Personality and Individual Differences 117 (2017) 71–73

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Short Communication

Lonely people tend to make fun of themselves: A behavior genetic analysis of humor styles and loneliness

Julie Aitken Schermer [a,*], Rod A. Martin [b], Philip A. Vernon [b], Nicholas G. Martin [c], Lucia Colodro Conde [c], Dixie Statham [d], Michael T. Lynskey [e]

[a] Management and Organizational Studies, Faculty of Social Science, The University of Western Ontario, London, Ontario, N6A 5C2, Canada
[b] Department of Psychology, Faculty of Social Science, The University of Western Ontario, London, Ontario, Canada
[c] QIMR Berghofer Medical Research Institute, Brisbane, Queensland, Australia
[d] University of the Sunshine Coast, Queensland, Australia
[e] Addictions Department, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, England

ARTICLE INFO

Article history:
Received 18 January 2017
Received in revised form 28 April 2017
Accepted 22 May 2017
Available online xxxx

Keywords:
Humor
Loneliness
Twins
Behavior genetics

ABSTRACT

The present study examined the phenotypic, genetic, and environmental correlations between four humor styles (affiliative, self-enhancing, aggressive, and self-defeating) and loneliness in Australian adult twins. At the phenotypic level, the two adaptive humor style dimensions (affiliative and self-enhancing) were found to correlate negatively with loneliness and the two maladaptive humor style dimensions (aggressive and self-defeating) were found to have positive correlations with loneliness. Because both humor and loneliness were found to be heritable (ranging from 7% for loneliness to 35% for self-defeating humor style), bivariate genetic analyses were conducted. Significant genetic and unique environmental correlations were found between loneliness and humor styles with the exception of aggressive humor. These results indicate that the phenotypic association between loneliness and humor style arises from the influence of shared familial and unique environmental factors.

1. Introduction

The present study investigates the relationship between loneliness and how people use humor (their individual humor styles). In addition, because the present sample is from adult twins, bivariate genetic analyses were conducted to assess the degree to which the phenotypic correlations observed between loneliness and humor styles is due to common genetic and/or environmental factors.

1.1. Humor and psychological correlates

The Humor Styles Questionnaire (HSQ; Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003) assesses four (two socially positive and two socially negative) dimensions relating to uses of humor, which have been found to be correlated with individual differences in psychological well-being. The two socially positive humor styles are affiliative humor, which involves using humor to enhance interpersonal relationships, and self-enhancing humor, or using humor to alleviate personal distress. The two socially negative styles include aggressive humor, such as making fun of others in a disparaging manner, and self-defeating humor, or using excessively self-disparaging humor in an attempt to ingratiate oneself with others. These humor styles have been found to correlate with mental health dimensions. For example, positive correlations, of moderate magnitude, have been reported between the positive humor styles and social competence (Fitts, Sebby, & Zlokovich, 2009), happiness (Ford, McCreight, & Richardson, 2014), perceived social support, satisfaction with life (Dyck & Holtzman, 2013), and resiliency (Cann & Collette, 2014). The socially positive humor styles have been found to have moderate negative correlations with shyness (Fitts et al., 2009), depression, perceived burdensomeness, thwarted belonginess, suicidal ideation (Tucker, Wingate, O'Keefe, Slish, Judah, & Rhoades-Kerswill, 2013), depressive symptoms (Dyck & Holtzman, 2013; Tucker, Judah, O'Keefe, Mills, Lechner, Davidson, Grant, & Wingate, 2013), neuroticism (Dyck & Holtzman, 2013), social anxiety (Tucker, Judah, et al., 2013), and borderline personality disorder (Schermer et al., 2015). Self-enhancing humor has also been found to have a moderate positive correlation with psychological well-being (Cann & Collette, 2014) and a moderate negative relationship with chronic worrying (Cann & Cann, 2013).

The two socially negative humor styles have been found to have moderate negative correlations with happiness (Ford et al., 2014) and positively with thwarted belonginess, suicidal ideation (Tucker, Wingate, et al., 2013), depressive symptoms (Tucker, Judah, et al.,

* Corresponding author.
E-mail address: jharris@uwo.ca (J.A. Schermer).

http://dx.doi.org/10.1016/j.paid.2017.05.042
0191-8869/

2013), and borderline personality disorder (Schermer et al., 2015). Self-defeating humor has been also found to have moderate positive correlations with loneliness, shyness (Fitts et al., 2009), depression, suicidal ideation (Tucker, Judah, et al., 2013), neuroticism (Dyck & Holtzman, 2013), social anxiety (Tucker, Judah, et al., 2013), and chronic worrying (Cann & Cann, 2013). Fitts et al. (2009) further found a significant negative relationship between self-defeating humor and social competence, and Dyck and Holtzman (2013) reported a negative correlation with self-defeating humor and perceived social support and satisfaction with life. Aggressive humor has been found to be positively correlated with the likelihood to perform risky behaviours and self-reports of actual risk behaviours (Cann & Cann, 2013). In addition, Fitts et al. (2009) reported that the two socially positive humor styles had significant negative correlations with self-report loneliness, self-defeating humor had a significant positive correlation with loneliness, but that aggressive humor had a non-significant negative correlation with loneliness in a sample of students. This pattern of correlations between loneliness and positive versus negative humor styles suggests that the relationship between humor styles and loneliness may require further examination.

1.2. Genetic studies of humor styles and loneliness

The four humor styles have been found to have a genetic component, with heritability estimates ranging from 5% for self-defeating humor in a sample of North American twins (Vernon, Martin, Schermer, & Mackie, 2008) to 47% for both the aggressive and self-defeating humor styles in a sample of Australian twins (Baughman et al., 2012). In a large sample of twins from The Netherlands, Distel et al. (2010) examined the genetic and environmental properties of loneliness using the three-item scale from the revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980). Approximately 37% of the variance in loneliness was found to be due to genetic factors. In the present study, the same loneliness scale is examined in a sample of Australian twins which is assessed at both the univariate level and at the bivariate level with the humor styles.

In summary, although at least one study, conducted by Fitts et al. (2009), has reported correlations between humor styles and loneliness, the present study adds to the literature by examining the genetic and environmental correlations between the two constructs. This level of examination has not been previously examined.

2. Method

2.1. Participants

Participants were from a cross-sectional twin study from Australia (see Baughman et al., 2012; Lynskey et al., 2012) and included 747 pairs of same-sex adult twins (309 monozygtic (MZ) female pairs, 138 MZ male pairs, 216 dizygotic (DZ) female pairs, and 84 DZ male pairs) recruited through the National Health and Medical Research Council Australian Twin Registry. The mean age was 34.83 years (SD = 2.92, range = 23 to 48). Age was found to not differ across the zygosity and sex combinations ($F(3,1973) = 0.27$, $p > 0.80$).

2.2. Measures and procedure

Individuals completed a battery of questionnaires as part of a larger study (see description by Lynskey et al., 2012). Included in the set of questionnaires were three questions assessing loneliness from the revised UCLA Loneliness Scale (Russell et al., 1980). Items asked how often an individual felt that they lacked companionship, how often the individual felt that they were "left out", and how often the individual felt that they were "isolated from others". Responses to these items were on a *1 Hardly ever* to *3 Often* scale. The internal consistency (coefficient alpha) for these three items was 0.82 in the present data therefore a total loneliness score was generated as an aggregate of the three items. For the present sample, the mean was 4.41 (SD = 1.60), a value similar to the sample of twins from The Netherlands (Distel et al., 2010).

Individuals also completed the Humor Styles Questionnaire (HSQ; Martin et al., 2003). The HSQ consists of 32 items and measures four styles of humor: affiliative, self-enhancing, aggressive, and self-defeating. For the present sample, the internal consistency values were: 86 for affiliative, 82 for self-enhancing, 71 for aggressive, and 83 for self-defeating.

3. Results

Table 1 reports the univariate genetic analyses for the humor style and loneliness scales. For each of the scales, the MZ correlations (between twin 1 and twin 2) were higher than the DZ correlations. Although not significantly higher, as the z-score differences ranged from 0.25 for loneliness to 1.56 for affiliative humor, the MZ versus DZ correlation pattern does suggest genetic influences. Following, the additive genetic (a^2), common environment (c^2), and unique environment (e^2) estimates were computed based on a univariate genetic model in the program Mx (Neale, Boker, Xie, & Maes, 2006). As reported in Table 1, heritability (a^2) estimates ranged from 7% for the loneliness scale to 35% for self-defeating humor, common environment (c^2) was not found to be significant (as the 95% confidence intervals included zero), and the remaining variance was due to unique environmental effects (e^2).

Table 2 reports the phenotypic correlations (*r*p) between the humor style scales and the loneliness scale. The two positive humor styles (affiliative and self-enhancing) were found to have negative correlations with loneliness and the negative humor styles (aggressive and self-defeating) were positively correlated with loneliness. Bivariate genetic analyses were then performed to further examine the covariance between loneliness and the humor scales. Cholesky or triangular decomposition (see Neale & Cardon, 1992) was applied to the MZ and DZ mean square between- and within-pair covariance matrices to calculate genetic and environmental correlations using the program Mx (Neale et al., 2006). Specifically, models including the full ACE (A = additive genetic; C = common environment; E = unique environment and measurement error), AE, CE, and E only were computed for each pair of variables. The model with the lowest chi-square per-degree of freedom and lowest AIC was deemed to be the best fitting model. For all of the bivariate genetic models computed, the AE model was found to have the best fit, indicating that the phenotypic correlations

Table 1
Twin correlations and univariate genetic analyses of the humor style and loneliness scales.

Scale	MZ*r*	DZ*r*	a^2	c^2	e^2
Affiliative humor	0.44	0.22	0.34 (0.09 to 0.48)	0.08 (0.00 to 0.30)	0.58 (0.51 to 0.66)
Self-enhancing humor	0.31	0.10	0.28 (0.07 to 0.36)	0.00 (0.00 to 0.18)	0.72 (0.64 to 0.80)
Aggressive humor	0.48	0.27	0.32 (0.07 to 0.51)	0.14 (0.00 to 0.35)	0.54 (0.48 to 0.61)
Self-defeating humor	0.53	0.35	0.35 (0.14 to 0.57)	0.18 (0.00 to 0.36)	0.47 (0.41 to 0.54)
Loneliness	0.28	0.24	0.07 (0.01 to 0.35)	0.21 (0.00 to 0.33)	0.72 (0.63 to 0.81)

a^2 = additive genetic; c^2 = common environment; e^2 = unique environment; values in brackets represent the 95% confidence intervals and those not containing zero are deemed to be significant.

Table 2
Phenotypic, genetic, and environmental correlations between humor styles and loneliness.

Humor style	Phenotypic	Genetic	Unique environmental
Affiliative	−0.22*	**−0.35 (−0.20 to −0.49)**	**−0.15 (−0.07 to −0.23)**
Self-enhancing	−0.25*	**−0.28 (−0.09 to −0.45)**	**−0.25 (−0.17 to −0.32)**
Aggressive	0.08*	0.05 (−0.10 to 0.19)	0.04 (−0.04 to 0.13)
Self-defeating	0.28*	**0.41 (0.28 to 0.54)**	**0.14 (0.06 to 0.22)**

95% confidence intervals are in the brackets; those which do not contain zero are deemed to be significant and are in bold text. All cross-correlations were best fit by an AE model therefore common environmental correlations are not reported.
* $p < 0.001$; two-tailed.

were best explained by common genetic and unique environmental factors.

The results of the bivariate genetic analyses are reported in Table 2. Correlations with a 95% confidence interval (values within the brackets) that do not include zero are considered to be statistically significant. The results were found to be very similar (or the same) when the uncorrected and the corrected (age and sex regressed) data were analyzed. Because of the similar results, the uncorrected results are presented in the present study. As reported in Table 2, three of the four genetic and unique environmental correlations were significant with the exception of aggressive humor, suggesting that for the other three humor styles, the observed phenotypic correlations with loneliness were due to common genetic and unique environmental influences.

4. Discussion

The present study examined the correlations between humor styles and loneliness at the phenotypic, genetic, and environmental levels. In general, positive humor styles were found to be negatively correlated with loneliness whereas the negative humor styles were found to be positively correlated with loneliness (although the correlation with aggressive humor was small). These correlations were similar to the results reported by Fitts et al. (2009) in their sample of undergraduate students, although the present study was not limited to a student sample and goes beyond reporting the phenotypic correlations. Following bivariate analyses, three of the four phenotypic correlations were found to also have significant genetic and unique environmental correlations with the largest value found between self-defeating humor and loneliness. These results expand the understanding of the relationship between humor styles and loneliness by demonstrating that the observed correlations can be partially explained by common genetic and unique environmental factors.

In general, both the results reported by Fitts et al. (2009) and the present study suggest that people who engage in affiliative and self-enhancing humor styles are less lonely which may reflect the positive social nature of these styles of humor. In contrast, those people who make fun of themselves (engage in self-defeating humor) are more likely to be lonely. One possible reason for this finding is that if a person is making fun of them self, people around that individual may be uncomfortable (realize that they are laughing at the person and not with them) and therefore may avoid that individual. Future research may want to explore the reaction people have when exposed to a self-defeating humorist and whether or not individuals feel uncomfortable and wish to leave the situation. Alternatively, shyness may play a role in the relationship between self-defeating humor and loneliness as Hampes (2006) reported that shyness is positively correlated with self-defeating humor because of the low self-esteem felt by shy people.

In both the present study and the results reported by Fitts et al. (2009), aggressive humor styles did not have robust correlations with loneliness. A possible explanation for this finding is that although aggressive humor is anti-social in nature, people who engage in aggressive humor may seek out the company of others who also engage in aggressive humor and experience a positive social bond with those people. Future research may want to investigate how aggressive humor styles play a role with friendships and whether or not aggressive humorists do seek out the company of others who engage in aggressive humor.

Although the present study is limited in that the study was cross-sectional and the majority of the sample was female, the findings are unique in that the genetic and environmental correlations add to the understanding of loneliness and humor. Although future research is required to determine the malleability of humor styles, instruction in, or encouragement of, social humor styles (affiliative and self-enhancing humor) may be beneficial for lonely individuals.

References

Baughman, H. M., Giammarco, E. A., Veselka, L., Schermer, J. A., Martin, N. G., Lynskey, M., & Vernon, P. A. (2012). A behavioral genetic study of humor styles in an Australian sample. *Twin Research and Human Genetics*, *15*(5), 663–667.

Cann, A., & Cann, A. T. (2013). Humor styles, risk perceptions, and risky behavioral choices in college students. *Humor*, *26*(4), 595–608.

Cann, A., & Collette, C. (2014). Sense of humor, stable affect, and psychological well-being. *Europe's Journal of Psychology*, *10*(3), 464–479.

Distel, M. A., Rebollo-Mesa, I., Abdellaoui, A., Derom, C. A., Willemsen, G., Cacioppo, J. T., & Boomsma, D. I. (2010). Familial resemblance for loneliness. *Behavior Genetics*, *40*, 480–494.

Dyck, K. T. H., & Holtzman, S. (2013). Understanding humor styles and well-being: The importance of social relationships and gender. *Personality and Individual Differences*, *55*, 53–58.

Fitts, S. D., Sebby, R. A., & Zlokovich, M. S. (2009). Humor styles as mediators of the shyness-loneliness relationship. *North American Journal of Psychology*, *11*(2), 257–272.

Ford, T. E., McCreight, K. A., & Richardson, K. (2014). Affective style, humor styles and happiness. *Europe's Journal of Psychology*, *10*(3), 451–463.

Hampes, W. P. (2006). Humor and shyness: The relation between humor styles and shyness. *Humor*, *19*(2), 179–187.

Lynskey, M. T., Agrawal, A., Henders, A., Nelson, E. C., Madden, P. A. F., & Martin, N. G. (2012). An Australian twin study of cannabis and other illicit drug use and misuse, and other psychopathology. *Twin Research and Human Genetics*, *15*(5), 631–641.

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*, 48–75.

Neale, M. C., Boker, S. M., Xie, G., & Maes, H. H. (2006). *Mx: Statistical modeling manual* (7th ed.). Richmond, VA: Department of Psychiatry, Medical College of Virginia.

Neale, M. C., & Cardon, L. R. (1992). *Methodology for genetic studies of twins and families*. Norwell, MA: Kluwer.

Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*(3), 472–480.

Schermer, J. A., Martin, R. A., Martin, N. G., Lynskey, M. T., Trull, T. J., & Vernon, P. A. (2015). Humor styles and borderline personality. *Personality and Individual Differences*, *87*(1), 158–161.

Tucker, R. P., Judah, M. R., O'Keefe, V. M., Mills, A. C., Lechner, W. V., Davidson, C. L., ... Wingate, L. R. (2013). Humor styles impact the relationship between symptoms of social anxiety and depression. *Personality and Individual Differences*, *55*, 823–827.

Tucker, R. P., Wingate, L. R., O'Keefe, V. M., Slish, M. L., Judah, M. R., & Rhoades-Kerswill, S. (2013). The moderating effect of humor style on the relationship between interpersonal predictors of suicide and suicidal ideation. *Personality and Individual Differences*, *54*, 610–615.

Vernon, P. A., Martin, R. A., Schermer, J. A., & Mackie, A. (2008). A behavioral genetic investigation of humor styles and their correlations with the Big-5 personality dimensions. *Personality and Individual Differences*, *44*, 1116–1125.