



Original Research

Passion for Academics and Problematic Health Behaviors

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ABSTRACT

International Journal of Exercise Science 10(3): 417-433, 2017. According to the Dualistic Model of Passion (39), passion entails valuing, liking, and spending time on an activity. The Dualistic Model also posits two types of passion for activities: harmonious passion (individual voluntarily engages in the activity) and obsessive passion (individual is compelled to engage in the activity). The purpose of the present study was to examine the possible links between college students' passion for academic activities and problematic health behaviors including smoking, excessive drinking, exercise addiction, disordered eating, and sleepiness, which is a possible indicator of sleep deprivation. Participants ($n = 502$) completed a survey gauging passion type and health behaviors. Regression analyses revealed obsessive passion for academic activities was positively associated with scores on measures of excessive drinking ($\beta = .15$, $p = .008$), exercise addiction ($\beta = .19$, $p < .001$), and disordered eating ($\beta = .17$, $p < .001$) but was not associated with sleep deprivation ($\beta = .07$, $p = .15$). Harmonious passion for academic activities, in contrast, was negatively associated with excessive drinking behavior ($\beta = -.16$, $p = .002$) and sleep deprivation ($\beta = -.13$, $p = .007$) but was not associated with exercise addiction ($\beta = .002$, $p = .97$) and disordered eating ($\beta = -.04$, $p = .37$). These findings provide further support for the Dualistic Model of Passion. Students who are obsessively passionate about their academic activities are more likely to engage in poor health behaviors and, in turn, may experience greater negative outcomes than students who are harmoniously passionate about their academics.

KEY WORDS: Academic activities, academic major, stress, dualistic model of passion, drinking behaviors, disordered eating, exercise addiction, sleepiness

INTRODUCTION

Most people engage in an activity about which they are passionate, and individuals can be passionate about a seemingly infinite number of activities (39). Vallerand et al. (38, 39) have also suggested that passionate activities make one's life worth living. However, is engaging in

a passionate activity universally beneficial? Or is it possible that we are doing more harm than good when engaging in certain activities?

Passion for an activity is defined as, “a strong inclination toward an activity that people like, that they find important, and in which they invest time and energy” (39, p. 757). Researchers also proposed two distinct types of passion for activities: harmonious passion and obsessive passion. Harmonious passion is an optimal passion where an individual feels as if he or she has control over an activity, and that feeling of control contributes to positive psychological outcomes (39). Harmoniously passionate individuals experience an autonomous internalization, meaning the individual is motivated and chooses freely to engage in the behavior (39). Obsessively passionate individuals experience a controlled internalization that results in the feeling that the passionate activity controls the individual and can lead to negative psychological outcomes (39). A controlled internalization occurs when the individual feels compelled to engage in an activity because of external contingencies (38, 39).

Three factors determine whether an activity becomes a passion: activity selection, activity valuation, and activity internalization (38). An individual who is passionate for an activity will incorporate the passionate activity into their identity (e.g., someone who is passionate about hockey will say, “I *am* a hockey player” vs. “I play hockey”).

Harmonious and obsessive passions are associated with distinct psychological outcomes. Individuals who report harmonious passion tend to report more well-being and positive affect while they engage in their preferred activity and less disappointment when unable to engage in the activity (29, 39). In contrast, obsessive passion was unrelated to positive affect during preferred activity engagement, negatively related to flow and well-being, and positively related to negative affect (29, 39). The findings that positive psychological outcomes are associated with harmonious passion and negative psychological outcomes with obsessive passion are rather consistent throughout the passion literature (e.g., 1, 4, 19, 22).

Recent research findings also suggest that passion affects behavioral outcomes in addition to psychological outcomes. Vallerand et al. (39) observed that cyclists with higher harmonious passion scores for cycling were more likely to abstain from riding in poor weather conditions. In contrast, obsessively passionate cyclists still rode in those same conditions. Similarly, Rip, Fortin, and Vallerand (31) found dancers with higher harmonious passion scores for dance suffered less from acute injuries and were more likely to engage in injury prevention behaviors. In contrast, the more obsessively passionate dancers suffered longer from chronic injuries because they continued to dance through their injuries. Donahue, Rip, and Vallerand (4) similarly found that harmoniously passionate basketball players were less aggressive than obsessively passionate basketball players.

It is also possible that students could be taught to identify their strengths and passions to make their academic experience in college more meaningful. For example, Forest et al. (6) conducted an interesting study in which college students with jobs identified their “signature strengths.” A signature strength can be described as, “a distinctive characteristic that energizes and

motivates people to develop and function optimally” (p. 1234). When these participants were taught to find and use their signature strengths, they experienced increased harmonious passion for their job and increased well-being.

Consistent with the notion that passion affects behavioral outcomes (e.g., 31, 39), the purpose of the present study was to examine the possible link between college students’ passion for academic activities and problematic health behaviors. Specifically, we examined if harmonious and obsessive passion for academic activities and undergraduate major predict engagement in problematic health behaviors including excessive smoking, drinking, and exercising; sleepiness possibly as a result of not getting enough sleep; and disordered eating. These behaviors were selected due to their potential to cause harm, and because they are behaviors in which college students may engage.

A survey of 4,592 college students revealed that binge drinkers frequently experienced or engaged in additional dangerous behaviors as a result of drinking (e.g., getting hurt or injured, drinking and driving, unplanned sexual activity) (43). Additionally, it has been found that college students will use alcohol to try and regulate their negative mood states (18).

Smoking has serious health implications that are well documented, such as an increased risk of death as a result of smoking (36). Further, smoking is a behavior that is relatively common on college campuses, and although college students are likely to attempt stopping smoking, students often fail to quit smoking (27).

Exercise addiction, similar to other forms of addiction, can be a physically and psychologically damaging pattern of behaviors (20). While a full blown addiction to exercise may be less frequent than other addictions, Warner and Griffiths found that 8% of their sample (100 participants aged 18-74) could be considered “at risk for exercise addiction” (42).

Another variable of interest in the present study, disordered eating can be associated with increased mortality risk and an increased risk of suicide (3). College students have reported experiencing eating disorder symptoms at a relatively high level. For example, Eisenberg, Nicklett, Roeder, and Kirz (5) found that 13.5% of undergraduate women, 9.3% of graduate females, 3.6% of undergraduate males, and 3.1% of graduate males at a large university had positive screens for possible eating disorders.

Sleepiness and sleep deprivation could possibly lead to problems with academics, regulation of mood, and ability to operate an automobile (14). College students have reported they frequently experience fatigue and drowsiness as a result of reduced sleep, and this is higher than samples of adolescents (14-16 years of age) and adults (30-45 years of age) (25).

In the present study, we examined if a student’s passion for academic activities and for undergraduate major predict engagement in problematic health behaviors. Depending on the students’ specific passion type, they may be more or less likely to engage in behaviors that are problematic and damaging. Therefore, inferring potential associations between passion type

and risky behaviors can help both students and educators minimize risks and maximize the benefits inherent in the students' dispositions.

Previous findings suggest that obsessive passion positively correlates with scores of problematic health behavior measures and harmonious passion negatively correlates with those problematic health behaviors (4, 22, 29, 39). Consequently, we hypothesized that students with high scores in obsessive passion for academics would score high in measures of problematic behaviors and students with high scores in harmonious passion about academics would score low in measures of problematic behaviors.

METHODS

Participants

Undergraduate students ($n=502$; 417 women, 82 men, 1 transgender, 1 identified as "other," and 1 with gender not listed) who were taking psychology courses at an Eastern university in the US participated in this study. Participants represent each year in school (256 freshman, 179 sophomores, 55 juniors, 10 seniors, and 2 "other") and ranged in age from 17 to 42 ($M = 18.91$, $SD = 1.68$). Seven students in the sample fell outside the "traditional" college student age range of 18-23 (17). Two of these students were 17 years old, two students were 25 years old, one student was 29 years old, one student was 31 years old, and one student was 42 years old. Participants were given partial course credit for their participation. The institution's review board approved this study and the participants were informed about confidentiality of their information and their right to stop the study at any point.

Protocol

The online Qualtrics survey was made available via a participation pool website for undergraduate psychology courses. The survey was available from the beginning of the semester until after mid-term. Students who clicked on the study link were directed to the informed consent. Once completed, a link was electronically provided to the online Qualtrics survey which included two copies of the Passion Scale (one for academic activities in general and one for undergraduate major activities), the Fagerstrom Test for Nicotine Dependence, the Michigan Alcoholism Screen Test, the Exercise Addiction Inventory, the Epworth Sleepiness Scale, the Eating Attitudes Test-26, and demographic information. The survey took approximately 20 minutes to complete, and its items appeared in the same order for every respondent. No identifying information was collected from participants besides demographic information

The Passion Scale (39) is a valid and reliable 16-item self-report questionnaire used for measuring an individual's passion for an activity and has two subscales: obsessive and harmonious passion (23, 39). The first four items on the Passion Scale are used in assessing overall passion for an activity and include such statements as "I spend a lot of time doing _____" and "_____ is a passion for me." The level of passion is determined by averaging the scores on the first four items. The two subscales, comprised of the next 12 items (six for harmonious passion and six for obsessive passion), include questions such as: "I have

difficulties controlling my urge to do____," or "The new things that I discover doing ____ allows me to appreciate it even more." Participants in the present study answered the Passion Scale twice, once while thinking about their "typical academic activities" and once while thinking about activities done "for your major." They answered each item on a seven-point Likert scale ranging from 1 (*Do not agree at all*) to 7 (*Completely agree*). The Passion Scale for academic activities was shown to be reliable ($\alpha = 0.77$), along with the harmonious passion subscale ($\alpha = 0.85$) and obsessive passion ($\alpha = 0.73$). The Passion Scale for one's major was reliable ($\alpha = 0.81$), with the subscales demonstrating high reliability (harmonious $\alpha = 0.89$; obsessive $\alpha = 0.82$).

The Michigan Alcoholism Screen Test (MAST) is a 25-item questionnaire used to screen individuals for alcoholism (33). According to the National Institute of Alcohol Abuse and Alcoholism, alcohol use disorder (alcoholism) is severe problems that arise due to an individual's drinking that can be classified as mild, moderate, or severe (www.niaaa.nih.gov). The severity of the disorder is determined by the number of criteria for the disorder that the individual meets. Some of the criteria include (but are not limited to) situations in which an individual is hurt due to his or her drinking, continues to drink despite feeling depressed or anxious, and experiences withdrawal symptoms when the effects of alcohol wear off.

The MAST is widely used and has demonstrated validity and reliability in an adult population (10). For each item, respondents answer either "Yes" or "No." Each of the items is weighted differently. Respondents get 1 point if they answer "Yes" to items 3, 5, 7, 10, and 17, and 2 points if they answer "Yes" to items 1, 2, 11-16, 18-19, or 22-25. Two points are also given if the participant answers "No" to items 4, 6, or 8. Five points are given for answering "Yes" to items 9, 20, or 21. A total score of 5 or more is indicative of problematic drinking or alcohol dependence. Questions on the MAST include, "can you stop drinking without difficulty after one or two drinks?" "Do you ever feel guilty about your drinking?" and, "have you ever gotten into trouble at work because of drinking?" The MAST had a Cronbach's alpha of 0.74 in the current study.

The Exercise Addiction Inventory (EAI) is a 6-item self-report measure used to determine if individuals are at risk for exercise addiction and has been shown to be reliable and valid in exercisers ages 18-40 (12, 35). The EAI is used for measuring the salience, conflict, mood modification, tolerance, withdrawal, and relapse due to exercise in a individual's life. The six components measured in the EAI are the six components that comprise an addiction to a behavior (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse), which are detailed by Griffiths (11). According to Griffiths, an activity can become an important aspect in an individual's life and may become a focus of the individual's thoughts. Griffiths labeled this phenomena "salience." Mood modification is the behavioral consequence of engaging in the activity (e.g., a runner's high). Tolerance refers to an increase in the amount of engagement needed for the individual to achieve a particular level of mood modification. Withdrawal symptoms are the consequences resulting when the individual stops or reduces engagement in the activity. Conflict refers to any issues between the individual and other aspects of his or her life due to his or her engagement in the activity. Finally, relapse refers to

the likelihood that the individual will return to previous levels of engaging in the behavior after a period of controlling the behavior. As previously stated in the introduction, exercise addiction is a potentially harmful pattern of behaviors, but the EAI is a quick assessment tool for determining an individual's risk of exercise addiction.

The EAI consists of six questions with responses on a 5-point Likert scale. Anchors range from 1 is (*Strongly Disagree*), to 5 (*Strongly Agree*). For example, the participant would indicate on the Likert scale the degree to which they agreed with the statement, "Exercise is the most important thing in my life." Total points range from 1-30; individuals who score in the range of 0-12 are considered to have few or no symptoms of exercise addiction; scores ranging from 13-23 suggest some symptoms of exercise addiction; and a score above 24 is considered "at risk for exercise addiction." The EAI had a Cronbach's Alpha of 0.76 in the current study.

The Epworth Sleepiness (ESS) is an 8-item self-report scale that is used for measuring an individual's daytime sleepiness (15). The scale has established reliability and validity for adults and university students (15, 16). On the ESS, participants rate their chances of falling asleep during everyday circumstances. These circumstances include: watching TV or reading, lying down in the afternoon, sitting and talking, and so on. The participants have to rate their chances of sleeping on a scale ranging from 0 (*would never doze or sleep*) to 3, (*high chance of dozing or sleeping*). A score of 10 or more indicates that the individual is "sleepy" and a score of 18 or more indicates "very sleepy." The Cronbach's alpha for the ESS in this study was 0.67.

The Eating attitudes Test-26 (EAT) is a 26-item self-report test that was originally designed to measure anorexia nervosa symptoms (8). Higher scores on the assessment indicate more concern with eating behaviors, and individuals who score highly on the EAT are encouraged to meet with a professional to determine whether the issue is clinical (8, 9).

The EAT-26 has been validated for use with college students and as a screening tool to assess eating disorder risk (8, 24). The scale includes three subscales: dieting, bulimia and food preoccupation, and oral control. The dieting statements are used for assessing the individual's awareness of their eating habits and their willingness to diet. Statements for this subscale include, "[I am] aware of the calorie content of foods I eat," and, "[I] engage in dieting behavior." The bulimia and food preoccupation subscale are used to assess symptoms of bulimic behaviors (i.e., binge eating, vomiting following eating) and the extent to which an individual is preoccupied with thinking about their eating behaviors. An example of a statement from this subscale includes, "[I] vomit after I have eaten." Finally, the oral control subscale helps assess how much an individual controls their eating behaviors and how social pressures affect their eating behavior. Examples of statements from this subscale include, "[I] cut my food into small pieces," and, "[I] feel that others pressure me to eat."

Each statement on the test provides responses ranging from 0, "Always," to 6, "Never." The participant is asked to check a response to each of the statements on the test. The EAT-26 also includes measures of Body Mass Index (BMI) and behavioral questions regarding other eating

and dieting behaviors. A score of 20 or more is indicative of problematic eating. The EAT had a Cronbach's alpha of 0.91 in the current study.

Statistical Analysis

All statistical analyses were conducted using SPSS software. In order to determine if there were possible extraneous variables, one-way ANOVAs, Pearson correlations, and independent samples T-tests were run on the demographic information and scores on the criterion variables. Hierarchical regression analyses were run in order to examine further the relations between the two types of passion and the primary criterion variables. Greek affiliation, year in school, gender, and cumulative GPA were controls and the two passion types were predictors. Scores on the MAST, EAI, EAT, and ESS were the criterion variables.

RESULTS

In order to determine if there were possible extraneous variables, we ran one-way ANOVAs and independent samples T-tests on the demographic information and scores on the criterion variables. The demographic variables in this study had several relationships with our criterion variables (see below). A relatively small number of students reported being smokers ($n= 18$), and the subsequent analyses excluded the results from the FTND.

Relationships between demographic information and criterion variables were found following preliminary analyses. We found that scores on the EAT differed as a function of a Greek-life affiliation. An independent samples T-test revealed that the 116 individuals who were Greek affiliated scored higher ($M= 11.87$, $SD = 10.20$) than non-Greek members ($M= 9.22$, $SD = 9.82$) on the EAT ($p = .01$).

Year in school, according to the results of a one-way ANOVA, was significantly related to scores on the ESS ($p = .01$). For scores on the ESS, freshmen ($M = 10.55$, $SD = 3.62$) reported significantly higher ($p = .02$) than sophomores ($M = 9.75$, $SD = 3.32$) and freshmen reported significantly higher scores ($p = .01$) than juniors ($M = 9.18$, $SD = 4.21$) according to the results of a Fisher's LSD post-hoc test. For scores on the EAT, freshman ($M = 10.55$, $SD = 10.54$) reported significantly higher scores ($p = .01$) than juniors ($M = 6.82$, $SD = 6.01$), who, in turn, reported marginally lower scores ($p = .06$) than sophomores ($M = 9.70$, $SD = 9.91$) according to the results of a Fisher's LSD post-hoc test.

Cumulative GPA was significantly and positively correlated with scores on the EAT ($r = .11$, $p = .02$). All but 3 individuals reported their cumulative GPAs, and the GPA scores ranged from 2.0 to 4.0. Finally, gender differences on the EAT and the ESS following an independent samples T-test. On the EAT, women ($M = 10.49$, $SD = 10.28$) scored significantly higher ($p < .001$) than men ($M = 6.34$, $SD = 7.25$); and on the ESS, women ($M = 10.35$, $SD = 3.55$) also scored significantly higher ($p < .001$) than men ($M = 8.61$, $SD = 3.73$). Because of our preliminary analyses, gender, Greek-life affiliation, year in school, and cumulative GPA were controlled for in the regression analyses.

Tables 1 and 2 contain bivariate and partial correlations between the variables in this study. First, students' passion scores for academics and for major were positively related to both harmonious and obsessive passion for academics and major. Passion scores for academics and major were also negatively related to scores on the MAST and on the ESS. In addition, passion for academics was positively related to scores on the EAI, and passion for one's major was positively related to scores on the EAT. For both academics and major, obsessive and harmonious passion scores were positively and significantly correlated.

Table 1. Partial and bivariate correlations-passion for academic activities.

	M	SD	HP	OP	MAST	EAI	ESS	EAT
Passion	5.40	0.92	0.71***	0.19***	-0.11*	0.13**	-0.9*	0.04
HP	4.95	0.94	-	0.23***	-0.18**	-0.01	-0.06	0.01
OP	2.94	1.94		-	0.14**	0.17**	0.04	0.15**
MAST	6.52	3.61			-	0.06	0.16**	0.11*
EAI	17.61	4.33				-	0.11	0.35***
ESS	10.37	3.61					-	0.12*
EAT	10.33	10.29						-

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2. Partial and bivariate correlations-passion for major.

	M	SD	HP	OP	MAST	EAI	ESS	EAT
Passion	5.70	0.94	.76***	0.15***	-0.13*	0.05	-0.126*	0.09*
HP	5.43	0.95	-	0.18***	-0.21**	-0.03	-0.08	0.08
OP	3.06	1.16		-	0.11**	0.11**	0.05	0.15*
MAST	6.48	3.55			-	0.06	0.18**	0.12*
EAI	17.66	4.36				-	0.11*	0.35***
ESS	10.30	3.62					-	0.12*
EAT	10.37	10.55						-

* $p < .05$, ** $p < .01$, *** $p < .001$

As such, we controlled for each type of passion in the partial correlations in Tables 1 and 2. Obsessive passion for academics was significantly and positively correlated with scores on the MAST, the EAI, and the EAT. On the other hand, harmonious passion for academics was significantly and negatively correlated with MAST scores. The same pattern emerged when examining participants' obsessive and harmonious passion for their majors. Obsessive passion for major was significantly and positively correlated with scores on the MAST, the EAI, and the EAT. Harmonious passion for major, in contrast, was significantly and negatively correlated with the scores on the MAST. Hierarchical regression analyses were run in order to examine further the relations between the two types of passion and the primary criterion variables. Greek affiliation, year in school, gender, and cumulative GPA were controls and the two passion types were predictors. Scores on the MAST, EAI, EAT, and ESS were the criterion variables. The following results initially relate to passion for academics and then passion for major.

Additionally, regression analyses were run twice in this study. The regression analyses revealed that the 12 participants that indicated they were "seniors" (n=10) or "other" (n=2),

which represents 2% of the overall sample, were having a relatively large effect on the results. The differences between the results with and without the seniors will be discussed in the following paragraphs. Tables 3 and 4 illustrate the results of the analyses that excluded these 12 participants.

Table 3. Regression Analyses–Passion for Academic Activities

MAST		β	t	p	R^2	ΔR^2	Adj. R^2	f	p
Step 1	GPA	-.09	-1.49	.137	.02		.01	1.89	.112
	Sex	-.07	-1.28	.201					
	Year	-.07	-1.22	.225					
	Greek	.09	1.67	.096					
Step 2	Ob. Pass.	.15	2.65	.008	.06	.035	.04	3.40	.003
	Ha. Pass.	-.16	-2.87	.004					
EAI									
Step 1	GPA	.05	.98	.326	.01		.00	1.32	.261
	Sex	-.03	-.68	.500					
	Year	-.01	-.28	.783					
	Greek	-.09	-1.96	.051					
Step 2	Ob. Pass.	.19	4.16	.000	.05	.036	.04	3.94	.001
	Ha. Pass.	.002	.04	.969					
ESS									
Step 1	GPA	-.01	-.21	.832	.03		.03	3.48	.008
	Sex	.11	2.33	.020					
	Year	-1.06	-2.17	.031					
	Greek	.00	.08	.934					
Step 2	Ob. Pass.	.07	1.43	.153	.04	.016	.02	3.70	.001
	Ha. Pass.	-.13	-2.71	.007					
EAT									
Step 1	GPA	.09	1.82	.070	.05		.04	5.88	.000
	Sex	.11	2.39	.017					
	Year	-.06	-1.20	.229					
	Greek	-.11	-2.55	.011					
Step 2	Ob. Pass.	.172	3.76	.000	.07	.027	.06	6.37	.000
	Ha. Pass.	-.041	-.89	.374					

For scores on the MAST, obsessive and harmonious passion accounted for an additional 3.5% of the variance over and above the control variables ($p = .003$) (see Table 3). The Beta weights showed that harmonious passion for academics ($\beta = -.16, p = .004$) was negatively related to scores on the MAST, whereas obsessive passion for academics ($\beta = .15, p = .008$) was positively related to scores on the MAST. The model had an adjusted R^2 of .04. There were some differences when the 12 “senior” and “other” participants were included in the analyses for the MAST. Obsessive passion for academics still positively predicted scores on the MAST ($\beta = .15, p = .005$), and harmonious passion still negatively predicted scores on the MAST ($\beta = -.14, p = .013$). However, the first regression model, that did not include obsessive and harmonious passion for academic activities, accounted for 3.5% of the variance ($p = .015$). While the first

model was now significant, harmonious and obsessive passion for academic activities still accounted for an additional 3.1% of the variance ($p = .001$).

For scores on the EAI, the inclusion of harmonious and obsessive passion for academics accounted for an additional 3.6% of the variance over the control variables ($p = .001$) (see Table 3). The Beta weights showed that only obsessive passion for academics ($\beta = .19, p < .001$) predicted scores on the EAI. Harmonious passion, in contrast, did not significantly predict changes in the EAI ($\beta = .002, p = .97$). The model had an adjusted R^2 of .04. The model including the 12 "senior" and "other" students had similar results. Again, obsessive passion for academic activities positively predicted scores on the EAI ($\beta = .18, p < .001$), and harmonious passion was not related to scores on the EAI ($\beta = .02, p = .635$). Obsessive and harmonious passion for academic activities accounted for an additional 3.2% of the variance ($p = .001$).

On the ESS, including harmonious and obsessive passion for academics accounted for an additional 1.6% of the variance over the control variables ($p = .001$) (see Table 3). The Beta weights showed that harmonious passion ($\beta = -.13, p = .007$) was negatively related to scores on the ESS. In contrast, obsessive passion was not significantly related to ESS scores ($\beta = .07, p = .15$). The model had an adjusted R^2 of .03. For the regression analyses that included the 12 "senior" and "other" participants, the results were similar. Harmonious passion negatively predicted scores on the ESS ($\beta = -.12, p = .009$), and obsessive passion was not related to score on the ESS ($\beta = .09, p = .057$). Obsessive and harmonious passion accounted for an additional 1.2% of the variance over the controls ($p < .000$).

For the EAT, harmonious and obsessive passion for academics accounted for an additional 2.7% of the variance over the control variables ($p = .001$) (see Table 3). The Beta weights showed that obsessive passion for academics ($\beta = .17, p < .001$) significantly predicted increasing scores on the EAT. In contrast, harmonious passion was not significantly related to the EAT ($\beta = -.04, p = .37$). The model had an adjusted R^2 of .06. Once again, the regression models including the 12 "senior" and "other" participants had similar results. Obsessive passion significantly predicted increasing scores on the EAT ($\beta = .17, p < .001$), and harmonious passion was unrelated to scores on the EAT ($\beta = -.04, p = .442$). Obsessive and harmonious passion accounted for an additional 2.8% of the variance over controls ($p = .001$).

Similar results were found for passion for major. For scores on the MAST, obsessive and harmonious passion accounted for an additional 4.3% of the variance over and above the control variables ($p = .005$) (see Table 4). The Beta weights showed that harmonious passion for academics ($\beta = -.20, p = .001$) was negatively related to scores on the MAST, whereas obsessive passion for academics ($\beta = .12, p = .04$) was positively related to scores on the MAST. The model had an adjusted R^2 of .04. The regression models that included the 12 "senior" and "other" participants had similar results. Obsessive passion for major activities positively predicted scores on the MAST ($\beta = .12, p = .028$), and harmonious passion negatively predicted

scores on the MAST ($\beta = -.19, p = .001$). In this model, obsessive and harmonious passion accounted for an additional 4.0% of the variance of the controls ($p = .002$).

Table 4. Regression analyses- passion for major.

MAST		β	t	p	R^2	ΔR^2	Adj. R^2	f	p
Step 1	GPA	-.07	-1.18	.239	.02		.00	1.14	.338
	Sex	-.07	-1.20	.231					
	Year	-.05	-.86	.390					
	Greek	.07	1.16	.249					
Step 2	Ob. Pass.	.12	2.06	.040	.06	.043	.04	3.14	.005
	Ha. Pass.	-.20	-3.48	.001					
EAI									
Step 1	GPA	.05	.93	.35	.01		.00	1.22	.304
	Sex	-.03	-.60	.550					
	Year	-.03	-.47	.637					
	Greek	-.09	-1.83	.068					
Step 2	Ob. Pass.	.14	2.92	.004	.03	.019	.02	2.25	.038
	Ha. Pass.	-.04	-.79	.433					
ESS									
Step 1	GPA	-.02	-.36	.719	.04		.03	3.96	.004
	Sex	.15	3.04	.002					
	Year	-.08	-1.61	.108					
	Greek	-.02	-.39	.696					
Step 2	Ob. Pass	.08	1.64	.101	.06	.021	.04	4.31	.000
	Ha. Pass	-.14	-2.92	.004					
EAT									
Step 1	GPA	.10	1.96	.050	.05		.05	6.21	.000
	Sex	.12	2.56	.011					
	Year	-.06	-1.09	.275					
	Greek	-.12	-2.48	.013					
Step 2	Ob. Pass	.161	3.41	.001	.07	.029	.07	6.53	.000
	Ha. Pass	.036	.75	.453					

For scores on the EAI, the inclusion of harmonious and obsessive passion for major accounted for an additional 1.9% of the variance over the control variables ($p = .038$) (see Table 4). The Beta weights showed that only obsessive passion for academics ($\beta = .14, p = .004$) predicted scores on the EAI. Harmonious passion, in contrast, did not significantly predict changes in the EAI ($\beta = -.04, p = .43$). The model had an adjusted R^2 of .02. There were some differences in the regression model that included the 12 "senior" and "other" participants. In this model, harmonious passion for major did not predict scores on the EAI ($\beta = .00, p = .988$), and obsessive passion for major positively predicted scores on the EAI ($\beta = .12, p = .011$). However, the overall model to predict scores on the EAI was not significant ($p = .06$).

On the ESS, inclusion of harmonious and obsessive passion for major accounted for an additional 2.1% of the variance over the control variables ($p < .001$) (see Table 4). The Beta weights showed that harmonious passion ($\beta = -.14, p = .004$) was negatively related to scores on the ESS. In contrast, obsessive passion was not significantly related to ESS scores ($\beta = .08, p$

= .10). The model had an adjusted R^2 of .04. The model that included the 12 “senior” and “other” participants had one difference. Harmonious passion still negatively predicted scores on the ESS ($\beta = -.14, p = .002$), but obsessive passion positively predicted scores on the ESS ($\beta = .10, p = .041$). Obsessive and harmonious passion accounted for an additional 2.4% of the variance over the controls ($p < .001$).

For the EAT, inclusion of harmonious and obsessive passion for academics accounted for an additional 2.9% of the variance over the control variables ($p < .001$) (see Table 4). Beta weights show that obsessive passion for academics ($\beta = .16, p = .001$) significantly predicted increasing scores on the EAT. In contrast, harmonious passion was not significantly related to the EAT ($\beta = .04, p = .45$). The model had an adjusted R^2 of .07. The model included the 12 “senior” and “other” participants had similar results. Obsessive passion for major activities positively predicted scores on the EAT ($\beta = .17, p < .001$), and harmonious passion was not significantly related to scores on the EAT ($\beta = .03, p = .47$). Obsessive and harmonious passion for one’s major accounted for 3.1% of the variance over the controls ($p < .001$).

DISCUSSION

The purpose of this study was to assess if students’ passion for their academic activities and passion for their major were related to problematic health behaviors including excessive smoking, excessive drinking, excessive exercise, not getting enough sleep, and disordered eating. We originally intended to measure smoking behaviors using the FTND, but this measure was excluded from the analyses due to the small number of participants that reported being smokers. In line with previous research (e.g., 19, 29, 30, 38, 39), we expected that obsessive passion would be positively associated with the measures of problematic health behaviors and that harmonious passion would be negatively associated with those scores (38, 39). These hypotheses were partially supported. Obsessive passion for academic activities and major predicted increases in problematic drinking, problematic exercising, and problematic eating. Obsessive passion, however, did not predict sleepiness. On the other hand, harmonious passion for academic activities and for one’s major predicted decreases in problematic drinking and problematic sleeping but did not predict decreases in problematic eating or problematic exercising. Therefore, these findings support The Dualistic Model of Passion’s general framework in which obsessive passion for an activity is related to negative outcomes and harmonious passion for an activity is related to positive outcomes. Of the two types of passion, obsessive passion for academics is most likely to be predictive of potentially problematic health behaviors.

Our findings contribute to previous research in at least two important ways. First, we examined students’ harmonious and obsessive passion for academic activities and majors and their relation to behavioral outcomes. Thus, the present results support previous studies suggesting that passion for an activity predicts in behavioral outcomes. Second, the current study examined how passion for an activity may affect a wide variety of behavioral outcomes outside of the scope of the passionate activity. This varies from the majority of previous studies that focused on how passion for an activity related to engagement in the passionate

activity. Of the scant research that examined how passion for one activity affects a wide variety of behaviors beyond that activity, one study demonstrated obsessive passion for Internet use was related to lower motivation towards one's relationship and also to a lower quality of romantic relationship (32).

The results of the current study thus support the notion that passion for one activity can produce changes in behavior that likely "spread out" and affect other events in an individual's life. Moreover, this is the first study of which we are aware that examined passion for academic activities (i.e., academics, in general, and major, more specifically) and how it may be related to various health behaviors. Specifically, students who are obsessively passionate about their academics may be more likely to engage in problematic health behaviors

Vallerand and Verner-Filion (41) suggested two reasons why obsessive passion would be more likely to predict negative outcomes. First, obsessive passion is more likely to result in negative psychological outcomes such as negative cognitions and negative affect. For example, there is evidence that obsessive passion is positively related to perceived stress and general negative affect (13, 40). Second, obsessive passion is more likely to lead to an inflexible pattern of behavior toward the passionate activity.

Particularly relevant to the present framework, stress and negative affect predict negative health behaviors. For example, there is a relationship between stress and disordered eating. In addition, studies have demonstrated that stress can lead to an increase or decrease in eating behaviors, and stress is predictive of eating disorders (21, 37).

Stress has also been connected to drinking behaviors in college students. Perkins (28) found that stress was one of the predictive factors for drinking in undergraduate students. Likewise, Park, Armeli, and Tennen (26) showed that students drank more alcohol on days they perceived as more stressful. Further, there may also be a link between stress and experiencing exercise addiction. In a study by Warner and Griffiths (42), participants completed the EAI and 8% of this sample were identified as being at risk for exercise addiction. The researchers noted that the majority of the at risk individuals reported that exercise was a form of coping with stress. Further, stress is also predictive of sleeping disorders (7).

Perhaps the negative psychological outcomes, including high levels of stress, that come with being obsessively passionate and rigidly persistent toward academic activities puts individuals at a greater risk for engaging in the problematic health behaviors (drinking, excessive exercise, disordered eating) in an effort to cope with the stress. Future research should examine the extent to which negative psychological outcomes, such as stress and rigid behavioral patterns toward academic activities, mediate the relationship between passion and problematic health behaviors in college students.

There are several limitations to the current study. First, it is important to remember the nature of the analyses was correlational. In addition, the correlations had small effect sizes, and therefore the differences between the groups were small. Future studies ought to use designs

(e.g., experiments, prospective designs) that allow for a better understanding of how passion for academic activities and problematic health behaviors might causally be related. Studies would also benefit from further examining possible mediating variables (such as stress) between passion and problematic health behaviors. In addition, the present framework included self-report measures rather than behavioral observations. Future studies might thus benefit from using more objective assessments. Further, the present sample was comprised mostly of women and undergraduate students in an introductory psychology courses. As such, the sample may not be representative of other populations. This is also important in that college aged women report higher levels of overall stress than college men (2). Thus, one can argue that the problematic behaviors observed in this study could be due to potentially higher levels of stress levels in the respondents.

The sample was further limited in representativeness because a small number of participants who indicated they were “seniors” or “other” for their grade level appeared to have relatively large effect on the results of our analyses. The inclusion of these 12 participants in our analyses revealed that the regression model including obsessive and harmonious passion for one’s major was no longer predictive of scores on the EAI. Additionally, obsessive passion for one’s major significantly predicted scores on the ESS when these 12 participants were included. Perhaps these 12 participants, because they were a higher grade level than a majority of this sample, completed the surveys differently due to having more experience with their academic and major activities. Regardless, the fact that these 12 participants affected the results so significantly demonstrates that the sample used in this study had limited representativeness. Further to this point, there were seven students that were outside the traditional age range (18-23 years old) of college students. These individuals may have ordinary experiences (e.g., financial responsibility for schooling, families to care for) that would not be considered non-normal for traditionally aged students. These varied experiences could lead nontraditional students to answer the surveys differently.

The limited sample in this study was recruited from an introductory psychology course. Consequently, most of the participants were freshman or sophomores. To obtain a more representative sample, a mass email could have been sent to all the students in school. Relatively speaking, the present data included smaller numbers of junior and above students as compared to freshman and sophomore students. Thus, our comparisons and subsequent conclusions that draw upon these higher grade levels should be taken with caution. A final word of consideration is that the particular institution at which the study took place is notable for a large Greek-life and drinking culture. Specifically, the school has numerous Greek-life organizations, and Greek-life students are known to engage in more alcohol use than non-Greek students (34). This may in turn limit the generalizability of the present findings to other institutions with different cultures and may have potentially contributed to the small effects in this study.

Taken together, these results may hint at the potential benefits of equipping students with harmonious passion toward academics for facilitating health behavior. Future studies should identify ways to increase involvement in harmonious passions instead of obsessive passions.

Of particular interest, the identification of signature strengths has been shown to increase harmonious passion toward work (6). Perhaps students could be similarly taught to identify strengths that might encourage participation in harmonious activities. However, such undertakings are beyond the scope of this study. Future studies should then explore the effectiveness of similar approaches that aim at encouraging the pursuit of harmonious passion in college.

In conclusion, we examined whether passion for academic activities was related to problematic health behaviors. The present results suggest that passion for academic activities may be predictive of problematic health behaviors in college students but only if the passion is obsessive in nature. Specifically, these results support the hypotheses that obsessive passion for academic activities is positively associated with select problematic health behaviors (i.e., drinking, eating and exercise behavior) while the opposite may be true for harmonious passion (i.e., less drinking and fewer sleeping problems).

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