



Trait hostility and aggression as a partial function of lower dispositional mindfulness

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Abstract

Introduction: Dispositional mindfulness has yet to be examined in relation to maladjustment indicators.

Materials and Methods: This study established associations between dispositional mindfulness, trait hostility, lifetime aggression, and additional maladjustment indicators in a college (N= 945) and a national (N= 239) sample. We assessed the samples through an electronic survey. The college sample was collected through the Psychology Department extra credit participant pool at North Dakota State University. An abbreviated survey was administered in the national sample using a financial incentive for participation.

Results: Significant differences were found between the least (below 20th percentile) mindful and remaining respondents on 19 of 31 maladjustment indices. Significant group effect sizes (d) averaged 0.49 with a high of 0.94 (prior psychiatric treatment in national sample) ($P < 0.001$).

Conclusion: Mindfulness was associated with propensities toward physical aggression, as indicated by multiple indicators. These results suggested that a primary concern posed by low dispositional mindfulness was hostile attitudes toward others that extended to violent acts among a smaller subset of this high-risk cohort.

Keywords: Aggression, Hostility, Mindfulness

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Introduction

Enhanced consciousness through immediate, nonjudgmental sensory experience has been praised across various disciplines (1). About fifty years ago, mindfulness emerged as a vital component in stress management therapies, promoting resilience and psychological well-being (2-5). This study explores the relationship

between dispositional mindfulness and maladjustment indicators. Mindfulness can be classified into state (momentary awareness) and trait (consistent psychological trait) categories. Dispositional mindfulness scales emphasize immediate, nonjudgmental information processing, with tools like the Mindful Attention Awareness Scale (MAAS) (6), Five

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Facet Mindfulness Questionnaire (FFMQ) (7), and others measuring these traits. Clinical anger management increasingly focuses on raising dispositional mindfulness (8,9), although questions persist about how mindfulness affects hostility traits (10).

Research suggests mindfulness may impact emotional reactivity, decoupling processes, and anger rumination reduction. These theories can be differentiated to a considerable extent based on the cognitive (judgment and anger rumination), behavioral (decoupled response inhibition), and/or emotional (dampened autonomic reactivity) intervention targets they emphasize in mindfulness training.

Experimental evidence supporting these theories often stems from mindfulness training interventions, showcasing their ability to moderate negative emotional responses to social rejection (11-13). Equanimity, rooted in Buddhist philosophy, involves maintaining composure amidst intense emotions, supported by response inhibition and objective decision-making. Mindfulness training has effectively reduced behavioral reactions to negative emotions (14). Studies have also linked dispositional mindfulness to reduced anger, rumination, and hostile behaviors (15). Personality traits like low neuroticism and high conscientiousness are closely tied to dispositional mindfulness (16).

Mindfulness has shown associations with both adaptive and maladaptive outcomes. While it is its well-established in mitigating internalized distress (17,18), recent attention has shifted towards its role in modulating externalized symptoms like anger and aggression (19,20). Intervention studies have demonstrated the clinical benefits of mindfulness in reducing aggressive behaviors and moderating antisocial traits among offenders (21). The Buss-Perry Aggression Questionnaire (BPAQ) (22) is often applied to measure hostility and aggressive tendencies, with correlations between BPAQ scores and dispositional mindfulness in previous studies. Mindfulness enhancements have decreased aggressive responses, showcasing their potential benefits in managing aggression and hostility (23). This study examined the strengths of the association between dispositional mindfulness and a range of trait, behavioral, and indirect indicators of anger, hostility, and aggression. Relationships between dispositional mindfulness and a range

of maladjustment indicators were examined within the context of trait anger and aggressiveness, lifetime violence, indirect hostility, and generalized emotional dysregulation indicators.

Materials and Methods

The college sample (N= 945) of the present study was selected among undergraduates students enrolled in psychology classes (introductory, personality, developmental, and abnormal) at North Dakota State University who fulfilled the anonymous online survey for extra credit. The majority of the sample was young (Mean age= 20.15, SD=3.92, Range= 18-55) and identified as white (Caucasian, 89.8%; African American, 1.8%; Asian, 2.2%; Hispanic, 1.1%; Native American, 1.5%; bi-racial, 1.0%; and other, 2.6%), and female (76.8% female, 21.5% male).

The national sample (N= 241) was selected using Amazon's Mechanical Turk (MTurk) with participation restricted to United States residents over 18 years of age. Participants received \$.75 for their participation. This national sample was roughly equal in gender distribution (55.6% female, 44.4% male) but varied in age (M= 36.4, SD= 13.4, Range= 18-72) and ethnicity (Caucasian, 74.8%; African American, 7.6%; Asian, 5.6%; Hispanic, 4.8%; Native American, 1.2%; bi-racial, 3.2%; and other, 2.8%). Respondents were excluded from the college (N= 33) and national (N= 11) samples due to inconsistent responses to a near-identical item embedded in two different survey points. Data from the Lifetime Assessment of Violent Acts questionnaire (LAVA) was excluded from analysis in the college (N= 80) and national (N= 14) sample for any respondent failing to meet the LAVA validity standard described below.

Research instruments

A) *Mindful Attention Awareness Scale (MAAS)*: This scale was generated through an exploratory factor analysis of 184 items. These items are scored on a six-point Likert system (responses range from almost always to rarely) in a college sample (6). This scale has links with a wide range of maladjustment, well-being, and/or alternative mindfulness indicators, which underscores its reliability (test-retest, $r = 0.81$; Cronbach's alpha= 0.83 and 0.87 in students and national samples, respectively) and validity (25).

B) Buss-Perry Aggression Questionnaire (BPAQ): The BPAQ is a 29-item tool. Its four subscales included physical aggression, verbal aggression, trait anger, and trait hostility. All BPAQ subscales have acceptable reliabilities (ranging from 0.72 to 0.89) in the literature (22), and BPAQ scores are linked extensively to aggressive and angry behavior (23).

C) Lifetime Assessment of Violent Acts (LAVA): The LAVA is a self-reporting test designed to identify individuals' past aggression throughout their lives, including any mitigating factors and harm caused to others due to previous actions. The LAVA consists of four primary indices of lifetime aggression: Lifetime Aggressive Acts (LAGG), Trouble from Violent Acts (TVA), Injury to Others (ITO), and the Motivated Acts (MA). LAVA dimensional and categorical reliability estimates were calculated from the normative college sample: LAGG, $r = 0.74$, $\kappa = 0.71$; MA, $r = 0.74$, $\kappa = 0.66$; ITO, $r = 0.83$, $\kappa = 0.77$; Reactive, $r = 0.73$, $\kappa = 0.69$; IPV, $r = 0.52$, $\kappa = 0.57$; Alcohol-Related, $r = 0.74$, $\kappa = 0.67$; and Lethal, $r = 0.72$, $\kappa = 0.65$ (26).

D) Levenson Self Report Psychopathy Scale (LSRP): The LSRP is a 26-item self-report tool used to assess the psychopathic tendencies and is scored four-point Likert system (27). Recent factor analyses summarize the discriminant and convergent validity of this scale, which captures some of the content areas intended for the PCL-R (28).

E) Narcissistic Personality Inventory (NPI): This brief index of narcissistic attributes is widely used. Recent studies on psychometrics support its reliability and validity, making it suitable to apply in various clinical and nonclinical populations (29,30).

F) Conduct Disorder Symptoms: A customized survey was developed to quantify the number of core DSM-5 Conduct Disorder symptoms individuals exhibited before age 15. The total score was calculated by adding each of the 15 symptoms, scored 0 or 1, together.

G) Employment Stability: Four items from the Developmental History Questionnaire identified respondents with erratic work histories. Each of the following questions was scored using a 0 to 6 metric. "How many paid (at least 16 hours/week) jobs have you had? How many of these jobs ended because you were fired? How many of these jobs ended in a resignation that was pressured by your employer? How many of these jobs ended because of a conflict you had with an employer or co-worker?"

H) Acquaintance Description Form-2 (ADF-2): This form provides subscale scores measuring relationship qualities experienced within a target friendship (31). This study relied on the Personal Maintenance Difficulty (MD-P subscale) of the respondent's "best friendship." The ADF-F2 defines MD-P as the extent to which the relationship was seen to be "frustrating, inconvenient, or unpleasant due to the habits, mannerisms, or personal characteristics" of the best friend. The MD-P subscale of the ADF-F2 has acceptable internal and test-retest reliability according to previous studies.

I) Active Mental Health Symptoms: The depression symptom identification relied on a customized survey of the 12 primary DSM-5 criteria for Major Depression (Depression). Anxiety symptom (Panic) identification relied on a customized survey of the 13 primary DSM-5 criteria used to define panic attacks. Both indices were measured on a five-point Likert system from 0 (symptom not present) to 5 (present daily with significant distress or impairment). The scores ranged from 0 to 60 (depression) or 0 to 75 (anxiety).

J) Mood Volatility Factor: The 15-item test of the HPS estimated the respondent's affective, behavioral, and/or cognitive instability (32). The literature provides extensive reliability and validation information for this scale (33). Dichotomous scoring was used with a range of 0 to 15.

K) Khavari Alcohol Test (KAT): Using this test, individuals estimated the number of drinks (12 oz can of beer, 6 oz glass of wine, or 1 oz shot of liquor) they usually consumed when drinking. This test estimate was multiplied by a frequency index (daily= 365; 3-4 times a week= 180; twice a week= 104; once a week= 52; 3-4 times a month= 42; twice a month= 24; once a month= 12; 3-4 times a year= 3.5; twice a year= 2; once a year= 1; not currently drinking= 0) to obtain the number of drinks on average consumed daily (34).

L) Michigan Alcoholism Screening Test (MAST): The MAST includes 24 dichotomous (yes/no) items. These items are assigned different weights depending on how well they differentiate between alcoholic and comparison respondents in the validation sample (35). This test has established reliability and validity (36).

M) Psychiatric Treatment History: This history is estimated from affirmative responses to a customized question: "Have you been prescribed

any of the following types of psychiatric medication (leave bubble blank if the answer is no or not applicable)?" Options included mood-stabilizing medications (for bipolar disorder), antidepressants, stimulants (for ADHD), anti-anxiety medication, electroconvulsive trials, and/or antipsychotics. Prior psychiatric hospitalization and/or psychotherapy treatment were included as two of the eight total options.

N) Satisfaction with Life Scale (SLS): This brief 5-item tool evaluates global satisfaction with life (37). The item content is reliable (38) and face-valid. The Likert metric includes scores from 1 (strongly disagree) to 7 (strongly agree).

Analytic strategy

MAAS links to various maladjustment indicators were examined by dimensional and categorical dispositional mindfulness scores. All outcome indices were transformed into standard z-scores before the standard linear regression analyses with pairwise exclusions for missing scores. We applied Fisher z-transformations to

assess whether or not the bivariate correlation coefficients between MAAS and adjustment scores differed in strength between the men and women in these two samples (39). Respondents falling into the lowest 20th percentile of dispositional mindfulness were contrasted with the remaining sample on the same maladjustment indices.

Results

MAAS scores were equally reliable ($\alpha = 0.93$) in the college and national samples. Tables 1 (college sample) and 2 (national sample) consist of descriptive statistics for the variables of interest in this study. MAAS correlation strengths differed by gender in only one case. The association between MAAS scores and alcohol intake was significantly stronger for men than women in the college sample ($r = -0.29$ versus -0.13). The limited impact of respondent age on these MAAS associations also appeared evident (Tables 1 and 2).

Table 1. Descriptive statistics and bivariate MAAS correlates in the college sample

Index	n	M	SD	Range	MAAS r	*MAAS r
Dispositional Mindfulness (MAAS)	947	67.78	14.57	15-90	X	X
Age	927	20.14	3.93	18-55	0.00	X
Trait anger and aggressiveness						
Trait Anger (BPAQ _{AN})	894	13.36	4.85	7-34	-0.23***	-0.22***
Trait Hostility (BPAQ _{HOS})	914	15.36	6.99	8-40	-0.35***	-0.34***
Verbal Aggression (BPAQ _{VA})	924	11.46	4.74	5-25	-0.18***	-0.14*
Physical Aggression (BPAQ _{PA})	896	16.24	6.19	9-42	-0.17***	-0.19**
Lifetime violence						
Life Acts (LAGG)	646	2.11	2.80	0-10	-0.16***	-0.18***
Injury to Other (ITO)	641	0.77	2.18	0-12	-0.05	-0.06
Trouble from Violent Acts (TVA)	622	0.21	0.79	0-6	-0.04	-0.04
Reactive acts	646	1.08	1.71	0-15	-0.14***	-0.16***
IPV acts	646	0.59	1.24	0-9	-0.15***	-0.17***
Alcohol-related acts	646	0.35	1.02	0-10	-0.08*	-0.11*
Weapons-related acts	646	0.13	0.58	0-3	-0.04	-0.05
Indirect hostility indicators						
Psychopathy	865	58.74	14.18	26-105	-0.22***	-0.25***
Narcissism	889	44.86	10.12	16-80	-0.06	-0.17**
Conduct problems	914	0.63	1.20	0-9	-0.14***	-0.19**
Work problems	923	3.15	2.38	0-24	-0.06	-0.10
Friendship strains	753	11.42	4.57	5-26	-0.16***	-0.14*
Generalized emotional dysregulation indicators						
Depression	798	6.07	7.96	0-44	-0.31***	-0.40***
Panic	775	5.33	8.23	0-52	-0.24***	-0.28***
Mood volatility	900	5.96	3.87	0-15	-0.39***	-0.39***
Alcohol intake	788	0.56	0.91	0-9.72	-0.17***	-0.13*
Alcoholism	849	4.68	5.04	0-45	-0.08*	-0.11
Prior psychiatric treatment	947	0.65	1.16	0-8	-0.09**	-0.20**
GPA _{HS}	922	3.57	0.40	1.90-4.00	0.04	0.06
GPA _{Coll}	888	3.33	0.50	0.50-4.00	0.09**	0.17**
LifeSat	839	20.54	6.18	0-30	0.22***	0.26***

MAAS= Mindful Attention Awareness Scale; BPAQ=Buss-Perry Aggression Questionnaire; *Age-adjusted bivariate MAAS correlations

Table 2. Descriptive statistics and bivariate MAAS correlates in the national sample

Index	n	M	SD	Range	MAAS	*MASS
					r	r
Dispositional Mindfulness (MAAS)	239	68.10	16.45	15-90	X	X
Age	236	36.49	13.46	18-72	0.16*	X
Trait anger and aggressiveness						
Trait Anger (BPAQ _{AN})	223	15.25	6.83	7-35	-0.35***	-0.37***
Trait Hostility (BPAQ _{HOS})	227	19.22	8.52	8-40	-0.44***	-0.44***
Verbal Aggression (BPAQ _{VA})	235	12.95	5.00	5-25	-0.21**	-0.27***
Physical Aggression (BPAQ _{PA})	222	19.96	8.22	9-45	-0.25***	-0.24**
Lifetime violence						
Life Acts (LAGG)	225	3.11	3.49	0-10	-0.14*	-0.11
Injury to Other (ITO)	221	0.65	1.44	0-12	-0.05	-0.04
Trouble from Violent Acts (TVA)	221	0.33	1.11	0-6	-0.04	0.08
Reactive acts	225	1.79	2.36	0-15	-0.18**	-0.12
IPV acts	225	0.74	1.49	0-11	-0.14*	-0.10
Alcohol-related acts	225	0.51	1.56	0-12	0.00	0.10
Weapons-related acts	225	0.30	0.98	0-9	-0.15*	0.02
Indirect hostility and Emotional dysregulation indicators						
Conduct problems	239	2.28	2.26	0-15	-0.32***	-0.26***
Work problems	228	9.74	3.24	4-22	-0.14*	-0.13
Prior psychiatric treatment	239	1.17	1.84	0-8	-0.35***	-0.29***

MAAS= Mindful Attention Awareness Scale; BPAQ=Buss-Perry Aggression Questionnaire; *Age-adjusted bivariate MAAS correlations

General regression models were tested in the college and national samples using variables that were significantly associated with MAAS scores in the initial analyses (Table 3). In the college sample, four variables (BPAQ_{HOS}, Depression, Mood Volatility, and Psychopathy) accounted for 34.2% (SE= 0.83) of the variance in MAAS scores, $F(19,409)= 11.20, P < 0.001$. In the national sample, BPAQ_{HOS}, Conduct Disorder

symptoms, and prior psychiatric treatment accounted for 27.8% (SE= 0.88) of the variance in MAAS scores, $F(12,185)= 5.94, P < 0.001$. Tables 4 and 5 show symptom index differences in 19 of 31 contrasts between the lowest (below 20th percentile) and remaining MAAS respondents in the two samples. Effect sizes (d) averaged 0.49 and 0.60 standard deviations in the college and national samples, respectively.

Table 3. MAAS general linear regression prediction models

Maladjustment indicator	Unstandardized coefficients	Standardized coefficients	Significance testing		
	β	SE	Beta	t	P
College sample					
BPAQ _{AN}	0.019	0.061	0.019	0.31	0.758
BPAQ _{HOS}	-0.227	0.063	-0.232	-3.60	0.000
BPAQ _{VA}	-0.049	0.055	-0.048	-0.89	0.374
BPAQ _{PA}	0.050	0.057	0.051	0.88	0.381
Depression	-0.152	0.051	-0.159	-3.01	0.003
Panic	-0.088	0.051	-0.089	-1.72	0.086
Mood volatility	-0.286	0.045	-0.278	-6.31	0.000
Psychopath	-0.141	0.047	-0.137	-2.97	0.003
Life aggression	0.067	0.048	0.067	1.23	0.221
Reactive acts	-0.054	0.053	-0.054	-1.03	0.302
IPV acts	-0.047	0.051	-0.047	-0.92	0.357
Alcohol-related acts	-0.027	0.052	0.027	0.52	0.600
Conduct	-0.063	0.042	-0.066	-1.50	0.135
GPA _{Coll}	-0.020	0.042	-0.021	-0.48	0.634
Alcohol intake	-0.076	0.047	-0.069	-1.60	0.111
Alcoholism	0.030	0.045	0.031	0.67	0.501
Prior psychiatric treatment	0.026	0.046	0.026	0.56	0.579
Best friend	0.039	0.047	0.036	0.83	0.408
LifeSat	0.032	0.048	0.032	0.68	0.500
(Constant)	0.019	0.041		0.47	0.637
National sample					
BPAQ _{AN}	-0.168	0.116	-0.168	-1.45	0.150

BPAQHOS	-0.374	0.094	-0.373	-3.98	0.000
BPAQVA	0.164	0.096	0.161	1.71	0.089
BPAQPA	0.109	0.106	0.110	1.03	0.305
Life Acts (LAGG)	0.086	0.085	0.086	1.01	0.314
Reactive acts	-0.044	0.081	-0.044	-0.55	0.587
IPV acts	0.029	0.078	0.029	0.37	0.710
Weapons-related acts	0.083	0.078	0.083	1.08	0.283
Conduct	-0.185	0.085	-0.176	-2.17	0.031
Work issues	-0.072	0.079	-0.070	-0.91	0.364
Prior psychiatric treatment	-0.175	0.080	-0.170	-2.17	0.031
Age	0.095	0.072	0.095	1.32	0.189
(Constant)	0.004	0.089		0.21	0.836

Table 4. MAAS extreme group differences in the college sample

Maladjustment Indicator	Average MAAS (Top 80%)	Low MAAS (Bottom 20%)	MAASGroup d
	M	M	
Gender	1.77	1.81	0.10
Trait anger and aggressiveness			
Trait anger (BPAQAN)	12.99	15.05	0.42***
Trait hostility (BPAQHOS)	14.55	18.89	0.62***
Verbal aggression (BPAQVA)	11.28	12.10	0.17*
Physical aggression (BPAQPA)	15.99	17.37	0.22*
Lifetime violence			
Life Acts (LAGG)	2.06	2.81	0.27*
Injury to Other (ITO)	0.75	1.07	0.14
Trouble from Violent Acts (TVA)	0.22	0.23	0.01
Reactive acts	1.01	1.49	0.28*
IPV acts	0.52	1.01	0.40**
Alcohol-related acts	0.31	0.56	0.24*
Weapons-related acts	0.12	0.25	0.22
Indirect hostility indicators			
Psychopath	55.46	61.02	0.41***
Narcissist	44.64	45.85	0.12
Conduct	0.59	0.79	0.17
Work issues	3.11	3.33	0.09
Best friendship strains	11.10	12.79	0.37***
Generalized emotional dysregulation indicators			
Depression	5.12	9.59	0.57***
Panic	4.67	8.57	0.46***
Mood volatility	6.38	8.55	0.57***
Alcohol intake	0.51	0.79	0.31*
Alcoholism	4.62	4.93	0.06
Prior psychiatric treatment	0.61	0.78	0.15
GPAHS	3.57	3.56	0.02
GPAColl	3.35	3.25	0.20*
LifeSat	21.12	18.14	0.48***

Table 5. MAAS extreme group differences in the national sample

Maladjustment indicator	Average MAAS (Top 80%)	Low MAAS (Bottom 20%)	MAAS Group d
	M	M	
Gender	1.56	1.56	0.00
Trait anger and aggressiveness			
Trait anger (BPAQAN)	14.20	18.80	0.67***
Trait hostility (BPAQHOS)	17.70	25.17	0.88***
Verbal aggression (BPAQVA)	12.53	14.45	0.38*
Physical aggression (BPAQPA)	19.17	22.91	0.45**
Lifetime violence			
Life Acts (LAGG)	3.22	3.26	0.01
Injury to Other (ITO)	1.56	2.56	0.30
Trouble from Violent Acts (TVA)	1.09	1.17	0.09
Reactive acts	2.25	2.96	0.41*
IPV acts	0.69	1.49	0.53*
Alcohol-related acts	0.51	0.81	0.19
Weapons-related acts	0.27	.086	0.53*
Indirect hostility and emotional dysregulation indicators			
Conduct	1.91	3.60	0.64**
Work Issues	9.46	10.77	0.40

*P<0.05; **P< 0.01; ***P< 0.001; Low MAAS< 53

Discussion

Several prior research teams established associations between dispositional mindfulness and internalized psychological distress symptoms (40).

A few of these factors were replicated in our college sample. However, we aimed primarily to extend the current understanding of MAAS links to trait hostility, aggression, and a wider range of externalized maladjustment indicators. A subset of these relationships (BPAQ scores, conduct disorder symptoms, prior psychiatric treatment, and lifetime aggression) were found in both the college and national samples. MAAS scores were associated with almost all the adjustment indicators examined in this study.

Similar associations between dispositional mindfulness and Buss-Perry Aggression Questionnaire scores have now been found in six independent samples comprising nearly 4,000 respondents. While bivariate correlations between mindfulness and the four BPAQ subscales have been strong, trait hostility accounts for unique MAAS variance in this and another recent study (23). Mean MAAS correlation strengths across these samples (adjusted by sample size) were estimated as follows: trait hostility, $r = -0.40$; trait anger, $r = -0.28$; verbal aggression, $r = -0.20$; physical aggression, $r = -0.17$. Relationships between dispositional mindfulness and psychological maladjustment are likely to be bidirectional. Mindfulness skills must enhance psychological functioning and mitigate mental illness trajectories to a considerable extent.

An equally sound conclusion is that psychosocial stress and dysfunction detract from individual capacities to engage in the mindful processing of life events. These present findings merely identify some distinctive high-risk symptom clusters that warrant continued systematic future investigation. Mindfulness deficits pose serious cause for concern regarding these likely concomitant negative emotional qualities and episodic behavioral transgressions exhibited by an unclearly specified subset of the larger group.

These findings generalize college and general samples. This retrospective and cross-sectional methodology warrants interpretive caution. Inferences regarding the directionality of these observed MAAS relationships should be tentative. While most MAAS correlational relationships were significant, dispositional

mindfulness accounted for only about 12% of the trait hostility in the two samples. These results did not provide differential support for any of the identified theoretical models regarding how dispositional mindfulness may translate into anger tolerance. Future studies might consider reliance on longitudinal designs to trace dispositional mindfulness developmental trajectories with close attention to the specific cognitive, behavioral, and emotional response sequences in response to situational stressors.

Conclusion

Extreme MAAS deficits (lowest 20%) were linked to higher scores on a wide range of maladjustment indicators in both samples. Respondents describing low dispositional mindfulness in the national sample were much more likely to have an extensive psychiatric treatment history.

These psychiatric history scores ranged widely from 0 to 8, with 59.8% of respondents indicating no prior treatment history. Among the remainder, 11.4% described four or more forms of prior treatment. This close relationship between dispositional mindfulness and psychiatric treatment history was not evident in the relatively younger and better-adjusted college sample.

Regression analyses were useful in identifying the subset of factors that accounted for unique MAAS variance in the college (trait hostility, depression, mood volatility, and psychopathic attributes) and national (trait hostility, conduct disorder symptoms, and prior psychiatric treatment) samples. MAAS scores were associated with a propensity toward physical aggressiveness, as both BPAQ_{PA} and LAGG scores indicated. These collective results suggest that a primary concern posed by a low MAAS score should be hostile attitudes toward others that extend to violent acts among a smaller subset of this high-risk cohort.

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Conflicts of Interests

The authors report no conflicts of interest.

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Ethical Considerations

This project was approved by the institutional review board. All participants signed a consent form.

Authors' Contributions

Olivia Revels-Strother: Manuscript preparation, literature search; Alan King: Study design, statistical analysis, manuscript preparation, literature search, data interpretation, and data

collection. Amanda Auen: Literature search, manuscript preparation; Tiffany Russell: Statistical analysis, manuscript preparation; and Corey Doan: Literature search, manuscript preparation.

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