

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

IDENTIFYING MODERATORS IN THE ASSOCIATION BETWEEN BULLYING
AND DEPRESSION IN PENNSYLVANIA MIDDLE SCHOOL STUDENTS

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Fall 2012

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Human Development and Family Studies
with honors in Human Development and Family Studies

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ABSTRACT

Bullying is detrimental to adolescents and can affect them physically, mentally, and socially. Depression is often a consequence of bullying and early onset depression can lead to outcomes such as unemployment and suicide. Anti-bullying interventions in schools have been very successful, but for optimal effectiveness, we need to continue to understand the relationship between bullying and depression and what factors influence that relationship. We measured sex, grade, and opportunities and rewards for prosocial involvement as moderators in the relationship between bullying and depression. Utilizing data from the Pennsylvania Annual Youth Survey, we ran linear regressions from 610 middle schools across the state. From these analyses we learned that gender is related to bullying and therefore not an accurate moderator, females are more likely to exhibit depressive symptoms than males. Depression increases with grade, despite the level of bullying behavior. Therefore certain grades may have more bullying behavior, but those students will not be more likely to exhibit depressive symptoms. Finally, the opportunities and rewards for prosocial involvement were found to be a strong moderator that buffered the effects of bullying. These findings can help shape future interventions by specifically focusing on females who are predisposed to expressing depressive symptoms. Also, anti-bullying interventions may be placed in grades with higher levels of bullying, but it would be advantageous to have interventions in later grades to help students cope with depression whether or not it is related to bullying. Finally, the relationship the teachers develop with their students is one of the strongest protective factors against bullying. Anti-bullying programs need to address teachers as much as students to equip them with these skills.

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ACKNOWLEDGEMENTS

I wish to express sincere appreciation to the EpisCenter for their extended long-term support and especially to Doctor Jennifer Frank for her vast reserve of patience and knowledge. I owe my deepest gratitude to my fiancé, Daryl, who provided continual support from the initial to the final draft. Lastly, a special thank you to my roommates and parents whose encouragement and guidance were essential in the completion of this project.

Katherine J. Schneider

IMPORTANCE

According to the National School Safety Center, American schools in the year 2010 alone, contained 2.1 million adolescents who have bullied others and 2.7 million who have been victims of bullying (Olweus, 2010). Recent studies report that almost one in five students in America experience bullying on a regular basis (Olweus, 2010). The effects of bullying can be severe, long-term, and can impact physical, mental, and social functioning. A portion of students who are bullied develop low-self esteem (Kokkinos & Panayiotou 2004), suffer from stress related illness (Arseneault, Walsh, Trzesniewski, Newcombe, Caspi, & Moffitt 2006; Gruber & Fineran 2007), and a very small percentage commit suicide, also known as bullycide (Bonanno & Hymel 2010; Card, Isaacs, & Hodges 2007).

Health Consequences of Bullying		
Somatic Symptom	Bullied	Not Bullied
Headache	16%	6%
Sleep Problems	42%	23%
Abdominal Pain	28%	10%
Anxiety	28%	10%
Feeling Unhappy	23%	5%
Depression		
Moderate Indication	49%	16%
Strong Indication	16%	2%

Figure 1-1 Fekkes, Pijpers, Verloove-Vanhorick, 2004

The table demonstrates that adolescents who are bullied experience an almost fifty percent increase of the likeliness in each category of poor health symptoms. However, as this is correlational data, it is not clear as to what percentage of cases the bullying, itself, is causing these differences, or whether in some cases children who are bullied may already be predisposed to have higher rates of these poor outcomes. Youth who are bullied are more likely to experience these somatic symptoms because bullying may cause stress-related physical and mental illnesses in some cases. These health consequences as well as their fear of attending school can contribute to victims of bullying absenteeism, which may lead to overall poorer academic performance (Beran, 2008). In fact, it is estimated that 160,000 children miss school every day due to fear of attack or intimidation by other students (Olweus, 2010). The consequences of poor academic performance are extensive and can be long-term.

These consequences may also contribute to the prevalence of depression in victims of bullying. Several studies have found that being the target of bullying may place one at greater risk for depression (Roth, Coles, & Heimburg, 2002; Storch et al., 2001). As depicted in Figure 1-1, the dominant somatic symptom of bullied adolescents was moderate depression. Depression, in turn, has a myriad of substantial consequences of its own. A longitudinal study conducted in New Zealand by Fergusson and Woodward (2002) found the following:

Young people with depression in adolescence were at significantly ($P < .05$) increased risk of later major depression, anxiety disorders, nicotine dependence, alcohol abuse or dependence, suicide attempt, educational underachievement, unemployment, and early parenthood. These associations were similar for girls and boys. The results suggested the presence of 2 major pathways linking early depression to later outcomes. First, there was a direct linkage between early

depression and increased risk of later major depression or anxiety disorders.

Second, the associations between early depression and other outcomes were explained by the presence of confounding social, familial, and individual factors.

(p. 229)

Therefore it is absolutely critical that bullying occurring in American schools must be effectively prevented and reduced to not only enhance adolescents' school experience, but protect them from devastating risk factors associated with depression.

Olweus has defined five characteristics of school-based peer abuse bullying, which include, "(1) It is a subtype of violent behavior, (2) It involves a broad range of negative actions of a physical, psychological, and/or social nature, which are deployed repeatedly over a prolonged period of time and which are harmful to the person at whom they are directed, (3) It is deliberate in nature; that is, there is a conscious goal of harming the victim, (4) In general, it is assumed that these actions are not provoked by the victim, (5) The abuse may be enacted by an individual or group, and the object of the abuse may be one or more individuals, although there is usually a single victim" (Olweus, 2010).

Funded by a variety of state and foundation funders, numerous schools within Pennsylvania are currently implementing the Olweus Bullying Prevention Program (OBPP). OBPP was first implemented in Norway by its developer, Dan Olweus. After much success overseas, American schools began using the program in the early 1990's with promising results. The Olweus Bullying Prevention Program is designed for students in third to tenth grade, with special intervention for students targeted by bullies. The goals of this specific program include (1) reducing the existing bully-victim problems among students (2) preventing the development of new bully-victim problems, and (3) improving peer relations at the schools (Olweus, Limber,

Flerx, Mullin, Riese, & Snyder, 2007). Based on the known risk factors for bullying which include lack of parental warmth and involvement, a lack of supervision, a lack of clear and consistent rules to govern children's behavior, and harsh or corporal punishment, OBPP implements the following principles for all adults within the school environment: "(1) Show warmth and positive interest in students, (2) Set firm limits to unacceptable behavior, (3) Consistently use non-corporal, non-hostile consequences when rules for inappropriate behavior are not followed, (4) Function as authorities and positive role models" (Olweus et al., 2007). Programs such as OBPP are continuously evolving because the nature of bullying continues to evolve, in addition to continual research revealing more effective ways to prevent and reduce bullying. Therefore it is pertinent to study schools that implement OBPP to further develop the program to target populations that are most at risk for being victims of bullying.

Bullying at school is manifested in several forms such as mobbing, ostracism, and physical fighting. Mobbing is defined by a target being selected and bullied (mobbed) by a group of people rather than by one individual (Davenport, 2010). Ostracism occurs when the target is excluded from the group (Free Merriam-Webster Dictionary). For example, an adolescent may ostracized by other classmates refusing to talk and/or look at them. As individuals develop and mature, their use and implementation of bullying does as well. Therefore, there are several demographic variables that contribute to the changing nature of bullying. By further understanding the evolving nature of bullying, administrators, teachers, and programs can better prevent and reduce bullying.

Although bullying has previously been assumed to be utilized by boys more often than girls, recent studies have shown that it is implemented equally by both girls and boys (Card, Stucky, Sawalani, & Little, 2008). The discovery was the result of redefining the constructs of

bullying to encompass both physical and social aggression. However, there is still a significant difference between how girls and boys exert bullying. Females are more likely to use social aggression such as ostracism, whereas males tend to utilize physical aggression such as fighting.

The prevalence and type of bullying exerted in school can drastically shift as adolescents age. Past research has demonstrated that bullying is generally more likely to take place in the early grades and tends to decrease at higher grades (Dinkes, Kemp, & Baum, 2009). Figure 1-2 validates this finding. In this particular study, physical bullying refers to fighting, punching, and/or kicking. Verbal bullying is using words to vocally demean an individual. Relational bullying includes mobbing and ostracism. Cyber bullying includes any type of bullying utilizing technology such as texting, instant messenger, and social networking sites. Excluding cyber bullying, sixth grade has the highest level of all types of bullying. It is also interesting to note that each type of bullying is significantly reduced between the transition of middle school to high school, which is eighth to ninth grade. In addition, relational and verbal bullying were the most prevalent throughout secondary school. These findings can help shape preventive programs such as OBPP and effectively equip administrators, teachers, and parents to educate their children.

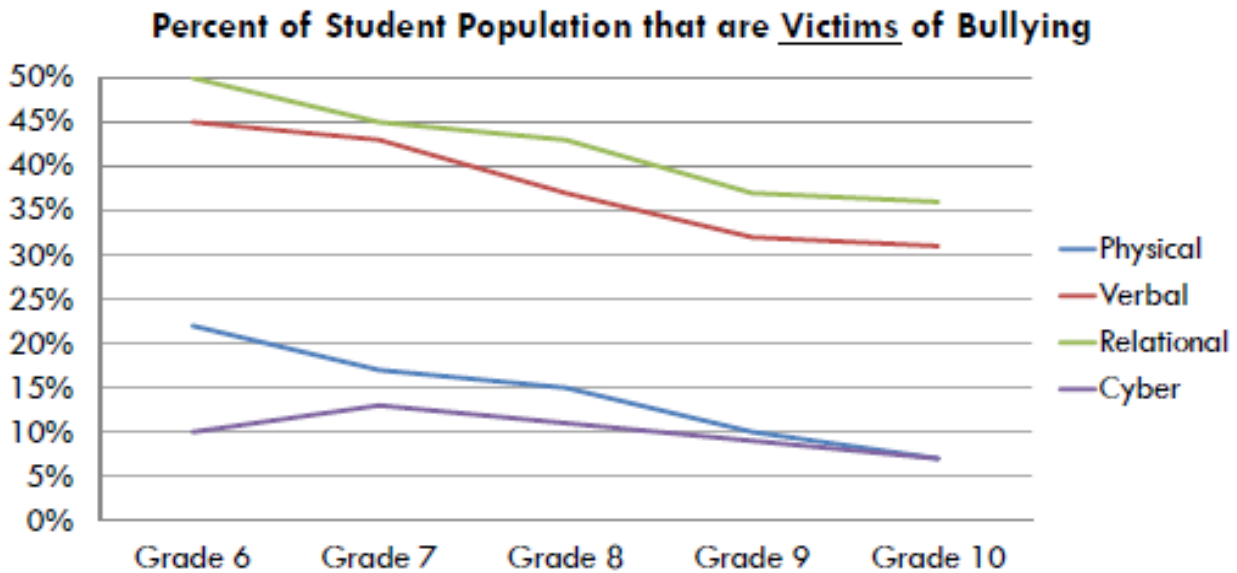


Figure 1-2 Wang, Iannotti & Nansel, 2009

Past research has found that the two major areas that protect individuals against the effects of bullying are family and school. Parental support mainly protects against maladjustment, especially in peer-victimized girls entering secondary school (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010). School support is equally effective in both males and females, in addition to being increasingly effective in buffering the effects of victimization as the adolescents age (Bowes, et al., 2010). One of the most influential factors in abating bullying within the classroom is the relationship the teachers develop with their students. When the teachers are sensitive to their students' needs, as well as holds high expectations for them, their sense of class membership improves, their feelings of helplessness are reduced, and peer conflict diminishes (Baker, Grant, & Morlock, 2008; Bru, Stephens, & Torsheim, 2002). This conduct from the teacher broadly describes opportunities and rewards for prosocial involvement for students.

The purpose of this study is to examine the relationship between bullying and depression in middle school students from grades sixth to eighth. Past research has demonstrated that bullying is highly correlated to the expression of depressive symptoms. Furthermore, these depressive symptoms, especially when exhibited at an early age, can be severely detrimental to the adolescent. Although past research has made considerable progress in identifying variables related to bullying, there is a large gap of identifying potential variables that could moderate the effect of bullying. For instance, we have learned how prevalent bullying is in each grade; however we do not know how this information relates to the outcome of depression. In addition, this lack of information results in a lack of effectiveness in anti-bullying programs. Therefore this study will explore whether the relationship between bullying and depression is impacted (moderated) by sex, grade, and presence of opportunities and rewards for prosocial involvement. The bullying behaviors studied will only include those experienced within the confines of the school building. We hypothesize that girls will be more likely to exhibit depressive symptoms after being bullied. In addition, we believe that sixth graders, due to the high level of bullying in that grade, will be more likely to express depressive symptoms as a result. Finally, we expect that opportunities and rewards for prosocial involvement provided by the teacher will negate the effect bullying has on the expression of depressive symptoms.

METHODS

SAMPLE:

This study used data from the Pennsylvania Youth Survey (PAYS). Sponsored by the Pennsylvania Commission on Crime and Delinquency, this survey of secondary school students focuses on their behavior, attitude, and knowledge of ATOD: alcohol, tobacco, and other drugs (Pennsylvania Commission on Crime and Delinquency [PCCD], 2010). In addition, the survey measures the opportunities and rewards for prosocial involvement in both the individual's school and community in order to identify protective and risk factors. The PAYS survey continually revises its questions to gain crucial insight on the issues facing secondary students, such as bullying both inside and outside of the classroom. Teachers administer the survey in the classroom; however, some schools had their students answer the survey via computer using SmarkTrack, Inc. The survey took approximately one class period to complete. The students were informed that the survey was completely voluntary, there were no right or wrong answers, and their completed answers would remain completely confidential (PCCD, 2010). The 2009 PAYS survey includes 610 schools across the state with 134,435 participants ages ten to nineteen (PCCD, 2010). This current study will utilize the middle school data which includes responses from 67,830 adolescents in sixth (42.3%), seventh (2.1%), and eighth (55.6%) grade. The sample is comprised of 74% Caucasian, 7% African American, 3.3%, Native American, 7% Latino, 2.8% Asian, and 5.9% Other. The middle school sample included 50.1% males and 49.9% females. 94.8% of the middle school students spoke English at home, 3.3% Spanish, and 1.9% spoke another language at home.

MEASURES:*Bullying*

The bullying scale has seven items. The questions pertained to how often other students acted aggressively towards them, including both social and physical aggression questions. A sample item was "How often have other students spread rumors?" These items had a response range of five options, starting with "not at all" and ending with "greater than once per week". The alpha (internal consistency) for this scale was .789.

Gender

Respondents were asked whether they were male or female. The response values were zero for females and one for males.

Grade

This study utilized the middle school data of the PAYS 2009 survey, which included sixth, seventh, and eighth graders. The response values were zero (sixth), one (seventh), and two (eighth).

School Opportunities and Rewards for Prosocial Involvement

School opportunities and rewards for prosocial involvement was assessed using the school opportunities for prosocial involvement scale and school rewards for prosocial involvement scale included in the PAYS survey. Participants responded on a 4-point scale range from 0 (NO!) to 3 (YES!) for nine items. The questions focused on the students' relationship with the teacher as well as how comfortable they felt in the classroom. Sample items included "Can talk to teachers one-on-one?" and "Teachers praise me for my hard work". The alpha for this scale was .735.

Depression

Depression was assessed using the depression scale included in the PAYS survey. Participants responded on a 4-point scale range from 0 (NO!) to 3 (YES!) for four items. The questions focused on adolescents' perceived value of themselves. A sample item was "I am inclined to think that I am a failure." The alpha for this scale was .892.

ANALYTICAL FRAMEWORK

Aim 1: Examine how being bullied predicts the exhibition of symptoms of depression in middle school adolescents.

Hypothesis 1 predicts that being a victim of bullying behavior will be positively associated with the symptoms of depression. To examine this main effect on Depression, we will regress on a Bullying scale.

Aim 2: Determine the extent to which gender moderates associations between bullying and depression in middle school students.

Although the bullying is implemented equally by both males and females, we predict there is a greater relationship between bullying and depression for girls than for boys. Thus, we predict that gender will moderate the effects of bullying on adolescents' depression. This moderation will be investigated by adding an interaction in the Aim 1 Model. A significant interaction term will indicate that the association between Bullying and Depression differs by gender.

Aim 3: Determine the extent to which grade moderates associations between bullying and depression in middle school students.

Previous research has shown that bullying peaks during the sixth grade and gradually declines as the adolescents develop. Thus, we predict that Grade will moderate the effects of bullying on adolescents' depression. Specifically, we hypothesize that there will be a stronger association between Bullying and Depression in sixth grade than in eighth grade. This moderation will be investigated by adding an interaction in the Aim 1 Model. A significant interaction term will indicate that the association between Bullying and Depression differs by grade level of the middle school students.

Aim 4: Determine the extent to which opportunities and rewards for prosocial involvement moderates associations between adolescents' victimization through bullying and their level of depression.

Bullying has been demonstrated to negatively affect an individual, leading to higher rates of depressive symptoms. The teacher-student relationship has acted as a prominent protective factor for the victims of bullying. Thus, we predict that rewards and opportunities for prosocial involvement can buffer the effects of bullying on adolescents' depression. This moderation will be investigated by adding an interaction in the Aim 1 Model. A significant interaction term will indicate that the association between Bullying and Depression differs by the level of Rewards and Opportunities for Prosocial Involvement.

RESULTS

Aim 1: Examine how being bullied predicts the exhibition of symptoms of depression in middle school adolescents.

We performed a linear regression using Bullying as the independent variable and Depression as the dependent variable. The regression examines how bullying affects individuals' perceived value of themselves. Table 1 shows the regression results examining the association between Bullying and Depression. This association is positive and significant ($\beta = .424$; $R^2 = .180$; $p < .05$). This result indicates that middle school students who are subjected to higher levels of bullying behavior are more likely to exhibit symptoms of depression.

Table 1. *Regression Analysis for Predicting Depression by Bullying (N=59050)*

Variable	B	S.E.	β	t	R^2
<u>Depression</u>					
Bullying	.331*	.003	.424	113.768	.180

Note: * = significance when $p < .05$

Aim 2: Determine the extent to which gender moderates associations between bullying and depression in middle school students.

To investigate moderation by gender we added the main effect of Gender and the interaction between Bullying and Gender to the previous regression model from Aim 1. Table 2 shows the addition of the main effect Gender to the regression of Depression. Bullying is still found to be a significant main effect ($t=92.123$). Gender was coded as 0 for females and 1 for males, so as gender increased, depressive symptoms decreased, demonstrating that males are less

likely to exhibit depressive symptoms. Gender ($t=-18.608$) and the interaction between Gender and Bullying are found to be significant ($\beta= -.106$, $R^2=.204$, $p<.05$). Since the interaction term is significant we can conclude that the control is moderating the relationship between bullying and depression; however, due to the large sample size, it is common for the interaction term to be significant. The R^2 slightly increased between Model 1 and Model 2, thus suggesting that there is a slight relationship between gender and bullying and therefore could distort the data. The R^2 increase discredits the significant interaction term. Thus the regression from Aim 1 is unreliable to draw inferences from.

Table 2. *Regression Analysis for Gender Moderation of Bullying to Depression (N=57449)*

Variable	B	S.E.	β	t	R^2
<u>Depression</u>					
Bullying	.381*	.004	.489	92.123	.2
Gender	-.558*	.030	-.089	-18.608	
Bullying X Gender	-.101*	.006	-.106	-17.450	.204

Note: * = significance when $p < .05$

Aim 3: Determine the extent to which grade moderates associations between bullying and depression in middle school students.

To investigate moderation by grade we added the main effect of Grade and the interaction between Bullying and Grade to the previous regression model from Aim 1. Table 3 shows the addition of the main effect Grade to the regression of Depression. Bullying is still found to be a significant main effect ($t=70.786$), as is Grade ($t=11.644$). The interaction between Grade and Bullying is not significant ($\beta=.004$, $R^2=.183$, $p=.542$), demonstrating that Grade does not modify

the relationship between Bullying and Depression. Depression increases with grade, but bullying is not that cause of that relationship.

Table 3. *Regression Analysis for Grade Moderation of Bullying to Depression (N=59050)*

Variable	B	S.E.	β	t	R²
			<u>Depression</u>		
Bullying	.327*	.005	.419	70.786	.183
Grade	.178*	.015	.055	11.644	
Bullying X Grade	.002	.003	.004	.610	.183

Note: * = significance when $p < .05$

Aim 4: Determine the extent to which opportunities and rewards for prosocial involvement moderates associations between adolescents' victimization through bullying and their level of depression.

To investigate moderation by opportunities and rewards for prosocial involvement, we added the main effect of Opportunities and Rewards for Prosocial Involvement and the interaction between Bullying and Opportunities and Rewards for Prosocial Involvement to the previous regression model from Aim 1. Table 4 shows the addition of the main effect Opportunities and Rewards for Prosocial Involvement to the regression of Depression. Bullying is still found to be a significant main effect ($t=18.332$), as is Opportunities and Rewards for Prosocial Involvement ($t=-30.350$). The interaction between Opportunities and Rewards for Prosocial Involvement and Bullying also is found to be significant ($\beta = .062$, $R^2=.206$, $p<.05$), thus we can conclude that prosocial involvement is moderating the relationship between bullying and depression. Furthermore, the R^2 term remained stable from Model 1 to Model 2, bringing

more evidence in favor of the moderator effect. Thus this demonstrates that Opportunities and Rewards for Prosocial Involvement moderates the relationship between Bullying and Depression.

Table 4. *Regression Analysis for Opportunities and Rewards for Prosocial Involvement Moderation of Bullying to Depression (N=34357)*

Variable	B	S.E.	β	t	R²
<u>Depression</u>					
Bullying	.250*	.014	.322	18.332	.206
Opportunities and Rewards for Prosocial Involvement	-.160*	.005	-.189	-30.350	
Bullying X OppRwrds	.003*	.001	.062	-3.599	.206

Note: * = significance when $p < .05$

DISCUSSION

In this study, we examined gender, grade, and opportunities and rewards for prosocial involvement provided by the teacher in the classroom as moderators of the relationship between bullying and depression. Consistent with previous research, we found that as middle school adolescents who experience more bullying will be more likely to express depressive symptoms. The relationship was positive and significant. As discussed earlier, early onset of depression can lead to severe consequences including drug abuse, unemployment, and suicide. Therefore it is crucial to continue exploring the variables that affect bullying so we can more effectively protect against it.

In Aim 2 we investigated the possible moderation effect of gender on the relationship between Bullying and Depression. We found that males showed fewer symptoms of depression, meaning that females are more likely to show higher rates of depressive symptoms. However, the R^2 value increased slightly from Model 1 to Model 2 demonstrating that gender has a slight relationship with bullying. Therefore, despite numerous studies that have found boys and girls to equally implement bullying behaviors, our data demonstrates that this is not the case, especially in light of the bullying scale including both physical and social aggression. Despite the interaction term being significant, gender is not a reliable moderator because gender has a slight relationship with bullying and therefore distorts the data. Model 2 demonstrated that the interaction slightly increased the level of depression, but that does not further explain the relationship between bullying and depression because we already know that bullying increases the exhibition of depressive symptoms. This finding can help shape future anti-bullying interventions by specifically focusing on females since they are predisposed to expressing more depressive symptoms than males.

In Aim 3 we investigated the possible moderation effect of grade on the relationship between bullying and depression. With the addition of Grade to the regression of Depression, Bullying and Grade were significant, but not the interaction term. This demonstrates that grade does not influence the effect bullying has on depression, meaning that bullying may be more prevalent in certain grades, but it does not affect whether the individual will show higher rates of depressive symptoms. The lack of an interaction implies that the association between bullying and depression is not impacted by grade level. Grade itself was slightly related to depression in older grades of 6-8th grades; however, with age comes increased responsibilities. Therefore it is probably a normal occurrence for adolescents who are continually receiving more responsibilities to then be more likely to exhibit signs of depression than those without such commitments. As a result anti-bullying interventions may be placed in grades with higher levels of bullying, but it would be advantageous to have interventions in later grades to help students cope with depression whether or not it is related to bullying.

In Aim 4 we investigated the possible moderation effect of opportunities and rewards for prosocial involvement on the relationship between bullying and depression. Prosocial involvement was negatively related to depression, indicating that the more children perceived prosocial opportunities and rewards from their teacher, the less they reported depressive symptoms. The interaction term was found to be significant. Depression was significantly correlated to Bullying and Prosocial Involvement. The findings show that the middle school students who are bullied and have more opportunities and rewards for prosocial involvement from their teachers, will be less likely to become depressed than those who reported fewer opportunities and rewards for prosocial behavior. Thus, the relationship the teacher develops

with their students is one of the strongest protective factors against bullying. Anti-bullying programs need to address teachers as much as students to equip them with these skills.

The only difference between Table 1 and Table 2, 3, 4 was the addition of a moderator, gender, age, prosocial involvement, respectfully. The result of these additions was a significant drop in the magnitude of beta weights, suggesting that they were more thinly distributed between the two main effects and the interaction term.

Past research has found that school support was one of the strongest protective factors for the likelihood of depression as a result of bullying. Opportunities and rewards for prosocial involvement reduced this likelihood. Our results support these findings and further suggest that opportunities and rewards for prosocial involvement intercedes with bullying, potentially interfering with the patterns of behaviors that may ultimately lead to depression in adolescents.

LIMITATIONS:

There are a few limitations worth noting in this study. Although the data used is a part of a longitudinal study, our study only looks at the 2009 PAYS data, thus making it a cross-sectional study. Because of this, no causal conclusions can be made and inferences are limited. Another limitation is the fact that the data is based on questionnaires and relies on the participants' self-report. Future studies could look at multiple years of PAYS data creating longitudinal designs. To avoid the biases of questionnaires, researchers could observe and code classroom bullying, including the interactions between the adolescents' peers and teachers. Additionally, the use of linear regression is based on four principle assumptions, which include "1) Linearity of the relationship between dependent and independent variables, 2) Independence of the errors (no serial correlation), 3) Homoscedasticity (constant variance) of the errors, and 4)

Normality of the error distribution" (Duke University, 2012). Violations of these principles will result in skewed and unreliable data.

FUTURE DIRECTIONS:

Ultimately, all the knowledge we continue to reveal about the relationship between bullying and depression needs to be utilized within the anti-bullying programs, such as Olweus, so they can continue to evolve and be more effective. Specifically from this study, further exploration of the gender and bullying relationship separate from depression would be crucial to then discover how these three components interact. Investigating why depression seems to naturally increase with age, even in middle school, regardless of bullying behavior will also be valuable. Although opportunities and rewards was the best moderator in this study, we should explore them separately to see if one is more effective than the other or if the combination is the key. In addition, there is a need to explore what other classroom behaviors moderate bullying at school, such as teacher to student ratio. Finally, as school and family are the strongest protective factors against the effects of depression caused by bullying, it is critical that we bridge the gap between them, especially since technology has brought bullying into the home.

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Presentations/Activities:

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Sneak Peak Street Team Leader of Mid-Atlantic Conference for Penn State
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Volunteer for Tides, local program for grieving children and their families
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