



A lethal imitation game? Exploring links among psychoactive substance use, self-harming behaviors and celebrity worship

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ABSTRACT

Recently, psychoactive substance use and suicidal behaviors have become general themes in popular culture, raising concerns that celebrity admirers may have become more affected in such health-risk behaviors. This study aimed to provide a more nuanced understanding of the role of celebrity worship in psychoactive substance use and self-harming behaviors. An online questionnaire was used recruiting 1,763 Hungarian adult participants (66.42% male, $M_{age} = 37.2$ years, $SD = 11.4$). Linear and binary logistic regressions were performed to investigate the contribution of celebrity worship to psychoactive substance use and self-harming behaviors for males and females. It was found that higher celebrity worship levels consistently predicted intentional self-injury and suicide attempts for both genders. Generally high levels of celebrity worship also predicted drunkenness and the use of illicit drugs and sedatives or tranquilizers for nonmedical purpose among males, while these behaviors were predicted only by excessive levels of celebrity worship among females. However, the explanatory power of celebrity worship for psychoactive substance use and self-harming behaviors was small for both genders (below 5%), indicating that these health-risk behaviors are largely independent of celebrity admiration. The present findings also suggest that individuals with excessive celebrity worship are more likely to encounter severe, potentially life-threatening excesses than more benign forms of maladaptive behaviors relating to substance use.

1. Introduction

1.1. Psychoactive substance use and self-harming behaviors in celebrity culture

Recently, famous rock musicians, actors and fashion models having alcohol and drug problems have attracted considerable media attention (Shaw, Whitehead, & Giles, 2010), suggesting that drug use has become part of the popular culture (Manning, 2007). Indeed, celebrities who became notorious for their excessive alcohol and drug use (e.g., Britney Spears, Paris Hilton and Robert Downey Jr.) have generated extensive media coverage (Oksanen, 2014; Shaw et al., 2010). Applying the social

learning theory in the field of media effects, it has been proposed that the exposure to glamorous celebrities' excesses may increase individuals' interest in modeling these health-risk behaviors (Bryant & Zillmann, 2002). More concerning is that medical studies have pointed out that addiction is a common cause of death among celebrities (e.g., Prince, Whitney Houston, Amy Winehouse) (Lathan, 2009).

Relating to the imitation effect, another concern is self-injury, which is frequently represented in popular movies, music videos and lyrics (Purinton & Whitlock, 2010). Although popular media representations of non-suicidal self-injury can help individuals feel less isolated with this problem, Purinton and Whitlock (2010) expressed concerns that exposure to such media content may increase the likelihood of

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engagement in such behaviors. Indeed, copycat suicide is a well-known phenomenon that generated a considerable amount of research in the past few decades (Cheng, Hawton, Lee, & Chen, 2007; Hawton & Williams, 2005; Stack, 2005). Copycat suicide is an incident of suicide committed by an individual following the announcement of a suicidal act of a famous person (Cheng, Hawton, Lee, et al., 2007). Studies have consistently found evidence for the increase in suicide rates due to the extensive media coverage of a celebrity suicide (e.g., Cheng, Hawton, Chen, et al., 2007; Fu & Yip, 2009; Stack, 2005), even after controlling for other relevant suicide risk factors (e.g., negative life events, anxiety) (Fu & Yip, 2007). Jeong et al. (2012) found that visits of emergency departments for suicide attempts and incidents of self-injury increased following celebrity suicides in Korea. Myung et al. (2015) also found that female and younger individuals are more likely to become involved in copycat suicide.

Previous studies have suggested that individuals fascinated by celebrities may be more likely to model health-risk behaviors such as alcohol and drug use (Shaw et al., 2010), smoking (Phua, Jin, & Hahm, 2018), and self-injury (Purinton & Whitlock, 2010; Stack, 2005). Recently, Shabahang et al. (2020) have found that celebrity worship expressed towards a narcotic-addicted celebrity was associated with higher addiction potential in adult males. However, little is known about the contribution of celebrity admiration to the problem of psychoactive substance use and self-harming behaviors. The present study endeavors to provide a more nuanced knowledge of the role of celebrity worship in these health-risk behaviors.

Based upon previous findings, gender differences should be considered when investigating the contribution of celebrity admiration to psychoactive substance use and self-harming behaviors. Indeed, meta-analyses found evidence for robust gender differences in psychoactive substance use and self-harming behaviors (Bresin & Schoenleber, 2015; McHugh, Votaw, Sugarman, & Greenfield, 2018). Specifically, smoking (Tombor et al., 2010), alcohol consumption (Delker, Brown, & Hasin, 2016), drunkenness (Horváth et al., 2020), and the use of illicit drugs (McHugh et al., 2018) along with sedatives and tranquilizers (Lev-Ran, Le Strat, Imtiaz, Rehm, & Le Foll, 2013) are more prevalent among males than females. In turn, non-suicidal self-injury (Bresin & Schoenleber, 2015) and suicide attempts (Freeman et al., 2017) are more prevalent among females than males. Drawing upon these findings, the present investigation is extended to the exploration of gender differences.

1.2. Celebrity worship and addictions

Celebrity worship is an excessive admiration towards a famous person (McCutcheon, Lange, & Houran, 2002; McCutcheon, Maltby, Houran, & Ashe, 2004). According to the theoretical model by McCutcheon et al. (2002), celebrity worship can be considered as a continuum ranging from a healthy enthusiasm to compulsive behaviors and pathological feelings towards a favorite celebrity. Recent studies have reported a positive relationship between celebrity worship and behavioral addictions such as gambling addiction (Lian, Aruguete, Huynh, McCutcheon, & Murtagh, 2019), compulsive buying (Reeves, Baker, & Truluck, 2012) and problematic Internet (Zsila, McCutcheon, & Demetrovics, 2018) and social media use (Zsila, Urbán, McCutcheon, & Demetrovics, 2020).

Celebrity worship shares several common features with behavioral addictions. For instance, both constructs have been associated with poor mental health (e.g., symptoms of depression and anxiety), impulsivity and impairment in everyday functioning (e.g., reduced school/work performance, deteriorated social relationships, poor cognitive ability) (Brailovskaia, Rohmann, Bierhoff, Margraf, & Köllner, 2019; Grant, Lust & Chumberlain, 2019; Lian et al., 2019; McCutcheon et al., 2014; Sansone & Sansone, 2014). The dynamics of the motivational forces driving the absorption with a favorite celebrity can take on an addictive component that sometimes leads to more extreme attitudes and

behaviors, like stalking (see McCutcheon, Scott, Aruguete, & Parker, 2006; McCutcheon, Aruguete, McCarley, & Jenkins, 2016), that are needed to sustain an individuals' satisfaction with this one-sided, parasocial relationship. This process is similar to the mechanism of tolerance in behavioral addictions, which refers to the increased need to intensify a behavior in order to achieve the same levels of satisfaction as before (Brailovskaia et al., 2019). Furthermore, there is a significant overlap among the components of celebrity worship in the assessment (e.g., individuals feel that maintaining their interest in a celebrity provides them a temporary escape from life's problems, they have frequent thoughts about a favorite celebrity even when they do not want to) and general symptoms of behavioral addictions (e.g., salience, loss of control, escapism). Therefore, it could be argued that individuals most predisposed to celebrity worship are likely to be predisposed to other addictive behaviors. Based upon these findings, it can be assumed that greater identification with a celebrity may be associated not only with behavioral addictions but also with a higher tendency for excessive psychoactive substance use.

1.3. The aim of the study

Drawing on the imitation effect, concerns have been raised that celebrity admirers may have a higher tendency to engage in psychoactive substance use and self-harming behaviors (Purinton & Whitlock, 2010; Shaw et al., 2010). A recent study has supported this assumption (Shabahang et al., 2020), reporting a positive association between celebrity worship and male fans' addictive potential. Although previous studies have found associations between celebrity worship and some behavioral addictions (e.g., Lian et al., 2019; Reeves et al., 2012), there is a lack of research investigating the contribution of celebrity admiration to psychoactive substance use and self-harming tendencies. This study aims to provide a more nuanced understanding of the role of celebrity worship in these health-risk behaviors. The exploration of these associations can help clarify the relationship of celebrity admiration to these problems. Considering the robust gender differences in these psychological constructs, associations are examined separately for males and females.

2. Method

2.1. Participants and procedure

Participants were recruited from a leading Hungarian news website (444.hu) using an online questionnaire focusing on attitudes towards celebrities and mental health. Participation in the survey was voluntary and anonymous; informed consent was obtained from all respondents. Following the data cleaning process, the final sample comprised 1,763 Hungarian adults (66.42% male, $M_{age} = 37.22$ years, $SD = 11.38$). Major demographic characteristics of the sample are presented in Appendix 1. This research was approved by the Institutional Review Board of the research team's university and was performed following the ethical principles of the Declaration of Helsinki.

2.2. Measures

Participants were requested to provide information regarding their favorite celebrity (i.e., name, primary field of expertise, period of being a fan). Celebrity was defined as a famous living person or one who died during the respondent's lifetime as suggested by McCutcheon et al. (2004). Questions exploring psychoactive substance use and self-harming behaviors were derived from the Hungarian survey of the 2015 European School Survey Project on Alcohol and Other Drugs (ESPAD) (Molinario et al., 2018).

Celebrity worship. Participants' dedication to their favorite celebrity was assessed using the 23-item Celebrity Attitude Scale (CAS; McCutcheon et al., 2002; McCutcheon et al., 2004). The CAS comprises

Table 1
Pairwise comparisons across gender in study-relevant variables.

	Total (N = 1,763)	Male (n = 1,171)	Female (n = 592)	χ^2/t	Effect size
Demographic characteristics					
Age (years)	37.22 (11.84)	36.91 (11.15)	37.83 (13.09)	-1.46	-
Celebrity worship					
CAS Entertainment–Social	22.46 (7.20)	22.50 (7.26)	22.38 (7.10)	0.34	-
CAS Intense–Personal	14.57 (5.71)	14.46 (5.66)	14.78 (5.80)	-1.11	-
CAS Borderline–Pathological	6.36 (2.48)	6.44 (2.56)	6.19 (2.29)	2.02*	0.10
CAS Total	43.39 (13.85)	43.40 (13.90)	43.36 (13.75)	0.07	-
Psychoactive substance use					
Cigarette smoking	768 (43.56%)	518 (44.24%)	250 (42.23%)	0.42	-
Alcohol consumption	22.70 (16.02)	24.57 (15.90)	19.01 (15.60)	6.98***	0.35
Being drunk	3.82 (8.50)	4.51 (9.17)	2.46 (6.77)	5.33***	0.24
Cannabis use	4.38 (11.05)	5.38 (12.19)	2.41 (8.01)	6.11***	0.27
Illicit drug use	0.97 (4.71)	1.19 (5.30)	0.55 (3.20)	3.15**	0.14
Sedative or tranquilizer use	0.89 (4.82)	0.72 (4.13)	1.25 (0.95)	-1.95 ⁺	0.16
Self-harming behaviors					
Intentional self-injury	0.22 (2.37)	0.12 (1.78)	0.42 (3.22)	-2.13*	0.13
Suicide attempts	0.08 (1.66)	0.08 (1.67)	0.08 (1.65)	0.04	-

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; ⁺ $p = 0.05$.

Effect size is Cohen’s d.

CAS = Celebrity Attitude Scale.

Cigarette smoking was a binary variable coded as 0 = “Non-smoker” and 1 = “Smoker”. For this variable, χ^2 -test was conducted, while t-tests were performed for all other variables.

The number of smoking participants and the respective percentages are reported (in parenthesis) for the variable of cigarette smoking, while means and standard deviations (in parenthesis) are reported for all other variables.

The values for variables of psychoactive substance use and self-harming behaviors reflect the occasions these behaviors occurred in the past 12 months.

three subscales: Entertainment–Social (ten items; e.g., “I love to talk with others who admire my favorite celebrity”) ($\alpha = 0.84$), Intense–Personal (nine items; e.g., “The successes of my favorite celebrity are my successes also”) ($\alpha = 0.83$), and Borderline–Pathological (four items; e.g., “If I were lucky enough to meet my favorite celebrity, and he/she asked me to do something illegal as a favor, I would probably do it”) ($\alpha = 0.55$). Participants indicated their level of agreement with the statements on a five-point Likert scale (ranging from 1 = “strongly disagree” to 5 = “strongly agree”). In line with previous studies reporting high reliability indices for the total scale (α s ranged from 0.84 to 0.94) (McCutcheon et al., 2004), the CAS yielded high internal consistency in the present study ($\alpha = 0.91$). Similar to some recent studies reporting Cronbach’s alphas between 0.43 and 0.54 for the Borderline–Pathological factor (e.g., McCutcheon, Griffith, Aruguete, & Haight, 2012; McCutcheon, Rich, Browne, & Britt, 2016; Reeves et al., 2012), the internal consistency of this subscale was low in the present study. Thus, results relating to this subscale should be interpreted with caution.

Psychoactive substance use and self-harming behaviors. First, participants answered the following question: “How often do you smoke cigarettes?” The response options were: 1 = “Never”, 2 = “Occasionally” and 3 = “Daily”. In the data analysis, this variable was recoded in the following way: 0 = “Non-smoker” (including the category of 1 = “Never”) and 1 = “Smoker” (including the categories of 2 = “Occasionally” and 3 = “Daily”). Second, participants were requested to respond to questions about how often they consumed alcohol, used cannabis, other drugs (e.g., LSD, cocaine, ecstasy, crack, etc.), and sedatives or tranquilizers for nonmedical purposes in the past 12 months. Third, participants were asked to respond to two questions about how often they injured themselves intentionally and attempted suicide in the past 12 months. Participants indicated their response using the following scale: 1 = “0 times”, 2 = “1–2 times”, 3 = “3–5 times”, 4 = “6–9 times”, 5 = “10–19 times”, 6 = “20–39 times”, and “7 = “More than 40 times”. In the data analysis, these variables were linearized in the following way: “0 = “0 times”, 0.5 = “1–2 times”, 4 = “3–5 times”, 7.5 = “6–9 times”, 14.5 = “10–19 times”, 29.5 = “20–39 times”, and 40 = “More than 40 times”.

2.3. Statistical analysis

For the data analysis, SPSS version 20 (IBM SPSS Inc., Chicago, Illinois) was used. The proportion of participants scoring high on specific subscales of the CAS was determined based on the calculation of mid-points as suggested by Maltby, Houran, and McCutcheon (2003) and Stever (2011). Therefore, values of 30 or above on the Entertainment–Social subscale, 27 or above on the Intense–Personal subscale and 12 or above on the Borderline–Pathological subscale were considered as high scores on the respective subscale.

For group comparisons across gender, χ^2 -test and t-tests were performed. Effect size (Cohen’s d) is being interpreted in the following way: 0.2 = small effect, 0.5 = medium effect, 0.8 = large effect (Cohen, 1988).

In the final step, multiple ordinary least squares (OLS) regressions were performed separately for males and females following the principle of parsimony. In these models, psychoactive substance use and self-harming behaviors were outcome variables, while celebrity worship dimensions were predictor variables. Age was added as a control variable. For the dichotomous variable of smoking, binary logistic regression analysis was conducted, while linear regressions were performed for all other variables. To reduce the impact of intercorrelations among predictor variables, the CAS subscales were entered separately in the models. Semi-partial correlations (sr^2) were also calculated to estimate the unique contribution of celebrity worship to psychoactive substance use and self-harming behaviors.

3. Results

3.1. Descriptive statistics

A detailed overview of descriptive statistics relating to study-variables is presented in Appendix 1. The most frequently named favorite celebrities were Keanu Reeves ($n = 46$; 2.61%), Elon Musk ($n = 46$; 2.61%), and David Bowie ($n = 40$; 2.27%) in the present sample. The most frequently selected field of expertise of a favorite celebrity were music ($n = 578$; 32.79%), acting ($n = 390$; 22.12%) and science ($n = 179$; 10.15%). The vast majority of participants reported being fans of their favorite celebrity for more than three years (88.03%).

Table 2
Regression models predicting psychoactive substance use and self-harming behaviors among male and female participants.

Outcome variables	Explanatory variable: Celebrity worship <i>Beta (SE)</i>					
	Male participants (n = 1,171)			Female participants (n = 592)		
	CAS Total	R ²	sr ²	CAS Total	R ²	sr ²
Cigarette smoking	1.01 (0.004)*	0.9%	–	1.00 (0.006)	0.1%	–
Alcohol consumption	0.02 (0.03)	0.0%	0.02	–0.008 (0.05)	0.2%	–0.008
Being drunk	0.07 (0.02)*	1.0%	0.07	0.08 (0.02) ⁺	0.7%	0.08
Cannabis use	0.03 (0.03)	0.2%	0.03	0.009 (0.02)	0.1%	0.009
Illicit drug use	0.13 (0.01)***	2.0%	0.13	0.07 (0.01)	0.5%	0.07
Sedative or tranquilizer use	0.12 (0.009)***	1.5%	0.12	0.04 (0.02)	0.0%	0.04
Intentional self-injury	0.18 (0.004)***	3.2%	0.18	0.15 (0.01)***	2.0%	0.15
Suicide attempts	0.16 (0.004)***	2.5%	0.16	0.22 (0.005)***	4.2%	0.22

Notes: ****p* < 0.001; **p* < 0.05; +*p* = 0.05.

Beta (SE) = standardized coefficient and its standard error.

CAS = Celebrity Attitude Scale.

Cigarette smoking is coded as 0 = “Non-smoker” and 1 = “Smoker”. For this variable, odds ratios and Nagelkerke R² are reported. All other variables are linearized continuous variables representing the occasions these behaviors occurred in the past 12 months.

For the sake of clarity, values for the control variable (i.e., age) are not represented.

R² values represent the percentages of explained variance without adding the control variable.

Using the theoretical midpoints proposed by Maltby et al. (2003) and Stever (2011), it was found that 18.21% of participants (n = 321) yielded high scores on at least one subscale of the Celebrity Attitude Scale (CAS). Using overlapping categories, 16.56% (n = 292) of participants scored high on the Entertainment–Social subscale, while

Table 3
Celebrity worship dimensions predicting psychoactive substance use and self-harming behaviors by gender.

Outcome variables	Explanatory variables: Dimensions of celebrity worship <i>Beta (SE)</i>					
	Male participants (n = 1,171)			Female participants (n = 592)		
	CAS Entertainment–Social	CAS Intense–Personal	CAS Borderline–Pathological	CAS Entertainment–Social	CAS Intense–Personal	CAS Borderline–Pathological
Cigarette smoking	1.02 (0.008)*	1.01 (0.01)	1.07 (0.02)**	1.00 (0.01)	0.99 (0.02)	1.00 (0.04)
Alcohol consumption	0.04 (0.07)	–0.02 (0.08)	0.05 (0.18)	0.02 (0.09)	–0.05 (0.11)	0.04 (0.28)
Being drunk	0.07 (0.04)*	0.06 (0.05)*	0.08 (0.10)**	0.07 (0.04)	0.06 (0.05)	0.14 (0.12)**
Cannabis use	<0.001 (0.05)	0.01 (0.06)	0.12 (0.14)***	–0.02 (0.05)	<0.001 (0.06)	0.11 (0.14)**
Illicit drug use	0.08 (0.02)***	0.14 (0.03)***	0.18 (0.06)***	0.04 (0.02)	0.09 (0.02)*	0.11 (0.06)**
Sedative or tranquilizer use	0.07 (0.02)*	0.15 (0.02)***	0.13 (0.05)***	0.03 (0.04)	0.04 (0.04)	0.09 (0.11)*
Intentional self-injury	0.12 (0.007)***	0.21 (0.00)***	0.18 (0.02)***	0.12 (0.02)**	0.14 (0.02)***	0.13 (0.06)**
Suicide attempts	0.10 (0.007)**	0.19 (0.009)***	0.16 (0.02)***	0.17 (0.009)***	0.23 (0.01)***	0.20 (0.03)***

Notes: ****p* < 0.001; ***p* < 0.001; **p* < 0.05; +*p* = 0.05.

Beta (SE) = standardized coefficient and its standard error.

CAS = Celebrity Attitude Scale.

Cigarette smoking is coded as 0 = “Non-smoker” and 1 = “Smoker”. Odds ratios are reported for this variable. All other variables are linearized continuous variables reflecting the occasions these behaviors occurred in the past 12 months.

Age was used as a control variable. For the sake of clarity, values for the control variable are not represented.

Values of semi-partial correlations (sr²) were identical to the beta-values presented above except for the following variables: CAS Intense–Personal predicting suicide attempts (sr² = 0.22) and sedative or tranquilizer use (sr² = 0.03) among female participants, CAS Borderline–Pathological predicting intentional self-injury (sr² = 0.17), illicit drug use (sr² = 0.17) and alcohol consumption (sr² = 0.04) among male participants.

only 4.42% (n = 78) yielded high scores on the Intense–Personal subscale and 3.97% (n = 70) on the Borderline–Pathological subscale. Specifically, only a small minority of participants yielded high scores on all subscales (n = 28; 1.59%) or at least one of the two problematic subscales (i.e., Intense–Personal and Borderline–Pathological) (n = 119; 6.75%). The total score on the Celebrity Attitude Scale (M = 43.4, SD = 13.9) aligned with the total scores reported in previous studies using adult samples from the UK and the USA (Ms ranged between 41 and 59 with SDs between 11 and 20) (McCutcheon et al., 2004).

3.2. Group comparisons across gender

Results of pairwise comparisons are presented in Table 1. With regard to celebrity worship, male participants scored higher than female participants only in the Borderline–Pathological dimension. The effect size was negligible (d = 0.10).

With regard to psychoactive substance use, male participants consumed alcohol and reported being drunk more frequently than female participants. Additionally, males used cannabis more frequently than females. Effect sizes were small-to-moderate (d = 0.24–0.35). Illicit drug use was also more frequently reported by males than females; however, the effect size was small (d = 0.14). By contrast, females reported using sedatives or tranquilizers for nonmedical purposes more frequently than males (d = 0.16). In relation to self-harming behaviors, incidents of intentional self-injury were more frequently reported by females than males (d = 0.13). However, effect sizes were small.

Zero-order correlations between study-variables are presented in Appendix 2. Weak, negative associations were found between age and celebrity worship for both genders (r_{male} = –0.15; r_{female} = –0.09), indicating that celebrity worship slightly decreases with age.

3.3. Regression models predicting psychoactive substance use and self-harming behaviors

In the final step, regression models were performed to investigate celebrity worship as a possible predictor of psychoactive substance use and self-harming behaviors across gender (see Table 2). High levels of

celebrity worship predicted smoking and the use of illicit drugs and sedatives or tranquilizers among males. In turn, higher celebrity worship predicted more frequent drunkenness for both genders. Likewise, generally higher celebrity worship predicted more frequent incidents of intentional self-injury and suicide attempts irrespective of gender. However, these associations were generally weak (β s ranged from 0.07 to 0.22), and celebrity worship explained only a small proportion of these behaviors (0.9–3.2% for males and 0.7–4.2% for females).

When investigating the contribution of different aspects of celebrity worship to psychoactive substance use and self-harming behaviors, it was found that all dimensions of celebrity worship consistently predicted self-harming behaviors for both genders (see Table 3). Celebrity worship dimensions also consistently predicted drunkenness and the use of illicit drugs and sedatives or tranquilizers among males, while these behaviors were predicted only by Borderline–Pathological levels of celebrity worship among females. Similarly, more frequent cannabis use was predicted only by the Borderline–Pathological dimension of celebrity worship for both genders. However, these associations were weak (β s ranged from 0.06 to 0.23). Smoking was inconsistently associated with celebrity worship dimensions (see Table 3 for details), while celebrity worship dimensions were not predictors of alcohol consumption.

4. Discussion

Drawing on the imitation effect, previous studies have suggested that extensive media attention to famous stars' personal problems involving alcohol, drug abuse and self-harming behaviors may increase the likelihood of engagement in such health-risk behaviors (Purington & Whitlock, 2010; Shaw et al., 2010). The present study investigated the association of celebrity worship with psychoactive substance use and self-harming behaviors in an attempt to clarify the links between celebrity admiration and health-risk behaviors. It was found that generally high levels of celebrity worship consistently predicted incidents of intentional self-injury and suicide attempts for both genders. Additionally, celebrity worship predicted more frequent occasions of drunkenness and illicit substance use among males. Although the limited explanatory power of celebrity worship suggests that these behaviors are largely independent of celebrity influence, the results pointed out that individuals were more likely to experience severe problems (e.g., self-harming practices) than more benign forms of substance use (e.g., alcohol consumption) when they had an excessive admiration towards a celebrity.

In the present study, 6.8% of participants scored at or above the midpoint on either of the two problematic dimensions (i.e., Intense–Personal and Borderline–Pathological). The percentages of individuals scoring at or above the midpoint in the present study are similar to the percentages reported by Maltby and Day (2011) (2.5% and 8% scored at or above average on the Intense–Personal and the Borderline–Pathological dimensions), but relatively lower in comparison with the prevalence reported by Maltby et al. (2003) (27% yielded high scores on the two problematic subscales) and Zsila et al. (2018) (14% scored at or above average on at least one of the problematic dimensions). This might be due at least partly to the fact that participants of this study were quite a bit older than the college-age students that have served as participants in many previous studies (e.g., Maltby et al., 2003; McCutcheon et al., 2006, McCutcheon et al., 2016). Celebrity worship scores have been shown to decline slightly with age (Brooks, 2018).

In general, the results of the present study are consistent with the Absorption-Addiction model proposed by McCutcheon et al. (2002). The model argues that most celebrity worshipers never progress beyond the relatively benign first level, on which level feelings toward one's favorite celebrity are marked by entertainment and social value. In the present study a higher percentage of participants scored at or above the midpoint on this first level than scored at or above the midpoint of the other two, more problematic levels. The finding that intentional self-

injury and suicide attempts for both genders, while drunkenness and psychoactive substance use for males are associated with higher celebrity worship levels is also consistent with the pattern of negative attitudes and behaviors linked to high celebrity worship levels in previous studies (see Brooks, 2018, for a review). However, these associations are relatively weak, a fact that the Absorption-Addiction Model explains by pointing out that most celebrity worshipers experience no severe mental health difficulties and are attracted to their favorite celebrity because they find that celebrity entertaining and a topic for conversation/socialization with their friends. This result is also consistent with the classification of media fans proposed by Stever (2009), who found that the majority of respondents exhibited less intense emotions towards their favorite celebrity and were more motivated to improve their social relationships through their fascination with a celebrity, while a small minority of fans expressed obsessive feelings towards their favorite media personae and were more likely to engage in behaviors that are harmful for either the object of their admiration or themselves.

Consistent with previous findings, celebrity worship was associated with younger age for both genders (see Brooks, 2018 for a review). Furthermore, the present results demonstrating similar levels of celebrity worship across gender aligns with those studies reporting no gender difference in celebrity admiration (e.g., Ashe, Maltby, & McCutcheon, 2005; Maltby & Day, 2011, McCutcheon et al., 2006).

With regard to self-harming practices, higher levels of celebrity worship predicted more frequent incidents of self-injury and suicide attempts for both genders in this study. Previously, celebrity worship has been associated with psychiatric symptoms such as depression, anxiety and somatic symptoms (see Sansone & Sansone, 2014 for a review), which have been associated with higher risk for self-injury along suicide ideation and behavior (Cogle, Keough, Riccardi, & Sachs-Ericsson, 2009; Gollust, Eisenberg, & Golberstein, 2008; Perroud et al., 2007). Although the association between celebrity worship and suicide attempts was weak in the present study, this result suggests that individuals with an excessive admiration towards a favorite celebrity may be at a slightly higher risk for self-injury and suicide behavior.

With regard to psychoactive substance use, generally higher levels of celebrity worship predicted more frequent occasions of drunkenness and the use of illicit drugs and sedatives or tranquilizers among males, while these behaviors were predicted only by the most excessive level of celebrity worship among females. Furthermore, higher celebrity worship predicted smoking among males. These results suggest that higher levels of celebrity worship can slightly elevate the risk of psychoactive substance use among males, while the contribution of celebrity admiration to these behaviors can only be observed at the most excessive levels of celebrity worship among females. These findings are consistent with those studies reporting more frequent incidents of drunkenness (Horváth et al., 2020), cigarette smoking (Tombar et al., 2010), and the use of illicit drugs (McHugh et al., 2018) along with sedatives and tranquilizers (Lev-Ran et al., 2013) among males than females.

The present findings also suggest that health-risk behaviors such as psychoactive substance use and self-harming practices have particularly limited explanatory power in celebrity worship. This result is similar to the findings of Shabahang et al. (2020), who found that celebrity worship weakly predicted the addiction potential of respondents with an admiration towards a narcotic-addicted celebrity.

One possible explanation for the present results is that more recent media representations of celebrities with alcohol and drug problems have focused on the struggles and rehabilitation of these celebrities instead of promoting substance use (Oksanen, 2012). Indeed, television shows such as *Celebrity Rehab* and *Dr Drew* provided viewers with a detailed picture of the long process of recovery (Oksanen, 2014). Therefore, it is plausible that celebrity admirers became more reluctant to model such behaviors since they were exposed to the harmful consequences. However, it is also possible that popular culture delivered a detailed picture of the effect of drugs, allowing viewers to indirectly

experience these effects without actually taking drugs (Boothroyd, 2006). Shaw et al. (2010) and Oksanen (2014) also emphasized that audiences are able to actively construct their own interpretations of the content they are exposed to, suggesting that viewers may not be that receptive for the modeling effect as was assumed earlier.

Another alternative explanation worth mentioning is related to the specifics of the present sample. Although each of the most frequently selected favorite celebrities in this sample (i.e., Keanu Reeves, Elon Musk and David Bowie) admitted using drugs earlier (marketwatch.com, 2018; abcnews.go.com, 2006; telegraph.co.uk, 2017), and the majority of participants selected musicians and actors as favorite celebrities, and famous stars from these fields of expertise were found to be particularly involved in psychoactive substance use (Manning, 2007; Shaw et al., 2010), it is possible that there is no overlap between participants' and their favorite celebrities' health-risk behaviors, and participants' maladaptive behaviors are rooted in other reasons (e.g., personal problems). Furthermore, the prevalence of excessive celebrity worship in the present sample was low (6.8% scored high on the two problematic dimensions of celebrity worship) with comparison to previous studies reporting 2.5%–27% (Maltby & Day, 2011; Maltby et al., 2003). Therefore, it is possible that participants in the present study were not that strongly attached to their favorite celebrity to model their behavior, and psychoactive substance use and self-harming behaviors are simply further indicators of the generally poor mental health of those with a higher tendency to become fascinated with celebrities. Future research that explores the direct link among celebrities' and their fans' psychoactive substance use and self-harming behaviors can possibly help clarify the role of modeling effect in these problem behaviors. This study provided a more nuanced picture of the contribution of attraction towards celebrities to these health-risk practices, suggesting that compulsive feelings toward a favorite celebrity has no prominent role in these maladaptive behaviors. However, further research is needed to gain a more advanced understanding of the behavioral patterns and mechanisms underlying the imitation effect.

Besides the limitations described above, it should be noted that the present findings cannot be generalized to the whole population of Hungarian adults due to the convenience sampling method used in this study. Based on qualitative investigation and 20 years of observation in fan communities, Stever (2009) suggested that celebrity–fan interactions and their effects on the level of behavior might be bidirectional. However, causal directions could not be ascertained in the present study due to the cross-sectional research design. Finally, similar to previous studies (e.g., McCutcheon et al., 2016; Reeves et al., 2012), the reliability of the Borderline–Pathological subscale of the Celebrity Attitude Scale was low; therefore, results relating to this dimension of celebrity worship should be interpreted with caution. Considering the weak associations found in the present study, future studies should also provide further support for these associations using more diverse samples (e.g., in other age groups or different cultural settings). A recent study by Franssen (2020) also pointed out that influential role models integrating self-improvement and recovery in their celebrity image can possibly promote self-care among fans. Future studies should also extend the scope of research to beneficial practices and behaviors of celebrities that can potentially enhance fans' psychological well-being.

In summary, the present findings indicated that high levels of celebrity worship predicted self-harming behaviors for both genders and more severe practices of psychoactive substance use for males. Although the contribution of celebrity worship to these behaviors was particularly small, indicating that the attachment to a celebrity played no crucial role in these health-risk behaviors, the present results point out that celebrity admiration can slightly elevate the risk of engagement in such harmful practices. Hence, compulsive feelings for an

admired celebrity can be considered as precursors of an elevated risk for self-injury and suicidal behaviors irrespective of gender, while males with an excessive admiration towards a celebrity may be at a higher risk of engaging in substance use. These findings also indicate that excessive celebrity worship is more strongly associated with potentially life-threatening excesses and serious forms of substance use than less harmful behaviors. Hence, decreasing the strength of emotional attachment to an admired celebrity can potentially decrease the risk of engagement in self-harming behaviors. These findings can also possibly help developing prevention strategies to reduce the psychological harms relating to celebrity admiration by providing a more nuanced understanding of the association of celebrity worship with self-destructive tendencies.

Author statement

The authors (Ágnes Zsila, Gábor Orosz, Lynn E. McCutcheon, Zsolt Demetrovics) declare that they do not have any interests that could constitute a real, potential or apparent conflict of interest with respect to his/her involvement in the publication. The authors also declare that they do not have any financial or other relations (e.g., directorship, consultancy or speaker fee) with companies, trade associations, unions or groups (including civic associations and public interest groups) that may gain or lose financially from the results or conclusions in the study. Sources of funding are acknowledged.

The study was exclusively carried out by the investigators. The authors of this manuscript had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

The submission to your journal has been approved by all of the authors as well as the indicated authorship order.

Author Disclosure

Role of Funding Sources

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Contributors

Ágnes Zsila and Zsolt Demetrovics designed the study. Lynn E. McCutcheon conducted literature searches and provided summaries of previous research studies. Ágnes Zsila and Gábor Orosz conducted the statistical analysis. Ágnes Zsila wrote the first draft. All authors contributed to and have approved the final manuscript.

CRedit authorship contribution statement

Ágnes Zsila: Conceptualization, Formal analysis, Writing - original draft. **Gábor Orosz:** Methodology, Writing - review & editing. **Lynn E. McCutcheon:** Resources, Writing - review & editing. **Zsolt Demetrovics:** Investigation, Supervision, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix 1. Demographic characteristics and descriptive data of study-variables

See [Table A1](#).

Table A1

	Participants (N = 1,763)
Demographic characteristics	
Gender	
Male n (%)	1,171 (66.42%)
Female n (%)	592 (33.58%)
Age (years) (range: 18–79) Mean (SD)	37.22 (11.38)
Educational level	
Primary school education n (%)	22 (1.25%)
Secondary school certificate n (%)	497 (28.19%)
College degree or higher n (%)	1,244 (70.56%)
Celebrity worship	
CAS Entertainment–Social (range: 10–50) Mean (SD)	22.46 (7.20)
CAS Intense–Personal (range: 9–45) Mean (SD)	14.57 (5.71)
CAS Borderline–Pathological (range: 4–20) Mean (SD)	6.36 (2.48)
CAS Total (range: 23–112) Mean (SD)	43.39 (13.85)
Period of time being a fan	
Less than one year n (%)	49 (2.78%)
1–2 years n (%)	162 (9.19%)
3–5 years n (%)	298 (16.90%)
More than 5 years n (%)	1,254 (71.13%)
Psychoactive substance use in the past 12 months	
Cigarette smoking	
Daily n (%)	500 (28.36%)
Occasionally n (%)	268 (15.20%)
Never n (%)	995 (56.44%)
Alcohol consumption	
0 times n (%)	141 (8.00%)
1–2 times n (%)	119 (6.75%)
3–5 times n (%)	145 (8.22%)
6–9 times n (%)	176 (9.98%)
10–19 times n (%)	255 (14.46%)
20–39 times n (%)	258 (14.63%)
More than 40 times n (%)	669 (37.95%)
Being drunk	
0 times n (%)	808 (45.83%)
1–2 times n (%)	444 (25.18%)
3–5 times n (%)	196 (11.12%)
6–9 times n (%)	113 (6.41%)
10–19 times n (%)	110 (6.24%)
20–39 times n (%)	37 (2.10%)
More than 40 times n (%)	55 (3.12%)
Cannabis use	
0 times n (%)	1,226 (69.54%)
1–2 times n (%)	196 (11.12%)
3–5 times n (%)	65 (3.69%)
6–9 times n (%)	53 (3.01%)
10–19 times n (%)	62 (3.52%)
20–39 times n (%)	35 (1.99%)
More than 40 times n (%)	126 (7.15%)
Illicit drug use	
0 times n (%)	1,535 (87.07%)
1–2 times n (%)	114 (6.47%)
3–5 times n (%)	43 (2.44%)
6–9 times n (%)	13 (0.74%)
10–19 times n (%)	29 (1.64%)
20–39 times n (%)	18 (1.02%)
More than 40 times n (%)	11 (0.62%)
Sedative or tranquilizer use	
0 times n (%)	1,585 (89.90%)
1–2 times n (%)	75 (4.25%)
3–5 times n (%)	41 (2.33%)
6–9 times n (%)	19 (1.08%)
10–19 times n (%)	15 (0.85%)
20–39 times n (%)	10 (0.57%)
More than 40 times n (%)	18 (1.02%)
Self-harming behaviors	

(continued on next page)

Table A1 (continued)

	Participants (N = 1,763)
Intentional self-injury	
0 times n (%)	1,701 (96.48%)
1–2 times n (%)	35 (1.99%)
3–5 times n (%)	13 (0.76%)
6–9 times n (%)	1 (0.06%)
10–19 times n (%)	8 (0.45%)
20–39 times n (%)	5 (0.28%)
More than 40 times n (%)	
Suicide attempts	
0 times n (%)	1,743 (98.87%)
1–2 times n (%)	14 (0.79%)
3–5 times n (%)	2 (0.11%)
6–9 times n (%)	1 (0.06%)
10–19 times n (%)	0 (0.00%)
20–39 times n (%)	0 (0.00%)
More than 40 times n (%)	3 (0.17%)

Note: CAS = Celebrity Attitude Scale.

Appendix 2. Zero-order correlations between study-variables among male (n = 1,171) and female (n = 592) participants

See Table A2.

Table A2

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Age	–	–0.07	–0.08	–0.12**	–0.09*	0.06	–0.12**	–0.17***	–0.13**	–0.07	0.08+	–0.04	0.08+
2. CAS	–0.15***	–	0.76***	0.64***	0.95***	–0.04	0.02	0.08	–0.01	0.04	0.02	0.12***	0.16***
Entertainment–Social subscale													
3. CAS Intense–Personal subscale	–0.08**	0.72***	–	0.61***	0.92***	–0.03	–0.04	0.07	0.01	0.09*	0.03	0.15***	0.22***
4. CAS Borderline–Pathological subscale	–0.18***	0.66***	0.64***	–	0.75***	–0.02	0.05	0.16***	0.13**	0.12**	0.08+	0.13***	0.19***
5. CAS Total	–0.15***	0.94***	0.90***	0.79***	–	–0.04	0.003	0.10*	0.02	0.08	0.04	0.15***	0.21***
6. Cigarette smoking	–0.07*	0.06+	0.04	0.10***	0.08**	–	0.14***	0.18***	0.24***	0.11***	0.04	–0.01	–0.009
7. Alcohol consumption	–0.07*	0.05	–0.009	0.06	0.03	0.14***	–	0.36***	0.12**	0.10*	–0.003	0.04	0.05
8. Being drunk	–0.21***	0.10**	0.08**	0.11***	0.10***	0.22***	0.38***	–	0.26***	0.24***	0.08	0.29***	0.23***
9. Cannabis use	–0.19***	0.03	0.03	0.15***	0.05	0.32***	0.16***	0.26***	–	0.44***	0.03	0.19***	0.21***
10. Illicit drug use	–0.13***	0.09**	0.15***	0.19***	0.15***	0.23***	0.13***	0.24***	0.41***	–	0.13***	0.28***	0.50***
11. Sedative or tranquilizer use	–0.06	0.07*	0.15***	0.14***	0.13***	0.08**	0.07*	0.17***	0.14***	0.26***	–	0.15***	0.27***
12. Intentional self-injury	–0.06*	0.12***	0.21***	0.18***	0.18***	–0.02	0.03	0.17***	0.13***	0.32***	0.44***	–	0.53***
13. Suicide attempts	–0.04	0.10***	0.19***	0.16***	0.16***	0.01	0.04	0.16***	0.12***	0.30***	0.40***	0.93***	–

Notes: *** p < 0.001; ** p < 0.01; * p < 0.05; + p = 0.05.

CAS = Celebrity Attitude Scale.

Correlations performed using the subsample of male participants are presented below the diagonal, while correlations in the subsample of female participants are presented above the diagonal.

Cigarette smoking was coded as 1 = “Never”, 2 = “Occasionally” and 3 = “Daily”, and Spearman rank-order correlations were calculated for this variable, while Pearson-correlations were calculated for all other variables. Linearized variables were used for psychoactive substance use and self-harming behaviors, which reflected the occasions these behaviors occurred in the past 12 months.

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