Agenda for Effective Interventions. *The American Behavioral Scientist*, 57(8).

<https://doi.org/10.1177/0002764213487341>

Wilson, N., Syme, S. L., Boyce, W. T., Battistich, V. A., & Selvin, S. (2005). Adolescent alcohol, tobacco, and marijuana use: the influence of neighborhood disorder and hope. *American Journal of Health Promotion: AJHP*, 20(1), 11–19.

Yerger, V., & Malone, R. (2002). African American leadership groups: smoking with the enemy. *Tobacco Control*, 11(4), 336–345. <https://doi.org/10.1136/tc.11.4.336>