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Re-exploring the relationships of humor styles with dark triad and self-esteem using structural equation modelling

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ABSTRACT

Previous relationships between Dark Triad and Humor styles are theoretically difficult to interpret since Dark Triad traits present general and specific sources of variance. In the present study, we used structural equation modelling techniques to allow us to separate the two sources and detect which source of variance of Dark Triad plays the main role in the relationship observed with Humor styles. Similarly, it was tested if relationships among measures of Self-esteem and Humor styles are replicated at structural level. Moreover, the vast majority of previous studies have been conducted with university samples, which represents a limitation. Hence, a series of bi-factor models to test the relationship between Dark Triad and Humor styles and structural models for Self-esteem and Humor styles were fitted on a community sample of 987 Spanish people. Results suggest that the common variance of the Dark Triad traits was mainly responsible for the reported relationships with Humor styles. It is noteworthy that relations reported for Aggressive and Self-defeating humor styles were higher than those observed in previous studies. Similarly, a higher correlation between Self-esteem and Self-defeating was observed at the structural level. Futures studies are suggested to better establish the psychological reasons behind these relationships.

1. Introduction

Sense of humor can be conceived as a relatively stable psychological characteristic (Martin et al., 2003; Ruch, 1998), and a powerful human resource against adversity (i.e., Ayisire et al., 2022). Nowadays, the perspective of Martin et al. (2003) is the most influential in humor research, and the Humor Style Questionnaire (HSQ), the corresponding instrument, represents the most widely used research tool for assessing humor (Ruch & Heintz, 2016).

Martin's model considers four humor styles: Affiliative, Self-enhancing, Aggressive and Self-defeating. The Affiliative humor style concerns the use of positive humor directed at others to establish relationships, foster group spirit, and reduces tensions. The Self-enhancing humor style measures the use of positive humor directed at oneself and refers to the ability to find humor in unpleasant life situations rather than being overwhelmed by negative emotions, enabling a certain distance from stressful situations. Both Affiliative and Self-enhancing have been described as adaptive humor styles. On the other hand, the Aggressive humor style concerns the use of detrimental humor aimed at harming others, and includes insulting, sarcasm, irony, ridicule, and the use of humor as a manipulation strategy. The Self-defeating humor style assesses the use of negative humor directed at oneself, and includes jokes at one's own expense, the purpose of which is to gain approval from others and to reduce stress. Both Aggressive and Self-defeating humor styles have been described as maladaptive humor styles.

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1.1. Humor styles and Dark Triad

In the last twenty years, the Dark Triad traits (Machiavellian, Narcissism, and Psychopathy; Paulhus & Williams, 2002) have received a fair amount of attention to explain maladaptive behaviors (Egan et al., 2014; Jonason et al., 2015). These traits have subsequently been related with Humor styles. Firstly, Veselka et al. (2010) reported that Psychopathy and Machiavellianism correlated positively with both Aggressive and Self-defeating humor. Martin et al. (2012) replicated these results, with Affiliative style correlating 0.36 with Narcissism, Aggressive correlating 0.40, 0.24 and 0.22 with Psychopathy, Machiavellianism, and Narcissism, respectively, and Self-defeating correlating 0.25 with Psychopathy and 0.18 with Machiavellianism. The remaining correlations, including all with Self-enhancing, were non-significant.

Knight (2015) reported that the Dark Triad traits were significant predictors of humor, Psychopathy being the best predictor for both Aggressive and Self-defeating humor styles, and Siddoju (2021) found that people high on Psychopathy and Machiavellianism exhibited a greater inclination to utilize maladaptive humor styles (Self-defeating and Aggressive), whereas people with higher scores on Narcissism had a preference for Affiliative and Self-enhancing humor styles. Recently, Torres-Marín et al. (2022) reported an association between Narcissism and all HSQ humor styles (correlations ranged between 0.23 and 0.27), Psychopathy and Aggressive (0.40) and Self-defeating (0.24), and Machiavellianism and Aggressive (0.35), and also Self-defeating (0.23) humor styles. In general, it has been replicated in several countries that Psychopathy and Machiavellianism, especially the former, are related to maladaptive humor styles, and Narcissism could be associated with an adaptative one, especially Affiliative.

Despite the highly congruent pattern of correlations across samples, the theoretical meaning of these correlations is hard to interpret since all of them have been found at the measurement level. Evidence demonstrates that the three Dark triad traits show high intercorrelations (Aluja et al., 2022; Hodson et al., 2018; Jones & Paulhus, 2014; McLarnon & Tarraf, 2017) pointing out a general source of variance. On the other hand, they also show specific variance (McLarnon & Tarraf, 2017; O'Boyle Jr. et al., 2012). Hence, Paulhus and Jones (2015) stated that analyzing correlations with one dark trait only or separately for the three dark triad traits could be largely misleading since it is unknown if results could be attributable to the general or specific variance of the Dark Triad traits (Sleep et al., 2017). Since no previous paper has analyzed the correlations of HSQ scales separately for both sources of variance of the Dark Triad, there are doubts about the psychological nature of the reported correlations. It should also be noted that all studies about this topic analyzed university samples, except for Torres-Marín et al. (2022).

1.2. Humor styles and self-esteem

Initially, Zeigler-Hill and Besser (2011) reported that Self-esteem correlates with Affiliative (0.27), Self-enhancing (0.32), and with Self-defeating (−0.26) humor styles. Further studies found that Self-esteem is a good predictor of high scores on positive humor styles and low scores on negative ones, especially Self-defeating (Leist & Müller, 2013; Ozyesil, 2012; Yue et al., 2014), and Gopalakrishnan et al. (2018) reported a positive correlation between Self-esteem and Self-enhancing (0.36), and a negative one with Self-defeating (−0.21). As happened with the Dark Triad, most of these studies analyzed university samples only.

More recently, Schermer et al. (2021) computed correlations between the HSQ scales and Self-esteem in 15 countries. Considering the total sample ($N = 4701$), Self-esteem correlated 0.26 0.35, 0.07 and −0.15 with Affiliative, Self-enhancing, Aggressive, and Self-defeating humor styles, respectively. It should be noted that the average age of the total sample was 23.75 years (SD = 6.65), suggesting that most of the samples were also composed of university students or young people.

1.3. Aims of the study

The first aim of the present study is to compute the relationships of the four HSQ humor styles separately for the general and specific latent factors of the Dark Triad (McLarnon & Tarraf, 2017). To this end, it is necessary to use structural equation modelling to define general (common) and specific latent factors of the Dark Triad. Similarly, all studies about the relationships between Rosenberg Self-Esteem Scale (RSES) and Humor styles were also conducted at the measurement level, so another aim is to test the correlations at the structural level.

As stated earlier, the vast majority of the commented research has been conducted with university samples, and some researchers have pointed to the need to conduct this research in more appropriate and representative samples (e.g., Torres-Marín et al., 2022; YeeYee, & Lee, 2022). A third aim of the present paper is, therefore, to replicate the observed relationships between Humor styles, Dark Triad and Self-esteem in a large non-university sample gathered from the general population.

2. Method

2.1. Participants and procedure

The participants of this study were 987 volunteers from the general population (466 men [$M_{age} = 46.69$; SD = 19.32] and 521 women [$M_{age} = 44.77$; SD = 20.14]). They were recruited by undergraduate students (trained to apply personality questionnaires) from their relatives, peers and other people using paper-and-pencil protocols. In compensation, participants received an interpretive report of their scores on a personality questionnaire to motivate them and to increase honesty in their answers. The study was part of a wider research project authorized by the ethics committee of the University of Lleida. Participants signed an informed consent.

2.2. Measures

2.2.1. Humor Styles Questionnaire (HSQ)

The Humor Styles Questionnaire (Martin et al., 2003) has 32 items and assesses four dimensions referring to different uses of humor: Affiliative, Self-enhancing, Aggressive and Self-defeating: Reliability coefficients and factor structure in the Spanish population were adequate and similar to the original version (Čekrlija et al., 2023).

2.2.2. Dark Triad: the Dirty Dozen and Rosenberg Self-Esteem Scale (RSES)

The Dirty Dozen is a 12-item measure of the Dark Triad (Machiavellianism, Psychopathy, and Narcissism) developed by Jonason and Webster (2010). The questionnaire presents a robust structure of 4 items per factor. The internal consistency alpha ranges from 0.77 to 0.96. The instrument was adapted to the Spanish context for this research. The authors of the current study, fluent in English, translated the instrument from English to Spanish, and an independent professional translator translated it back into English. The two versions in English checked for their linguistic and psychological similarity. After making changes and amendments, it was agreed that the translation and the back-translation had a high degree of equivalence. The Rosenberg Self-esteem Scale (Rosenberg, 1965) has 10 items designed to measure Self-esteem in general. The internal consistency was about 0.88 in the Spanish context.

2.2.3. Data analysis

Descriptives, Cronbach's alpha and correlations between scales were computed. Later, Robust Unweighted Least Squares (RULS) with Oblimin normalized rotation was performed. Note that we conducted an exploratory factor analysis to detect patterns of common variance among variables.

To test the relationships between general and specific sources of

variance of Dark Triad traits with the four HSQ humor styles, a series of structural equation models were conducted. In regard to the Dark Triad, the model tested is identical to the bi-factor model designed by McLarnon & Tarraf (figure 3, p. 70; 2017). It includes a general factor on which load all items of the Dirty Dozen, and orthogonal specific factors on which load only the corresponding items of every scale representing the specific unique variance that it is not explained by the general factor. Thus, the scale variance is decomposed directly into general and specific variances. Four bi-factor models were tested, each of them including a latent factor for one of the HSQ scales (it should be mentioned that a model including the four scales at the same time did not achieve identification). To define the latent factors of the HSQ scales, all items of the corresponding scale were linked to this factor. To achieve identification, variances of latent factors and error terms of items were fixed to one. To test the relationships between instruments, the model includes, as free parameters, the correlations between the HSQ scale latent factor with the general Dark Triad and the three specific latent factors. Usual goodness-of-fit indexes will be reported (χ^2, χ^2/d.f, GFI, NFI, TLI, CFI, and RMSEA).

The association between the Self-esteem and humor styles was tested with a similar method. Four models were fitted. Each of them includes an HSQ latent factor defined equally, and a Self-esteem latent factor that was defined after all items of RSES. Both latent factors and item error terms variance was fixed to 1 to achieve identification. Relationship was tested through the correlation between both latent factors. We used SPSS 26.0, AMOS 26.0 (Arbuckle, 2019; IBM Corp., 2019) and Factor.exe (Ferrando & Lorenzo-Seva, 2017).

3. Results

3.1. Descriptive, alpha internal consistency and correlations

Table 1 shows the descriptives of all variables, including age, Cronbach's alpha and the correlation matrix between all variables. Alphas were between 0.69 (Aggressive humor) and 0.87 (RSES). At the scale level, Machiavellianism, Psychopathy and Narcissism correlated positively with Aggressive humor (0.35, 0.37 and 0.24 respectively), and with Self-defeating (0.27, 0.19 and 0.26, respectively). Narcissism correlated positively with Affiliative style (0.18), and no Dark Triad trait correlated with Self-enhancing. On the other hand, RSES correlated strongly and negatively with Self-defeating (−0.39) and positively with Self-enhancing (0.27).

3.2. Factor analysis of HSQ, Dark Triad and RSES

The procedure for determining the number of dimensions used was the optimal implementation of Parallel Analysis (Horn, 1965). The method for components extraction was the Robust Unweighted Least Squares (RULS). Correction for robust Chi square LOSEFER empirical correction (Lorenzo-Seva & Ferrando, 2022) and Oblimin Normalized rotation were conducted (Bartlett's statistic = 1457.6 [df = 28; $p <$ 0.000010]). Parallel analysis advised 3 factors that explained 64 % of the variance. The goodness of fit indexes of this three-factor solution (Table 2) were: RMSEA (0.048), NNFI (0.962) and CFI (0.990). Confirming the existence of a general factor, the three Dark Triad traits load on the same factor. Aggressive humor also loaded on this first factor. The second factor was formed by Self-enhancing and Affiliative humor styles, and the third factor was composed of RSES (in negative) and Self-defeating humor. Note that RSES also had a secondary loading (0.32) on the second factor.

3.3. Structural Equation Models (SEM)

Goodness of fit-indexes of the bi-factor models were adequate (Table 3). Correlations of the general Dark Triad latent factor with Affiliative, Self-enhancing, Aggressive and Self-defeating latent factors were: 0.13, −0.06, 0.57, and 0.31, respectively. Correlations with the specific variance of the Dark Triad tended to be lower (Table 4). In detail, specific variance of Narcissism correlated slightly and positively with Affiliative and Self-defeating, of Psychopathy with Aggressive, and of Machiavellianism with Affiliative only. Path coefficients of all models have been reported in S1 at supplementary material.

Table 5 shows the goodness-of-fit indexes and the correlations between RSES and each HSQ latent factor. Goodness-of-fit indexes were also close to being acceptable. The largest correlation is reported for Self-defeating with negative sign. Correlations were somewhat high and positive for Self-enhancing and low for Affiliative and Aggressive. Path coefficients of all models have been reported in table S2 in supplementary material.

4. Discussion

Regarding adaptive Humor styles, structural equation models show that correlations with Affiliative are lower than those reported at the measurement level, and the null correlations with Self-enhancing are confirmed. In regard to maladaptive humor styles, correlations were larger than those reported at the measurement level. It is noteworthy that we have found the largest correlation ever reported in the literature between any Humor Styles and Dark Triad for the relationship between the general factor of Dark Triad and Aggressive humor style (0.57).

Table 2
Robust Unweighted Least Squares (RULS) with Oblimin normalized rotation introducing Humor Styles, Dark Triad and Self-esteem Scale (RSES).

	I	II	III	H^2
Machiavellianism	**0.82**	−0.06	−0.06	*0.63*
Psychopathy	**0.60**	−0.11	−0.02	*0.35*
Narcissism	**0.52**	0.10	0.00	*0.30*
Aggressive Humor	**0.41**	0.18	0.21	*0.33*
Self-enhancing Humor	−0.07	**0.70**	−0.02	*0.49*
Affiliative Humor	0.08	**0.62**	0.03	*0.40*
RSES	−0.01	**0.32**	**−0.54**	*0.40*
Self-defeating Humor	0.05	0.22	**0.83**	*0.76*

H^2: Communalities. Loadings larger than 0.30 are in boldface.

Table 1
Descriptive, Skewness, Kurtosis, Cronbach alpha and Pearson inter correlation matrix.

	Min	Max	Mean	*SD*	α	1	2	3	4	5	6	7	8
1.Age	18	94	45.68	19.76	–								
2.Affiliative Humor	12	56	42.00	9.33	0.85	−0.40							
3.Self-enhancing Humor	12	56	35.34	7.85	0.70	−0.04	0.43						
4.Aggressive Humor	8	56	22.80	7.86	0.69	−0.18	0.23	0.10					
5.Self-defeating Humor	8	49	21.74	8.43	0.76	−0.22	0.16	0.11	0.37				
6.Machiavelism	4	26	8.45	4.74	0.81	−0.26	0.12	−0.02	0.35	0.27			
7.Psychopaty	4	28	8.23	4.36	0.71	−0.12	−0.01	−0.03	0.37	0.19	0.45		
8.Narcississm	4	28	11.81	5.62	0.84	−0.19	0.18	0.06	0.24	0.26	0.46	0.27	
9.Self-esteem	12	44	32.08	5.65	0.87	0.20	0.15	0.27	−0.12	−0.39	−0.15	−0.13	−0.04

Note: SD: Standard Deviation; α: Cronbach's alpha. Correlations higher than or equal to 0.12 has a $p < 0.0001$.

Table 3
Goodness of fit indexes of bi-factor models of the HSQ scales.

HSQ scale	χ^2 [(a)]	d.f.	χ^2/d.f	GFI	NFI	TLI	CFI	RMSEA	(LO-HI)
Affiliative	494.78	154	3.21	0.95	0.93	0.94	0.95	0.047	0.043–0.052
Self-enhancing	596.81	154	3.88	0.94	0.90	0.91	0.92	0.054	0.049–0.059
Aggressive	453.96	154	2.95	0.96	0.92	0.93	0.95	0.044	0.040–0.049
Self-defeating	382.34	154	2.48	0.96	0.94	0.95	0.96	0.039	0.034–0.044

Note:χ^2: Chi Square. d.f.: Degrees of Freedom. GFI: Goodness of Fit Index. NFI: Normed Fit Index. TLI: Tucker Lewis Index. CFI: Comparative Fit Index. RMSEA: Root Mean Square Error of Approximation. RMSEA (LO-HI): Low and High limits of the confidence interval for RMSEA. ([a])The associated *p*-values were always lower than 0.001.

Table 4
Correlations between Humor and specific Dark Triad latent factors.

	Narcissism	Psychopathy	Machiavellianism
Affiliative	0.17	−0.10	0.16
Self-enhancing	0.09	0.03	−0.01
Aggressive	0.02	0.21	−0.04
Self-defeating	0.17	0.05	0.01

Similarly, we have found the largest correlation ever reported in the literature between Dark Triad and Self-defeating (0.31). Results suggest that: 1) Relationships reported in previous studies are mainly due to the general source of variance of the Dark Triad more than the specific part, 2) the relationship of Dark Triad with maladaptive humor styles has been underestimated in previous studies, and 3) the Dark Triad is almost barely associated with adaptive humor styles. The medium positive relationships previously reported between Dark Triad and Affiliative style could therefore be attributable to the variance shared with the other two Dark Triad traits.

It is important to discuss the nature of the general factor of the Dark Triad to properly understand the psychological reasons behind the reported relationships. Hodson et al. (2018) and Aluja et al. (2022) found an almost perfect overlap between the general Dark Triad factor and the Honesty-Humility trait from the HEXACO model (correlations between both latent factors were − 0.95 [Hodson et al., 2018) and − 0.94 [Aluja et al., 2022]). Since people with low scores on the Honesty-Humility trait tend to manipulate others and break rules for personal gain and to feel a strong sense of self-importance, Aggressive humor style could be employed to gain social reputation or material profit by undermining others (Yee & Lee, 2022). Thus, Aggressive humor could have an instrumental aim. On the other hand, Lobbestael and Freund (2021) reported that impulsivity was the component most related with Aggressive humor style. Considering together low caring about others and impulsive behavior, Aggressive humor could be understood as a strategy to obtain rewards and the need for more stimulation. This view is consistent with Gray's Reinforcement Sensitivity Theory (Corr, 2004).

Comparing with previous studies, structural equation modelling suggests that Self-esteem presents a slightly lower relationship with Affiliative, equal to Self-enhancing, slightly higher with Aggressive and, notably, a higher one with Self-defeating. In fact, the difference is considerably larger in the last case if we compare the present coefficient (0.46) with, for instance, the average one reported by Schermer et al. (2021) in fifteen countries (0.15). Thus, people with low Self-esteem are prone to using Self-defeating humor to reduce stress in social situations and improve social reputation. At the same time, people with high Self-esteem are more prone to using Self-enhancing humor to manage negative situations. These adaptive and maladaptive uses of humor by Self-esteem profiles are in agreement with the strong relationship between Self-esteem and Neuroticism (Aluja et al., 2007; Judge et al., 2002) and with the fact that both humor styles are associated with Neuroticism (Plessen et al., 2020) and negative and depressive emotions (Fox et al., 2016). As a final comment, Schermer et al. (2021) used a one-item measure of Self-esteem, so a lack of reliability could also account for some of the differences observed compared with the present study.

Another hypothesis about the differences reported between the literature and the present study is the sampling differences between university populations and the present older community sample. Note that age affects Humor Styles (Martin et al., 2003; Tsai et al., 2023), Dark Triad (Aluja et al., 2022), Self-esteem (Orth et al., 2018), and personality traits such as Honesty-Humility (Ashton & Lee, 2016; Moshagen et al., 2019). Hence, non-representative university or younger samples could present a biased distribution with some restriction of range that would affect the correlations.

The present paper suggests several future studies to conduct. The unexpected high correlations between Psychopathy, Self-defeating and the general factor of Dark Triad, and between RSES and Self-defeating call for replication. Note that the present sample was a convenience sample, so samples more representative of the general population should be analyzed. In addition, most previous studies used English-speaking samples, so reported differences with these studies could be due to language or cultural differences. Future studies should therefore seek to replicate the present results in larger and representative English-speaking contexts and in other countries.

The second one is to compute the correlations between Dark Triad and HSQ styles controlling for the Honesty-Humility scale of the HEXACO. It is expected that correlations, especially for the Aggressive humor style, would be much lower, indicating that this particular HEXACO trait might play a crucial role in this relationship. Similarly, if Neuroticism or Anxiety measures are considered, it is expected that the strong relationship between Self-esteem and Self-defeating would also be greatly weakened.

It is also necessary in future studies to replicate these results using facets or components of the Dark Triad traits. For instance, Zeigler-Hill and Besser (2011) found that Affiliative humor style was positively associated with grandiose, but negatively with vulnerable narcissism. This opposite pattern could explain the low correlation between

Table 5
Goodness of fit indexes of the models relating RSES and HSQ scales, and estimated correlation between both latent factors (r).

HSQ scale	χ^2 [(a)]	d.f.	χ^2/d.f	GFI	NFI	TLI	CFI	RMSEA	(LO-HI)	r
Affiliative	682.70	134	5.10	0.92	0.90	0.90	0.92	0.064	0.060–0.069	0.15
Self-enhancing	747.69	134	5.58	0.91	0.86	0.87	0.88	0.068	0.063–0.073	0.32
Aggressive	580.56	134	4.33	0.93	0.88	0.89	0.91	0.058	0.053–0.063	−0.17
Self-defeating	582.55	134	4.35	0.93	0.90	0.91	0.92	0.058	0.053–0.063	−0.46

Note:χ^2: Chi Square. d.f.: Degrees of Freedom. GFI: Goodness of Fit Index. NFI: Normed Fit Index. TLI: Tucker Lewis Index. CFI: Comparative Fit Index. RMSEA: Root Mean Square Error of Approximation. RMSEA (LO-HI): Low and High limits of the confidence interval for RMSEA. ([a])The associated p-values were always lower than 0.001.

Affiliative and Narcissism, and reinforces the need to analyze the facets or components of the Dark Triad to properly understand the particular psychological factors involved in the relationships between humor styles and Dark Triad traits. In this sense, to apply longer and facet-based instruments (the Dirty Dozen is a small set of items that would capture the key elements of all three Dark Triad traits but without facets) combined with statistical methods to partial out the different sources of variance of Dark Triad are necessary (Vize et al., 2018). Finally, we should be cautious about drawing any conclusions regarding causation on the basis of the present study, and future studies using experimental or longitudinal designs might shed some light on the role played by Dark-Triad and Self-Esteem in the developing of concrete humor styles profiles or vice versa.

CRediT authorship contribution statement

Luis F. García: Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Lara Cuevas:** Writing – review & editing, Writing – original draft, Formal analysis. **Sergio Escorial:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Ferran Balada:** Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Óscar García:** Writing – review & editing, Writing – original draft, Formal analysis. **Anton Aluja:** Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2024.112563.

References

Aluja, A., García, L. F., Rossier, J., Ostendorf, F., Glicksohn, J., Oumar, B., … Hansenne, M. (2022). Dark triad traits, social position, and personality: A cross-cultural study. *Journal of Cross-Cultural Psychology, 53*(3–4), 380–402. https://doi.org/10.1177/00220221211072816

Aluja, A., Rolland, J. P., García, L. F., & Rossier, J. (2007). Dimensionality of the Rosenberg self-esteem scale and its relationships with the three-and the five-factor personality models. *Journal of Personality Assessment, 88*(2), 246–249. https://doi.org/10.1080/0022389070 1268116

Arbuckle, J. L. (2019). *Amos (version 26.0) [computer program]*. Chicago: IBM SPSS.

Ashton, M. C., & Lee, K. (2016). Age trends in HEXACO-PI-R self-reports. *Journal of Research in Personality, 64*, 102–111. https://doi.org/10.1016/j.jrp.2016.08.008

Ayisire, O. E., Babalola, F., Aladum, B., Oyeleye-Adegbite, O. C., Urhi, A., Kilanko, A., … Anugwom, G. O. (2022). A comprehensive review on the effects of humor in patients with depression. *Cureus, 14*(9), Article e29263. https://doi.org/10.7759/cureus.29263

Čekrlija, Đ., Balada, F., Garcia, L. F., & Aluja, A. (2023). Factor invariance of the humor styles questionnaire and its relationship with the HEXACO personality model in a Spanish community sample. *The European Journal of Humour Research, 11*(3), 123–144. https://doi.org/10.7592/EJHR.2023.11.3.823

Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience and Biobehavioral Reviews, 28*(3), 317–332. https://doi.org/10.1016/j.neubiorev.2004.01.005

Egan, V., Chan, S., & Horter, G. W. (2014). The dark triad, happiness and subjective well-being. *Personality and Individual Differences, 67*, 17–22. https://doi.org/10.1016/j.paid.2014.01.004

Ferrando, P. J., & Lorenzo-Seva, U. (2017). Program FACTOR at 10: Origins, development, and future directions. *Psicothema, 29*(2), 236–241. https://doi.org/10.7334/psicothema2016.304

Fox, C. L., Hunter, S. C., & Jones, S. E. (2016). Longitudinal associations between humor styles and psychosocial adjustment in adolescence. *Europe's Journal of Psychology, 12*(3), 377–389. https://doi.org/10.5964/ejop.v12i3.1065

Gopalakrishnan, H., Sundar, V., & Veerapandian, K. (2018). Relationship between humour styles, optimism and self esteem. *International Journal of Indian Psychology, 6*(3), 107–115. https://doi.org/10.25215/0603.092

Hodson, G., Book, A., Visser, B. A., Volk, A. A., Ashton, M. C., & Lee, K. (2018). Is the dark triad common factor distinct from low honesty-humility? *Journal of Research in Personality, 73*, 123–129. https://doi.org/10.1016/j.jrp.2017.11.012

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*(2), 179–185. https://doi.org/10.1007/BF02289447

IBM Corp. (2019). *IBM SPSS statistics for windows, version 26.0*. Armonk, NY: IBM Corp.

Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. D. (2015). Dorian Gray without his portrait: Psychological, social, and physical health costs associated with the dark triad. *Personality and Individual Differences, 78*, 5–13. https://doi.org/10.1016/j.paid.2015.01.008

Jonason, P. K., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. *Psychological Assessment, 22*(2), 420–432. https://doi.org/10.1037/a0019265

Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (SD3). *Assessment, 21*(1), 28–41. https://doi.org/10.1177/1073191113514105

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology, 83*(3), 693–710. https://doi.org/10.1037//0 022-3514.83.3.693

Knight, J. E. (2015). *The role of social exclusion as a mediator of humor style among dark triad personalities* [Master's thesis, Marietta College]. *OhioLINK Electronic Theses and Dissertations Center*. http://rave.ohiolink.edu/etdc/view?.

Leist, A. K., & Müller, D. (2013). Humor types show different patterns of self-regulation, self-esteem, and well-being. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being, 14*(2), 551–569. https://doi.org/10.1007/s10902-012-9342-6

Lobbestael, J., & Freund, V. L. (2021). Humor in dark personalities: An empirical study on the link between four humor styles and the distinct subfactors of psychopathy and narcissism. *Frontiers in Psychology, 12*, Article 548450. https://doi.org/10.3389/fpsyg.2021.548450

Lorenzo-Seva, U., & Ferrando, P. J. (2022). *A simulation-based scaled test statistic for assessing model-data fit in least-squares unrestricted factor-analysis solutions*. Technical report. Universitat Rovira i Virgili

Martin, R. A., Lastuk, J. M., Jeffery, J., Vernon, P. A., & Veselka, L. (2012). Relationships between the dark triad and humor styles: A replication and extension. *Personality and Individual Differences, 52*(2), 178–182. https://doi.org/10.1016/j.paid.2011.10.010

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being: Development of the humor styles questionnaire. *Journal of Research in Personality, 37*(1), 48–75.

McLarnon, M. J., & Tarraf, R. C. (2017). The dark triad: Specific or general sources of variance? A bifactor exploratory structural equation modeling approach. *Personality and Individual Differences, 112*, 67–73. https://doi.org/10.1016/j.paid.2017.02.049

Moshagen, M., Thielmann, I., Hilbig, B. E., & Zettler, I. (2019). Meta-analytic investigations of the HEXACO personality inventory (-revised): Reliability generalization, self–observer agreement, intercorrelations, and relations to demographic variables. *Zeitschrift für Psychologie, 227*(3), 186–194. https://doi.org/10.1027/2151-2604/a000377

O'Boyle, E. H., Jr., Forsyth, D. R., Banks, G. C., & McDaniel, M. A. (2012). A meta-analysis of the dark triad and work behavior: A social exchange perspective. *Journal of Applied Psychology, 97*(3), 557–579. https://doi.org/10.1037/a0025679

Orth, U., Erol, R. Y., & Luciano, E. C. (2018). Development of self-esteem from age 4 to 94 years: A meta-analysis of longitudinal studies. *Psychological Bulletin, 144*(10), 1045–1080. https://doi.org/10.1037/bul0000161

Ozyesil, Z. (2012). The prediction level of self-esteem on humor style and positive-negative affect. *Psychology, 3*, 638–641. https://doi.org/10.4236/psych.2012.38098

Paulhus, D. L., & Jones, D. (2015). Measures of dark personalities. In G. J. In Boyle, D. Salklofske, & G. Mattews (Eds.), *Measures of personality and social psychological constructs* (pp. 562–594). Elsevier. https://doi.org/10.1016/B978-0-12-386915-9.00020-6.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machia- vellianism and psychopathy. *Journal of Research in Personality, 36*(6), 556–563. https://doi.org/10.1016/S0092-6566(02)00505-6

Plessen, C. J., Franken, F. R., Ster, C., Schmid, R. R., Wolfmayr, C., Mayer, A. M., … Tran, U. S. (2020). Humor styles and personality: A systematic review and meta-analysis on the relations between humor styles and the big five personality traits. *Personality and Individual Differences, 154*, Article 109676. https://doi.org/10.1016/j.paid.2019.109676

Rosenberg, M. (1965). *Rosenberg Self-esteem Scale (RSES)*.. https://doi.org/10.1037/t01038-000

Ruch, W. (1998). *The sense of humor: Explorations of a personality characteristic*. New York, NY: Mouton de Gruyter.

Ruch, W., & Heintz, S. (2016). The virtue gap in humor: Exploring benevolent and corrective humor. *Translational Issues in Psychological Science, 2*(1), 35–45. https://doi.org/10.1037/tps000 0063

Schermer, J. A., et al. (2021). Predicting self-esteem using humor styles: A cross-cultural study. In E. Vanderheiden, & C. H. Mayer (Eds.), *The Palgrave handbook of humour research*. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-030-78280-1_2.

Siddoju, A. (2021). The influence of negative personality factors on choice of humor: A study on undergraduate students. *International journal of Indian. Psychology, 9*(4), 1338–1343. DIP:18.01.127.20210904 10.25215/0904.127.

Sleep, C. E., Lynam, D. R., Hyatt, C. S., & Miller, J. D. (2017). Perils of partialing redux: The case of the dark triad. *Journal of Abnormal Psychology, 126*(7), 939–950. https://doi.org/10.1037/a bn0000278

Torres-Marín, J., Navarro-Carrillo, G., & Carretero-Dios, H. (2022). Differentiating the traits of the dark tetrad in their linkages with humor styles, dispositions toward ridicule and laughter, and comic styles. *Personality and Individual Differences, 185, Article 111281*. https://doi.org/10.1016/j.paid.2021.111281

Tsai, P. H., Chen, H. C., Hung, Y. C., Chang, J. H., & Huang, S. Y. (2023). What type of humor style do older adults tend to prefer? A comparative study of humor style tendencies among individuals of different ages and genders. *Current Psychology, 42*, 2186–2197. https://doi.org/10.1007/s12144-021-02381-4

Veselka, L., Schermer, J. A., Martin, R. A., & Vernon, P. A. (2010). Relations between humor styles and the dark triad traits of personality. *Personality and Individual Differences, 48*, 772–774. https://doi.org/10.1016/j.paid.2010.01.017

Vize, C. E., Collison, K. L., Miller, J. D., & Lynam, D. R. (2018). Examining the Effects of Controlling for Shared Variance among the Dark Triad Using Meta–Analytic Structural Equation Modelling. *European Journal of Personality, 32*(1), 46–61. https://doi.org/10.1002/per. 2137

Yee, J. W., & Lee, S. L. (2022). The dark triad traits, humor styles, and schadenfreude: Others' misery as the Devil's laughing Stocks1. *Japanese Psychological Research.*. https://doi.org/10.1111/jpr.12403

Yue, X. D., Liu, K. W., Jiang, F., & Hiranandani, N. A. (2014). Humor styles, self-esteem, and subjective happiness. *Psychological Reports, 115*(2), 517–525. https://doi.org/10.2466/07.02.PR0.11 5c18z6

Zeigler-Hill, V., & Besser, A. (2011). Humor style mediates the association between patho- logical narcissism and self-esteem. *Personality and Individual Differences, 50* (8), 1196–1201. https://doi.org/10.1016/j.paid.2011.02.006