



The role of narcissism in health-risk and health-protective behaviors

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Erin M Hill

Abstract

This study examined the role of narcissism in health-risk and health-protective behaviors in a sample of 365 undergraduate students. Regression analyses were used to test the influence of narcissism on health behaviors. Narcissism was positively predictive of alcohol use, marijuana use, and risky driving behaviors, and it was associated with an increased likelihood of consistently having a healthy eating pattern. Narcissism was also positively predictive of physical activity. Results are discussed with reference to the potential short-term and long-term health implications and the need for future research on the factors involved in the relationship between narcissism and health behaviors.

Keywords

drinking behavior, eating behavior, exercise behavior, health behavior, health psychology

Introduction

The participation in health-protective behaviors and the minimization of health-risk behaviors are important factors influencing morbidity and mortality (Johnson et al., 2014). Personality offers an important framework for understanding health behaviors as personality traits can have long-term influences on health and well-being (Friedman and Kern, 2014). Narcissism, a personality trait characterized by feelings of self-importance, superiority and entitlement, and a continual focus on the enhancement of one's self-esteem (Twenge et al., 2008a), has been linked with psychological health (e.g. Sedikides et al., 2004) and also with risk-taking behaviors (Buelow and Brunell, 2014; Campbell et al., 2004). There is evidence that society is becoming more narcissistic with younger generations

exhibiting more narcissistic attitudes and behaviors than older generations (Twenge et al., 2008a, 2008b). Therefore, further examination of the relationship between narcissism and health and well-being is needed with specific focus on health behaviors and health-related decisions.

The relationship between narcissism and health is complex. While there is some evidence that narcissism is positively linked to subjective well-being and psychological health (e.g.

West Chester University, USA

Corresponding author:

Erin M Hill, Department of Psychology, West Chester University, West Chester, PA 19383, USA.
Email: ehill@wcupa.edu

Sedikides et al., 2004; Zuckerman and O'Loughlin, 2009), narcissism is also associated with various risk behaviors (e.g. Buelow and Brunell, 2014; MacLaren and Best, 2013; Martin et al., 2013). Narcissism has also been linked to problematic functioning of the stress-response systems (Cheng et al., 2013; Reinhard et al., 2012) and, in turn, may be a long-term risk factor for physical health problems (McEwen, 2008).

Research on the relationship between narcissism and psychological health has revealed that narcissism is inversely linked with anxiety, depression, and loneliness (Sedikides et al., 2004; Spano, 2001) and positively associated with subjective well-being (Sedikides et al., 2004; Zuckerman and O'Loughlin, 2009). However, the research by Sedikides et al. (2004) and Zuckerman and O'Loughlin (2009) found that self-esteem fully mediated the relationship between narcissism and well-being. Therefore, the link between self-esteem and narcissism appears to be an important factor in the role of narcissism in psychological health.

While narcissism has been linked to exercise behaviors, possibly due, in part, to concerns about bodily appearance (Davis et al., 2005; Spano, 2001), there has been limited focus on its potential influence on other health-protective behaviors. There has, however, been research on narcissism in relation to risk-taking behaviors, including problematic gambling behaviors (Campbell et al., 2004; Lakey et al., 2008), risky financial decision-making (Foster et al., 2011), drinking (Luhtanen and Crocker, 2005), and unsafe sex behaviors among HIV-positive individuals (Martin et al., 2013). Experimental research found that narcissists are more likely to take risks in gambling scenarios (Campbell et al., 2004). Lakey et al. (2008) demonstrated that the link between narcissism and problematic gambling behaviors was partially influenced by overconfidence, heightened risk acceptance, and a shortsighted focus on the potential rewards. Such cognitive factors might also come into play in other behavioral decision-making relevant to health and well-being.

Narcissism has also been identified as an influential factor in substance use behaviors (Luhtanen and Crocker, 2005; MacLaren and Best, 2013). In a study of undergraduate students, Luhtanen and Crocker (2005) found that narcissism was predictive of binge drinking behaviors (self-report of frequency of consuming five or more drinks) and weekly alcohol consumption. MacLaren and Best (2013) also found that narcissism was predictive of addictive behaviors including alcohol use and illegal drug use in their sample of college students. In the context of risk-taking, research indicates that narcissism is positively correlated with approach motivation rather than avoidance motivation (Foster et al., 2009a, 2009b; Miller et al., 2009). That is, it appears that individuals elevated on narcissism seem to understand the potential dangers involved in engaging in risky behaviors, but nonetheless choose to take part in the behavior due to the anticipated benefits (Foster et al., 2009b).

There is evidence that narcissism is associated with heightened activity of stress-related physiological processes of the neuroendocrine and sympathetic nervous systems (Cheng et al., 2013; Reinhard et al., 2012). Additionally, Cascio et al. (2015) found that narcissism was associated with hypersensitivity of brain regions involved in social pain and exclusion. Importantly, hypersensitivity of this brain region and overactivation of the stress-response systems (e.g. increased cortisol) may lead to long-term health problems (Cascio et al., 2014; McEwen, 2008). Therefore, in the area of physical health, there seem to be physiological pathways that may put an individual with elevated narcissism at risk for health problems.

Although narcissism has been linked to psychological health (Sedikides et al., 2004), there is also evidence that narcissism may be a health risk factor through risk-taking behaviors (Buelow and Brunell, 2014; MacLaren and Best, 2013; Miller et al., 2009) and physiological strain (Cheng et al., 2013; Reinhard et al., 2012). It is therefore important to continue to examine the influence of narcissism on health and well-being. Engaging in health-protective

behaviors (e.g. eating well, exercising) and minimizing health-risk behaviors (e.g. substance use) are important ways to achieve and maintain health and well-being (Brannon et al., 2014). Beyond risk-taking, this study sought to investigate the role of narcissism in a range of health behaviors. Further complicating the relationship, gender is correlated with both narcissism and health behaviors; specifically, men are more likely to have higher narcissism scores (Miller and Campbell, 2008; Twenge et al., 2008a) and are more likely to engage in health-risk behaviors (Courtenay et al., 2002). Therefore, the overall aim of this study was to assess the role of narcissism in health-risk and health-protective behaviors after controlling for the influence of relevant socio-demographic factors (gender and age).

Method

Participants and procedure

Participants were 365 undergraduate students (129 males, 236 females) from a university in the northeastern United States who took part in the study as an option in completing the research credit for their Introduction to Psychology class. The data presented in this article represent a subsection of a larger study on individual differences in altruism and well-being. Participants took part in the study in a university classroom; after completing the consent forms, the participants completed the set of questionnaires and received a debriefing form after handing back the questionnaire. The university institutional review board approved the study protocol.

Measures

Narcissism. The Narcissistic Personality Inventory (NPI; Raskin and Terry, 1988) is a 40-item forced-choice questionnaire designed to measure narcissism as a personality trait. Each item is composed of paired statements, and the participant chooses the statement with which they most identify. One statement is characteristic of

a narcissistic response, while the other is a neutral response. Narcissistic statements are coded 1, while neutral responses are coded 0; the total score for the scale ranges from 0 to 40. Raskin and Terry (1988) established reliability and validity of the NPI using a sample of undergraduate students. The scale has been widely used among the undergraduate student population (e.g. Sedikides et al., 2004; Twenge et al., 2008a; Weikel et al., 2010). In this study, the scale had good internal consistency ($\alpha = .83$).

Health behavior measurement overview. A series of single-item questions were used to measure both health-risk and health-protective behaviors. Using single-item questions to assess health behaviors can be used to decrease participant burden and thus allow for the collection of information on various types of behaviors (e.g. Bylund et al., 2010; Hall et al., 2006; Rolstad et al., 2011). The following six items were classified as health-risk behaviors: smoking behaviors, weekday alcohol consumption, weekend alcohol consumption, marijuana use, other drug use (e.g. 3,4-methylenedioxy-methamphetamine (MDMA)/ecstasy, Adderall, methamphetamine, cocaine), and risky driving behaviors. The following four variables were considered health-protective behaviors in this study: fruit and vegetable consumption, having a well-balanced and healthy eating pattern, safe sex behaviors, and physical activity.

Health-risk behaviors. In assessing smoking behaviors, participants were asked, "What is your smoking status?" with the following response options: non-smoker, ex-smoker, social smoker, occasional smoker, and daily smoker. To gather information on alcohol consumption, participants were asked, "How much alcohol do you consume on a typical weekday?" with the following response options: 0 drinks, 1–2 drinks, 3–4 drinks, 5–6 drinks, and 7 drinks or more. For the analyses, due to a low number of responses for 5–6 drinks ($n = 3$) and 7 drinks or more ($n = 9$) response options, the following three categories were used: 0 drinks, 1–2 drinks, and 3 or more drinks. Participants were also

asked about their weekend alcohol consumption; they were asked, "How much alcohol do you consume on a typical weekend?" with the following response options: 0 drinks, 1–4 drinks, 5–8 drinks, 9–12 drinks, and 13 drinks or more.

The item regarding marijuana use asked participants, "In the past month, have you engaged in marijuana use?" with the following response options: not at all, very little, a fair amount, and a great deal. Similarly, in gathering information about other drug use, participants were asked, "In the past month, have you engaged in other forms of drug use (e.g. MDMA/ecstasy, Adderall, methamphetamine, cocaine)?" with the following response options: not at all, very little, a fair amount, and a great deal. In assessing risky driving behaviors, participants were asked, "Do you take part in risky driving behaviors (e.g. not wearing a seatbelt, driving under the influence, texting while driving, or other distracting behaviors)?" with the following response options: never, sometimes, often, usually, and always. Due to the low response for usually ($n=16$) and always ($n=7$), the response options were combined for the analyses.

Health-protective behaviors. To gather information on eating patterns, participants were asked, "Do you eat at least five servings of fruits and vegetables per day (serving examples: one banana, half cup of orange juice, five broccoli florets)?" the recommended intake by the World Health Organization (WHO, 2003) to prevent chronic disease, and "Is your daily eating pattern well-balanced and healthy?" with the following response options: never, sometimes, often, usually, and always. Participants were asked whether they had ever engaged in sexual activity (yes/no), and if they had, they were asked, "When you participated/participate in sexual activity, do you engage in safe sex behaviors (e.g. condom use or other forms of sexually transmitted infection prevention/birth control)?" with the following response options: never, sometimes, often, usually, and always.

In assessing physical activity, the Godin Leisure-Time Exercise Questionnaire was used

(Godin and Shephard, 1997). The scale asks participants to report the number of times on average per week that they engaged in the following forms of physical activity during their free time for more than 15 minutes: strenuous exercise (e.g. running, hockey, soccer), moderate exercise (e.g. fast walking, volleyball, easy swimming), and mild exercise (e.g. bowling, easy walking). A total weekly leisure activity score was calculated using the following equation developed by Godin and Shephard (1997): $(9 \times \text{strenuous}) + (5 \times \text{moderate}) + (3 \times \text{light})$. The scale is a psychometrically sound instrument with established reliability and validity (Godin and Shephard, 1997).

Socio-demographics. Information on socio-demographics was also collected. Participants were asked to report their gender, ethnicity, and date of birth.

Statistical approach

Regression models were conducted to assess the influence of narcissism on health-risk and health-protective behaviors. Ordinal regression models were initially tested on ordinal outcomes. However, due to the violation of the assumption of parallel lines for many of the models ($p < .05$), it was determined that ordinal regression was not appropriate, and therefore, multinomial logistic regressions were applied (Orme and Combs-Orme, 2009). The total NPI score was entered into the models along with gender and age entered as covariates. Gender and age are variables that have been previously associated with narcissism (Buelow and Brunell, 2014; Foster et al., 2003; Twenge et al., 2008a) and therefore were included as covariates for the models of this study (for the gender variable, females were coded as 2, males as 1).

Multinomial logistic regression models are structured such that the outcome variables in the model are compared to a reference category. For the purpose of this study, the reference category was consistently the healthiest behavior pattern. Therefore, the remaining behavior levels were compared to the healthiest behavior

response (e.g. reporting “sometimes,” “often,” and “usually/always” engaging in risky driving behaviors was compared to reporting “never” engaging in risky driving behaviors).

A total of 368 participants initially took part in the study. After removing participants who had missing data for key information (e.g. age), 365 participants remained. In total, 11 cases had missing data on the NPI (<30%), which was determined to be missing at random—indicating no significant pattern to the missing data. Expectation maximization (EM) was therefore used to impute values for the cases with missing data, a recommended method that uses observed values to estimate parameters, which are then used to compute missing values (Schlomer et al., 2010). Importantly, EM is a maximum likelihood approach to missing data that is used in psychological research as a way to estimate missing case values without distorting population parameters (Schlomer et al., 2010). Listwise deletion was applied to the models. The data were screened for regression assumptions, and three multivariate outliers were identified for the Godin Leisure-Time regression variables. The linear regression model of narcissism on physical activity was tested with outliers included as well as excluded, and because the results did not differ between models, the cases were kept in the final analyses.

Results

Descriptives and correlations

Participants in the study ranged in age from 18 to 43 years ($M=19.42$, standard deviation (SD)=1.99), and 76.7percent identified as White American. The narcissism scores ranged from 1 to 34.73 ($M=16.82$, $SD=6.68$), with males ($n=129$; $M=18.25$, $SD=6.54$) scoring higher than females ($n=236$; $M=16.04$, $SD=6.63$), $t(363)=3.06$, $p=.002$. There was no correlation between age and narcissism ($r=.085$, $p=.105$). The physical activity scores from the Godin Leisure-Time Exercise Questionnaire ranged from 0 to 146 ($M=59.09$, $SD=30.82$).

Health-risk behavior regression models

Multinomial logistic regression models were tested for each of the health-risk behaviors to examine the influence of narcissism on the behaviors. A summary of the regression model results is presented in Table 1. The regression of narcissism on smoking status was significant, $\chi^2(12)=32.76$, $p=.001$, Nagelkerke $R^2=.107$, indicating that model variables differentiated non-smokers ($n=280$) from at least one of the other response categories: ex-smokers ($n=13$), social smokers ($n=42$), occasional smokers ($n=24$), and daily smokers ($n=5$). The predictive power of the model largely reflects the role of increasing age in differentiating ex-smokers ($b=.29$, Wald $\chi^2(1)=8.53$, $p=.003$; odds ratio (OR)=1.33, 95% confidence interval (CI): 1.10–1.61) and occasional smokers ($b=.20$, Wald $\chi^2(1)=4.65$, $p=.031$; OR=1.23, 95% CI: 1.02–1.48) from non-smokers, and the influence of gender in that males were significantly more likely than females to report being a social ($b=-.77$, Wald $\chi^2(1)=5.08$, $p=.024$; OR=.46, 95% CI: .24–.90) or an occasional smoker ($b=-1.27$, Wald $\chi^2(1)=7.99$, $p=.005$; OR=.28, 95% CI: .12–.68) rather than a non-smoker.

The weekday alcohol use regression was significant, $\chi^2(6)=26.40$, $p<.001$, Nagelkerke $R^2=.109$, indicating that model variables differentiated participants who reported consuming 0 drinks during the weekday ($n=234$) from those who reported consuming 1–2 drinks ($n=51$) or those who reported consuming 3 or more drinks ($n=23$).¹ Greater age ($b=.22$, Wald $\chi^2(1)=5.78$, $p=.016$; OR=1.24, 95% CI: 1.04–1.48) and narcissism ($b=.07$, Wald $\chi^2(1)=8.90$, $p=.003$; OR=1.08, 95% CI: 1.03–1.13) were associated with having 1–2 drinks on a weekday in comparison with 0 drinks on a weekday. Additionally, narcissism was predictive of consuming 3 or more drinks during a weekday in comparison with consuming 0 drinks ($b=.09$, Wald $\chi^2(1)=6.76$, $p=.009$; OR=1.09, 95% CI: 1.02–1.17).

The weekend alcohol use regression was also significant, $\chi^2(12)=56.72$, $p<.001$, Nagelkerke

Table 1. Summary of the influence of narcissism in the health-risk behavior logistic regression models.

Health-risk behavior	Influence of narcissism in model ^a
Smoking Reference category: non-smoker (<i>n</i> = 280); other categories: ex-smoker (<i>n</i> = 13), social smoker (<i>n</i> = 42), occasional smoker (<i>n</i> = 42), daily smoker (<i>n</i> = 5)	Not significant
Weekday alcohol consumption Reference category: 0 drinks (<i>n</i> = 234); other categories: 1–2 drinks (<i>n</i> = 51), 3 or more drinks (<i>n</i> = 23)	Predictive of consuming 1–2 drinks Predictive of consuming 3 or more drinks
Weekend alcohol consumption Reference category: 0 drinks (<i>n</i> = 97); other categories: 1–4 drinks (<i>n</i> = 98), 5–8 drinks (<i>n</i> = 78), 9–12 drinks (<i>n</i> = 51), 13 or more drinks (<i>n</i> = 40)	Predictive of consuming 1–4 drinks Predictive of consuming 5–8 drinks Predictive of consuming 9–12 drinks Predictive of consuming 13 or more drinks
Marijuana use in the past month Reference category: not at all (<i>n</i> = 223); other categories: very little (<i>n</i> = 57), a fair amount (<i>n</i> = 45), a great deal (<i>n</i> = 39)	Predictive of a fair amount of marijuana use
Other drug use in the past month Reference category: not at all (<i>n</i> = 317); other categories: very little (<i>n</i> = 57), a fair amount (<i>n</i> = 45), a great deal (<i>n</i> = 45)	Not significant
Risky driving behaviors Reference category: never (<i>n</i> = 151); other categories: sometimes (<i>n</i> = 169), often (<i>n</i> = 22), usually/always (<i>n</i> = 23)	Predictive of often engaging in risky driving behaviors Predictive of usually/always engaging in risky driving behaviors

^aCompared to the reference category.

$R^2 = .151$, indicating that model variables differentiated participants who reported consuming 0 drinks during the weekend (*n* = 97) from at least one of the other response options: consuming 1–4 drinks (*n* = 98), 5–8 drinks (*n* = 78), 9–12 drinks (*n* = 51), or 13 drinks or more (*n* = 40). Narcissism was associated with an increased likelihood of consuming 1–4 drinks ($b = .06$, Wald $\chi^2(1) = 6.88$, $p = .009$; OR = 1.06, 95% CI: 1.02–1.11), 5–8 drinks ($b = .07$, Wald $\chi^2(1) = 7.81$, $p = .005$; OR = 1.07, 95% CI: 1.02–1.12), 9–12 drinks ($b = .06$, Wald $\chi^2(1) = 4.20$, $p = .040$; OR = 1.06, 95% CI: 1.00–1.12), or 13 drinks or more ($b = .08$, Wald $\chi^2(1) = 6.78$, $p = .009$; OR = 1.09, 95% CI: 1.02–1.15) over the weekend in comparison with abstaining from drinking over the weekend. Gender was also significant in

the model with females being significantly more likely than males to report consuming 1–4 drinks ($b = .65$, Wald $\chi^2(1) = 3.84$, $p = .050$; OR = 1.92, 95% CI: 1.00–3.68) in comparison with not drinking over the weekend. Males were significantly more likely than females to report consuming 13 drinks or more over the weekend ($b = -1.83$, Wald $\chi^2(1) = 16.85$, $p < .001$; OR = .16, 95% CI: .07–.38) in comparison with abstaining from drinking.

The regression of narcissism on marijuana use was significant, $\chi^2(9) = 42.59$, $p < .001$, Nagelkerke $R^2 = .125$, indicating that model variables differentiated participants who reported not engaging in marijuana use at all (*n* = 223) from at least one of the other response options: very little (*n* = 57), a fair amount (*n* = 45), or a

great deal ($n=39$). Higher narcissism was associated with an increased likelihood of consuming a fair amount of marijuana in the past month in comparison with not consuming any marijuana ($b=.07$, Wald $\chi^2(1)=6.65$, $p=.010$; OR=1.07, 95% CI: 1.02–1.13). Gender was also a significant predictor in the model; males were more likely than females to report using a fair amount of marijuana ($b=-.83$, Wald $\chi^2(1)=5.63$, $p=.018$; OR=.44, 95% CI: .22–.87) or a great deal of marijuana ($b=-1.62$, Wald $\chi^2(1)=18.03$, $p<.001$; OR=.20, 95% CI: .09–.42) in the past month than to report not using marijuana at all. Age was also a significant predictor in the model with younger age being associated with an increased likelihood of engaging in marijuana use a fair amount in the past month in comparison with not engaging in marijuana use at all ($b=-.43$, Wald $\chi^2(1)=6.33$, $p=.012$; OR=.65, 95% CI: .47–.91).

The multinomial logistic regression model for other drug use was significant, $\chi^2(9)=23.84$, $p=.005$, Nagelkerke $R^2=.098$, indicating that model variables differentiated participants who reported not engaging in any drug use in the past month ($n=317$) from at least one of the other response options: engaging in drug use very little ($n=27$), a fair amount ($n=12$), or a great deal ($n=9$). The explanatory power of the model was largely explained by the predictive power of gender. Males were significantly more likely than females to report having engaged in very little drug use ($b=-1.41$, Wald $\chi^2(1)=10.58$, $p=.001$; OR=.25, 95% CI: .11–.57) or a fair amount of drug use ($b=-1.41$, Wald $\chi^2(1)=4.93$, $p=.026$; OR=.24, 95% CI: .07–.85) in comparison with reporting not having used drugs. Narcissism and age were not significant in the model.

The multinomial logistic regression of narcissism on risky driving behaviors was significant, $\chi^2(9)=21.96$, $p=.009$, Nagelkerke $R^2=.066$, indicating that model variables differentiated participants who reported never taking part in risky driving ($n=151$) from at least one of the other categories: sometimes ($n=169$), often ($n=22$), or usually/always ($n=23$). Narcissism was associated with an increased

likelihood of reporting engaging in risky driving behaviors often in comparison with never engaging in risky driving behaviors ($b=.08$, Wald $\chi^2(1)=5.16$, $p=.023$; OR=1.09, 95% CI: 1.01–1.17). Narcissism was also associated with an increased likelihood of reporting engaging in risky driving behaviors usually or always ($b=.11$, Wald $\chi^2(1)=9.33$, $p=.002$; OR=1.12, 95% CI: 1.04–1.20) in comparison with never engaging in risky driving behaviors. Gender and age were not significant predictors in the model.

Health-protective behavior regression models

Regression models were conducted to examine the influence of narcissism on health-protective behaviors. A summary of the regression model results is presented in Table 2. Among the four health-protective behaviors tested in this study, only two outcome models were significant: having a well-balanced and healthy eating pattern and physical activity. Narcissism was not predictive of the other health-protective behaviors. The model of narcissism on fruit and vegetable consumption was not significant, $\chi^2(12)=20.76$, $p=.054$, indicating that the model variables did not differentiate participants who reported always consuming at least five servings of fruits or vegetables each day ($n=31$) from the other responses: usually ($n=72$), often ($n=77$), sometimes ($n=152$), or never ($n=33$). Based on the subsection of the sample who reported having engaged in sexual activity ($n=321$), the model of narcissism on safe sex behaviors was not significant, $\chi^2(12)=17.02$, $p=.149$. The model variables did not differentiate participants who reported always engaging in safe sex behaviors ($n=178$) from the other responses: usually ($n=67$), often ($n=26$), sometimes ($n=27$), or never ($n=23$).

The multinomial logistic regression of narcissism on the likelihood of having a well-balanced and healthy eating pattern was significant, $\chi^2(12)=24.46$, $p=.018$, Nagelkerke $R^2=.069$, indicating that the model variables differentiated those who reported always having a healthy

Table 2. Summary of the influence of narcissism in the health-protective behavior regression models.

Health-protective behavior	Influence of narcissism in model ^a
Fruit and vegetable consumption (at least five servings each day) Reference category: always ($n=31$); other categories: usually ($n=72$), often ($n=77$), sometimes ($n=152$), never ($n=33$)	Not significant
Having a well-balanced and healthy daily eating pattern Reference category: always ($n=36$); other categories: usually ($n=102$), often ($n=86$), sometimes ($n=123$), never ($n=18$)	Negatively predictive of <i>sometimes</i> having a well-balanced and healthy daily eating pattern
Safe sex behaviors Reference category: always ($n=178$), usually ($n=67$), often ($n=26$), sometimes ($n=27$), never ($n=23$)	Not significant
Physical activity Measured with the Godin Leisure-Time Exercise Questionnaire	Positively predictive of physical activity (linear regression model)

^aCompared to the reference category.

eating pattern ($n=36$) from at least one of the other response categories: usually ($n=102$), often ($n=86$), sometimes ($n=123$), or never ($n=18$). Narcissism was associated with a decreased likelihood of reporting having a well-balanced and healthy eating pattern sometimes in comparison with always ($b=-.06$, Wald $\chi^2(1)=4.70$, $p=.030$; OR=.94, 95% CI: .89–.99). That is, individuals elevated on narcissism were more likely to report always having a healthy eating pattern in comparison to reporting sometimes age was also significant in the model; it was associated with a decreased likelihood of reporting having a well-balanced and healthy eating pattern often in comparison with always ($b=-.22$, Wald $\chi^2(1)=4.05$, $p=.044$; OR=.80, 95% CI: .64–.99).

The linear regression of narcissism on physical activity was significant, $F(3, 344)=10.63$, $p<.001$, $R^2=.085$, $Adjusted\ R^2=.077$. After controlling for gender and age and adding narcissism in the model, the amount of explained variance in physical activity increased ($R^2_{change}=.056$, $p<.001$). In the final model, narcissism was predictive of physical activity ($\beta=.24$, $p<.001$). Among the covariates, age was negatively predictive of physical activity ($\beta=-.18$, $p=.001$) and gender was not significant in the model ($\beta=-.04$, $p=.431$).

Discussion

The aim of this study was to examine the relationship between narcissism and health-risk and health-protective behaviors. While narcissism has been studied in relation to psychological health (e.g. Sedikides et al., 2004; Zuckerman and O'Loughlin, 2009) and risky decision-making (e.g. Foster et al., 2009b; Miller et al., 2009), there has been less attention on the role of narcissism in both health-risk and health-protective behaviors. Among the health-risk behaviors investigated in this study, narcissism was positively predictive of weekday and weekend alcohol use, marijuana use, and risky driving behaviors. In terms of health-protective behaviors, narcissism was associated with an increased probability of consistently having a healthy eating pattern and it was positively predictive of physical activity. Overall, the results of the study indicate that narcissism may be a health risk through its association with health-risk behaviors. However, narcissism was also linked to healthy eating and physical activity, health-protective behaviors, thus highlighting the complex relationship between narcissism and health behaviors.

Among the health behavior models tested in this study, the regression of narcissism on weekend alcohol consumption was the strongest. The

relationship between narcissism and alcohol use is consistent with previous research in this area (Luhtanen and Crocker, 2005; MacLaren and Best, 2013). Importantly, the results of this study identify narcissism as a predictor of both weekend and weekday alcohol use; narcissism was associated with an increased likelihood of consuming alcohol on weekdays (either 1–2 drinks or 3 or more drinks) in comparison with reporting not drinking during the week. Given the link between extraversion and narcissism (e.g. Miller and Campbell, 2008), increased engagement in social activities where substance use is more likely to occur could play a role (Cruz et al., 2012). However, other motivational factors are likely involved in the association between narcissism and alcohol use. Some research suggests that moderate alcohol intake is not detrimental to one's health, but there is evidence that alcohol consumption increases an individual's risk for alcohol-related motor vehicle accidents and some cancers (Brannon et al., 2014). Therefore, the behavior pattern of alcohol use among those elevated on narcissism could have important short-term and long-term health implications.

Narcissism was also associated with an increased likelihood of using a fair amount of marijuana in comparison with not using marijuana in the previous month. MacLaren and Best (2013) reported that narcissism was predictive of illegal drug use in their study, but their measure did not differentiate between different types of drugs. This study specifically examined the relationship between marijuana use and narcissism. Narcissism was not predictive of other forms of drug use, a finding similar to the results reported by Martin et al. (2013) in their study of risk behaviors of HIV individuals. However, the use of different populations—undergraduate students and HIV individuals—limits the comparability of these findings. Taken together, the connection between narcissism and the use of illegal substances remains unclear and requires further examination.

A novel finding in this study was the observed relationship between narcissism and risky driving behaviors. Previous research has indicated a relationship between narcissism and

aggressive driving (Schreer, 2002), and Miller et al. (2009) discussed the correlation between narcissism and self-defeating behaviors, a variable in their study that consisted of a composite measure of various risk behaviors that included reckless driving, drinking too much, spending more money than one has, and other related behaviors. Miller et al. (2009) discussed that one of the ways narcissism is linked to self-defeating behaviors is through approach orientation—the pursuit of reward or excitement. The excitement and perceived benefits of risky driving, such as texting while driving (e.g. continuing a conversation, the enjoyment of multitasking) or driving while intoxicated, are potential motivational factors that could be involved in the relationship. Given the increase in technology used in cars, which, in turn, increases the likelihood of distracted driving (Coben and Zhu, 2013), examining the specific motivational factors involved in the relationship between narcissism and risky driving is a particularly important area of further study.

In terms of the health-protective behaviors investigated in this study, narcissism was associated with a decreased likelihood of reporting having a healthy and well-balanced eating pattern *sometimes* rather than *always*. It is possible that due to the relationship between narcissism and vanity (Vazire et al., 2008), individuals with elevated narcissism are more likely to engage in healthy eating to help maintain a certain physical appearance. Research focused on the detailed dietary patterns associated with narcissism would help to further expand upon this novel finding.

Narcissism was also positively predictive of physical activity in this study. This finding is congruent with previous research on narcissism and exercise behaviors (MacLaren and Best, 2013; Morrison et al., 2004; Spano, 2001). Spano (2001) proposed that one of the factors involved in the correlation between physical activity and narcissism is concern with bodily appearance. That is, similar to the previously proposed factor underlying narcissism's link with healthy eating, the relationship between narcissism and physical activity could be explained, in part, by a focus on

maintaining or improving bodily appearance. Indeed, research among young men has found that narcissism is predictive of drive for muscularity (Davis et al., 2005), which, in turn, may fuel exercise behaviors. The increased physical activity among individuals elevated in narcissism may have important health benefits, but research on motivational factors involved will help to elucidate the cognitive and affective mechanisms underlying the relationship.

Limitations

One of the main strengths of this study is that it adds to the current body of literature through its examination of both health-risk and health-protective behaviors in relation to narcissism. Although there is some research on the relationship between narcissism and risk-taking, both health-risk and health-protective behaviors were of focus in this study. Nonetheless, there are limitations of the study that should be considered in interpreting the results. First, a relatively homogeneous undergraduate sample was used to collect the data, thus limiting the generalizability of the findings. Some of the health behavior patterns may be specific to the sample (e.g. drinking behaviors), and therefore, future research on narcissism and health behaviors should be conducted with more diverse community-based samples. It is also important to note that although the models were structured with narcissism positioned as a predictor of health behaviors, the direction of the relationship cannot be determined in this correlational study. Longitudinal investigations including measures of narcissism, health behaviors, and other health outcomes will help in better understanding the role of narcissism in health and well-being.

The reliance on single-item measures to assess most of the health behaviors is another limitation of this study. Further research on this topic should consider using multi-item validated scales to help to capture the complexity of the health behaviors (e.g. risky driving, safe sex behaviors, alcohol use, smoking). Notably, this study was exploratory in nature and serves to

identify areas for further investigation. Expanding upon the findings of this study, it would be advantageous for future research to focus on specific aspects of health behaviors (e.g. different forms of risky driving, patterns of eating) and examine the cognitive, affective, and social mechanisms that may be mediating the relationship between narcissism and decisions about health behaviors.

Finally, the complexity of narcissism as a trait must be noted. In this study, a single narcissism score, calculated with the NPI, was used. However, there is discussion in the literature regarding the forms and various dimensions of narcissism (Brown et al., 2009; Tamborski et al., 2012; Weikel et al., 2010). Rose (2002) posited that the NPI measures an overt adaptive form of narcissism, which helps to explain its relationship with self-esteem and psychological health. Covert narcissism, on the other hand, characterized by self-absorption, low self-esteem, and hypersensitivity to criticism, may be less adaptive (Rose, 2002; Weikel et al., 2010). Other research suggests that narcissism distilled into dimensions (e.g. entitlement, exploitativeness, grandiosity) can independently predict decision-making about ethical and risk behaviors (Brown et al., 2009; Buelow and Brunell, 2014; Tamborski et al., 2012). Future research should consider the utility of overt narcissism as well as other forms and dimensions of the trait in understanding the relationship between narcissism and health.

Conclusion

Overall, this study provided evidence for the influence of narcissism on health-risk behaviors, including alcohol use, marijuana use, and risky driving behaviors, as well as health-protective behaviors, including eating patterns and physical activity. The association between narcissism and health behaviors, in turn, has important implications for physical and mental health. To gain a better understanding of the role of narcissism in health and well-being, future research is needed to identify the motivational, cognitive, and social factors underlying

the association between narcissism and health-risk and health-protective behaviors.

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Note

1. Due to an error on the questionnaire, some participants ($n=57$) did not respond to this question leaving a total of 308 cases for this item.

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