INDIVIDUAL PROTECTIVE FACTORS ASSOCIATED

WITH BULLYING VICTIMIZATION

by

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ABSTRACT

Bullying victimization is the most common type of violent victimization in high schools in the U.S. and may lead to psychological maladjustment and problematic behaviors in adolescence and in adulthood. Researchers have identified the characteristics of certain student populations as risk factors, such as being overweight, having sexual minority status, and being depressed. Most research has focused on protective factors that assist the bullied victim in coping with the trauma experienced, or it has focused on target hardening. What has been neglected is the role of individual protective factors that render the possible victim as a less attractive target, or a less "suitable target," using the terminology of routine activity theory. National survey data were analyzed for identifying individual characteristics that alter the vulnerability of a victim to an offender, such as the use of weapons, fighting behavior, academic achievement, sleep patterns, and team sports participation. The main predictors of being overweight, having sexual minority status, or being depressed, along with weapon-carrying and fighting behavior, had the strongest, positive effects on bullying victimization. Increasing levels of sleep had negative effects on victimization, and it moderated the main effects of both sexual minority and heterosexual statuses, decreasing the risk of victimization. None of the other proposed moderators had significant effects. Policies that promote longer sleep duration and lessen sleep latency for adolescents may be beneficial in managing the risk of bullying victimization.

I. INTRODUCTION

Bullying is associated with undesirable or problematic consequences for adolescents victimized by peers at school. The School Crime Supplement (SCS) of the National Crime Victimization Survey (NCVS) indicates that bullying victimization is the most prevalent form of victimization for students ages 12-18 (U.S. Department of Education, 2016; see also Zhang et al., 2016). In 2013, 22% of students in this age group reported that they had been bullied at school. Comparatively, the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey (YRBS) of 2015 indicated that 20.2% of high school students reported being bullied at school (CDC, 2016b; also, see Table 6).

The SCS further indicates what type of bullying the victims experienced, including verbal insults, being the subject of rumors, threatened with harm, and physical assaults. Those involving threats, assaults, or vandalism constituted 13.3 % of bullying victimizations. This percent is about twice larger than the next two types of violent victimization. The *Indicators of School Crime and Safety: 2015* report, compiled by Zhang et al. (2016), indicates that 8% of students (7.8% according to the YRBS) fought on school property, and 7% (6% according to the YRBS) were threatened or injured by a weapon on school property. Although bullying may take several forms, some of them are classified as assaults or vandalism and subject to legal sanctions.

Some of the consequences of violent victimizations for adolescents are carrying weapons on school grounds (5% according to the YRBS), which for some students is a means of self-protection, and avoiding school (i.e., truancy) due to fear of harassment or assault (5% according to the SCS and 6% by the YRBS). Sexual minority students

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constituted the largest group that was bullied (34.2% compared to 18.8% of heterosexual students) in the YRBS of 2015 (Kann et al., 2016), and students in a national survey identified sexual minority status as the second most common motivation for bullying, after one's appearance (Harris Interactive and GLSEN, 2005). Among other things, appearance pertains to being below or above normal weight parameters (Wang et al., 2010; Kaltiala-Heino et al., 2016). Another major population that suffers bullying is depressed adolescents (Kaltiala-Heino & Fröjd, 2011).

Psychological Consequences

Psychological symptoms, such as anxiety and social anxiety, have been linked to victimization and specifically to bullying victimization (Albdour & Krouse, 2014; Bond et al, 2001; Dryden-Edwards, 2015; Graham & Juvonen, 1998; Hawker & Boulton, 2000; Nishina et al., 2005; Turner et al., 2010; Vernberg et al., 1992), and Siegel et al. (2009) found that anxiety may lead to further victimization. Other psychological symptoms include dysphoria and depression (Albdour & Krouse, 2014; Craig, 1998; Ford et al., 2010; Hawker & Boulton, 2000; Henrich & Shahar, 2014; Sweeting et al., 2006; Tynes & Glang, 2009; Ybarra et al., 2015), with depression being linked to risky behaviors, such as substance abuse, violence, and racial discrimination (Albdour & Krouse, 2014). Lowered self-esteem and self-worth are other psychological symptoms that are associated with bullying victimization (Egan & Perry, 1998; Graham & Juvonen, 1998; Grills & Ollendick, 2002; Hawker & Boulton, 2000; Juvonen et al., 2000; Kochenderfer & Ladd, 1996; Ybarra et al., 2015), as well as unhappiness, loneliness, and self-blame (Arseneault et al., 2006; Gilmartin, 1987; Graham & Juvonen, 1998; Kochenderfer-Ladd & Wardrop, 2001; Nishina, et al., 2005; Vernberg et al., 1992).

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Fear of assault and other crimes have been linked to victimization and, specifically, to bullying victimization (Albdour & Krouse, 2014; Custers & van den Bulck, 2013; Ferraro, 1996; Ferraro & LaGrange, 1987; Haynie, 1998; LaGrange et al., 1992; May et al., 2010; Rountree, 1998; Warr, 1984; Warr & Stafford, 1983; Wilcox et al., 2006). Fear leads to avoidance and defensive behaviors, such as skipping school and carrying a weapon. Security cameras at school, as well as previous bullying victimization, may be associated with increased fear in school (Albdour & Krouse, 2014).

Behavioral Consequences

Problematic behaviors have been linked to victimization and bullying victimization, such as poor school performance as measured by absences, GPA, and disciplinary problems (Buhs et al., 2006; Feldman et al., 2014; Gastic, 2008; Juvonen et al., 2000; Kochenderfer & Ladd, 1996; Nishina et al., 2005; van der Werf, 2014), suicide, attempted suicide, and suicidal ideation (Bonanno & Hymel, 2010; De Nies et al., 2010; Hay et al., 2010; Kotz, 2010; LeVasseur et al., 2013; Luxton et al., 2012; Rigby & Slee, 1999; Roh et al., 2015; Sampasa-Kanyinga et al., 2014; Ybarra et al., 2015), substance abuse, difficulty concentrating, sleep disturbances (Azagba, 2016; Beauvais et al., 1996; Storch et al., 2003; Ttofi et al., 2016; Williams et al., 1996), delinquency, adult crime, carrying weapons (Hay et al., 2010; Sansone et al., 2013; Turner et al., 2016; Valdebenito et al., 2017), and school shootings (Espelage & Swearer, 2003). Bullying victimization has been linked to recurring victimization as well as poor outcomes in adulthood, such as smoking, homelessness, an inability or reticence for male victims to assume marriage and family roles (Bouffard & Koeppel, 2014; Gilmartin, 1987), and criminal activity (Menard, 2002; Widom, 2000). Victimization may lead to offending due to the stressors

of bullying victimization and the mediating effects of disturbed emotions (Agnew, 2005, 2006; Nishina et al., 2005).

In the present political climate of politicians and constituents who engage in bullying behaviors, there is some concern about these effects on adolescents' behavior as well as on adults (Miller, 2016; Natanson et al., 2020). Future SCS and YRBS data may indicate a trend toward increased bullying in school, due perhaps, in part, to the influence of political role models.

Purpose of the Study

The focus of the present research is bullying victimization in a school environment, and the potential, moderating effects of ascribed and achieved personal traits on selected outcomes. These moderating effects, or interactions, are conceptualized as protective factors, rendering some students less suitable for predation. The most common characteristics of victims that invite bullying are being of non-normal weight, sexual minority status, and depression. These characteristics have a main effect on bullying victimization, but their effects may depend on traits, such as the use of weapons, fighting behavior, academic achievement, sleep patterns during the school week, and sports involvement, attenuating the suitability of high school students as targets for predation. In the research literature, the variables of weapon-carrying and fighting behavior have been conceptualized by researchers as target hardeners (Felson, 1996; Hertz et al., 2015; Salmivalli et al., 1996; Simon et al., 1997; Valdebenito et al., 2017); however, academic achievement, sleep patterns, and team sports involvement may render targets less attractive or less suitable in other ways besides hardening.

The organization of this research will include a literature review of bullying behavior and victimization, and a review of routine activity theory and its relevance for understanding bullying. An examination of crucial concepts in routine activity theory may suggest applications to bullying events and how those concepts may explain bullying behavior. The methods used in the study will be explained, including the sources and limitations of the data, the measurement of certain concepts from the data, and an analysis of the data using statistical techniques, such as contingency tables and logistic regression. Several models are presented, with varying independent, moderating, and demographic variables.

II. LITERATURE REVIEW

Research on Bullying Victimization

The first research on bullying was conducted by Dan Olweus in Scandinavian schools in the early 1970s. In these studies, he was able to document the prevalence and characteristics of bullies and their victims. He identified bullying behavior as a subcategory of aggression, and physical bullying was conceptualized as a further subcategory (Figure 1). Olweus defined bullying based on his research findings (Olweus, 1993, 1999, 2013), and his definition has been mostly adopted by researchers, with few modifications (cf. Bradshaw et al., 2013; CDC, 2016b; Craig et al., 2000; Gladden et al., 2014; Smith & Morita, 1999; Swearer et al., 2010).
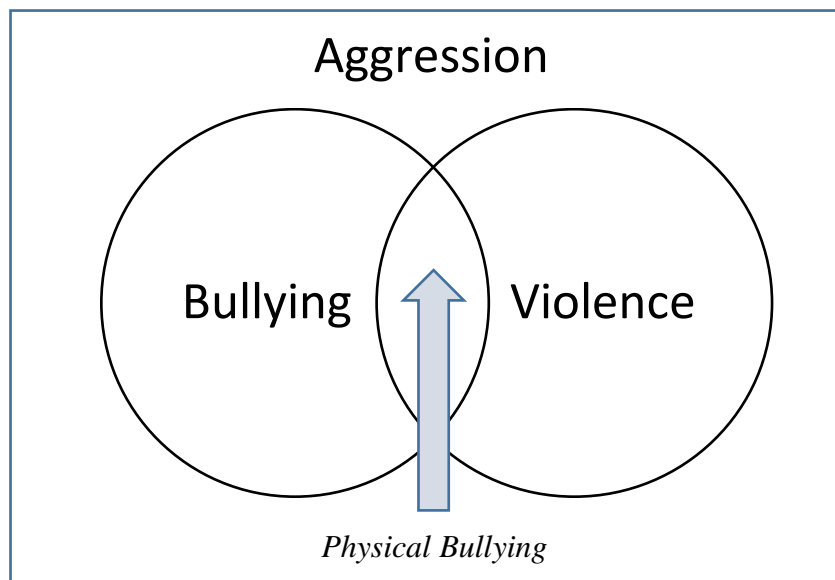
Figure 1. Subcategories of Aggression (adapted from Olweus, 1999)

According to Olweus (1993, 1999, 2013), bullying of students involves intentional, repeated, negative actions toward other students. These negative actions include physical attacks, verbal attacks, or gestures that are intended to inflict injury or discomfort to the victims. Bullying events also entail a strength or power imbalance, so that victims have difficulty defending themselves or warding off attacks, and these victims may be characterized as younger, weaker, or alone. In addition, most bullying events occur at school (see also Grant, 2004; Olweus, 1993; Schumann et al., 2014; Seals & Young, 2003; Smith & Morita, 1999; Wang et al., 2018), although the frequency of these events at school appear to decrease with the progression of grade level (Adams & Lawrence, 2011; Wang et al., 2009; Zhang et al., 2016).

In recent years, researchers began to study another type of bullying called "electronic bullying" or "cyberbullying" through the internet, emails, or text messages from cellphones. To distinguish it from the new type, researchers now refer to the original research on bullying as *traditional* bullying. Olweus (2013), however, does not view cyberbullying as a legitimate form of bullying, because certain aspects of the definition of bullying are missing. For example, traditional bullying implies a power imbalance, which is difficult to measure or justify for instances of electronic bullying (see also Vandebosch & Van Cleemput, 2008). In addition, traditional bullying is associated with the bully's popularity or status, a feature that may be absent in electronic bullying. In fact, electronic forms of bullying can be anonymous, wherein the bully is not identified or is hidden within a false identity. In traditional bullying, victims have a difficult time defending themselves against attacks, and this aspect is missing or modified in electronic attacks, such as the inherent, anonymous nature of electronic bullying and the ability of

victims to block unwanted texts. Last, and perhaps more importantly, bullying behavior

must be distinguished from other types of aggression. Exclusion of a power imbalance in

the definition eliminates the distinction of bullying behavior as separate from other forms

of aggression and may also render interventions less effective (Olweus, 2013). Due to the

issues conceptualizing cyberbullying as a legitimate type of bullying behavior, the

present research focuses on traditional bullying victimization.

The Bully

Researchers have identified several correlates of bullying, such as sex, relative

strength, size, or weight, psychological and social needs, personality, and patterns of

behavior. A description of these features will aid the reader in understanding what makes

victims attractive or a suitable target to the bully.

Sex. Bullies who engage in physical violence are usually boys rather than girls,

and the victims are usually boys as well (Björkqvist et al., 1992; Cairns et al., 1989;

Cillessen & Mayeux, 2004; Craig & Pepler, 1997; de Bruyn et al., 2010; Graham, 2016;

Jolliffe & Farrington, 2006; Juvonen et al., 2013; Kärnä et al., 2011; Lagerspetz et al.,

1988; Ojanen et al., 2005; Olweus, 1993; Smith & Morita, 1999; Wang et al., 2010). Due

to gender socialization, boys are less likely to use physical force on girls (Felson, 1996),

and this may explain, in part, why boys generally bully other boys instead of girls (Cairns

et al., 1989; Craig & Pepler, 1997; Karatzias et al., 2002; Seals & Young, 2003).

Girls generally aggress other girls by using indirect or relational means, such as

social ostracism, psychological and emotional attacks, and manipulation (Björkqvist et

al., 1992; Cillessen & Mayeux, 2004; Crick & Grotpeter, 1995; Lagerspetz et al., 1988;

Merten, 1997; Smith & Morita, 1999; Wang et al., 2010). Paradoxically, certain notions of masculinity underlie attacks on boys who display certain traits that are aligned with effeminacy, such as physical weakness and other features (Grant, 2004; Jordan, 1995; Phoenix et al., 2003; Rogoff & van Leer, 1993; Sandfort, 2005).

Relative strength, size, and weight. To a bully, an obvious characteristic of a possible victim would be lesser strength, size, and weight. Relative strength may also be surmised based upon visible musculature or certain body movements. Researchers have found significant correlations between weight, strength, and bullying behavior (Atlas & Pepler, 1998; Bradshaw et al., 2013; Craig & Pepler, 1997; Felson, 1996; Hodges & Perry, 1999; Olweus, 1993, 1999, 2013; Smith & Morita, 1999; Vaillancourt et al., 2003; Veldwijk et al., 2012; Wang et al., 2010; Wang et al., 2018). Some bullies are obese boys due to their greater physical dominance over other boys (Griffiths et al., 2006; Janssen et al., 2004; Kim et al., 2016). Olweus (1993) cautions, however, that greater physical strength does not necessarily correlate with bullying behavior, nor does less physical strength correlate with victimization. The combination of physical strength with an aggressive pattern of behavior renders a boy likely to become a bully (see also Atlas & Pepler, 1998); correspondingly, the combination of physical weakness with anxiety signals a vulnerability that the bully can exploit (Olweus, 1993).

Psychological and social needs. Researchers have understood bullies to have psychological needs for power and dominance. Supposedly, superiority is experienced when bullies successfully accost victims, especially if the victims are anxious, ineffective at resisting attack, or cry (Ojanen et al., 2005; Olweus, 1993; Salmivalli & Nieminen, 2002; Smith & Morita, 1999; Vaillancourt et al., 2003). Von Hentig (1948) recognized

that perpetrators used language that designated the victim as inferior, such as "easy mark," "chump," or "clown." This language denoting inferiority is also noted by researchers when bullies refer to their targets as "sissies," "wimps," or "gays," whether or not the targets are gay, in an effort to belittle the targets (Grant, 2004; Harris Interactive and GLSEN, 2005; Jordan, 1995; Phoenix et al., 2003; Poteat & Espelage, 2005; Poteat & Rivers, 2010; Swearer et al., 2008).

The needs of popularity and social status are gained and maintained by the bully's use of power and aggression over others. Juvonen et al. (2013) found associations between aggressive behavior, popularity, and social prominence in early adolescence, wherein boys gain and maintain social status by physical assaults (see also Juvonen & Graham, 2014, Olweus, 1993; Salmivalli & Nieminen, 2002; Sijtsema et al., 2009; Smith & Morita, 1999; Vaillancourt et al., 2003). Socially, bullies seek to be visible, influential, and admired. They especially desire social status, popularity, and prestige in their own peer support groups (Juvonen et al., 2013; Juvonen & Graham, 2014; Ojanen et al., 2005; Olweus, 1993; Parkhurst, 1998; Sijtsema et al., 2009; Smith & Morita, 1999). Bullying events usually involve an audience, whether they are bystanders or the bully's own support group. Researchers observe that when bystanders do not intervene, the bully is enabled not only to complete the assault, but also to continue harassment in the future (Craig & Pepler, 1997; Craig et al., 2000). Olweus (1993) observes that bullies usually have an audience that supports them in their behavior. Chein et al. (2011) found that the presence of peers increases risk taking, and brain studies indicate that adolescents have an increased sensitivity to the prospect of rewards when peers are present.

Personality. A number of researchers have identified features of antisocial personality disorder in bullies. Loeber (1982) noted that children who exhibit antisocial behavior are likely to persist in that behavior, and chronic delinquents tend to have been children with antisocial behaviors. Although overt antisocial acts decline with age, covert acts tend to increase. Bullies are described as having a positive view of violence, being impersonal in their calculations, having low empathy or exhibiting moral disengagement, and appearing to enjoy inflicting suffering on their victims (Boldizar et al. 1989; Craig & Pepler, 1997; Gini et al., 2007; Jolliffe & Farrington, 2006; Juvonen & Graham, 2014; Olweus, 1993; Pepler et al., 2008; Salmivalli & Nieminen, 2002). Juvonen and Graham (2014) added that bullies have an inflated view of themselves. For the bully, the rewards for aggression are important, and there is no concern about the damaging effects of their behaviors (Boldizar et al., 1989). Narcissism is also a significant predictor of aggression and violence. Narcissism may be defined as an unconscious sense of inadequacy, coupled with a conscious sense of superiority, and a pattern of aggression. Understandably, violence is stronger following a threat to one's ego (Lambe et al., 2018). Bullies tend to deflect responsibility, believing that victims need to change in order to accommodate them (Cranham & Carroll, 2003). In keeping with the purported antisocial personalities of bullies, Olweus (2011) found that bullies in school later became criminals at a higher rate (four times) than those who were not bullies.

An alternative and somewhat noble view of bullies is that they are guardians of the social order. In school, there is a need to belong to peer groups and to conform to social norms. In one study, bullies explained why they bully others: (1) the need for group status and (2) the need to have others conform to group norms (Burns et al., 2008).

Provocation by other children, whether perceived or real, motivates bullies to maintain group norms and their own social status (Burns et al., 2008). Accordingly, Davies (2011) does not interpret bullying behavior as pathological as much as misguided in one's attempt to defend a dominant moral order. He refers to bullies as "overzealous guardians," in that they believe their moral positions are right and certain. Although bullies may be perceived as popular by their peers in protecting the moral order, they are generally disliked by their peers (Forsberg & Thornberg, 2016).

Patterns of behavior. Bullies adopt particular strategies for gratification of their psychological and social needs. They strive for status with peers, and this is achieved by their use of power and aggression (Burns et al., 2008). The use of prejudicial language is also used to emphasize the bully's own heterosexuality and masculinity, as well as to enforce gender norms among boys who display feminine features (Grant, 2004; Harris Interactive and GLSEN, 2005; Herek, 2000a; Jordan, 1995; Phoenix et al., 2003; Poteat & Espelage, 2005; Poteat & Rivers, 2010; Swearer et al., 2008). This latter finding appears to be consonant with notions of guardians of the moral order as expressed by Burns et al. (2008) and Davies (2011).

Summary of bully characteristics. Typical characteristics of bullies pertain to sex, relative strength, size, or weight, psychological and social needs, personality, and patterns of behavior. Bullies who engage in physical violence or threats of violence, such as assault, are usually boys inflicting harm on other boys. Girls, however, tend to bully in relational ways, such as rejecting other girls from group membership and activities. Male bullies tend to be larger in size, strength, and weight than their victims. Some bullies, for example, are obese boys. Bullies appear to have psychological and social needs, such as

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yearnings for power, superiority, popularity, and social status, especially from their own peer support groups. Bullies seek to satisfy these needs by wielding power and aggression over others, primarily in the visible context of having an audience of some kind, composed of their peer support group and bystanders. Prejudicial language is used in order to denigrate or belittle the victim. Bullies appear to exhibit features of antisocial personality, but a minority view is that they assume the role of "guardians," although misguided, of a social or moral order.

The Victim

Researchers have identified several correlates of bullying victimization, such as relative strength, size, or weight, membership in marginal groups or categories, psychological problems, and social deficiencies.

Relative strength, size, and weight. Adolescents report that body size is a significant predictor of bullying predation (Harris Interactive and GLSEN, 2005). Less physical strength, especially with underweight males, is an obvious characteristic that a male bully would notice in others. Underweight adolescents are viewed as having less physical strength than those in other weight groups. Researchers have found significant correlations between relative weakness and bullying victimization (Felson, 1996; Hodges & Perry, 1999; Olweus, 1993; Olweus, 2013; Smith & Morita, 1999; Veldwijk et al., 2012; Wang et al., 2010; Wang et al., 2018). Although Olweus' research in the 1970s identified underweight individuals as prime targets for bullies, research generally has focused on overweight and obese adolescents, possibly due to societal stigmas attached to such individuals. In a recent examination of the relationship between weight and bullying

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victimization, Wang et al. (2018) admit that the association between bullying and being underweight has not been examined as extensively as being overweight or obese.

Researchers have found correlations between bullying victimization and obesity (Graham, 2016; Harris Interactive and GLSEN, 2005; Juvoven & Graham, 2014). Obesity may be defined as at or above the 95th percentile in weight, based on growth charts of individuals of the same age and sex (CDC, 2016b). Obese people may function more poorly in the U.S. due to prejudice and discrimination. For adolescents, weight stigma is pervasive. Because of this stigma, adolescents suffer from psychological as well as social and health issues, and negative stereotypes affect employment opportunities as well. Obese individuals are depicted as lazy, unmotivated, lacking in self-discipline, and less competent than average weight persons (Crandall & Schiffhauer, 1998; Puhl & Heuer, 2009; Puhl & Latner, 2007). For some males, obesity may also be viewed as a threat to their masculinity (McPhail, 2009; Monaghan & Malson, 2013).

The pervading stigma attached to obese individuals appears to be that they deviate from appearance ideals (Goffman, 1963/1974; Graham, 2016; Griffiths et al., 2006; Juvonen & Graham, 2014). Some researchers find that obese students are more likely to be bullied than students of normal weight or to experience obesity as a consequence of adolescent bullying victimization (Janssen et al., 2004; Jeong et al., 2016; Kim et al., 2016; Lee et al., 2018; Midei & Matthews, 2011; Rosenthal et al., 2015; Takizawa et al., 2015; Veldwijk et al., 2012). There are studies, however, that contradict these findings. Griffiths et al. (2006) found that obese boys were more likely to be bullies themselves than victims, primarily because they are physically dominant. In a South Korean study, Kim et al. (2016) found that overweight boys were as likely to be bullies as victims, and

obese boys, when they were victimized, were no more likely than boys in other weight groups to be bullied. Interestingly, they found no associations between bullying and body weight among girls. Janssen et al. (2004) did find significant associations for being bullied for overweight or obese adolescents, but not for 15-16 years old boys. More importantly, they found that obese boys were more likely to be bullies than boys of other weight categories. These findings are consistent with the concept of a relative power imbalance as identified by Olweus (1993, 1999, 2013).

Sexual minority status. Researchers have found correlations between bullying victimization and individual membership in marginal groups or categories that "stand out." In this category would be such things, besides non-normal weight or size, as delayed puberty, disability, being highly gifted students in regular schools, linguistic minority status, ugliness, not wearing fashionable clothes, and sexual minority status (Dixon et al., 2004; Espelage & Asidao, 2001; Graham, 2016; Juvonen & Graham, 2014).

Research has amply demonstrated associations between bullying and sexual minority status. Sexual minority students constituted the largest group of bullied victims in 2015 (Kann et al., 2016), and this type of victimization had been documented in previous years (Olsen et al., 2014). Some researchers use minority stress theory to explain health problems with minority individuals that stem from stigma, prejudice, and discrimination. Sexual minority students have a higher prevalence of physical and mental disorders than heterosexual students, and researchers theorize that stigma and discrimination in the form of minority stress create an environment that contributes to these problems. Members of the LGBT (Lesbian, Gay, Bisexual, and Transsexual) community suffer from higher rates of hypertension, flu, cancer, depression, anxiety,

panic attacks, self-harming tendencies, and victimization than heterosexuals (Cochran et al., 2003; Frost et al., 2015; Herek & McLemore, 2013; Meyer, 1995, 2003; Rivers, 2001; Sandfort, 2005). Stress events may include being attacked, recurring discrimination, expectations of rejection, and self-devaluation (Frost et al., 2015; Johns et al., 2018).

Herek and McLemore (2013) theorize that heterosexuals in general have a negative attitude toward non-heterosexuals due to internalizing cultural stigmas against that group. Heterosexual prejudice against sexual minorities is based on the power and status differentials between groups. Sexual stigma refers to attitudes that devalue non-heterosexuals, assess them as having inferior status, and take advantage of the relative powerlessness of their stigmatized group. Herek (2000a), however, found that heterosexual attitudes toward lesbians differ from that of gay men. For example, heterosexual men were more hostile than heterosexual women to gay men. When asked about their feelings toward gay men, heterosexual men became ostensibly defensive. It appeared to Herek (2000a) that the men's responses to interviews were designed to prove their own masculinity or heterosexuality by rejecting gay men. Predictably, questions posed to heterosexual men about lesbians did not trigger responses related to proving one's masculinity. Herek (2000a) concluded from his study that although heterosexual men tend to frame their attitudes about gay men in terms of sexual identity, heterosexual women usually frame them in terms of minority group status. Although the phenomenon described is expressed in the academic literature as "homophobia," Herek (2000b) recommends that this term be replaced by "sexual prejudice" for two reasons: (1) the term is neutral regarding the motivations underlying the negative assessment of sexual

minorities, and (2) the term aligns with the concept of prejudice already used in sociological and psychological studies.

Rivers (2001) found that although name-calling and public ridicule were common in bullying of sexual minorities, 60% of those in his study suffered physical attacks. Pizmony-Levy et al. (2008) found that a third of adolescents ages 11-18 suffered verbal and physical attacks. Most of them considered school a dangerous place and felt unsafe at school. Examples of name-calling included "dyke," "faggot," and "queer." In addition, boys who act too feminine or girls who act too masculine are subject to remarks, such as "you're gay" (Harris Interactive and GLSEN, 2005); therefore, perceived sexual identity is also a stimulus for bullying.

Actual or perceived minority sexual orientation is the most common stimulus for bullying behavior, according to a national survey of middle and high school students (Harris Interactive and GLSEN, 2005), although students usually know who the sexual minority students are. As reported by students, the primary stimuli for bullying attacks is appearance and sexual minority status, but the third most common stimulus is the bully's perception of how masculine or feminine a student is (Harris Interactive and GLSEN, 2005). Olsen et al. (2014) found that although bullying was associated with sexual minority status for both sexes, male students who were gay or bisexual had equal or significantly higher rates of victimization than females who were gay or bisexual.

An important, related concept to prejudice and discrimination directed at sexual minorities is that of masculinity. Masculinity is the celebration of heterosexuality as a norm, coupled with a disdain for homosexuals (Mahalik et al., 2003; Murgo et al., 2017; Parent & Moradi, 2011). Another related concept is effeminacy. Effeminacy is a concept

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reserved only for men who express certain female qualities, and it is considered the absence of masculinity (Sandfort, 2005), but as Rogoff and van Leer (1993) observe, most homosexual men are not effeminate. They conclude that the stigma attached to effeminacy pertains to branding certain individuals as sexual deviants. Although homosexual men are viewed as unmanly, effeminate men have their sexuality at least questioned (Grant, 2004). A popular way to advertise one's masculinity is to avoid certain female behaviors and to engage in competitive sports (Adams, 2005; Jordan, 1995; Rogoff & van Leer, 1993; Sandfort, 2005). The alternative position to being a male is being a female, yet the alternative to being a manly boy is to be a boy who behaves as a girl (Jordan, 1995).

Psychological and social issues. *The Diagnostic and Statistical Manual of Mental Disorders* (5th ed.), known also as the DSM-5 (American Psychiatric Association, 2013), provides criteria for assessing anxiety and depression among adolescents and adults. An anxiety disorder shares "features of excessive fear and anxiety and related behavioral disturbances" (American Psychiatric Association, 2013, p. 189). Fear and anxiety are related concepts in that fear pertains to a real or perceived threat, whereas anxiety anticipates such a threat. Although there are a number of distinct depressive disorders, depression may be defined as "the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function" (American Psychiatric Association, 2013, p. 155). Both anxiety and depression may be present among bullied victims.

Anxiety has been correlated with bullying victimization in the literature. Olweus (1993) and Craig and Pepler (1997) assert that a male victim of bullying would need to

have not only a relative weakness in physical strength, but also to experience a noticeable level of anxiety (see also Goldbaum et al., 2003; Hawker & Boulton, 2000; Nakamoto & Schwartz, 2010; Olweus, 1993). Victimized adolescents report anxiety and recurring medical problems with no organic causes (Craig & Pepler, 2003). This finding could pertain to the repeated nature of bullying predation (Olweus, 1993, 1999, 2013).

Researchers have also found correlations between depression and victimization (Hawker & Boulton, 2000; Nakamoto & Schwartz, 2010). Kochel et al. (2012) examined children from grades 4 through 6. Those who exhibited depression in Grade 4 were generally victimized in Grade 5 and had lower peer acceptance by Grade 6. Both von Hentig (1948) and Schafer (1968) interpreted this condition to be related to victimization, because depression renders one submissive and unable to resist predation. Depression is also linked with an inability to form friendships, which is a protective factor against victimization; conversely, not having friends is a risk factor (Goldbaum et al., 2003; Graham, 2016; Hodges et al., 1999; Pellegrini et al., 1999; Juvonen & Graham, 2014).

Summary of victim characteristics. Typical characteristics of victims pertain to relative strength, size, or weight, membership in marginal groups or categories, and psychological and social issues. Underweight males are targeted due to their inability to defend themselves against physical attacks or threats of attacks. Obese males and females may be targeted for not conforming to appearance ideals, but some obese males engage in bullying behavior due to their larger body mass and their inertia to neutralize resistance. Sexual minority students are another example of "things that stand out," and those students are the victims of most bullying events. There are differences in how males and females interpret sexual minorities. Males are concerned with notions of masculinity and

effeminacy, especially pertaining to other males, whereas females tend to think in terms of social minority status. There is a tendency for bullies to engage in name-calling, threats, or violence based on behaviors that they interpret as not conforming to sexual norms, regardless of the victims' actual sexual orientations. Students who exhibit features of anxiety or depression are victimized more often than those who do not exhibit such traits. An important consequence of anxiety or depression may be the absence of friendships. For the present study, overweight status, sexual minority, and depression will be the primary predictors of bullying victimization.

Routine Activity Theory

In this study, routine activity theory (Cohen & Felson, 1979) is used to help explain bullying victimization in U.S. high schools. As an opportunity theory, routine activity theory relies on features of the physical and social environment to predict opportunities for delinquency, crime, bullying behavior, and victimization. Routine activity theory was introduced in 1979 by Cohen and Felson. Their research stemmed from a desire to understand the paradoxical increases in violent and property crimes in the 1960s when various socioeconomic indicators were improving (high school graduations, unemployment, poverty, and family income). They reviewed data since World War II pertaining to the circumstances and location of crimes, the increases in portable goods, the compositions of households by age, schooling, employment, marital status, and the trends in human activities. They sought to explain crime by the routine activities of people as they go about their daily lives. These activities create opportunities for physical-contact crimes against persons and property by bringing together offenders

and targets at certain locations (Cohen & Felson, 1979). The greatest risk of violent victimization occurred in different routine activities (Lemieux & Felson, 2012).

Routine activity is the preferred theory to explain victimization in general and specifically to explain bullying victimization in schools. Owing perhaps to its focus on targets instead of offenders, routine activity has been the most popular theory used in victimology (Burgess et al., 2013; Daigle & Muftić, 2016; Rock, 2018). One of the reasons for the popularity of routine activity theory is its strong empirical support. A number of studies support the theory, such as those dealing with sexual assault and stalking (Cass, 2007; Fisher et al., 2010; Mustaine & Tewksbury, 1999), theft (Mustaine & Tewksbury, 1998), auto theft (Rice & Smith, 2002), cybercrime (Holt & Bossler, 2009; Leukfeldt & Yar, 2016), robbery (Groff, 2007), adolescent violence (Lauritsen et al., 1992), assault, burglary, and personal theft (Cohen et al., 1981; Garofalo & Clark, 1992; Reynald, 2009, 2010; Tewksbury & Mustaine, 2003; Tseloni et al., 2004; Wilcox et al., 2007), violent and property crimes on college campuses (Fisher et al., 1998), and homicide (Messner & Tardiff, 1985).

At minimum, crime occurs when three elements converge in time and space: a motivated offender, a suitable target, and the absence of a capable guardian (Cohen & Felson, 1979). Each of these concepts is defined in their seminal article. The inclination of someone to commit a crime finds expression in criminal activity when opportunities arise from routine activities. A person with such an inclination, however, might or might not commit a crime. The relation between routine activities and crime, therefore, is probabilistic, owing to the offender's rational decision-making and the sometimes random arrangements of offenders, targets, guardians, locations, and time.

Target suitability pertains to the value, visibility, accessibility, and inertia of the victim or property. Daily activities affect the visibility and accessibility of targets at different times and locations. The timing of work, school, and recreation bring people together who have different backgrounds and characteristics. This convergence of people and property in time and space is crucial in explaining crime rates. Inertia against an offender is understood as its weight, size, and security features. (Cohen & Felson, 1979).

Capable guardians include police or security officers, but Cohen and Felson (1979) believe that guardianship provided by ordinary people as they go about their routine activities had been overlooked by criminologists. The theorists were more interested in the times and locations wherein crime did not occur or was less frequent, when the presence of ordinary citizens appear to justify their roles as guardians.

Motivated Offenders

According to routine activity theory, offenders calculate whether to commit crime, based on the amount of effort expended, the prospects of reward, and the likelihood of detection (Felson, 1986/2014). Adolescents make choices based on external cues regarding the likelihood of success or failure (cf. Brantingham & Brantingham, 1981e; Newman, 1972). To a limited extent, an offender engages in a utilitarian calculus, considering both the anticipated pleasure and the anticipated pain that could result from an action. Most adolescents, however, only consider a limited number of pleasures and pains before deciding what to do (Cornish & Clarke, 1986/2014). They desire quick rewards and the avoidance of immediate pain, and they prefer "easy" targets. Offenders respond to environmental cues regarding targets and guardians (Felson, 2006; Felson & Eckert, 2019).

Targets and Guardians

Cohen et al. (1981) proposed and tested an opportunity model of predation, and the model contained elements of routine activity (target attractiveness and guardianship). They defined and identified five factors pertaining to an increased risk of victimization: exposure, proximity, guardianship, target attractiveness, and the constraints of certain crimes. "Exposure" entailed visibility and accessibility, and an increase in exposure or its frequency increased risk. "Proximity" pertained to the spatial distance between offender and target; the closer the distance between offender and target, the higher the risk. "Target attractiveness" was the material or symbolic desirability of persons or property, as well as the perceived inertia of the target, such as weight, size, the capability of persons to resist attacks, or the characteristics of property to resist removal. Regarding these "constraints" of certain crimes, easier (less constrained) crimes were more likely to occur.

Researchers who study bullying victimization have identified targets that may be aligned with routine activity theory. In their routine activities, motivated offenders seek out attractive or suitable targets who have difficulty resisting verbal taunting or assaults, such as members of marginal groups. As mentioned, sexual minority status (Kann et al., 2016; Olsen et al., 2014), non-normal weight status (Felson, 1996; Griffiths et al., 2006; Harris Interactive and GLSEN, 2005; Hodges & Perry, 1999; Janssen et al., 2004; Kim et al., 2016; Olweus, 1993; Olweus, 2013; Smith & Morita, 1999; Veldwijk et al., 2012; Wang et al., 2010; Wang et al., 2018), and depression (Hawker & Boulton, 2000; Nakamoto & Schwartz, 2010) are characteristics of marginal groups whose members are likely to suffer bullying victimization. Researchers have also identified a specific routine

activity with which adolescents must comply: mandatory school attendance. Schoolyards have been identified by researchers as the node for such victimization, as well as crime attractors and crime generators (Felson, 2006; Felson & Eckert, 2019).

Researchers have also identified, in theory or in research, the correlations between victimization and academic achievement, sleep patterns, and team sports participation. These variables, along with their possible interactions with being overweight, having sexual minority status, or being depressed, are examined in this study.

Target Hardening Versus Capable Guardianship

Target hardening and capable guardianship are sometimes equated by researchers. For example, Cohen et al. (1981) conceptualized guardianship as the effectiveness of people or security devices to resist victimization. The security devices included burglar alarms, locks, and barred windows. Admittedly, there were only some features of routine activity theory in the opportunity theory they were investigating. As mentioned, the concepts of exposure, proximity, and the constraints of certain crimes may provide more definitional aspects to the notion of target suitability (Cohen et al., 1981). The addition of security devices, however, does not develop the concept of guardianship in routine activity theory. In Cohen and Felson's (1979) original article, security devices were aligned with target suitability, not guardianship, and Hollis et al. (2013) understand security devices as contributing to target hardening.

Some confusion between target hardening and guardianship continued for some time in the research literature. Garofalo and Clark (1992) extended the guardianship role to dogs and alarm systems. Mustaine and Tewksbury (1998, p. 845) combined target

suitability with guardianship: "Clearly, this relationship [persons who own dogs] is in the expected direction and is supportive of routine activity theory claims that persons who have guardians are less suitable targets because they are better protected." Tewksbury and Mustaine (2003) treated self-protection behaviors, such as gun possession, as a measure of guardianship. Tseloni et al. (2004) separated guardians into two categories: social guardians and physical guardians. Physical guardians included security devices, such as locks, leaving homes lit, alarms, and dogs. Wilcox et al. (2007) used four categories of guardianship in their study: physical (target hardening), personal (home occupancy), social (neighbor surveillance or informal social control), and natural (design features that foster defensible space). Bennett (1991) defined guardianship as formal criminal justice practitioners, target-hardening devices, and informal social control. Fisher et al. (2010) defined physical guardianship as carrying a weapon or attending a prevention program. Gee and Cooc (2019) conceptualized guardianship as security guards, security devices, locker checks, student ID's, and a code of conduct. All of these researchers blurred the concepts of target suitability, official guardians, natural guardians, and physical guardians (Hollis et al., 2013; see also Hollis-Peel et al., 2011).

Capable Guardians

In 1986, Felson (1986/2014) recognized that a capable guardian should not be limited to police officers, because they are not usually present at crime events. Later, Felson (1995) elaborated the guardianship concept to include people who, by their presence, interfere with crime events. Guardians of certain spaces vary in their levels of responsibility. Friends may provide personal responsibility at certain locations. Teachers may assume assigned responsibility as employees of schools. (Felson, 1995). Brooks and

Cohen (2020) note that informal guardians in the form of social and peer support networks offer greater protection against bullying than formal guardians, such as physical security and police officers.

Hollis et al. (2013) note that guardianship does not necessarily involve an intent to guard. In their view, the primary guardians in routine activity are the people who, by their mere presence, thwart crime (see also Hollis-Peel et al., 2011). Accordingly, Felson (2006) focuses on the presence of people who prevent crime; he is interested in people who are not victimized. In a sense, guardians are best measured where crime does not occur. This is a continuation of the original perspective on capable guardianship (Cohen & Felson, 1979). Until Reynald's (2009, 2010) observations of guardians in the Netherlands, guardians were only measured by proxy (Garofalo & Clark, 1992; Stahura & Sloan, 1988; Wilcox et al., 2007).

For adolescents, capable guardians in the form of teachers, staff, and security personnel are in small numbers relative to the student body (Olweus, 1993), and opportunities are present during times away from classroom settings, such as hallways, pathways between buildings, recesses, and lunches. Felson and Eckert (2019) note that schoolyards are only partially supervised, and there are some school activities that are not directly supervised by adults. Buildings, other structures, and foliage may be designed in indefensible ways, providing shielding for predatory activities. School days last for several hours per day, and sometimes school activities extend into the evening hours.

Recent Exposition of Routine Activity Theory

The most recent presentations of routine activity theory are found in Felson's *Crime and Nature* (2006) and the sixth edition of Felson and Eckert's *Crime and Everyday Life* (2019). The following is a summary of pertinent points. There is a general sequence of events that leads to crime. The offender must find a place that is unsupervised and has a target. Some settings are called "crime attractors" because they attract offenders, and the target is already present when the offender arrives. After the offender experiences a number of successful ventures at a certain location, however, the setting becomes a "crime generator." Schoolyards may become crime attractors as well as generators.

Youths are dispersed away from home for purposes of school and recreation. Youths are 20 times more likely to suffer violent victimization while traveling to and from school compared to their risks at home, and they are twice as likely to be violently victimized at school than at home (Felson & Eckert, 2019; see also Jordan, 1995). In addition, the influence of peers to engage in risky situations may be greater than when peers are absent. Chein et al. (2011) found that teenagers engaged in risky, simulated driving tasks when friends were monitoring their behavior. The researchers concluded that this social context heightened the test subjects' sensitivity to potential rewards while disregarding safety protocols.

A suitable target is an object or person that is attractive to the offender, offering little or no resistance. The offender, however, must have access to the target. Most guardians are "natural," in that they are present in the routine activities of themselves and others. Offenders may also surmise that certain people will interfere with their plans,

such as friends and teachers. Most of these people serve as natural guardians (e.g., friends or sympathetic bystanders to the target). Just by being present, a guardian elicits a cue to the offender that there will be a witness to the event.

Felson and Eckert (2019) reason that the adolescent's evasion of supervision correlates with an increase in delinquent behavior. Although the highest levels of supervision are experienced at home and in the classroom, schoolyards are only partially supervised, and moving from one classroom or function to another may not be supervised at all. Assigned guardians are limited in their abilities to monitor activities, however, due to the ratio of guardians to their areas, their limited visual perception, and the timing of teaching or work schedules.

Routine Activity Theory and Bullying Victimization

Schoolyards as Nodes

Since the introduction of routine activity theory, Felson (1986/2014, 1995, 2006, 2019) later began to explain in general ways how adolescents became offenders and the general characteristics of their mindset and prowess (2006, 2019). Felson and Eckert (2019) note that some settings, such as schoolyards, attract offenders and crime (see also Grant, 2004; Jordan, 1995; Olweus, 1993). The destination nodes of schools become crime attractors as well as crime generators. The routine activities of schooling bring a large number of motivated offenders and possible victims into the same space and time, aligned with the presence or absence of capable guardians, and it is an appropriate model for explaining bullying victimization. Predatory crimes occur where the density of people is the greatest, with young, single individuals being especially targeted (Cohen & Felson,

1979; Rock, 2018; van Kesteren et al., 2014). Due to mandatory school attendance laws, children from diverse backgrounds, ethnicities, and ages are brought together in specific destination nodes, creating a density that can be exploited for opportunistic purposes by some students, and in that context students are unable to separate themselves from one another (Eder, 1985; Smith & Morita, 1999).

Rational Decision-Making in Routine Activity Theory

Although there is ample literature on bullies and their victims, the research on capable guardianship is modest (e.g., Arntfield, 2015; Bouchard et al., 2012; Cass, 2007; Cho, 2017; Cho et al., 2017; Fisher et al., 1998; Holt et al., 2016; McHugh & Howard, 2017; Näsi et al., 2017; Navarro & Jasinski, 2012; but see Hollis-Peel et al., 2011 and Hollis et al., 2013). A flowchart of the surface calculations involved in bullying predation is graphically displayed in Figure 2. In a school environment, motivated bullies and possible victims are present at the same location at the same time. Superficially, bullies may note features of their possible targets that are attractive or suitable. For

Motivated Bully

Possible Target
Overweight
Sexual Minority
Depression

Surface Vulnerability
of Target

Capable Guardian
Present

No Victimization
or Victimization

Capable Guardian
Absent

Victimization
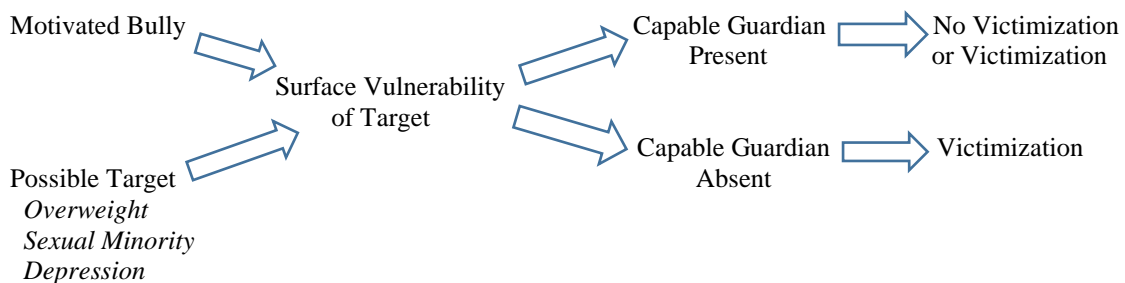
Figure 2. Simple Flowchart of Bullying Opportunities and Questionable Capable Guardians

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example, targets may be underweight or overweight, have a sexual minority status, behave in ways that do not appear to be appropriate for their apparent sexual role, or may appear anxious or depressed. The presence of capable guardianship in this scenario is uncertain. If the target were in the company of friends, the bully may decide not to attack the target, in keeping with the explanations provided in routine activity theory. Bullies may deem situations as too risky to be successful, and if the guardians were adults, they may fear detection and sanctions of some kind. Capable guardianship, however, must include a willingness to intervene (Reynald, 2009, 2010). Scholte et al. (2009) found that some victims of bullying tend to have no friends who are willing to intervene. Bullies apparently know which targets have the type of friends who might intervene in an encounter and then calculate a course of action accordingly.

In the absence of a *capable, willing-to-intervene* guardian, the motivated bully must assess elements of target hardening, such as the target's reputation as a fighter or as a weapon-carrier. In such a scenario, the motivated offender may be reluctant to engage the target. In the absence of a capable guardian, the absence of shielding devices (such as buildings, structures, or tall bushes), and the absence of target hardening features, the bully is more likely to accost the victim, feeling more confident in a successful venture. One should be aware, however, that the scenarios for successful bullying may be more complex than the flowchart graphed in Figure 2, for there may be support groups urging bullies to offend (Burns et al., 2008; Chein et al., 2011), or audiences that the bullies wish to impress (Collins, 2008), or both. In addition, there are other avenues of bullying that are less risky, such as name-calling or taunting, that bullies may exercise with less risk (Collins, 2008). One must recall, however, that about 13% of bullying events are

classified as violent encounters (U.S. Department of Education, 2016; Zhang, et al., 2016), indicating that bullies calculated neither the presence of target hardening nor capable guardianship into their decision-making.

Bullies in Routine Activity Theory

Within the context of the schoolyard, there are some qualities that may be mentioned regarding the bully, the target, and the capable guardian. Although different in several respects, both bullies and their targets are adolescents, subject to similar growth and life experiences, desires, and goals. The remarkable difference is the bullies' aggressiveness in order to satisfy their desires and goals (Olweus, 1993). Felson and Eckert (2019) understand that bullying behavior should be classified as a predatory crime. Predatory crimes are mostly impersonal, wherein the offender is self-centered. The offender as bully has no feelings for the victim, which is why the designation of "target" is preferred to "victim." Felson and Eckert's (2019) view is more consonant with notions of bullies who exhibit features of anti-social personality, rather than notions of "guardians of the moral order" (Boldizar et al., 1989; Craig & Pepler, 1997; Gini et al., 2007; Jolliffe & Farrington, 2006; Juvonen & Graham, 2014; Olweus, 1993; Pepler et al., 2008; Salmivalli & Nieminen, 2002). This view is also consistent with Felson and Eckert's (2019) imagery of offenders being on the prowl to find targets without guardians. Felson (2006) describes the bully as a parasite that flourishes over time by preying on its host, and he notes that such imagery depicts repeated victimizations, in keeping with Olweus' (1993, 1999, 2013) definition of bullying.

Targets in Routine Activity Theory

Targets may display certain behaviors that bullies may interpret as signaling their vulnerability. Felson and Eckert (2019) note that the primary target for any form of victimization is usually a single male who is alone. The father of modern victimology, von Hentig (1948), had theorized that crimes are directed at specific types of individuals. Olweus (1993) conjectured that victims signal to bullies that they are insecure, worthless, and will not defend themselves. Salmivalli and Isaacs (2005) posited that negative self-perceptions among certain adolescents signal vulnerability and submissiveness, and that they are easy targets. Gladden et al. (2014) related that a perpetrator perceives certain personal or situational characteristics that would limit a target's resistance. Collins, taking a "micro-sociological approach," views bullying events as "situational dramas," of the strong accepting attacking roles against the weak. Olweus (1993), who has studied bullying behavior extensively, portrayed the bully as searching for a target with certain characteristics. This notion, as mentioned, has also been expressed by Felson and Eckert (2019).

Boys acting effeminately and adolescents who are anxious or depressed have been mentioned as targets for bullies (Craig and Pepler, 1997; Grant, 2004; Hawker & Boulton, 2000; Kochel et al., 2012; Nakamoto & Schwartz, 2010; Olweus, 1993; Rogoff & van Leer, 1993; Sandfort, 2005; Schafer, 1968; von Hentig, 1948). Researchers have found certain features, however, that shield one from predation, including friendship, a perception that a weapon is being carried, and the notion that the target might effectively resist an attack, counterattack, or retaliate. Weapon-carrying and fighting may be

classified as interaction variables or moderators, and they will be discussed in that section.

Capable Guardianship in Routine Activity Theory

Natural guardians are those people who, by their mere presence, discourage a motivated offender from committing a crime (Felson, 1986/2014; Felson & Eckert, 2019; Hollis et al., 2013; Hollis-Peel et al., 2011). Usually, they are neither police officers nor official guardians of offenders, targets, or places. In the context of the schoolyard, guardians could be any adults who happen to be on the premises for certain routine activities, such as custodial staff, administrative assistants, teachers, or even visiting parents and other adults.

Guardians can also be other adolescents. Friends and bystanders may serve as guardians who intervene, but some adolescents encourage or participate in the bullying event if the bully is a friend. For the person being bullied, some friends may intervene or get help from teachers. If the victim is not a friend, however, bystanders are likely to ignore the event (Burns et al., 2008). Atlas and Pepler (1998) note that peers are present in the majority of bullying events, although they rarely intervene to stop bullying (see also Espelage & Asidao, 2001). Peers may be hesitant to intervene because they are not confident of teacher support or because of fear of being attacked themselves (Atlas & Pepler, 1998; Forsberg et al., 2018). Bystanders are more likely to intervene in cases of verbal bullying, although they are more likely to report the incident to a teacher when there is yelling and cursing. Friends of the victim are more likely to intervene than bystanders; bystanders are more likely to calculate whether they could successfully defend the victim (Forsberg et al., 2018).

Researchers note that as students advance in grade level, there is less adult supervision outside the classroom (American Association of University Women Educational Foundation, 2001; Atlas & Pepler, 1998; Craig et al., 2000; Swearer et al., 2010). Outside of the classroom, such as a hallway or outside of a building, is the most likely location for bullying activities to occur, due to a lack of adult supervision and the coupling of motivated bullies and suitable targets. Teachers are generally unaware of bullying events due to the covert nature of the events (Atlas & Pepler, 1998). In such an environment, a lack of capable guardianship fosters bullying behavior (Craig & Pepler, 1997; Craig et al., 2000; Swearer et al., 2010). Olweus (1993) found a negative correlation between adult "density" outside the classroom and bullying events.

Moderators

Most research regarding victims of aggression or violence examines the external support of family, friends, teachers, or counselors and how their support assists the victim cope with past trauma or difficulties. For example, the idea of resilience and the concepts of risk and protective factors have been expressed since the 1970s to describe a victim who can recover quickly from a crisis (e.g., see Masten & Garmezy, 1985). What has not been researched in regard to bullying victimization are the internal or individual protective features that are distinct from notions of resilience, but do modify, from the standpoint of routine activity theory, one's suitability or attractiveness as a target. This perspective has more relevance to events prior to victimization and to notions of self-esteem, although weapon-carrying and fighting behavior may be viewed as moderators due to their capacity to harden targets. In this study, certain variables are examined for their moderating effects on the primary predictors of overweight status, sexual minority,

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and depression. Specifically, variables such as weapon-carrying, fighting behavior, academic achievement, sleep patterns, and team sports participation are examined to determine if they reduce the likelihood of being bullied.

Weapons

Felson (1996) found that if a would-be victim wields or brandishes a weapon, then aggression is less likely. The physical size and strength of the aggressor is offset by the use of weapons on the part of the victim. Adolescent boys are more likely to bully other boys in violent encounters (Cairns et al., 1989; Craig & Pepler, 1997; Kärnä et al., 2011), yet boys are also more likely to carry weapons than girls (Simon et al., 1997). Carrying weapons to school has been associated for some groups with self-protection from bullying (Simon et al., 1997; Valdebenito et al., 2017), and the motivated bully may be aware of the target's tendency to carry a weapon. Hertz et al. (2015), however, found significant associations for weapon carrying and bullying for females, but not for males.

Fighting

Bullies are less likely to attack another if they expect a counterattack, successful resistance, or retaliation (Felson, 1996; Hertz et al., 2015; Salmivalli et al., 1996). This may relate to a target's reputation as a fighter or as one who retaliates, but, conversely, it may relate to fighting behavior that is a result of bullying and continues to trigger bullying behavior.

Academic Achievement

Researchers have found correlations between academic achievement and self-esteem, well-being, and popularity (e.g., see Dufner et al., 2015). Nakamoto and Schwartz (2010) also found significant, negative correlations between academic achievement and peer victimization for both sexes. There is considerable research linking academic performance or healthy lifestyles with positive self-regard or self-esteem (e.g., Baumeister et al., 2003; Çakar, & Tagay, 2017; Kiviruusu, et al., 2016; Lane et al., 2004; Zimmerman et al., 1997); therefore, this variable should be correlated with self-esteem.

Sleep Patterns

Researchers have found associations between good sleep and learning, mental health, daily functioning, improved attention, emotional regulation, and physical health (Bartel et al., 2015; Bartel et al., 2016; Paruthi et al., 2016). The consensus statement of the American Academy of Sleep Medicine recommends 8-10 hours of sleep for teenagers (Paruthi et al., 2016). Poor sleep, or sleeping less than the recommended number of hours per day, is associated with anxiety, depression, poor school performance, behavioral and learning problems, and suicidal tendencies (Fletcher et al., 2018; Owens et al., 2014; Park, 2020; Paruthi et al., 2016).

Team Sports Participation

Sports involvement provides team support and a sense of belonging. It is also associated with a sense of well-being and lower levels of anxiety and depression. Sports participation has the added features of increasing self-esteem, teaching tolerance, fostering self-improvement, and training in proactive coping skills (McMahon et al.,

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2017; Ruvalcaba et al., 2017), but it may also be related to one's physical prowess, such as physical abilities and bravery, regardless of one's body weight. Team sports participation may be considered a form of social inclusion, construed as a protective factor against victimization (see Schumann et al., 2014). Exercise, a corollary of sports participation, is related to improved mood, enjoyment, and achievement, and it is identified by researchers as a protective factor against depression (Carter et al., 2016; Damian et al., 2018; Owens et al., 2014). Bartel et al. (2015) found an association between exercise and good sleep.

Among adolescent boys, competitive sports participation has also been used to define masculinity or as a prescription for turning weak, "sissy boys" into "real boys" (Adams, 2005; Evans & Davies, 2000; Grant, 2004; Jordan, 1995). Sports are valued because they produce muscular, larger males, and those who avoid aggressive play are viewed as weak or effeminate (Grant, 2004). Conforming to gender expectations is stronger for boys than for girls (Jordan, 1995), and the dichotomy between the sexes is reinforced in schools and by adults and peer groups (Evans & Davies, 2000; Scott, 1981).

Summary of Moderators

Weapons, fighting, academic achievement, sleep patterns, and team sports participation may moderate the effects of being overweight, having sexual minority status, or being depressed. Weapon-carrying and fighting behavior have been identified as possible moderators, due to their purported target hardening capabilities. Carrying weapons is associated with violent victimization, although the context may determine the direction of the relationship, and fighting behavior may signal increased risks to a bully. Academic achievement is associated with decreased likelihood of victimization. Sleep

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patterns and sports participation are associated with mental and physical health and self-esteem. In Figure 2 (reproduced below), the outcome of victimization is problematic, owing to target vulnerability, the effects of an audience, or the willingness of a friend to intervene. With the addition of moderators, target vulnerability is altered, and this alteration, coupled with the presence of capable guardianship, changes the likelihood of victimization. Figure 3 shows the insulating or shielding effects of moderators and the effects of friends as capable guardians.

Motivated Bully

Possible Target
Overweight
Sexual Minority
Depression

Surface Vulnerability
of Target

Capable Guardian
Present

No Victimization
or Victimization

Capable Guardian
Absent

Victimization
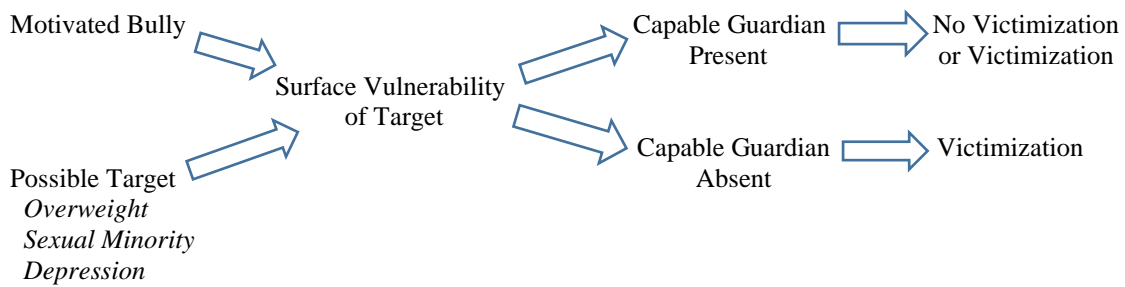
Figure 2 (Reproduced). Simple Flowchart of Bullying Opportunities and Questionable Capable Guardians

Motivated Bully

Possible Target
Overweight
Sexual Minority
Depression

Weapons
Fighting

Modified Vulnerability
of Target

Academics
Sleep
Sports

Capable Guardian
Present

No Victimization

Capable Guardian
Absent

Victimization
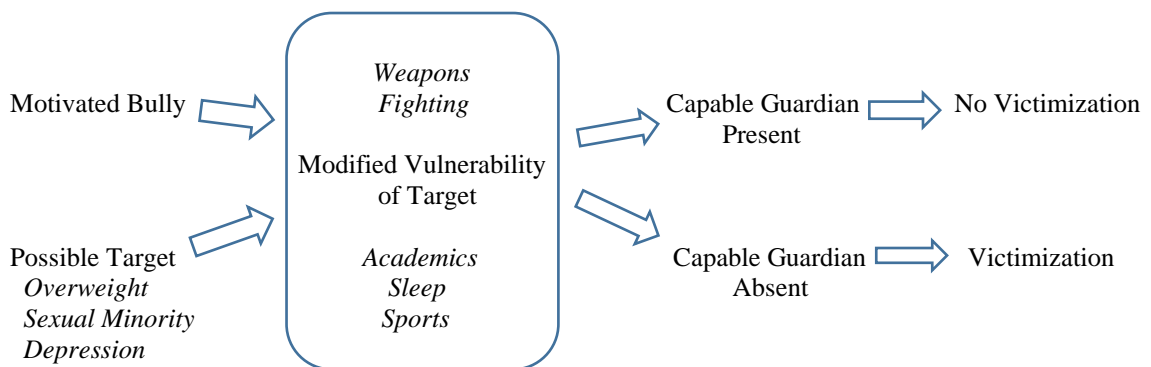
Figure 3. Flowchart of Bullying Opportunities With Moderators and Friends as Guardians

The diagram below (Figure 4) illustrates interaction between independent variables. Theoretically, being overweight, having sexual minority status, and being depressed will have main effects on bullying victimization, whereas weapons, fighting, academics, sleep, and sports will be examined for their interaction effects. For example, the main effect of having overweight status on bullying victimization may be positive,

Weapons
Fighting
Academics   Moderators
Sleep
Sports

Decreases the main effect

Overweight
Sexual Minority   Bullying victimization
Depression   Main effect
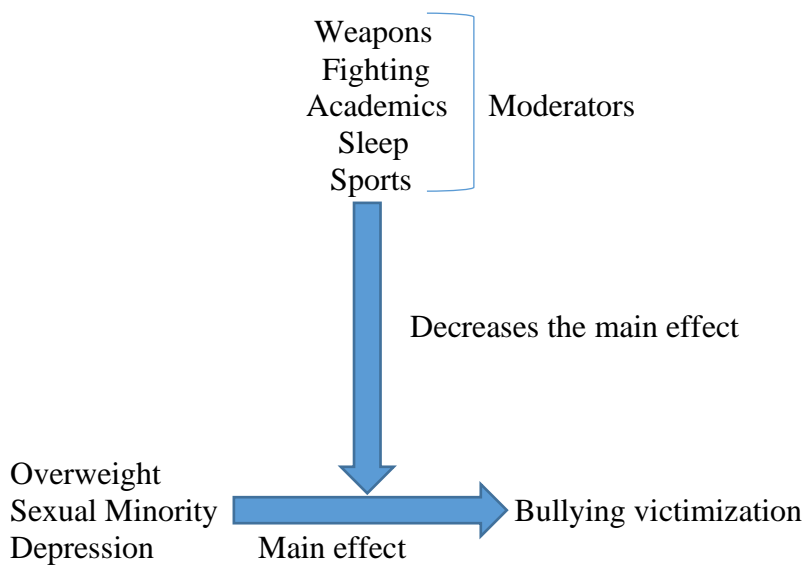
Figure 4. Interaction Effects

but the interaction effect of carrying a weapon may be negative, attenuating the main effect of being overweight. In this example, being overweight has a main effect on bullying victimization, but that effect depends on weapon-carrying. The same reasoning would apply to sexual minority status or depression, with each having a main effect on victimization, but their effects being dependent on the moderating effects of any of the five interaction variables (Figure 4).

Hypotheses

In this study, the primary predictors of bullying victimization are being overweight, having sexual minority status (measured as non-heterosexual), and being depressed. Each predictor will have a direct and significant effect on victimization. Friends provide capable guardianship, although this variable is not available for analysis. Demographic control variables include age, sex, and race (non-White versus White). Several models will be presented, based on the main effects, the control or demographic variables, and one moderating variable, each model having a different moderating variable. Moderators include weapon-carrying, fighting behavior, academic achievement, sleep patterns, and team sports participation. These moderators are viewed as providing an insulating or shielding effect on the vulnerable populations, rendering them less suitable or less attractive to bullying predation. Although weapons and fighting behaviors may be understood as target-hardening behaviors, the other moderators may provide cues or symbolic barriers to the bully that militate against victimization. Hypotheses 1-3 pertain to the main effects of being overweight, having sexual minority status, and being depressed. Hypotheses 4-18 pertain to all of these main effects and how they are changed through interaction with weapon-carrying, fighting behavior, academic achievement, sleep patterns, and team sports involvement.

Hypothesis 1: *There is an association between overweight and victimization, such that being overweight, compared to having normal weight, increases the odds of victimization.*

Hypothesis 2: *There is an association between sexual minority status and victimization, such that having a sexual minority status, compared to heterosexual status, increases the odds of victimization.*

Hypothesis 3: *There is an association between depression and victimization, such that being depressed, compared to not being depressed, increases the odds of victimization.*

Hypothesis 4: *There is an interaction between overweight and weapon-carrying. Being overweight has a main effect on victimization, but it depends on weapon-carrying. Weapon-carrying should reduce the main effect of being overweight.*

Hypothesis 5: *There is an interaction between overweight and fighting behavior. Being overweight has a main effect on victimization, but it depends on fighting behavior. Fighting behavior should reduce the main effect of being overweight.*

Hypothesis 6: *There is an interaction between overweight and academic achievement. Being overweight has a main effect on victimization, but it depends on academic achievement. Higher academic achievement should reduce the main effect of being overweight.*

Hypothesis 7: *There is an interaction between overweight and sleep patterns. Being overweight has a main effect on victimization, but it depends on sleep patterns. Sleep patterns entailing more hours of sleep should reduce the main effect of being overweight.*

Hypothesis 8: *There is an interaction between overweight and team sports involvement. Being overweight has a main effect on victimization, but it depends on team*

sports involvement. Team sports involvement should reduce the main effect of being overweight.

Hypothesis 9: *There is an interaction between sexual minority status and weapon-carrying. Sexual minority status has a main effect on victimization, but it depends on weapon-carrying. Weapon-carrying should reduce the main effect of sexual minority status.*

Hypothesis 10: *There is an interaction between sexual minority status and fighting behavior. Sexual minority status has a main effect on victimization, but it depends on fighting behavior. Fighting behavior should reduce the main effect of sexual minority status.*

Hypothesis 11: *There is an interaction between sexual minority status and academic achievement. Sexual minority status has a main effect on victimization, but it depends on academic achievement. Higher academic achievement should reduce the main effect of sexual minority status.*

Hypothesis 12: *There is an interaction between sexual minority status and sleep patterns. Sexual minority status has a main effect on victimization, but it depends on sleep patterns. Sleep patterns entailing more hours of sleep should reduce the main effect of sexual minority status.*

Hypothesis 13: *There is an interaction between sexual minority status and team sports involvement. Sexual minority status has a main effect on victimization, but it depends on team sports involvement. Team sports involvement should reduce the main effect of sexual minority status.*

Hypothesis 14: *There is an interaction between depression and weapon-carrying. Depression has a main effect on victimization, but it depends on weapon-carrying. Weapon-carrying should reduce the main effect of depression.*

Hypothesis 15: *There is an interaction between depression and fighting behavior. Depression has a main effect on victimization, but it depends on fighting behavior. Fighting behavior should reduce the main effect of depression.*

Hypothesis 16: *There is an interaction between depression and academic achievement. Depression has a main effect on victimization, but it depends on academic achievement. Higher academic achievement should reduce the main effect of depression.*

Hypothesis 17: *There is an interaction between depression and sleep patterns. Depression has a main effect on victimization, but it depends on sleep patterns. Sleep patterns entailing more hours of sleep should reduce the main effect of depression.*

Hypothesis 18: *There is an interaction between depression and team sports involvement. Depression has a main effect on victimization, but it depends on team sports involvement. Team sports involvement should reduce the main effect of depression.*

III. METHODS

Participants and Instrument

Since 1990, the Centers for Disease Control (CDC) has monitored health behaviors that contribute to injuries, death, drug use, and social problems among youth and adults in the US. Since 1991, the CDC has collected data for nearly five million high school students through some 2,000 surveys linked to the Youth Risk Behavior Surveillance System (YRBSS). A component of the YRBSS is the national Youth Risk Behavior Survey (YRBS) that collects data from a three-stage cluster sample. A total of 16 strata are linked to metropolitan statistical areas (MSA's), along with Black and Hispanic students. The largest Primary Sampling Units (PSU's), 54 of them in number, are classified as urban, the remaining ones classified as rural. The first stage includes the PSU's that consist of large counties and adjacent counties. The PSU's are then subdivided into smaller, sub-PSU's. High schools are assigned to these smaller PSU's (Brener et al., 2013).

The second stage is composed of schools that are selected from the PSU's. Most schools (whole schools) have all the grades 9-12; however, smaller grade sets in certain schools are combined to form "cluster schools." These cluster schools carry the same weight and importance as the "whole schools." Schools with at least 25 students in each grade are classified as large schools; those with less than 25 students per grade are classified as small schools. The third stage involves a random selection of one or two classes for all four grades. Since 1991, the national YRBS has been conducted every other year. Weights are applied to adjust for student non-response and oversampling of

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Black and Hispanic students. These estimates are representative of all high school students in the US who attend public and private schools (Brener et al., 2013).

High school adolescents in the United States (7,749 males, 7,757 females, M_{age} = 16.1 years, age range: 14-18) were surveyed in the YRBS in 2015. The YRBS collects data on risk-behaviors, alcohol, drug, and tobacco use, sexual behaviors that carry the risk of HIV infection or sexually transmitted diseases, and behaviors that could lead to injuries, inadequate diet, and inadequate exercise. Surveys are conducted every two years. The YRBS dataset is available without restriction from the Centers for Disease Control and Prevention website (CDC, 2016a). In 2015, students were asked 99 questions, most of them pertaining to health-risk factors.

Procedure and Measures

Version 14.2 of Stata SE is used to analyze data and to address design effects. The spost13 package provided by Long and Freese (2014) was also installed, containing a number of valuable commands. The CDC (2016c) recommends using the following to set up Stata commands for complex samples: svyset psu [pweight=weight], strata(stratum) vce(linearized) singleunit(centered). Logistic regression is used to estimate the probability of bullying victimization, because it is a binary measure. All variables are measured as ordinal or dichotomous (Table 1).

Table 1

Variables Used in the Study

Dependent	Independent Main Effects	Demographic or Control Effects	Moderating or Interacting Effects
Bullying Victimization[a]	Overweight[a] Sexual Minority[a] Depression[b]	Age[c] Sex[a] Race[d]	Weapons[a] Fighting[a] Academics[e] Sleep[f] Sports[a]

Note. Data derived from CDC, 2016a. [a]Dichotomous. [b]Additive scale with four levels. [c]Range of 14-18. [d]Dichotomous between non-White and White. [e]Range of 1 ("Mostly D's and F's") to 4 ("Mostly A's"). [f]Range of 4-10 hours on a school night.

Bullying Victimization

Bullying victimization is the dependent variable. The definition provided to students on the YRBS questionnaire (CDC, 2016d) incorporates certain aspects of Olweus' (1993, 1999, 2013) definition. For example, a preface to students answering the question on bullying victimization (Q24) is as follows: "**Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way.**" The student is then asked, "During the past 12 months, have you ever been bullied **on school property**?" The question on bullying victimization is dichotomous: a score of 1 indicates the presence of bullying victimization, whereas 0 indicates its absence.

Primary Predictors

The primary predictor variables are being overweight, having sexual minority status, and being depressed. Weights are only measured for students who answered the age (Q1), sex (Q2), height (Q6), and weight (Q7) questions. According to the CDC,

children of the same age and sex are considered overweight if their weight corresponds to the 85th percentile or more in body mass index (CDC, 2019). Normal weight corresponds at least to the 5th percentile but less than the 85th percentile (CDC, 2018). Overweight students are measured as an indicator variable, wherein non-overweight students are the reference group. Although underweight students (less than the 5th percentile in BMI) comprise a smaller part of the student sample, they are targeted for bullying victimization, according to the research literature (Felson, 1996; Hodges & Perry, 1999; Olweus, 1993; Olweus, 2013; Smith & Morita, 1999; Veldwijk et al., 2012; Wang et al., 2010; Wang et al., 2018). In the present study, however, only overweight status will be examined as a primary predictor of bullying victimization.

Sexual minority status is defined in this study as responses other than heterosexual to the following question (Q68): "Which of the following best describes you," with responses of heterosexual (straight), gay or lesbian, bisexual, or not sure. Sexual minority status will be measured dichotomously, scored as 1, whereas heterosexual status is scored as 0.

Depression is measured as an additive scale having four levels. The scale is based on three questions (Q26, Q27, and Q28) with yes/no responses, the lowest level indicating no depressive symptoms. For each of the three questions, a response of "yes" is scored as a 1 (the presence of the characteristic), and answering "no" is scored as a 0 (the absence of the characteristic). Depression scores will range from 0 to 3. The questions are as follows:

Q26: "During the past 12 months, did you ever feel so sad or hopeless almost every day for two **weeks or more in a row** that you stopped doing some usual activities?"

Q27: "During the past 12 months, did you ever **seriously** consider attempting suicide?"

Q28: "During the past 12 months, did you make a plan about how you would attempt suicide?"

The depression scale has a Kuder-Richardson 20 score of .76, which is acceptable for analytic purposes (Acock, 2016). One should note that the four different levels of depression do not imply more or less depression (e.g., euthymic, dysthymic, dysphoric, or clinical depression); rather, the scale simply assigns a numerical value of 1 to each symptom as expressed in questions Q26, Q27, and Q28. The absence of any of these symptoms is measured as Level 0 (no depression). Level 1 measures any one of the symptoms in Q26, Q27, and Q28. Level 2 measures any two of them, and Level 3 measures all three of them.

Demographic or Control Variables

Demographic control variables include age (Q1), sex (Q2), and race (RACEETH). The response categories for age in Q1 are as follows:

"A.   12 years old or younger

 B.   13 years old

 C.   14 years old

 D.   15 years old

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E.   16 years old

F.   17 years old

G.   18 years old or older."

Open-ended class intervals were closed to 14 years and 18 years, respectively. All categories are measured as ordinal for this study.

Sex (Q2) is measured dichotomously as male, scored as 1, with females scored as 0.

Race (RACEETH) is measured dichotomously as non-White, receiving a score of 1, for all categories other than White. White is measured as 0, the absence of the characteristic. The CDC's RACEETH variable applies numerical scores to a combination of questions Q4 ("Are you Hispanic or Latino?") and Q5 ("What is your race?"). Students were allowed multiple, non-numerical responses to Q5. Hispanic and Latino responses were included in the non-White category.

Moderating or Interacting Variables

Weapons. The weapon-carrying variable derives from question Q15: "During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club **on school property**?" The response categories are as follows:

"0 days

 1 day

 2 or 3 days

 4 or 5 days

6 or more days."

Weapons was originally quantified along several levels, but some of the levels were rare events or lacking in events ("sparse data," according to Osborne, 2015). For that reason, the variable was defined as an indicator variable, with scores of 0 and 1. This variable is measured dichotomously for this study, with carrying a weapon on any number of days being collapsed into a score of 1, and 0 days representing the reference group.

Fighting. The fighting variable derives from question Q20: "During the past 12 months, how many times were you in a physical fight **on school property**?" The response categories are as follows:

"0 times

1 time

2 or 3 times

4 or 5 times

6 or 7 times

8 or 9 times

10 or 11 times

12 or more times."

Fighting behavior, as with weapon-carrying, was originally quantified along several levels, but several of the levels were rare events or lacking in events. This variable, therefore, was defined as an indicator variable, with scores of 0 and 1. This variable is measured dichotomously for this study, with fighting for any number of times being collapsed into a score of 1, and 0 times representing the reference group.

Academic achievement. Academic achievement is measured ordinally from question Q97: "During the past 12 months, how would you describe your grades in school?" with "Mostly A's," "Mostly B's," "Mostly C's," "Mostly D's," "Mostly F's," "None of these grades," and "Not sure" as response categories. The latter two responses are excluded from analysis. "Mostly D's" and "Mostly F's" have been combined as a category due to sparse data (Osborne, 2015).

Sleep patterns. Amount of sleep is measured from question Q96: "On an average school night, how many hours of sleep do you get?" with responses as follows:

"A.   4 or less hours

  B.   5 hours

  C.   6 hours

  D.   7 hours

  E.   8 hours

  F.   9 hours

  G.   10 or more hours."

Open-ended class intervals were closed to 4 years and 10 hours, respectively. All categories are measured as ordinal for this study.

Team sports participation. Participation in team sports is measured dichotomously, with no participation in sports teams as the reference group, from question Q90: "During the past 12 months, on how many sports teams did you play?" The response categories are as follows:

"0 teams

1 team

2 teams

3 or more teams."

Any team sports participation was scored as a 1, and no sports participation as a 0 (the absence of the characteristic).

Models

Each of the three main predictors of bullying victimization, viz., overweight, sexual minority, and depression, are modeled in logistic regression using Stata SE (version 14.2), along with the control variables of age, sex, and race. Each of the presumed moderators is added to each model and replaced, one at a time, without the other moderators present, for a particular sub-model. This procedure should be sufficient to determine if interaction exists for any of the alleged moderators. Table 2 depicts the models for overweight, sexual minority, and depression.

Table 2

Models for the Study

Model	Model .1	Model .2	Model .3	Model .4	Model .5
O, SM, or D	O, SM, or D	O, SM, or D	O, SM, or D	O, SM, or D	O, SM, or D
Age	Age	Age	Age	Age	Age
Sex	Sex	Sex	Sex	Sex	Sex
Race	Race	Race	Race	Race	Race
	Weapons	Fighting	Academics	Sleep	Sports

Note. O = Overweight (Model 1); SM = Sexual Minority (Model 2);
D = Depression (Model 3)

Descriptive Statistics

Variable statistics are presented in Table 3. Zero-order correlations between all pairs of variables are presented in Tables 4 and 5. Of note, the variables of weapons and fighting have positive, significant correlations with bullying victimization. This would appear to question their alleged shielding effects, although they may interact with the main effect variables.

Weighted prevalences of variables are presented in Tables 6 and 7. Bullying victimization constitutes 20.2% of the sample. Although sexual minority status only constitutes 11.2% of the sample, researchers have found that such status identifies the largest group that is bullied (Kann et al., 2016; Harris Interactive and GLSEN, 2005). Regarding depression levels, the percentages decrease from no depression to Level 3 depression, except for the larger percentage at Level 3 than at Level 2 depression. Confidence intervals for all variables are provided so that one can calculate the goodness of the estimate. Larger confidence intervals are based on the sample size and provide the variation in the population. This range of variation captures the true estimate, and larger confidence intervals should be considered more cautiously than smaller ones. Confidence intervals also provide the limitations of the estimates. For example, victimization has a range of 2.84%. whereas those students who make "mostly C's" in academic achievement have a range of 5%. In this case, one has more confidence in the percentage of those bullied than in the percentage of those earning mostly C's (Table 6). The missing data for all variables has been corrected by the CDC through their weighting of variables (Zhang et al., 2016).

All of the correlations with being bullied (Table 4, column 1) are significant and weak, with the exception of sports participation, having neither significance nor strength, and depression, having a moderately strong, significant relationship with being bullied. Table 4 was too large for one page, and therefore Table 5 continued the correlation matrix for the remaining variables. Similarly, the descriptive statistics (Tables 6 and 7) were too large to be presented on one page, and, therefore, the remaining variables were presented on Table 7. The percentages of variables or variable levels (as in Depressed and Academics) inform the reader of their prevalences. In Tables 6 and 7, one notes that roughly 65% of the sample is considered not depressed, with levels of actual depression being relatively rare. The rarest characteristics of students were those who slept 10 hours on school nights (2%), carried weapons (4%), slept 9 hours on school nights (5%), earned D's and F's in academic achievement (5%), slept 4 hours on school nights (8%), and fought on school grounds (8%).

Based on CDC (2016b) guidelines, 30% of the students are considered overweight, a category that includes obesity (Table 6). The large majority of students (75%) receive A's and B's in academic work (Table 6). The largest category for sleep on school nights (30%) was 7 hours (Table 7). Nearly 58% of the students participated in team sports (Table 7).

Table 3

Variable Statistics

Variables	Observations	Missing	Mean	Std Dev	Min	Max
Bullied[a]	15,448	176	.1914	.3934	0	1
Overweight[a,b]	14,358	1,266	.3159	.4649	0	1
Sexual Minority[a,c]	14,703	921	.1190	.3237	0	1
Depression[d]	15,040	584	.6432	.9971	0	3
Weapons[a]	15,468	156	.0455	.2084	0	1
Fighting[a]	15,332	292	.0817	.2740	0	1
Academics[e]	14,160	1,464[f]	3.9837	.9262	1	4
Sleep[g]	14,534	1,090	6.6558	1.3815	4	10
Sports[a]	13,122	2,502	.5349	.4988	0	1
Age[h]	15,558	66	16.0508	1.2188	14	18
Male[a]	15,506	118	.4997	.5000	0	1
Non-White[a]	15,266	358	.5514	.4974	0	1

Note. Data derived from CDC, 2016a. Unless marked, all variables are measured ordinally. [a]Dichotomous. [b]BMI ≥ 85 & < 100. [c]Includes all responses that were not heterosexual. [d]Four levels, from 0 (no depression) to 3. [e]Ordinal from 1 (mostly F's & D's) to 4 (mostly A's) [f]Includes 609 responses such as "None of these grades" and "Not sure." [g]From 4-10 hours of sleep on a school night. [h]From 14-18 years of age.

Table 4

Pairwise Correlations for Variables (Partial Table A)

Measure	1	2	3	4	5	6	7	8
1. Bullied[a]	—							
2. Overweight[a]	.02**	—						
3. Sexual Minority[a]	.11***	.04***	—					
4. Depression	.31***	.03***	.26***	—				
5. Weapons[a]	.07***	.01	.06***	.11***	—			
6. Fighting[a]	.13***	.01	.07***	.12***	.22***	—		
7. Academics	-.05***	-.10***	-.06***	-.13***	.09***	-.14***	—	
8. Sleep	-.07***	-.02*	-.11***	-.21***	.04***	-.04***	.09***	—
9. Sports[a]	†	-.06***	-.12***	-.11***	†	.02*	.13***	.08***
10. Age[b]	-.08***	-.01	-.02*	-.01	.03**	-.06***	-.02**	-.11***
11. Male[a]	-.09***	.06***	-.13***	-.21***	.09***	.09***	-.15***	.07***
12. Non-White[a]	-.10***	.06***	.02*	.02*	.01	.06***	-.14***	-.05***

Note. Data derived from CDC, 2016a. Correlations for the remaining variables are found in Table 5. Variables are ordinal in measurement, unless noted. [a]Dichotomous. [b]Range of 14-18, with 12 and 13 year olds collapsed into 14 year olds.
*$p < .05$. **$p < .01$. ***$p < .001$. †Negligible and non-significant.

Table 5

Pairwise Correlations for Variables (Partial Table B)

Measure	9	10	11
9. Sports[a]	—		
10. Age[b]	-.07***	—	
11. Male[a]	.10***	.03***	—
12. Non-White[a]	-.08***	.02**	.01

Note. Data derived from CDC, 2016a. Correlations for the remaining variables are found in Table 4. Variables are ordinal in measurement, unless noted. [a]Dichotomous variable. [b]12 and 13 year olds collapsed into 14 year olds.

**p < .01. ***p < .0)1.

Table 6

Weighted Prevalences of Bullying Victimization, Overweight, Sexual Minority, Depression, Weapons, Fighting, and Academics Among U.S. High School Students in 2015

Subgroups	*n*	%	(95% CI[a])
Bullied[b]	3,121	20.19	(18.81-21.65)
Overweight[b]	4,318	29.94	(28.07-31.88)
Sexual Minority[b]	1,641	11.20	(9.89-12.67)
Depressed[c]			
Level 0[d]	9,712	64.59	(62.72-66.42)
Level 1	2,689	17.88	(16.71-19.12)
Level 2	1,258	8.37	(7.64-9.16)
Level 3	1,377	9.16	(8.13-10.30)
Weapons[e]	630	4.07	(3.53-4.69)
Fighting[f]	1,176	7.77	(6.75-8.93)
Academics[g]			
Mostly D's & F's	754	5.27	(4.36-6.34)
Mostly C's	2,811	19.62	(17.25-22.24)
Mostly B's	5,608	39.15	(36.18-42.21)
Mostly A's	5,150	35.96	(31.01-41.22)

Note. Data derived from CDC, 2016a. Missing cases excluded from analysis. [a]Confidence interval. [b]Dichotomous variable. [c]Additive depression scale based on questions Q26, Q27, & Q28 (CDC, 2016a, 2016d). [d]No depression at lowest level. [e]Over past month. [f]Over past year. [g]Categories of "None of these grades" and "Not sure" were excluded from analysis.

Table 7

Weighted Prevalences of Sleep, Sports, Age, Sex, and Race Among U.S. High School
Students in 2015

Subgroups	n	%	(95% CI[a])
Sleep[b]			
4 hours[c]	1,121	7.53	(6.52-8.69)
5 hours	1,876	12.60	(11.46-13.84)
6 hours	3,403	22.86	(21.48-24.30)
7 hours	4,423	29.71	(28.44-31.01)
8 hours	3,070	20.62	(19.01-22.33)
9 hours	746	5.01	(4.38-5.72)
10 hours[c]	249	1.67	(1.41-1.99)
Sports[d]	8,311	57.63	(54.03-61.14)
Age			
14[c]	1,603	10.30	(8.91-11.88)
15	4,063	26.11	(24.99-27.26)
16	3,904	25.09	(23.62-26.61)
17	3,686	23.69	(22.58-24.83)
18[c]	2,306	14.82	(13.36-16.40)
Male[d]	7,955	51.30	(48.00-54.59)
Non-White[d]	6,964	45.52	(40.12-51.02)

Note. Data derived from CDC, 2016a. Missing cases excluded from analysis. [a]Confidence
interval. [b]Average amount of sleep on school night. [c]Open-ended class interval in YRBS
of 2015 (CDC, 2016d) was closed for analysis. [d]Dichotomous variable.

IV. ANALYSIS

Contingency Tables and Partial Tables

A preliminary descriptive analysis of the effects of the primary, indicator variables (overweight and sexual minority status) on bullying victimization depends on the use of separate contingency tables, along with their respective probabilities, simple odds, and odds ratios. Crosstabulations were not attempted for levels of depression, academics, and sleep, due to the inability to compute odds ratios. Additionally, the proffered, indicator moderators (weapons, fighting, and sports) will be controlled for overweight and sexual minority status in partial tables to identify changes in the odds of experiencing victimization.

Overweight Students

The effects of being overweight are displayed in Table 8. The odds of overweight students being victimized is 1.12 times the odds of victimization for not overweight students. In terms of probabilities, 22% of overweight students were victimized, compared to the 20% of non-overweight students, and the difference is consistent with Hypothesis 1 ($p = .0245$).

In all of the overweight contingency tables (Tables 8, 8A, 8B, 9A, 9B, 10A, and 10B), the odds ratios are calculated by dividing the conditional odds of overweight by the conditional odds of not overweight (the excluded group's conditional odds). This procedure is followed for all contingency tables, including those for sexual minority status (Tables 11, 11A, 11B, 12A, 12B, 13A, and 13B).

The findings for overweight students, with controls for weapons, are shown in Tables 8A and 8B. The odds of bullying victimization for overweight students who carried weapons to school were lower than the odds of bullying victimization for overweight students who did not carry weapons (odds ratios .91 vs. 1.14), and lower than the original odds ratio of 1.12. The differences in victimization in Table 8A were significant ($p = .0119$), whereas the differences in Table 8B were not ($p = .6319$). These findings indicate that weapons have a modifying effect on the odds of bullying victimization for overweight students, in accordance with Hypothesis 4, but the findings are significant only for the "no weapons" group.

The findings for overweight students, with controls for fighting, are shown in Tables 9A and 9B. The odds of bullying victimization for overweight students who fought were considerably less than the odds bullying victimization for those who did not fight (odds ratios .80 vs. 1.14). This finding indicates a modifying effect of fighting on the odds of bullying victimization for overweight students, in accordance with Hypothesis 5, but the findings are significant only for the "no fighting" group. For those overweight students who did not fight, their odds ratio (1.14) was slightly higher than the original odds ratio of 1.12.

Table 8

Overweight Students by Bullying Victimization, Weighted

Overweight	Bullied No (0)	Bullied Yes (1)	Total	Conditional probabilities	Conditional Odds	OR
Yes (1)	3,347	929	4,277	.2172	.2775	1.1248
No (0)	8,030	1,981	10,011	.1979	.2467[a]	
Total	11,377	2,910	14,288	.2037		

Note. Design-based $F(1, 41) = 5.4502$, $p = .0245$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

A. Controlling for No Weapons

Overweight	Bullied No (0)	Bullied Yes (1)	Total	Conditional probabilities	Conditional Odds	OR
Yes (1)	3,193	871	4,064	.2143	.2728	1.1386
No (0)	7,735	1,854	9,589	.1933	.2396[a]	
Total	10,928	2,725	13,653	.1996		

Note. Design-based $F(1, 41) = 6.9346$, $p = .0119$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Weapons

Overweight	Bullied No (0)	Bullied Yes (1)	Total	Conditional probabilities	Conditional Odds	OR
Yes (1)	137	54	190	.2842	.3970	.9110
No (0)	241	105	346	.3035	.4358[a]	
Total	378	158	536	.2948		

Note. Design-based $F(1, 38) = .2333$, $p = .6319$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Table 9

Overweight Students by Bullying Victimization, Weighted

A. Controlling for No Fighting

Overweight	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	3,051	790	3,841	.2057	.2590	1.1410
No (0)	7,404	1,681	9,085	.1850	.2270[a]	
Total	10,455	2,471	12,926	.1912		

Note. Design-based $F(1, 40) = 5.4774$, $p = .0243$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Fighting

Overweight	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	231	108	339	.3186	.4676	.8021
No (0)	410	239	649	.3683	.5830[a]	
Total	641	347	988	.3512		

Note. Design-based $F(1, 39) = 1.1718$, $p = .2857$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Tables 10A and 10B display the findings for overweight, bullied students, with controls for participation in team sports. The odds of bullying victimization for those who participated in team sports are less than the odds bullying victimization for those who did not participate (odds ratios 1.00 vs. 1.24). This finding indicates a modifying effect of participation in team sports on the odds of victimization for the overweight students, in accordance with Hypothesis 8. However, only the findings for the "no sports" group were significant, despite the higher odds ratio, than the original odds ratio of 1.12.

Table 10

Overweight Students by Bullying Victimization, Weighted

A. Controlling for No Sports

	Bullied			Conditional	Conditional	
Overweight	No (0)	Yes (1)	Total	probabilities	Odds	OR
Yes (1)	1,443	426	1,870	.2278	.2950	1.2405
No (0)	2,894	688	3,582	.1921	.2378[a]	
Total	4,337	1,114	5,452	.2043		

Note. Design-based $F(1, 39) = 6.7955$, $p = .0129$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Sports

	Bullied			Conditional	Conditional	
Overweight	No (0)	Yes (1)	Total	probabilities	Odds	OR
Yes (1)	1,694	435	2,130	.2042	.2566	.9965
No (0)	4,488	1,156	5,644	.2048	.2575[a]	
Total	6,183	1,591	7,773	.2047		

Note. Design-based $F(1, 39) = .0009$, $p = .9761$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Sexual Minority Students

The effects of sexual minority students on bullying victimization are displayed in Table 11. The odds of sexual minority students being victimized are about twice the odds of heterosexual students being victimized. The conditional probability of bullying victimization is 32% for sexual minority students, compared to 19% for heterosexual students. This finding is consistent with Hypothesis 2, and the findings are significant.

The findings for bullied, sexual minority students, with controls for carrying weapons, are displayed in Tables 11A and 11B. The odds of bullying victimization for sexual minority students who carried weapons to school were lower than the odds of bullying victimization for those students who did not carry weapons (odds ratios 1.73 vs. 2.01). This finding indicates that weapons have a modifying effect on the odds of bullying victimization for sexual minority students, in accordance with Hypothesis 9,

although only the findings for the "no weapons" group were significant. That group had a significant, but only a slight, difference from the original odds ratio of 2.00.

The findings for bullied, sexual minority students, with controls for fighting, are displayed in Tables 12A and 12B. The odds of victimization for those who fought were greater than the odds of victimization for those who did not fight (odds ratios 2.02 vs. 1.87), and the fighting group had victimization odds slightly greater than the original odds ratio of 2.00. This finding indicates a modifying effect of fighting on sexual minority students, although in the opposite direction from that predicted in Hypothesis 5, and the findings are significant.

The findings for bullied, sexual minority students, with controls for sports participation are displayed in Tables 13A and 13B. The odds of bullying victimization for those who participated in team sports are slightly greater than the odds of bullying victimization for those who did not participate (odds ratios 2.08 vs. 2.04). This finding indicates a modifying effect of team sports participation for sexual minority students, although in the opposite direction to that predicted in Hypothesis 8, and the findings are significant. Both odds ratios are slightly higher than the original odds ratio of 2.00.

Table 11

Sexual Minority Students by Bullying Victimization, Weighted

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	1,105	509	1,614	.3154	.4607	1.9952
No (0)	10,472	2,418	12,890	.1876	.2309[a]	
Total	11,577	2,927	14,504	.2018		

Note. Design-based $F(1, 40) = 59.0393$, $p < .0001$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

A. Controlling for No Weapons

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	1,027	461	1,487	.3100	.4493	2.0076
No (0)	10,081	2,256	12,337	.1829	.2238[a]	
Total	11,108	2,716	13,824	.1965		

Note. Design-based $F(1, 40) = 60.9606$, $p < .0001$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Weapons

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	57	41	97	.4227	.7322	1.7257
No (0)	330	140	470	.2979	.4243[a]	
Total	386	181	567	.3192		

Note. Design-based $F(1, 37) = 3.2568$, $p = .0793$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Table 12

Sexual Minority Students by Bullying Victimization, Weighted

A. Controlling for No Fighting

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	985	395	1,380	.2862	.4010	1.8712
No (0)	9,722	2,084	11,806	.1765	.2143[a]	
Total	10,707	2,479	13,186	.1880		

Note. Design-based $F(1, 39) = 51.7540$, $p < .0001$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Fighting

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	95	90	185	.4865	.9474	2.0205
No (0)	613	287	899	.3192	.4689[a]	
Total	707	377	1,084	.3478		

Note. Design-based $F(1, 38) = 8.4340$, $p = .0061$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Table 13

Sexual Minority Students by Bullying Victimization, Weighted

A. Controlling for No Sports

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	663	290	953	.3043	.4374	2.0382
No (0)	3,943	846	4,789	.1767	.2146[a]	
Total	4,606	1,136	5,742	.1978		

Note. Design-based $F(1, 38) = 38.2354$, $p < .0001$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

B. Controlling for Sports

Sexual Minority	Bullied		Total	Conditional probabilities	Conditional Odds	OR
	No (0)	Yes (1)				
Yes (1)	364	183	547	.3346	.5029	2.0790
No (0)	5,928	1,434	7,362	.1948	.2419[a]	
Total	6,292	1,617	7,909	.2045		

Note. Design-based $F(1, 38) = 22.3153$, $p < .0001$. Count totals may vary due to rounding. OR = odds ratio (change in odds). [a] odds for excluded group.

Summary of Cross Tables Analysis

The odds ratios of overweight and sexual minority students who were bullied were obtained through crosstabulations. These odds ratios were compared to those derived from partial tables with the proposed moderators of weapons, fighting, and sports. Table 14 compares the odds ratios of the primary predictors with the odds ratios derived from partial tables, wherein the different values of the moderators are held constant.

Table 14

Comparison of Odds Ratios

Predictor	OR	Significant?
Overweight	1.12	Yes
No weapon	1.14	Yes
Weapon	.91	No
No fighting	1.14	Yes
Fighting	.80	No
No sports	1.24	Yes
Sports	1.00	No
Sexual Minority	2.00	Yes
No weapon	2.00	Yes
Weapon	1.73	No
No fighting	1.87	Yes
Fighting	2.02	Yes
No sports	2.04	Yes
Sports	2.08	Yes

The preceding crosstabulations, or 2x2 tables, portray the effects of the main

predictors and the moderating effects of weapons, fighting, and sports on the main

predictors. Interactions are relevant, only to the extent that they are significant. For

bullied, overweight students, there are significant interactions with not carrying weapons,

not fighting, and no sports participation. The odds ratios are, in all three instances, higher

than the original odds of overweight students. This means that the risk of bullying

victimization is greater than the original risk of overweight students without moderators.

The findings are inconsistent with Hypotheses 4, 5, and 8, wherein the effects of

moderators would attenuate the main effects of being overweight.

For bullied, sexual minority students, all interactions are significant, with the

exception of weapon-carrying. Not carrying a weapon entails the same risk as the original

odds ratio, and the finding contradicts the predicted effect as expressed in Hypothesis 9.

Not fighting entails less risk, and the remaining moderators (fighting and sports) entail

more risk. These findings are inconsistent with the predicted effects of moderators as expressed in Hypotheses 10 and 13.

These interactions should be explored more fully in logistic regression models, while adjusting for demographic variables, along with the main predictor of depression and the moderating effects of academic achievement and sleep.

Models and Logistic Regression

Model 1 (Overweight)

To compare models, one needs to work with identical samples. The Stata commands *mark* and *markout* allow one to exclude missing data in model comparisons (Long & Freese, 2014). For example, the frequency of excluded, missing data for Overweight Model 1 comparisons are illustrated in Table 15. Commands are then followed by the "if *variable*==1" option (Long and Freese, 2014). Missing data counts for the remaining 17 models follow the same procedure. Log likelihood values are not available for multilevel modeling.

Table 15

Missing Data for Overweight Model 1 Comparisons

	Frequency	Percentage
Missing data	1,622	10.38
Non-missing data	14,002	89.62
Total	15,624	100.00

The coefficients for all overweight models are shown in Table 16. Overweight status is a predictor of bullying victimization. Older, male, and nonwhite students suffer less bullying victimization. Although weapons, fighting, academics, and sleep had

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significant effects on victimization, none of their interactions with being overweight was significant, after adjusting for covariates. The conversion of coefficients to odds and odds ratios, along with the percentage change in odds, and marginal effects is displayed in Table 17. The coefficient values for overweight and the control variables are displayed for Model 1, with the remaining coefficients for possible moderator variables. None of the interactions, however, was significant.

Table 16

Multi-level Logistic Regression Models Explaining Bullying Victimization (Overweight)

	Model 1	Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5
Overweight	0.19**	0.22**	0.22**	-0.18**	0.18**	0.23*
Age†	-0.15**	-0.16**	-0.14**	-0.16**	-0.17**	-0.15**
Male	-0.57**	-0.62**	-0.67**	-0.62**	-0.55**	-0.58**
Nonwhite	-0.50**	-0.52**	-0.59**	-0.54**	-0.53**	-0.53**
Weapons		0.85**				
Overweight X Weapons		-0.37				
Fighting			1.18**			
Overweight X Fighting			-0.39			
Academics†				-0.19**		
Overweight X Academ.				-0.08		
Sleep†					-0.19**	
Overweight X Sleep					-0.04	
Sports						0.02
Overweight X Sports						-0.11
Constant	-0.95**	-0.97**	-0.98**	-0.90**	-0.96**	-0.93**

	Model 1	Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5
n	14,002	13,908	13,810	12,823	13,134	11,853
Weighted n	14,090	13,997	13,727	13,067	13,496	13,050
Design-based F	$(4, 38) =$ 35.81**	$(6, 36) =$ 24.22**	$(6, 35) =$ 33.53**	$(6, 36) =$ 25.83**	$(6, 36) =$ 26.68**	$(6, 34) =$ 26.21**

Note. Overweight is main predictor. * $p <.05$, ** $p <.01$, † standardized score

Table 17

Coefficient Values, Odds, and Marginal Effects for Overweight Models

	b	Exp(b)	% Δ Odds	Marginal or Incremental Effects
Overweight*†	0.19	1.21	21.48%	.04
Age*†	-0.15	0.86	-14.01%	-.03
Male*†	-0.57	0.56	-43.64%	-.10
Nonwhite*†	-0.50	0.60	-39.54%	-.09
Constant†	-0.95	0.39	---	---
Weapons*	0.85	2.34	134.10%	.20
Fighting*	1.18	3.26	226.36%	.28
Academics*	-0.19	0.83	-17.34%	-.04
Sleep*	-0.19	0.83	-17.20%	-.04
Sports	0.02	1.02	1.93%	.004

*significant predictor, †Model 1 variables and values, without moderators.

For overweight students, the odds of being victimized changed by a factor of 1.21, compared to non-overweight students, while controlling for the demographic variables in the model. The odds increased by 21.48%, for an increased, predicted probability of risk, if .04. These values pertain to Model 1, without the inclusion of moderator variables.

All three of the demographic variables (age, male, nonwhite) entailed decreased chances of bullying victimization, compared to younger, female, and white students. Odds, percentage changes in odds, and marginal or incremental effects are displayed in Table 17. These values pertain to Model 1, without the inclusion of moderator variables.

Four moderator variables (weapons, fighting, academics, and sleep) were significant predictors of victimization. For students who carried weapons to school, the odds of being victimized changed by a factor of 2.34, compared to students who did not carry weapons. The odds increased by 134.10%, for an increased, predicted probability of risk of .20. Those who fought on school grounds also had an increased risk of victimization. The odds of being victimized changed by a factor of 3.26, an increase in odds of 226.36%. The incremental or unit effect was .28. Fighting and carrying weapons, therefore, had the strongest effects on bullying victimization, greatly surpassing the effect of being overweight.

Model 2 (Sexual Minority)

The coefficients for all sexual minority models are depicted in Table 18. Sexual minority is a predictor of bullying victimization, whereas older, male, and nonwhite students suffered less bullying victimization. Weapons, fighting, academics, and sleep were significant predictors of victimization, and there was a significant interaction with sleep, after adjusting for covariates. The conversion of coefficients to odds and odds ratios, along with the percentage change in odds, and marginal effects is displayed in Table 19. The coefficient values for sexual minority and the control variables are shown for Model 2, with the remaining coefficients for possible moderator variables, and the interaction of sexual minority with sleep.

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For sexual minority students, the odds of being victimized changed by a factor of 1.86, compared to heterosexual students, while controlling for the demographic variables in the model. The odds increased by 85.85%, for an increased, predicted probability of risk, of .14. These values pertain to Model 2, without the inclusion of moderator variables.

Table 18

Multi-level Logistic Regression Models Explaining Bullying Victimization (SM[a])

	Model 2	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
SM[a]	0.62**	0.60**	0.54**	0.62**	0.62**	0.58**
Age†	-0.14**	-0.15**	-0.13**	-0.14**	-0.15**	-0.13**
Male	-0.48**	-0.54**	-0.58**	-0.51**	-0.47**	-0.50**
Nonwhite	-0.51**	-0.53**	-0.58**	-0.57**	-0.56**	-0.52**
Weapons		0.84**				
SM X Weapons		-0.22				
Fighting			0.97**			
SM X Fighting			0.08			
Academics†				-0.14**		
SM X Academ.				0.01		
Sleep†					-0.22**	
SM X Sleep					0.18*	
Sports						0.05
SM X Sports						0.11
Constant	-1.01**	-1.02**	-1.03**	-0.98**	-1.01**	-1.03**
n	14,209	14,108	14,044	13,040	13,374	12,070

	Model 2	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
Weighted n	14,177	14,085	13,962	13,154	13,647	13,343
Design-based F	$(4, 37) =$ 48.34**	$(6, 35) =$ 28.64**	$(6, 34) =$ 30.91**	$(6, 35) =$ 31.78**	$(6, 35) =$ 36.12**	$(6, 33) =$ 31.31**

Note. Sexual minority is main predictor. [a]SM = Sexual minority * $p <.05$, ** $p <.01$, † standardized score.

Table 19

Coefficient Values, Odds, and Marginal Effects for Sexual Minority Models

	b	Exp(b)	% Δ Odds	Marginal or Incremental Effects
SM*†[a]	0.62	1.86	85.85%	.14
Age*†	-0.14	0.87	-13.02%	-.03
Male*†	-0.48	0.62	-38.32%	-.08
Nonwhite*†	-0.51	0.60	-40.10%	-.09
Constant†	-1.0	0.36	---	---
Weapons*	0.84	2.31	131.48%	.19
Fighting*	0.97	2.64	163.85%	.22
Academics*	-0.14	0.87	-12.97%	-.03
Sleep*	-0.22	0.80	-20.05%	-.04
Sports	0.05	1.05	5.32%	.01
SM[a] X Sleep*	0.18	---	---	(Table 20)

*significant predictor, †Model 2 variables and values, without moderators, [a]SM = Sexual minority.

All three of the demographic variables (older, male, and nonwhite) reduced the odds of bullying victimization. Odds, percentage changes in odds, and marginal or

incremental effects are displayed in Table 19. These values pertain to Model 2, without the inclusion of moderator variables.

Four moderator variables (weapons, fighting, academics, and sleep) were significant predictors of victimization. For those students who carried weapons to school, the odds of being victimized changed by a factor of 2.31, compared to students who did not carry weapons. The odds increased by 131.48%, for an increased, predicted probability of risk of .19. Those who fought on school grounds also had an increased risk of bullying victimization. The odds of being victimized changed by a factor of 2.64, an increase in odds of 163.85%. The incremental or unit effect was .22. Fighting, weapon-carrying, and sexual minority status were the strongest predictors of bullying victimization.

Increasing academic achievement and increasing hours of sleep produced less risks for bullying victimization. Odds and percentage changes in odds for these two variables are displayed in Table 19.

The interaction between sexual minority and sleep is a significant predictor of victimization. The margins for the interaction are depicted in Table 20 and graphed in Figure 5. It should be noted, however, that one cannot rely exclusively on the value, direction, and significance level of a coefficient of an interaction term, for they may vary. In nonlinear models, the marginal effects are not constant for the full range of independent variables. Even without an interaction term, the marginal effects in logistic regression depend on all of the explanatory variables at certain locations on the probability curve (Ai & Norton, 2003; Karaca-Mandic et al., 2012; Mize, 2019). In the interaction between sexual minority status and sleep duration, one should follow certain

steps, as outlined by Mize (2019). The first procedure is to calculate the difference in the effect of sleep for sexual minority students, a "first difference," and the effect of sleep for heterosexual students, also a first difference. The difference between the two is known as a "second difference." This "difference of differences," in turn, needs to be tested for the equality of marginal effects (Long & Freese, 2014). Last, one needs to inspect the marginal effects of sexual minority status at all values of sleep duration.

In the dataset, sleep duration varied from 4 to 10 hours of sleep on school nights. Inasmuch as sleep was standardized, following Osborne (2015) and Mize (2019), the range of hours for each hour was converted to a z-score. For example, 4 hours became -1.922, and 10 hours was converted to 2.422, with .725 increments added to each hour (the mean was 6.656 hours, and the standard deviation was 1.382). One notes that increasing hours of sleep lessen the risks of victimization, regardless of sexual orientation or preference. One also notes that the predicted margins are different (Table 20). Over 3.34 standard deviations, the risk of bullying victimization for sexual minority students decreased 11.8% (from a probability of .425 to .375), whereas the risk of bullying victimization for heterosexual students decreased 44.5% (from a probability of .359 to .175). These predictive margins are graphed in Figure 5, showing confidence intervals, over the 6-hour range (4–10). One has less confidence at the -1.9 mark (i.e., 4 hours) due to overlapping confidence intervals, but increasing divergence in point estimates and confidence intervals is predicted from -1.2 to 1.7 standard deviations (5–10 hours). This method of interpreting interactions by means of margin plots conforms to best practices (Long & Freese, 2014; Osborne, 2015; Li & Barry, 2020).

A test for the equality of marginal effects of sleep duration for sexual minority students and the marginal effects for heterosexual students was insignificant at the 4-hour mark ($p = .075$). The remaining margins, however, were significant. These procedural steps underscore the need to examine the values and significance levels of all predictions across the range of observed data, without relying completely on the value and significance level of the model coefficient for the interaction term.

Table 20

Predictive Margins for Interaction Term in Model 2.4 Showing Point Estmates and CIs[a]

Sleep†	Sexual Minority	
	No	Yes
−1.9	.359 (.314, .404)	.425 (.362, .487)
−1.2	.322 (.287, .358)	.416 (.366, .466)
−0.5	.288 (.259, .317)	.408 (.363, .453)
0.3	.278 (.250, .305)	.405 (.359, .451)
1	.226 (.199, .253)	.391 (.327, .455)
1.7	.199 (.170, .229)	.383 (.302, .463)
2.4	.175 (.143, .207)	.375 (.276, .473)

Note. All margins at $p < 001$. †standardized. [a]Confidence intervals in parentheses.
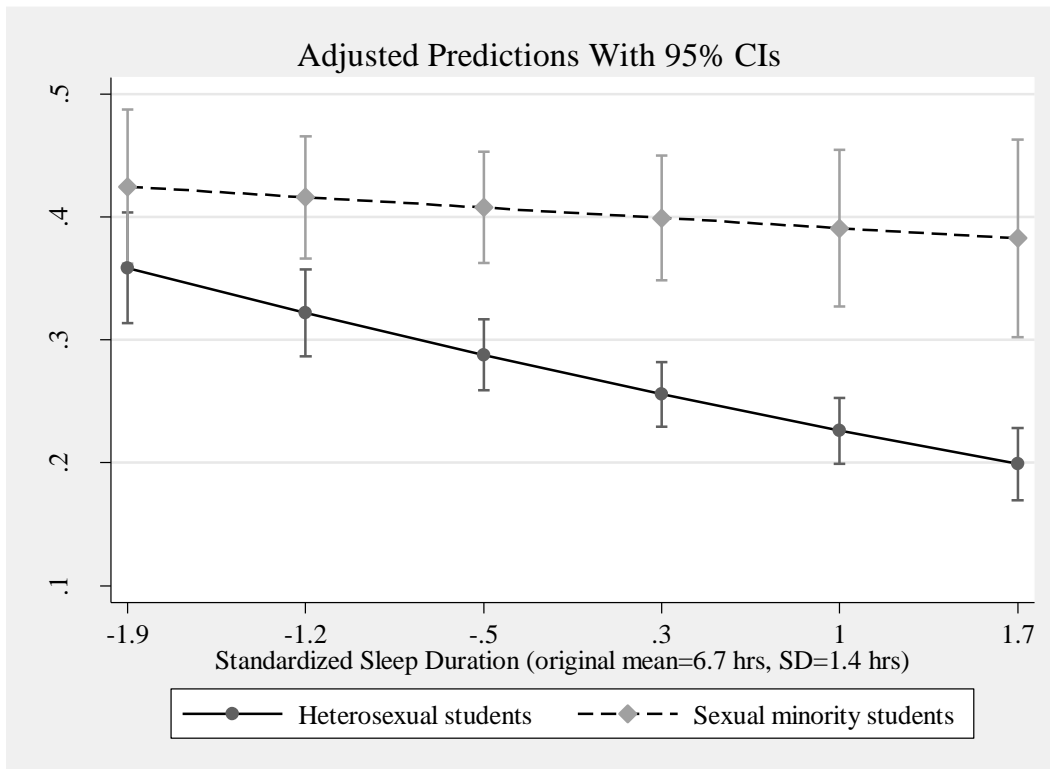
Figure 5. Interaction of Sexual Minority With Sleep Duration

Model 3 (Depression)

The coefficients for all depression models are shown in Table 21. Increasing amounts or levels of depressive symptoms are predictors of bullying victimization, whereas older, male, and nonwhite students suffer less bullying victimization. Weapons, fighting, and sleep had significant relationships with bullying victimization, but there were no significant interactions after adjusting for covariates.

The conversion of coefficients to odds and odds ratios, along with the percentage change in odds, and marginal effects (at the weighted mean of depressed) is displayed in Table 22. For depressed students, the odds of being victimized changed by a factor of 1.93, compared to non-depressed students, while controlling for the demographic

variables in the model. The odds increased by 93.12%, for an increased, predicted probability of risk of .14. These values pertain to Model 3, without the inclusion of moderator variables.

All three of the demographic variables (older, male, and nonwhite) had significant effects with decreasing chances of being victimized, compared to younger, female, and white students. Odds, percentage changes in odds, and marginal or incremental effects are displayed in Table 22. These values pertain to Model 3, without the inclusion of moderator variables.

Three moderator variables (weapons, fighting, and sleep) were significant predictors of bullying victimization. For students who carried weapons to school, the odds of being victimized changed by a factor of 1.53, compared to students who did not carry weapons. The odds increased by 52.67%, for an increased, predicted probability of risk of .08. Those who fought on school grounds also had an increased risk of bullying victimization. The odds of being victimized changed by a factor of 2.38, an increase in odds of 138.23%. The incremental or unit effect was .18. Fighting, depression, and weapon-carrying entailed the greatest effects for bullying victimization. Students with higher academic achievement and more hours of sleep suffered less risk for victimization. Odds and percentage changes in odds for these two variables are displayed in Table 22.

Table 21

Multi-level Logistic Regression Models Explaining Bullying Victimization (D[a])

	Model 3	Model 3.1	Model 3.2	Model 3.3	Model 3.4	Model 3.5
D[a]	0.66**	0.64**	0.65**	0.65**	0.65**	0.66**
Age†	-0.16**	-0.17**	-0.15**	-0.17**	-0.16**	-0.15**
Male	-0.28**	-0.31**	-0.36**	-0.28**	-0.28**	-0.30**
Nonwhite	-0.59**	-0.60**	-0.65**	-0.59**	-0.61**	-0.57**
Weapons		0.42*				
D X Weapons		-0.02				
Fighting			0.87**			
D X Fighting			-0.04			
Academics†				-0.05		
D X Academ.				0.02		
Sleep†					-0.09*	
D X Sleep					0.02	
Sports						0.17
D X Sports						0.01
Constant	-1.51**	-1.50**	-1.52**	-1.50**	-1.50**	-1.61**
n	14,602	14,496	14,425	13,293	13,657	12,359
Weighted n	14,641	14,546	14,414	13,505	14,017	13,711
Design-based F	(4, 38) = 204.78**	(6, 36) = 142.64**	(6, 35) = 161.59**	(6, 36) = 108.48**	(6, 36) = 133.09**	(6, 34) = 144.74**

Note. Depression is main predictor. [a]D = Depression. * $p <.05$, ** $p <.01$,
† standardized score

Table 22

Coefficient Values, Odds, and Marginal Effects for Depression Models

	b	Exp(b)	% Δ Odds	Marginal or Incremental Effects
D*†[a]	0.66	1.93	93.12%	.14
Age*†	-0.16	0.85	-14.89%	-.03
Male*†	-0.28	0.76	-24.06%	-.05
Nonwhite*†	-0.59	0.55	-44.58%	-.09
Constant†	-1.51	0.22	---	---
Weapons*	0.42	1.53	52.67%	.08
Fighting*	0.87	2.38	138.23%	.18
Academics	-0.05	0.95	-5.33%	-.01
Sleep*	-0.09	0.91	-9.02%	-.02
Sports	0.17	1.20	19.52%	.03

*significant predictor, †Model 3 variables and values, [a]D = Depression

V. SUMMARY

The effects of variables on bullying victimization have been presented in 18 models, wherein moderator variables are added and replaced, one at a time. The significance levels vary from model to model for specific variables. Tables 23 through 25 summarize these variations. For all of the overweight models summarized in Table 23, for example, all variables were significant, except for team sports participation. None of the interactions was significant after adjusting for covariates, and they have been excluded from the table.

Table 23

Significant Variables for Overweight

	Model 1	Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5
Overweight	Overweight	Overweight	Overweight	Overweight	Overweight	Overweight
Age	Age	Age	Age	Age	Age	Age
Male	Male	Male	Male	Male	Male	Male
Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite
Weapons	---	Weapons	---	---	---	---
Fighting	---	---	Fighting	---	---	---
Academics	---	---	---	Academics	---	---
Sleep	---	---	---	---	Sleep	---
Sports	---	---	---	---	---	NS

Note. --- (not measured). NS = not significant

Table 24

Significant Variables for Sexual Minority

	Model 2	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
SM	SM	SM	SM	SM	SM	SM
Age	Age	Age	Age	Age	Age	Age
Male	Male	Male	Male	Male	Male	Male
Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite
Weapons	---	Weapons	---	---	---	---
Fighting	---	---	Fighting	---	---	---
Academics	---	---	---	Academics	---	---
Sleep	---	---	---	---	Sleep	---
Sports	---	---	---	---	---	NS
SM x Sleep	---	---	---	---	SM x Sleep	---

Note. --- (not measured). SM = Sexual Minority. NS = not significant

For all of the sexual minority models summarized in Table 24, the effects for all variables were significant, except for team sports participation. Sleep duration was a significant moderator of sexual minority status. None of the other interactions was significant after adjusting for covariates. The remaining non-significant interactions have been excluded from the table.

For all of the depression models summarized in Table 25, the effects for all variables were significant, except for academics and sports. None of the interactions was significant after adjusting for covariates, and they are excluded from the table.

Table 25

Significant Variables for Depression

Depression	Model 3	Model 3.1	Model 3.2	Model 3.3	Model 3.4	Model 3.5
Depression	Depression	Depression	Depression	Depression	Depression	Depression
Age	Age	Age	Age	Age	Age	Age
Male	Male	Male	Male	Male	Male	Male
Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite	Nonwhite
Weapons	---	Weapons	---	---	---	---
Fighting	---	---	Fighting	---	---	---
Academics	---	---	---	NS	---	---
Sleep	---	---	---	---	Sleep	---
Sports	---	---	---	---	---	NS

Note. --- (not measured). NS = not significant

Regarding effects, the main predictors in each model, along with weapons and fighting, had the greatest effects on bullying victimization; in all cases, the risks of bullying victimization increased. As a moderator, only sleep interacted with sexual minority status. Sleep duration attenuated the main effect, although the decrease was more pronounced for heterosexual students (Table 20; Figure 5).

In accordance with theory and some empirical research, overweight status, sexual minority, and depression were significant predictors of victimization. The alleged moderator variables (weapons, fighting, academics, sleep, and sports) had variable effects. Weapons, fighting, and sleep were significant in all models. Academics was significant for Models 1 & 2, but team sports participation was not significant in any of the models. All demographic variables were significant in all models.

Weapons and fighting were originally quantified along several levels, but some of the levels were rare events or lacking in events ("sparse data," according to Osborne, 2015). For that reason, these two variables were defined as indicator variables, with scores of 0 and 1. Three quantitative variables (academics, sleep, and age) were standardized, as prescribed by Osborne (2015). Because the CDC dataset was a multi-level sample, complex sampling commands in Stata were used to determine means, standard errors, and standard deviations. In standard deviations, the mean is 0, and 1 represents a standard deviation above the mean. This procedure simplified the process of determining marginal effects. An example of a complex sampling command is the use of *svy* before the usual commands in regression. Thus, the command, *mean depressed*, becomes *svy: mean depressed*.

The hypotheses for this study assumed that certain variables, such as weapon-carrying, fighting behavior, academic achievement, sleep duration on school nights, and team sports participation, would modify the main effects of being overweight, having sexual minority status, and reporting depressive symptoms. Further, it was assumed that the moderators would, in effect, lower the risk of being bullied. The idea was that bullies sense certain vulnerabilities in prospective victims, and that by modifying the victim in some way, the bully would decide not to engage in bullying. The findings, however, did not support these assumptions, except for the lone interaction of sleep duration with sexual minority status. This interaction should be explored in further research and with datasets that include more information regarding sleep quality, such as sleep latency, bedtimes, daytime sleepiness, insomnia, and sleep disturbances.

The findings indicate an increased risk of bullying victimization for the main predictors of overweight, sexual minority, and depression, but there is greater risk for victimization with weapon-carrying and fighting behaviors. The findings for weapons and fighting contradict the hypotheses that protection (carrying weapons) and resistance (fighting) would lessen risks of bullying victimization. More sleep on school nights lessens the risk of bullying victimization, as expected, and sleep, along with weapons and fighting, should be understood as predictors of bullying victimization. The case for higher academic achievement varies, according to the model in which it is found, but it does support the assumption regarding a decreased risk of victimization. Team sports participation did not prove to be a significant predictor of victimization in any of the models.

VI. DISCUSSION

In this study, the crosstabulations of dichotomous variables provided weighted, conditional cell-counts for categories of dichotomous variables, along with odds ratios and significance levels, but the inclusion of partial tables for all dichotomous demographic variables, in addition to the expected moderators, would have proved unwieldy and complicated. Also, continuous variables addressed in this way would not have yielded odds ratios, facilitating the comparison of effects. Crosstabulations, however, are an important preliminary step in analysis, allowing one to compare odds ratios for the intersection of categories of dichotomous variables. Logistic regression provides estimates based on maximum likelihood estimation techniques for discrete, dependent variables and allows one to control for a number of variables in specific models. One should also be aware that the findings of the contingency tables were based on different samples than those used for logistic regression, and thus values will vary.

According to theory and empirical research, being underweight should be a significant predictor of victimization. Most of the research for underweight students has been done using different datasets, such as the Health Behavior in School Age Children Survey (Wang et al., 2009; Wang et al., 2010). Wang et al. (2018) did use the CDC's Youth Risk Behavior Survey, but they created a "symmetrical" portion of BMI for underweight, to correspond to the overweight portion of BMI, allowing a larger number of cases to be observed. The CDC has limited the underweight category to BMI's that are less than the 5th percentile and has framed the overweight category to the 85th percentile or more. On 1/6/19, Dong-Chul Seo (personal communication), one of the authors of the article (Wang et al., 2018), explained their reasoning for creating an underweight

category for the bottom 15th percentile of BMI (in that it is symmetrical). The authors interpreted the 5th percentile as "very underweight," and the 5th to 15th percentiles as "underweight." The CDC has interpreted the 85th to 95th percentiles as "overweight," and the remaining 5th percentile (more than 95th percentile) as "obese." Thus, Wang et al. (2018) created a bottom 15th percentile to "match" the upper 15th percentile. Although such a procedure allows for more cases to be analyzed, the CDC has not authorized this distinction. For this reason, underweight status was not used as a predictor of victimization in the present study.

Some puzzling features pertain to the significant findings of weapons and fighting that are in the opposite direction than hypothesized. Students who bring weapons to school and students who fight on school grounds are at higher risk for bullying victimization. The problem with weapons and fighting may be resolved by reasoning in probabilities that are hidden in cross-sectional research. For example, bringing weapons to school may be the victim's choice of protection based on past bullying events. The bullying events may have ceased after the victims began arming themselves, but the cross-sectional correlation is still there. Similarly, the students who have been victimized may choose to fight, thus ending future bullying events. Better explanations, however, are that bullies do not perceive that their targets have weapons, nor do they appreciate the alleged fighting reputations of prospective targets.

Sleep was a significant predictor in all models. As students sleep more on school nights, their risks of victimization decrease. Sleep duration interacts with sexual minority status, attenuating the risk of victimization, as hypothesized. This finding supports the recommendation of the American Academy of Sleep Medicine that teenagers receive 8-

10 hours of sleep (Paruthi et al., 2016). There are associations between sleep and learning, mental health, daily functioning, and emotional regulation (Bartel et al., 2015; Bartel et al., 2016; Paruthi et al., 2016). Sleeping less than the recommended 8-10 hours, however, is associated with anxiety, depression, and behavioral problems (Fletcher et al., 2018; Owens et al., 2014; Park, 2020; Paruthi et al., 2016). The primary thesis of this study is that bullies attack targets that they sense are vulnerable. A lack of sufficient sleep appears to render the student more vulnerable to bullying victimization.

The significant demographic variables require some explanation. As one ages (or advances in grade level in school), bullying encounters decrease. This pattern has been explicated in several empirical studies; as students mature, they engage in less bullying behaviors, especially physical contact. Regarding sex, males are at less risk than females for bullying victimization. This finding may be interpreted in several ways. Females may be more sensitive to what they perceive as bullying events than males. Also, information on the type of bullying experienced is not available in the dataset, the only distinction being made between cyber-bullying and traditional bullying. Females are more likely to experience relational-types of bullying than males.

One does need to explain the racial distinctions, for white students are at greater risk of bullying victimization than non-white students. There are most likely cultural features at play. For example, in a national survey, one finds that black students consider bullying events as less of a problem than white students (Gaughan et al., 2001). Blacks and Hispanics may be socialized into environments wherein toughness, physical contact, and threats are more commonplace. Thus, these racial groups may consider certain forms of bullying as acceptable behavior.

There are some policy implications that stem from this study. Bullying is considered a problem in schools by administrators, teachers, students, parents, and researchers. Notions that limit this problematic behavior and protect students should be explored and examined. The CDC does recognize overweight status and obesity as major health issues, but from the standpoint of bullying behavior, student education regarding acceptance of individual differences could be beneficial. Such education could also extend to matters of sexual orientation and preferences, although there are controversial, political and religious problems associated with this issue. The immediate efforts should not be to make students slimmer, nor to "correct" sexual desires, but to respect others who are different in some way. It is indeed possible to respect others without condoning their lifestyles. From a general guardianship perspective, certain well-publicized routines could be implemented, such as the installation of CCTV cameras and patrols consisting of teachers, staff, and security personnel in the hallways. These practices could have an effect on curbing some instances of bullying, despite their clandestine features.

Depression, however, is a treatable condition, contingent on referrals to counselors or therapy groups, and identifying depression in students should be a first step. Both teachers and parents can work together to assist students who are depressed. More problematic are issues related to fighting and weapon-carrying. Education and monitoring of these behaviors appear to be the best solutions. Regarding adequate amounts of sleep, a delay in school start times could be beneficial (Owens et al., 2014).

VII. LIMITATIONS

A recurring limitation in this study is bidirectional ambiguity stemming from the time-order problem for cross-sectional data, and this may explain the disparate findings for weapon-carrying and fighting behavior, for example. Accordingly, does overweight status trigger bullying events, or is overweight status a result of being bullied repeatedly? Similar arguments may be made for depression status, academic achievement, and sleep patterns. A more complex interpretation is whether these achieved statuses are a result of being bullying. Recurring victimization may be triggered by the achieved statuses, along with other concomitants, such as having a reputation for being bullied, having low self-esteem, or not having friends or the types of friends who would be motivated to intervene in bullying events.

A limitation pertains to the single-item question (Q24) that measures the dependent variable, bullying victimization. More questions regarding time frames for experiencing bullying victimization would be ideal, and the question does not ask for the type of bullying experienced by the victim, whether verbal, physical, or relational. Researchers have found that these types differ by sex and age, with females and older students experiencing relational types of bullying more than physical types. And, according to routine activity theory, a bully is motivated to engage a victim, but risks are also calculated. For example, a less risky type of bullying would be name-calling, jeering, or teasing, which would prompt an affirmative reply to Q24. Additionally, the questions in the CDC survey are not sorted randomly for different groups of respondents. Q24, therefore, will always precede Q25 that relates to electronic bullying. The respondent may answer Q24 with electronic bullying in mind and not bother to correct Q24 when

finding out in Q25 that the survey has excluded electronic bullying in Q24. If Q24 and

Q25 were sorted randomly, the problem of placement in a sequence would be resolved,

and answers to both questions would provide more accurate data. Randomization of these

two questions would eliminate the possibility of question order effects (Bradburn et al.,

2004; Dillman et al., 2009).

There is a bounding issue present when respondents have difficulties recalling

events within a given time frame (Addington, 2005; Cantor & Lynch, 2000). The students

are asked if they had been bullied over the past twelve months. Other questions use

different time frames, such as weapon-carrying (past 30 days) or fighting behavior (past

12 months), and the opportunities for confusion or inaccurate recall may increase,

resulting in inaccurate data.

A unit nonresponse rate of less than 85% should be evaluated for bias before data

are released (Zhang et al., 2016). The YRBS has a school response rate of 69%, a student

response rate of 86%, and an overall response rate of 60% (Kann et al., 2016). This

response rate could lead to misestimations. To compensate for this bias, the CDC applies

a weight to each record to adjust for nonresponses, as well as for the oversampling of

race and ethnicity (Zhang et al., 2016).

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