Title

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Journal

Behavioral Medicine, 49(1)

ISSN

0896-4289

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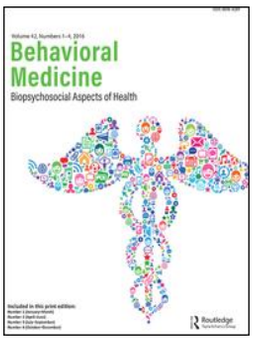
Publication Date

2023-01-02

DOI

10.1080/08964289.2021.1946468

Peer reviewed



Behavioral Medicine

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/vbmd20

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To cite this article: Katie Darabos, Mary Carol Mazza, Jennifer Somers, Anna V. Song & Michael A. Hoyt (2021): Peer victimization and relationships to approach and avoidance coping to health and health behaviors, Behavioral Medicine, DOI: 10.1080/08964289.2021.1946468

To link to this article: https://doi.org/10.1080/08964289.2021.1946468

BEHAVIORAL MEDICINE
https://doi.org/10.1080/08964289.2021.1946468

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RESEARCH ARTICLE

Peer victimization and relationships to approach and avoidance coping to health and health behaviors

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ABSTRACT

Peer victimization during high school is a common experience associated with engagement in risky health behaviors and elevated depressive symptoms. Mechanisms linking peer victimization to health outcomes remain inadequately understood. In the current study, latent class analysis was used to identify latent subclasses of college students who display similar patterns of responses to frequent peer victimization experiences during high school. We also examined moderating and mediating effects of coping (approach/avoidance) on relationships between victimization class and health outcomes (i.e., binge drinking, current smoking, depressive symptoms). College students completed questionnaire measures of peer victimization, approach and avoidance coping, binge drinking, smoking, and depressive symptoms. Four distinct patterns of peer victimization were identified among college students (Low, High, Moderate, and Social/Verbal). Moderation models revealed significant interactions of moderate victimization x approach coping on depressive symptoms and high victimization x avoidance coping on binge drinking. Mediation models revealed a significant indirect effect of avoidance coping on depressive symptoms for those in the high victimization class. Findings provide a greater understanding of the complex patterns of peer victimization. Coping efforts among varying peer victimization classes had different relationships with health outcomes during the college years. Interventions aimed at reducing health-risk and depressive symptoms among college student might benefit from increased attention to high school victimization experiences and current coping processes.

ARTICLE HISTORY
Received 8 December 2020
Revised 8 June 2021
Accepted 16 June 2021

KEYWORDS
Binge drinking; bullying; coping; depression; smoking

Introduction

Experiences of adversity, particularly interpersonal and social stressors, in adolescence can constitute vulnerability to physical and mental health problems in later stages of development.[1–3] Bullying[1] is experienced as a significant social stressor and is characterized by intentional use of physical, verbal, and/or social exclusion (e.g., repeated threat, teasing, or physical assault) with the intent to cause personal harm or distress against another with less power or social influence.[4–6] Bully victimization by peers is one of the most common forms of victimization experienced during childhood and adolescence, affecting approximately 20–35% of school-aged youth.[7–10] Such peer victimization is associated with adverse short- and long-term effects on social-emotional functioning, academic achievement, substance use, and other health behaviors.[11] The adverse impact following peer victimization may be ameliorated depending on how individuals respond to or cope with experiences of bullying.[12–13]

Despite this, few studies have examined whether specific patterns of peer victimization are associated with negative adjustment and whether coping strategies influence both the form of victimization and the impact on adverse emotional and health effects. To address these gaps, we use latent class analysis (LCA), a person-centered, data-driven approach, to first identify typologies (i.e., classes) of peer victimization and then to examine coping behavior as a potential self-regulatory mechanism linking peer victimization in high school to health behaviors (i.e., binge drinking, tobacco use) and depressive symptoms in college years. College students exhibit particular risk with nearly 10% of all college students reporting current use of cigarettes, nearly 30% have engaged in binge drinking behavior, and almost 20% report severe psychological distress.[14]

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Supplemental data for this article is available online at https://doi.org/10.1080/08964289.2021.1946468.

Being bullied or victimized is a stressful experience that has a detrimental impact on mental and physical health.[15,16] Such peer victimization has been associated with depression, anxiety, shyness, persistent loneliness, lower health-related quality of life, lower self-esteem, and lower quality of friendships.[17–19] Further, evidence suggests that peer victimization during youth is associated with increased risk for psychological distress and suicidality over time.[18,20–23]

Research on the impact of peer bully victimization and health risk behaviors in young people has also been emerging suggesting that bullied youth are more likely to engage in risky behaviors such as smoking and drinking over time. In a national sample of U.S. high school students ($N = 74{,}247$), those who were victims of bullying were more likely to use substances (cigarettes, alcohol, marijuana) than those involved (i.e., bullies) and uninvolved in bullying.[24] In a longitudinal study of middle and high school students, Topper and colleagues[25] showed that greater numbers of victimization experiences are related to both current and future problem drinking and alcohol use. In fact, a similar pattern emerges for cigarette use. A longitudinal study of predominantly Hispanic high school students found that students who experienced bullying reported increased cigarette use (and depressive symptoms) over time.[26] Similarly, men who report childhood bullying victimization are more likely to engage in daily heavy smoking by their college years.[27] By comparison, there is limited evidence that peer victimization during high school is associated with increased risk for substance use during the college years.

Interpersonal risk models have proposed that bullying victimization constitutes a chronic stressor. As with any stressful event, individuals that have been bullied have the capacity to cope with these experiences by utilizing a variety of strategies to protect against poorer psychological well-being and engagement in health risk behavior.[28,29] A number of studies have examined commonly used coping strategies among those that have been bullied with varied findings. Some studies found that responding to bullying victimization with verbal or physical aggression or engaging in avoidant behavior as commonly used coping strategies,[30,31] whereas other studies have found that the use of such approach-oriented strategies such as problem solving, distancing oneself from the bully, and seeking social support were most common.[15,32]

Hong and colleagues[33] offered a conceptual framework to identify psychological and behavioral factors that account for differential responses to the effects of bullying victimization (i.e., moderating variables) as well as factors that account for the negative health impact of bullying victimization (i.e., mediating variables). This framework has been useful in consideration of individual differences in these pathways and in motivating research to evaluate mediational links between being bullied and health-relevant outcomes including depressive symptoms and engagement in substance use.[34] However, while this framework suggests the importance of self-regulatory processes in accounting for the effects of being bullied (i.e., social support), theoretical and empirical work has largely overlooked the influence of coping behaviors. Only recently have researchers begun to examine the buffering and/or exacerbating effects of coping mechanisms, with coping behaviors being conceptualized to both moderate the potentially deleterious impact of bullying victimization on health (e.g., interpersonal supports) and mediate the path (e.g., emotion regulation). The question remains as to whether the impact of bullying victimization on health risk behavior and mental health is intensified (or mitigated) by adaptive or maladaptive coping (moderating contextual hypothesis) or if bullying victimization itself impacts coping behavior to ultimately lead to poorer health outcomes (mediating mechanistic hypothesis).

Many adaptive coping strategies have been found to moderate the relationship between victimization and psychological distress. In particular, seeking social support from family members and friends was found to buffer the relationship between bullying victimization and depressive symptoms, whereas assertive coping strategies (e.g., finding and contacting the bully, defending oneself without causing harm to others) intensified depressive symptoms.[35] Emotion-focused coping and problem-focused coping have also been found to buffer the adverse effects of victimization on psychological problems.[36] Misguided efforts at emotion-regulating coping (e.g., situational avoidance, expressive suppression) may be particularly likely to moderate the impact of bullying victimization on psychological adjustment in young people.[37]

In relation to health risk behavior, cognitive coping strategies (e.g., selective focusing on positive aspects of the situation; *I try to notice the good things in life*) significantly moderated the relationship between peer-based violent acts and substance use. Specifically, violent victimization was associated with greater alcohol and tobacco use among adolescents low in cognitive coping, compared to adolescents high in cognitive coping.[38]

Coping may mediate the effects of experiencing bullying on later health outcomes, such that being

bullied potentially perpetuates maladaptive responses associated with avoidant coping and emotion dysregulation. In fact, studies of victimization experiences in children and adolescents have demonstrated that being bullied is associated with increased avoidance coping cross-sectionally and over time.[12,15,35,39] Among college students who were victimized as youth, avoidant coping partially mediated the relationship between victimization and total stress symptoms among undergraduates and self-esteem among adolescents.[28,40] Emotional coping was also found to play a mechanistic role between bullying victimization and social anxiety and stress symptoms among undergraduates and with depressive symptoms as well as adolescents.[28,41,42]

Topper and colleagues[25] found that peer victimization was related to drinking specifically as a means to cope with daily stressors, exacerbating risk for longer-term alcohol-related problems. However, it is important to acknowledge that some substance use behaviors can themselves be construed as attempts at avoidance coping and an attempt to escape negative emotional arousal.[43] For instance, it might be that bullying impacts critical self-regulatory skills and leads to depletion of coping resources and poorer mental health.[44–46] In fact, McLaughlin et al.[47] demonstrated that victims of relational and reputational bullying were more emotionally dysregulated over time, which in turn predicted increased mental health symptoms later on.

The transition to college marks a period of time in which young adults enter new peer contexts and experience increased and novel life stressors. While prior peer victimization experiences may affect students' ability to weather the transition, little is known about the relationship between peer victimization in high school and psychological adjustment during college.

Research has highlighted the potential impact of bullying victimization on psychological adjustment and health risk behavior. In addition, coping strategies have been shown to both mediate and moderate these relationships. However, different types of coping strategies may play different roles under varying experiences of bullying victimization. In fact, research has neglected the influence of different forms of victimization (e.g., physical, relational) on adjustment and health risk behavior and in particular, the factors that reduce the negative impact of victimization on later functioning.[48–50] Additional work is needed to better understand the pathways and interactions by which coping strategies are most effective in response to specific forms of bullying victimization.

According to stress and coping paradigms, coping behaviors can both moderate the potentially deleterious impact of bullying victimization on health (e.g., interpersonal supports) and mediate the path (e.g., emotion regulation).[51,52] The question remains as to whether the negative impact of the type of peer victimization on health and health behavior is intensified (or mitigated) by approach or avoidance coping (moderating contextual hypothesis) or if type of peer victimization itself impacts coping behavior to ultimately lead to poorer health outcomes (mediating mechanistic hypothesis). Thus, in the current study, latent class analysis was used to identify latent subclasses of college students who display similar patterns of responses to frequent peer victimization experiences during high school. We examined moderating and mediating effects of coping (approach/avoidance) on relationships between victimization class and health outcomes (i.e., binge drinking, current smoking, depressive symptoms). Testing both moderation and mediation models with the same sample and variables will help to clarify theory and advance the clinical understanding of coping in the context of peer victimization.

Methods

Participants

Participants included 814 university undergraduates attending a large public university. As reported in Table 1, the majority were female (61.9%), in their first or second year of university (58%), and identified as either Hispanic/Latino (35%) or Asian (30.3%). The average age was 19.9 years (SD = 2.9) with a range of 17 to 55 years. Participants were recruited from a student subject pool to participate in a study of "high school experiences and health". Following informed consent procedures, participants completed questionnaire measures and received course participation credits.

Measures

Bullying victimization

Participants were asked to retrospectively recall experiences of bullying during high school via a modified version of the Olweus Bullying/Victimization Questionnaire (OBVQ).[10] The OBVQ has been widely used to assess peer victimization and bullying experiences. Ten items assessed experiences of social (*other students left me out of things on purpose, excluded me from their group friends, or completely ignored me*), and physical *(In high school, I was threatened or forced*

Table 1. Descriptive statistics of the sample and by victimization class.

			Victimization class								
	Full sample ($N = 814$)		Low ($n = 646$)		Moderate ($n = 72$)		High ($n = 31$)		Social/Verbal ($n = 65$)		
Variable	N	%	N	%	N	%	N	%	N	%	p*
Age (M/SD)	19.9	2.90	19.78	2.48	19.57	1.54	19.90	1.54	21.39	6.46	<0.001
Gender											0.37
Female	504	61.9%	413	63.9%	40	55.6%	16	51.6%	35	53.8%	
Male	303	37.2%	227	35.1%	32	44.4%	15	48.4%	29	44.6%	
Transgender/Other Gender	7	0.9%	6	0.9%	0	0.00%	0	0.00%	1	1.5%	
Race/Ethnicity											0.10
Hispanic/Latino	278	34.2%	226	35.0%	26	36.1%	10	32.3%	16	24.6%	
Asian/Pacific Islander	247	30.3%	199	30.8%	17	23.6%	10	32.3%	21	32.3%	
White	121	14.9%	86	13.3%	17	23.6%	2	6.5%	16	24.6%	
African American/Black	44	5.4%	37	5.7%	3	4.2%	3	9.7%	1	1.5%	
American Indian/Alaska Native	2	0.2%	1	0.2%	0	0.0%	0	0.0%	1	1.5%	
Multiracial/Other	122	15.0%	97	15.0%	9	12.5%	6	19.4%	10	15.4%	
Victimization Endorsement[a]											<0.001
Called names, teased	139	17.1%	57	9.3%	31	43.1%	18	58.1%	33	50.8%	
Left out, ignored	151	18.6%	80	12.4%	24	33.3%	20	64.5%	27	41.5%	
Hit, kicked, pushed	66	8.1%	26	4.0%	13	18.1%	20	64.5%	7	10.8%	
Told lies, rumors spread about	134	16.5%	66	10.2%	34	47.2%	19	61.3%	15	23.1%	
Things taken away/damaged	67	8.2%	25	3.9%	22	30.6%	17	54.8%	3	4.6%	
Threatened/forced to do things	67	8.2%	30	4.6%	20	27.8%	16	51.6%	1	1.5%	
Mean names about race/color	91	11.2%	32	5.0%	29	40.3%	18	58.1%	12	18.5%	
Names/gestures with sexual meaning	97	11.9%	43	6.7%	32	44.4%	16	51.6%	6	9.2%	
Cyber bullying	71	8.7%	25	3.9%	29	40.3%	15	48.4%	2	3.1%	
Bullied in some other way	86	10.6%	35	5.4%	25	34.7%	13	41.9%	13	20.0%	
Approach coping (M/SD)	2.73	0.52	2.73	0.53	2.63	0.51	2.75	0.50	2.77	0.48	0.43
Avoidance coping (M/SD)	2.16	0.51	2.15	0.51	2.19	0.45	2.47	0.56	2.11	0.57	0.01
Depressive symptoms (M/SD)	19.50	10.35	19.02	10.22	23.72	9.99	21.73	12.29	18.54	10.06	0.001
Binge drinker	297	36.8%	222	35.1%	32	44.4%	13	41.9%	25	38.5%	0.40
Current smoker	90	11.1%	67	10.4%	9	12.5%	3	9.7%	11	16.9%	0.42

Note: Total N's may vary due to missing data on bullying endorsement variables.
*ANOVA for continuous variables, chi-square for categorical variables.
[a]Victimization endorsement was dichotomized into 0 = Didn't happen, once/twice, 1 = More often; percentages are reported as the number of participants that endorsed type of victimization within the victimization class.

to do things I did not want to do) bullying on a five-point response scale ranging from (1) *this never happened to me* to (5) *several times a week*. Cronbach's alpha was 0.93.

Coping

Coping with stressful events was assessed by the Brief COPE, a 28-item self-report inventory, and the Emotional Approach Coping Scales.[53,54] Participants rated their coping behaviors in response to how they cope with stressful events on a four-point response scale ranging from (1) *I don't do this at all* to (4) *I do this a lot*. A composite measure of approach-oriented coping was constructed from the active coping (*I've been taking action to make the situation better*), planning (*I have been thinking hard about what steps to take)*, acceptance (*I've been learning to live with it*), support seeking (*I've been getting comfort and understanding from someone*), emotional expression (*I allow myself to express my emotions*), and emotional processing (*I take time to figure out what I'm really feeling*) subscales; the avoidance-oriented coping composite was constructed from the behavioral disengagement (*I've been giving up trying to deal with it*), denial (*I've been refusing to believe that it has happened*), and mental disengagement (*I daydream about things other than this*) subscales. The composite scale scores represent the mean of included items (approach $\alpha = 0.74$; avoidance $\alpha = 0.76$).

Depressive symptoms

Depressive symptoms during the past week was measured by the 20-item Center for Epidemiological Studies Depression Scale (CESD).[55] Participants rated their agreement with items on a response scale ranging from (0) *rarely or none of the time* to (3) *all of the time*. Scores were summed to a total score where higher scores reflect more depressive symptoms. Sample items include, "*I felt depressed*" and "*I was happy*" (reverse scored). A total score of ≥16 is typically used as a cut off for identifying individuals at risk for clinical depression. Cronbach's alpha was 0.90.

Binge drinking

To assess binge drinking, participants were asked to indicate the number of days, within the past 30 days, that they consumed five or more drinks in a row

within a couple of hours. Responses were coded: (0) *No binge drinking in the past 30 days* and (1) *Binge drank in the past 30 days*.

Smoking

To assess current smoking status, participants were asked to indicate the number of days, within the past 30 days, that they smoked cigarettes. Responses were coded: (0) *No smoking or less than 1 cigarette per day in the past 30 days* and (1) *Smoked at least 1 or more cigarettes a day in the past 30 days*.

Data analytic plan

Latent class analysis (LCA) was used to identify distinct, latent classes based on response patterns to experiences of peer victimization in high school using Mplus Version 8.3.[56] Latent class analysis was used to identify subclasses of participants who exhibit response patterns to experiences of peer victimization in high school that are similar to others within their subclass however are distinct from other participants in other subclasses. LCA was chosen to assess individual probabilities and makes decisions on class membership based on the best-fitting latent class. The first step in determining the best-fitting model was to fit a model that is constrained to one class. In the next step we fit a two-class model and compared indices of the two-class model to the one-class model. If indices improved, the two-class model was used as a comparison for fitting a three-class model. This was repeated until the model failed to converge or failed to improve upon the comparison model. The Akaike Information Criteria (AIC) and the Bayesian Information Criteria (BIC) were reported as fit indices of LCA. Lower values on the AIC and BIC indicate better model fit.[56] The bootstrap likelihood ratio test (BLRT) was used for model comparison. The BLRT provides a p-value that indicates which model is the better fitting model with an insignificant p-value ($p > 0.05$) indicating that the model with one fewer class is a better fit for the data.[57,58] As previous studies have suggested that the AIC is inconsistent for LCA models, the most weight in determining number of bullying classes was given to the BLRT and the BIC.[58,59] Further a model entropy value above 0.80 was examined to suggest classes that are well-separated and distinct.[60] In addition, because of the racial/ethnic diversity in the sample, we are able to test for measurement invariance and consider whether the prevalence of victimization profiles was equivalent across race/ethnicity. Race was grouped into four variables: Non-Hispanic White ($n = 121$), Asian/Pacific Islander ($n = 247$), Hispanic/Latino ($n = 278$), Other [African American/Black, American Indian/Alaskan Native, Multiracial/Other ($n = 168$)].

Item response probabilities in LCA described the response patterns in the data that are unique to each peer victimization class. Peer victimization class membership and item-response probabilities were calculated based on dichotomizing peer victimization experiences as, (0) *this never happened to me or happened only once or twice* and (1) *this happened more often*.

Descriptive statistics and zero-order correlations were conducted for key study variables. Associations between demographic variables were examined as possible covariates. ANOVA for continuous variables and chi-square for categorical variables were used to test demographic and peer victimization endorsement variables across peer victimization classes. Mediation and moderation analyses were conducted to test for possible mediating and/or moderating effects of approach and avoidance coping on the effects of peer victimization on college health behaviors. To test for possible mediating effects, approach and avoidance coping were examined as separate mediators of the relationship between peer victimization class and depressive symptoms and substance use (binge drinking and current tobacco use). Bootstrapping mediation analyses were conducted using methods outlined by Preacher and Hayes[61] for estimating total, direct, and indirect effects. Six models were tested via the PROCESS macro for SPSS with percentile bootstrap confidence intervals at 10,000 resamples to test effects.[62,63] Mediation was assessed by the indirect effect of X (peer victimization class) on Y (depressive symptoms, substance use) through M (approach/avoidance coping; entered in separate models). Given a multi-categorical X, effects were labeled as *relative* total, direct, and indirect effects. Regression coefficients were estimated using ordinary least square regression. The relative direct and indirect effects were interpreted as the effects of membership in one peer victimization class relative to the reference group.

To test for possible moderation effects, approach and avoidance coping were examined as separate moderators of the relationship between peer victimization class and depressive symptoms, through multiple linear regression, and substance use (binge drinking and current tobacco use), through binary logistic regression. In each regression model, relevant covariates were entered into the first block, categorical peer victimization class and coping (approach coping, avoidance coping; entered in separate models)

in the second block, and the interaction term (peer victimization class x coping) in the last block. To avoid multicollinearity, continuous coping variables were centered around the mean, and interaction terms were analyzed in accordance with methods outlined by Aiken and West[64]. To interpret significant interactions, simple slopes analyses were conducted at one standard deviation above and below the mean using PROCESS.[62]

Results

Descriptive and identification of covariates

Over half of the sample ($n = 480$; 59.0%) met the CES-D cutoff indicative of clinical depression ($M = 19.50$, $SD = 10.35$). More than one-third of participants ($n = 297$; 36.8%) reported binge drinking in the past 30 days whereas 9.8% ($n = 79$) of the sample reported smoking at least 1 cigarette a day in the past 30 days. The majority of participants (66.4%) reported either being bullied in high school. Among these, 64.4% stated the victimization lasted 1–2 weeks to a month whereas 35.1% stated the victimization lasted about 6 months to several years. Participants reported engagement in both approach ($M = 2.73$, $SD = .52$) and avoidance coping ($M = 2.16$, SD = .51). See Table 1.

Bivariate correlations and chi-square were conducted to test for associations between demographic and dependent variables. Significant associations of sexual orientation (straight vs. gay/bisexual) and ethnic status (people of color vs. non-Hispanic White people) were controlled for in the depressive symptoms model whereas gender (female vs. male) and ethnic status were controlled for in the binge drinking and smoking models.

Latent class analysis

Fit indices for the LCA model are presented in Supplemental Table 1. Models were tested by adding classes and comparing model fit until the tested model either failed to converge or did not provide a better fit over the previous model. Model fit for the four-class model showed a relatively small improvement over the three-class model, however a non-significant BLRT suggested better model fit of the four-class model (see Supplemental Table 1). Fit indices for the four-class model indicated an improvement in model fit compared to the five-class model. The five-class model produced a significant BLRT and a larger BIC, thus the model with four classes was retained and used in subsequent analyses (entropy value = 0.92). We employed a one-step approach as it has been found that it holds the same efficiency to the three-step approach if sufficiently good class separation is present, indicate by entropy values above 0.6, which was the case in the present study.[65] Figure 1 displays a plot of the four-class solution where each peer victimization item is presented on the x-axis and the item-class probabilities are plotted on the y-axis. Corresponding confidence intervals are reported in Supplemental Table 2.

Table 1 also describes the demographic characteristics of each latent class. Class 1 (*Low Victimization)* described 79.4% ($n = 646$) of the sample. Individuals in this class had a low probability of experiencing physical, verbal and/or social peer victimization. Across all peer victimization items those in the low victimization class experienced being bullied in high school 6.54% of the time. Class 2 (*High Victimization)* described 3.8% ($n = 31$) of the sample and was characterized by a high probability of experiencing physical, verbal and/or social peer victimization. Across all peer victimization items those in the low victimization class experienced being bullied in high school 55.48% of the time, class 3 (*Moderate Victimization)* described 8.8% ($n = 72$) of the sample and reflected moderate levels of peer victimization. Across all peer victimization items those in the low victimization class experienced being bullied in high school 35.98% of the time. Finally, class 4 (*Social/Verbal Victimization)* described 8.0% ($n = 65$) of the sample. Individuals in this class had a moderate probability of solely experiencing verbal and/or social peer victimization. Across all peer victimization items those in the low victimization class experienced being socially and verbally bullied in high school 18.31% of the time.

Of note, those in the social & verbal bullying class were more likely to be younger compared to other peer victimization classes [$F(3,808) = 6.29$, $p < 0.01$]. Those in the moderate victimization class were more likely to have higher depressive symptoms compared to the low and social/verbal victimization classes [$F(3,809) = 5.18$, $p < 0.01$]. Lastly, those in the high victimization class were more likely to use approach coping, compared to other victimization classes [$F(3,808 = 4.17$, $p < 0.01$].

Measurement invariance across classes

A multigroup LCA was run to test for invariance of classes across racial/ethnic groups. First, an LCA using the same victimization items and specifying one through five classes was run separately for each race/ethnicity group. Results from the analyses revealed that a four-class model provided the best fit for the

data and a similar pattern of victimization classes emerged within each racial/ethnic group. Next, a multigroup LCA was run to test for measurement invariance across racial/ethnic group. This involved running two models, an unconstrained and fully constrained model, where racial/ethnic group was modeled as having four latent classes. In the unconstrained model, latent class prevalence and item response probabilities were allowed to vary across racial/ethnic group whereas in the fully constrained model, class prevalence and item response probabilities were constrained to be equal. The two models were then compared by taking the difference between the log likelihood of each model and multiplying by two, which functions as a chi-square test. The two times the log likelihood difference test between the unconstrained and fully constrained models was not significant [(−2740.06) − (−2798.88) * 2 = 117.64, $df = 126$ (difference in parameters), $p = 0.68$] indicating that item response probabilities were equivalent across the groups.

Moderation model testing

Model testing was repeated to evaluate the moderating effects of approach and avoidance coping with each dependent variable. Results are organized by

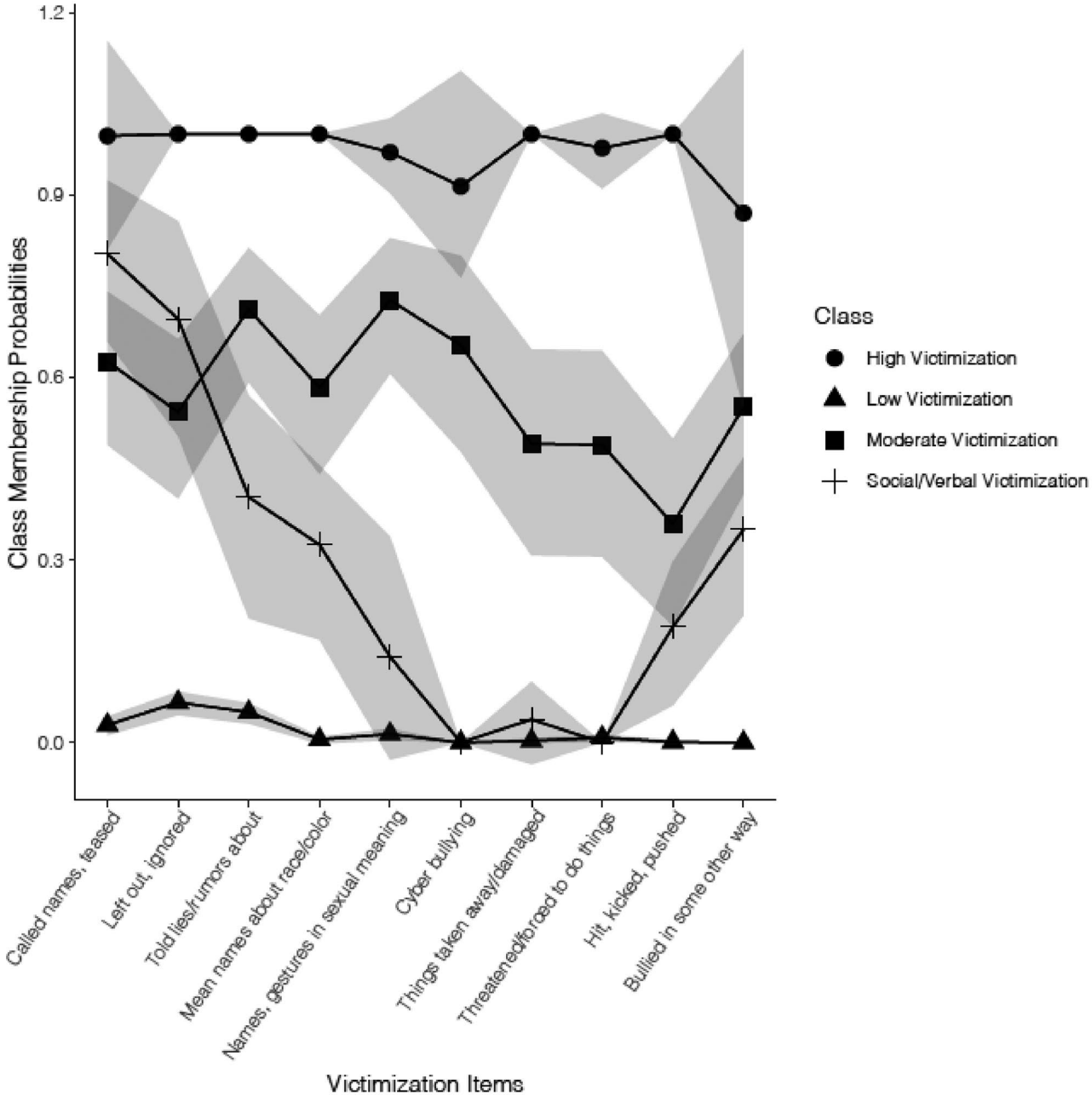


Figure 1. Latent class probabilities.

moderating process (approach and avoidance coping) and displayed in Tables 2 and 3, respectively.

Approach coping

Mirroring results above, there was a significant main effect for peer victimization class on depressive symptoms; being a member of the moderate victimization class ($\beta = 0.14$, $p < 0.01$) was associated with higher depressive symptoms. No other main effects were found for victimization class. Additionally, there was a significant main effect of approach coping on depressive symptoms ($\beta = -0.18$, $p < 0.01$), such that use of approach coping was associated with lower depressive symptoms. Likewise, approach coping predicted smoking behavior (OR = 0.62, 95% CI: 0.38–1.01). For every one-unit increase in approach coping, the odds of smoking decreased by 38%. Approach coping was not significantly associated with binge drinking.

Results revealed a significant moderate victimization class x approach coping interaction on depressive symptoms ($\beta = 0.08$, $p = 0.02$), which explained an additional 0.9% of the variance beyond the main effects. Simple slopes are displayed in Figure 2a and show that moderate victimization class membership is associated with significantly higher depressive

Table 2. Linear and binary logistic regression for approach coping.

	Depressive symptoms[a]			Binge drinking		Smoking	
Variable	*B*	*SE*	*β*	OR (95% CI)	*p*	OR (95% CI)	*p*
Class membership							
Low victimization				Referent		Referent	
High victimization	2.53	1.88	0.05	1.32 (0.62–2.82)	0.47	0.74 (0.17–3.22)	0.68
Moderate victimization	4.98	1.27	0.14***	1.33 (0.80 – 2.22)	0.27	0.95 (0.40 – 2.27)	0.91
Verbal & Social victimization	0.03	1.32	<0.001	1.00 (0.59 – 1.72)	0.99	1.57 (0.77 – 3.21)	0.21
Sexual Orientation							
Heterosexual				–	–	–	–
Non-Heterosexual	2.90	1.52	0.06†	–	–	–	–
Gender							
Male	–	–	–	Referent		Referent	
Female	–	–	–	1.87 (1.38 – 2.52)	<0.001***	1.87 (1.19 – 2.94)	0.01*
Ethnicity							
Non-Hispanic White				Referent		Referent	
Ethnic status	3.40	0.88	0.13***	1.49 (1.05 – 2.12)	0.03*	2.09 (1.29 – 3.38)	<0.001***
Approach Coping	−3.49	0.75	−0.18***	1.08 (0.79–1.48)	0.93	0.62 (0.38–1.01)	0.05*
High victimization x approach coping	−5.15	3.83	−0.05	1.14 (0.25–5.27)	0.87	7.60 (0.63–1.20)	0.11
Moderate victimization x approach coping	5.72	2.47	0.08*	0.83 (0.31–2.25)	0.72	0.63 (0.12–3.31)	0.59
Verbal & victimization bullying x approach coping	−1.17	2.71	−0.02	1.05 (0.35–3.19)	0.93	1.22 (0.38–5.36)	0.79

Note: a Regression coefficients reflect values at the end of block 3, with all variables entered into the model.
*$p < 0.05$; ***$p < 0.001$; †$p < 0.10$.

Table 3. Linear and binary logistic regression for avoidance coping.

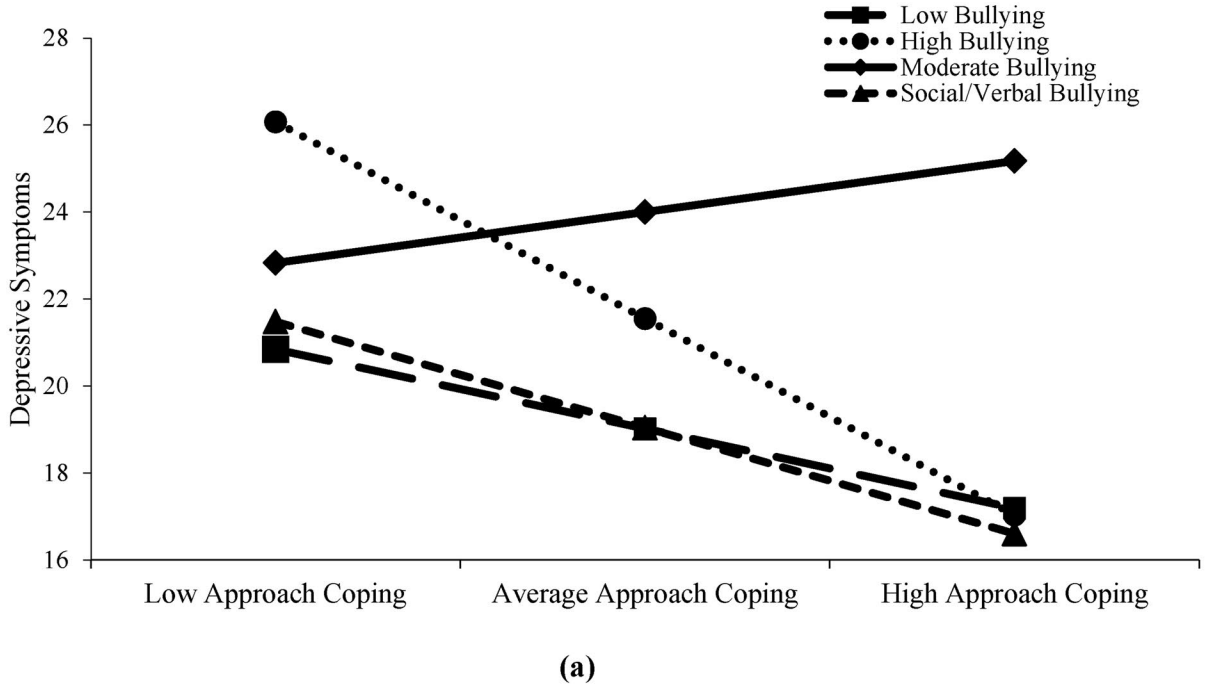
	Depressive symptoms[a]			Binge drinking		Smoking	
Variable	*B*	*SE*	*β*	OR (95% CI)	*p*	OR (95% CI)	*p*
Class membership							
Low victimization		Referent		Referent		Referent	
High victimization	2.08	2.09	0.04	1.95 (0.82–4.66)	0.13	0.68 (0.14–3.44)	0.65
Moderate victimization	4.37	1.23	0.12***	1.37 (0.82–2.27)	0.23	0.38 (0.07–1.99)	0.25
Verbal & Social victimization	−0.29	1.29	−0.01	1.03 (0.60–1.77)	0.91	1.54 (0.75–3.14)	0.24
Sexual Orientation							
Heterosexual		Referent		–	–	–	–
Non-Heterosexual	2.81	1.47	0.06†	–	–	–	–
Gender							
Male	–	–	–	Referent		Referent	
Female	–	–	–	1.87 (1.39–2.52)	<0.001***	01.94 (1.23–3.04)	<0.001***
Ethnicity							
Non-Hispanic White		Referent		Referent		Referent	
Ethnic status	1.74	0.87	0.07*	1.62 (1.13–2.33)	0.01*	2.55 (1.54–4.21)	<0.001***
Avoidance Coping	5.88	0.78	0.29***	1.55 (1.11–2.16)	0.01*	1.65 (1.00–2.71)	0.05*
High victimization x Avoidance coping	−5.19	3.29	0.06	0.18 (0.04–0.85)	0.03*	1.41 (0.18–11.04)	0.74
Moderate victimization x Avoidance coping	0.30	2.69	<0.001	0.38 (0.12–1.19)	0.10	0.38 (0.07–1.99)	0.25

[a]Regression coefficients reflect values at the end of block 3, with all variables entered into the model.
*$p < 0.05$; ***$p < 0.001$; †$p < 0.10$.

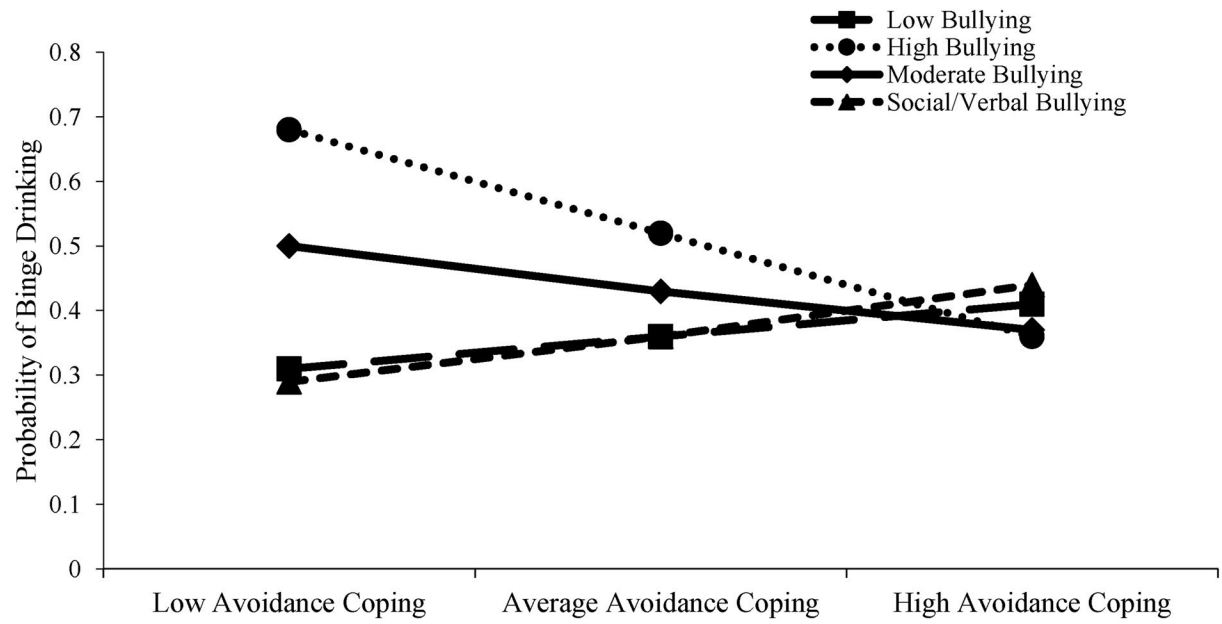
symptoms at average ($b = 4.98$, $p < 0.01$) or high ($b = 7.98$, $p < 0.01$) approach coping.

Avoidance coping

In analyses testing avoidance coping, again being a member of the moderate victimization class ($\beta = 0.12$, $p < 0.01$) was associated with higher depressive symptoms, and there were no other main effects for peer victimization class. Avoidance coping was significantly associated with all three dependent variables such that use of avoidance coping was associated with lower depressive symptoms ($\beta = -0.18$, $p < 0.01$), greater likelihood of binge drinking (OR = 1.55, 95% CI: 1.11–2.16; for every one-unit increase in avoidance coping, the odds of engaging in binge drinking increase by 55%) and greater likelihood of smoking



(a)



(b)

Figure 2. (a) Approach coping x bullying class interaction for depressive symptoms; (b) Avoidance coping x bullying class interaction for binge drinking.

(OR = 1.65, 95% CI: 1.00–2.71; for every one-unit increase in avoidance coping, the odds of being a smoker increase by 65%).

There was a significant high victimization class x avoidance coping interaction on binge drinking (OR = 0.18, $p = 0.03$). Simple slopes are displayed in Figure 2b and show that high victimization class membership is associated with significantly greater probability of binge drinking at low avoidance coping ($b = 1.56$, $p = 0.03$).

Mediation model testing

Models were tested to evaluate the impact of peer victimization class on health and the mediating effects of approach and avoidance coping with each dependent variable. Results are organized by mediating process (approach and avoidance coping). Given sample size, we were sufficiently powered to detect mediated effects at .80 power.[66]

Approach coping

Models testing the indirect effects of approach coping on depressive symptoms and substance use (binge drinking, smoking) (Models 1, 2, and 3, respectively) are reported in Supplemental Table 3. The relative direct effect of the moderate victimization class was significant (direct effect: 4.49, $p < 0.01$) for depressive symptoms; no other relative direct effects of victimization class were significant. Across dependent variables, victimization class was not related to depressive symptoms and substance use through approach coping.

Avoidance coping

Models testing the indirect effects of avoidance coping on depressive symptoms and substance use (binge drinking, smoking) (Models 4, 5, and 6, respectively) are reported in Supplemental Table 4. Again, the relative direct effect of the moderate victimization class was significant (direct effect: 4.40, $p < 0.01$) for depressive symptoms; no other relative direct effects of victimization class were significant. Notably, high victimization was found to be related to depressive symptoms through avoidance coping (depressive symptoms, relative indirect effect: 0.16, 95% CI: 0.06, 0.28).

Discussion

This study used a novel approach to identify patterns of peer victimization and their relationship to health behavior and mental health. Unique patterns emerged. Although the majority of individuals reported minimal past peer victimization, 12.7% reported a wide variety of peer victimization experiences with an additional portion (8%) reporting experiences of social and verbal peer victimization. Notably, 83.5% of those reporting peer victimization were people of color.

Results revealed the potential importance of the moderate victimization class to mental health (i.e., higher depressive symptoms). This group is characterized by experiencing a moderate number of peer victimization forms. It is possible that the inconsistent frequency in which those experience peer victimization in the moderate class generates uncertainty and such unpredictability might confer risk for depressive symptoms. However, distinguishing the mental health impact of specific victimization classes and bullying experiences will require additional research. Most developmental theorists and health psychologists have focused on overall incidence of bullying to purport that greater frequency in victimization experiences together with individual diatheses increase risk for depression.[67] Our results suggest that identification of more varied patterns, such as those revealed through LCA, might better contribute to understanding the impact of bullying victimization.

A major goal of this study was to contribute to existing conceptual models through the examination of both the moderating and mediating potential of coping. The pattern of results suggests the relationship of coping to health outcomes in the context of peer victimization is complex. The identification of latent classes, or patterns of peer victimization experiences, helps elucidate evidence for both a moderational and mediational role for approach and avoidance coping. Supporting the moderation hypothesis, results suggest that the moderate victimization class might experience decrements in the efficacy of approach-oriented coping. That is, with higher levels of approach coping those in the moderate victimization class reported higher depressive symptoms. It may be that membership in this peer victimization class lack specific skill or resources that result in failed coping attempts. Approach coping is effortful. Transactional stress and coping models demonstrate that failed coping attempts could exacerbate the impact of the stressor via resource depletion and escalation of the stressor itself.[51] Mental health improvement may be particularly amenable to enhancing coping efficacy in this peer victimization class.

In support of the mediation hypothesis, avoidance (and not approach) coping presents a pathway by which those experiencing high peer victimization in high school are more likely to exhibit poorer

adjustment, as indicated by depressive symptoms, in their college years. The high victimization class is marked by experiences of peer victimization in a variety of forms, presumably spanning a range of peer environments. It may be that adolescents find benefit in universally relying on avoidance coping strategies across stressful occurrences and social contexts or calling upon avoidance as a social tool to stave off future victimization. Over time this could result in a limited coping repertoire, poor resolution of problems, and ultimately poorer mental health. In the case of drinking behavior, avoidance coping acted as moderator of intensive victimization experiences such that the relative absence of avoidance coping was associated with increased binge drinking among those in the high victimization class. It may be that, in the absence of avoidant coping strategies (e.g., disengagement), those that experience high peer victimization look toward alcohol use as a means to ultimately achieve escape. Indeed, coping through alcohol use as a means to reduce or regulate negative emotion has been identified as a motive for drinking and has been found to be positively associated with the quantity and frequency of drinking.[68]

Findings related to mediational links help elucidate the conceptual complexities in understanding the role of coping. However, the cross-sectional design cannot establish true causal mediational paths. It is possible that another set of relationships exist. Although not consistent with conceptual models, patterns of coping (e.g., behavioral disengagement) could be a precursor to victimization. Longitudinal data is needed to truly establish the temporal sequence and clarify whether peer victimization precedes or is a consequence of psychological coping. Likewise, other third variable confounders should be considered. For instance, other factors related to coping appraisals, coping effectiveness, or self-regulation could alter the manner in which coping behavior relates to bullying-related stressors.

This study adds to the growing literature demonstrating that chronic life stressors experienced in earlier stages of development exert negative influence on health and health-related behaviors in later life periods. Several conclusions can be made regarding the influence of coping processes in exacerbating or mitigating the resulting health-related vulnerability. The results offer some support for the positive impact of approach coping and negative influence of avoidance on health and health behavior adding to the literature showing that victimized youth develop increased maladaptive coping strategies.[69] This pattern likely reflects attempts to prevent additional peer victimization or to mitigate its impact.[36,70]

Study results must be considered in light of limitations. This study relied on retrospective recall of high school peer victimization experiences. Although this approach has been used in prior studies, it is unclear to what degree college students are accurate in their reports of past bullying victimization.[71] It is also notable that current peer victimization was not assessed. Bullying victimization in college and university settings can also have detrimental impact and it is conceivable that some portion of the sample would report current peer victimization either within or outside the university environment.[14] Experiencing supportive peer relationships in college might help mitigate the negative impact of past victimization.[72] However, research in this area is limited. The reparative value of having healthy peer relationships in college after some patterns of peer vicitimization in high school has good potential as a focus for future research or intervention development. Also, this study focused on three health-related factors of high relevance to young adults; however, other health indicators may be equally or differently sensitive to peer victimization (e.g., sexual risk behavior, anxiety symptoms).

The final sample was representative of the institution from which recruitment occurred. However, this resulted in inclusion of relatively small numbers of individuals from some ethnic identity groups and the grouping of African-American/Black, American Indian/Alaskan Native, and Multiracial/Other racial and ethnic identity groups into one category for analyses. The different cultural experiences of different groups should be examined in a future study designed and powered to detect varied experiences. It should also be acknowledged that generational shifts in the culture surrounding bullying, smoking, drinking, and mental health exist. Although this study included a large range in participant age, less than 1% of the sample was over age 30 and so disallowing detection of such differences in these data. Notably, no meaningful differences in primary study variables, were detected for these participants. Finally, it is probable that some portion of participants were themselves the bullies. These students might represent a particular subset with unique patterns of behavior.

Conclusions

This study begins to disentangle the role of coping in the health-related impact of peer victimization. Future studies should continue to consider behavioral and

psychological adjustment, but also the possibility of resulting biological vulnerability, whereas victimization experiences have been linked to pronounced physiological stress responses.[37] As these findings apply broadly, experiencing victimization early on in adolescents might constitute particular risk for poor coping and adjustment in young adulthood. Newman and colleagues[28] found that when faced with frequent victimization, individuals try to reshape and restructure their environment by any means possible, which necessarily involves using a range of coping strategies (i.e., problem-focused coping, emotion-regulation coping, avoidance).

Understanding which coping behaviors (approach vs. avoidance) operate in which way (meditational vs. moderational) and on which outcomes (mental health vs. health behaviors) within what context (e.g., moderate vs. high peer victimization) is critical to developing evidence-based solutions. More specifically, high school programs as well as colleges might consider specific prior peer victimization as they attend to student health promotion efforts. Such interventions aimed at enhancing overall adjustment to college and reduce or prevent risky health behaviors should be theory-based and might target the meditational (e.g., expansion of coping repertoire) and moderational (e.g., bolstering coping resources) operations of coping.

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Note

1. We use the terms bullying, bullying victimization, and peer victimization synonymously. We acknowledge that although there are distinctions between these terms, there is also precedent for interchangeable use[73] and all are generally characterized by behavior that is aggressive or intended to harm, carried out repeatedly and over time; and 3) occurs in an interpersonal relationship where a power imbalance exists.[74]

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