Genetic and Environmental Correlations Between Trait Emotional Intelligence and Humor Styles

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Abstract. This article reports the first studies to investigate the genetic and environmental components of correlations between humor styles and trait emotional intelligence. In two independent adult-twin samples, significant phenotypic correlations were found between four humor styles (affiliative, self-enhancing, aggressive, and self-defeating) and five trait emotional intelligence (EI) variables (well-being, self-control, emotionality, sociability, and global trait EI). These observed phenotypic correlations were themselves found to be largely attributable to correlated genetic and correlated nonshared environmental factors.

Keywords: trait emotional self-efficacy, TEIQue, humor styles, behavioral genetics

Introduction

Adaptive styles of humor have been found to play a substantial role in contributing to positive mood, self-esteem, optimism, relationship satisfaction, and social support (Martin, 2007; Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003). These well-being variables, in turn, are integrated into the framework of trait emotional intelligence (trait EI or trait emotional self-efficacy; Petrides, Pérez-González, & Furnham, 2007). Greven, Chamorro-Premuzic, Arteche, and Furnham (2008) provided empirical confirmation of these conceptual links, by revealing a number of significant correlations on a sample of over 1,000 university students. The present studies extend this research by investigating the degree to which the observed (phenotypic) correlations between humor styles and trait EI have a genetic basis.

Trait EI refers to a constellation of emotion-related self-perceptions located at the lower levels of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007). The conceptualization of EI as a personality trait leads to a construct that lies outside the taxonomy of human cognitive ability (Carroll, 1993). The construct seeks to provide a comprehensive operationalization of the emotion-related facets of personality. At present, most of these facets are scattered across the Giant Three or the Big Five, while a few others are represented rather poorly within existing personality taxonomies (Petrides, Pita et al., 2007).

The sampling domain of trait EI as measured by the Trait Emotional Intelligence Questionnaire (TEIQue) comprises 15 distinct facets. Detailed factor-analytic work (see Freudenthaler, Neubauer, Gabler, & Scherl, 2008; Mikolajczak, Luminet, Leroy, & Roy, 2007) has demonstrated that 13 of these facets form four interrelated factors: *Emotionality* (facets: emotion-perception, empathy, emotion expression, and relationships), *Self-control* (facets: emotion control, impulsivity, and stress management), *Sociability* (facets: emotion management, assertiveness, and social awareness), and *Well-being* (facets: happiness, optimism, and self-esteem). Two further facets (adaptability and self-motivation) feed directly into the global trait EI score. Hitherto, the TEIQue has been used in numerous studies seeking to assess the emotion-related aspects of personality. These include research in psychoneuroendocrinology (Mikolajczak, Roy, Luminet, Fillee, & de Timary, 2007), relationship satisfaction (Smith, Heaven, & Ciarrochi, 2008), decision-making (Sevdalis, Petrides, & Harvey, 2007), job satisfaction (Singh & Woods, 2008), and behavioral genetics (Vernon, Petrides, Bratko, & Schermer, 2008).

Humor researchers have conceptualized and measured individual differences in sense of humor in several different ways, including humor creation ability, enjoyment of particular types of humorous stimuli, tendency to tell jokes and amuse others, tendency to laugh frequently, and so on (for a review, see Martin, 2007). Martin and colleagues (2003) argued that the aspect of humor that is most relevant to emotional and psychosocial well-being has to do with the

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ways people typically use humor in their interactions with others, which they referred to as humor styles. Martin et al. (2003) identified four distinct styles of humor, two of which were hypothesized to be beneficial for well-being (*affiliative* and *self-enhancing*) and two potentially detrimental (*self-defeating* and *aggressive)*. Affiliative humor is characterized by making humorous comments and telling jokes and funny anecdotes in order to amuse others and to facilitate relationships, while self-enhancing humor refers to the use of humor to regulate emotions and cope with stress by maintaining a humorous and cheerful outlook on life. Self-defeating humor involves attempts to amuse others by means of excessively self-disparaging humor, while aggressive humor involves the use of humor for the purpose of demeaning or manipulating others, as in sarcasm, teasing, or ridicule.

Martin and colleagues (2003) developed the Humor Styles Questionnaire (HSQ) to assess these four uses of humor. A considerable amount of research using this measure has confirmed that the four styles are differentially related to emotional and psychosocial well-being in predicted ways (see Martin, 2007, for a review of this research). In particular, self-enhancing humor correlates positively with such emotional well-being variables as self-esteem, optimism, positive moods, and cheerfulness, and negatively with depression, anxiety, rumination, perceived stress, and neuroticism. Affiliative humor, while somewhat less strongly related to emotional well-being, is particularly associated with positive relationship variables, including intimacy, relationship satisfaction, social support, interpersonal competence, secure attachment, and extraversion, and negatively related to loneliness and interpersonal anxiety.

On the other hand, self-defeating humor is positively correlated with anxiety, depression, psychiatric symptoms, anxious attachment, and neuroticism, and negatively associated with self-esteem and optimism. Finally, aggressive humor, while less strongly associated with emotional well-being, correlates negatively with relationship variables such as relationship satisfaction, interpersonal competence, agreeableness, and conscientiousness, and positively with hostility and neuroticism. Overall, then, greater use of self-enhancing humor and lower use of self-defeating humor seem to be important for emotional well-being, whereas greater use of affiliative humor and lower use of aggressive humor are predictive of more satisfactory interpersonal relationships.

Trait EI and Humor Styles

The characteristics of trait EI and the humor styles outlined above lead readily to hypothesized linkages between the two sets of constructs. The various emotionally and socially beneficial outcomes of positive humor styles such as relationship satisfaction, coping with stress, optimism, and high self-esteem are closely linked to emotional awareness and regulation of emotion, which in turn are central aspects of trait EI. In order to elicit amusement from others, which is what individuals with affiliative styles of humor strive for, they must be aware of the emotions of others, and know when something is appealing to them or when something is not appropriate. Moreover, those who engage in self-enhancing humor seem to be better at managing emotional information. In this case, humor is used as a coping strategy, and to be humorous in the face of adversity may be an aspect of a more general ability to manage and regulate emotions. These positive humor styles, therefore, seem to involve greater emotional awareness and emotion regulation both in oneself and others. Indeed, these forms of humor may be viewed as one mechanism by which high trait EI individuals are able to manage emotions and build satisfactory interpersonal relationships. We would, therefore, predict positive correlations between these humor styles and the facets of trait EI.

On the other hand, those with an aggressive sense of humor may not demonstrate this understanding of other people's emotions or the interest in managing them, possibly leading to their making insensitive and hostile remarks that are attempts to be amusing, but which may emotionally wound others. Similarly, those who engage in self-defeating humor appear to have difficulty understanding and regulating their own emotions, using humor as a form of defensive denial and a means of gaining attention or approval from others through excessive self-disparagement and cynicism. Thus, these negative humor styles may reflect difficulties in perceiving and managing emotions in oneself and in others. We would, therefore, predict negative correlations between these humor styles and trait EI.

It should be noted that EI has also been conceptualized as a new cognitive ability (ability EI) concerning a capacity to understand, manage, and utilize emotional information. Yip and Martin (2006) examined the relationship between ability EI and humor, using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) and the HSQ. Emotional perception was negatively correlated with aggressive and self-defeating humor, and emotional management was positively related to self-enhancing humor. However, neither the ability EI factors of emotional facilitation of thought and emotional understanding nor the total MSCEIT score were related to any of the four types of humor.

Trait EI, on the other hand, has shown stronger and more consistent associations with humor styles, providing support to the hypotheses outlined above. Greven et al. (2008) reported strong positive correlations between global trait EI and the affiliative and self-enhancing humor styles and strong negative correlations with the aggressive and self-defeating styles. With few exceptions, this pattern was also observed for the four trait-EI factors. Moreover, almost all correlations remained statistically significant after applying Bonferroni corrections to guard against type I errors. A secondary purpose of the two studies reported in the present paper was to see if we can replicate these correlational findings between trait EI and humor styles.

Behavioral Genetic Studies

Numerous behavioral genetic studies have examined the extent to which genetic, and nonshared or shared environmental factors contribute to the variance of different traits. This type of research frequently involves comparing correlations between monozygotic (MZ) twins, who share 100% of their genes, and dizygotic (DZ) twins, who share approximately 50% of their genes. The nonshared environment refers to experiences that one twin has, but that his or her co-twin does not have. These experiences will contribute to differences between the twins, and typically account for the majority of environmental effects. The shared environment refers to experiences that both twins have in common – such as being raised by the same parents in the same home and likely attending the same schools. These aspects of the environment will contribute to similarities between twins but, for the majority of personality traits, have only a minimal effect (Johnson, Vernon, & Feiler, 2008).

Two recent studies have examined genetic and environmental influences on humor as measured by the HSQ. In a study by Vernon, Martin, Schermer, and Mackie (2008), conducted in North America, affiliative and self-enhancing humor styles were largely influenced by genetic and nonshared environmental factors, while aggressive and self-defeating humor styles were influenced only by the shared and nonshared environments. In an attempt to replicate these results, Vernon, Martin, Schermer, Cherkas, and Spector (2008) administered the HSQ to twins in the UK. In this sample, it was found that all four humor styles had large genetic and nonshared environmental influences. The authors suggested that this different pattern of results may be because of real differences in the appreciation of diverse styles of humor that exist between citizens of North America and the UK.

Behavioral genetic investigations have also been conducted recently on trait EI. Vernon, Petrides et al. (2008) examined the heritability of trait EI using a family and a twin study. In the latter, they determined that approximately 40% of the variance in global trait-EI scores was from genetics and 60% was from nonshared environmental factors; percentages similar to those reported for the four HSQ humor styles by Vernon, Martin, Schermer, Cherkas et al. (2008).

Although behavioral genetic studies have been conducted on humor styles and trait EI separately, to date no previous research has explored the genetic and environmental breakdown of their interrelationships, which is the primary objective of the two studies reported in this paper. Clarifying the extent to which genetic and/or environmental factors contribute to correlations between humor and EI would have important theoretical as well as practical implications: topics that we return to in our general discussion section.

Study 1

Method

Participants

A total of 294 pairs of adult MZ twins (224 female pairs, 70 male pairs) and 162 pairs of adult DZ twins (64 female pairs, 48 male pairs, 50 opposite sex pairs) participated in this study. The twins ranged in age from 18 to 72 years ($M = 41.4$, $SD = 10.2$) and were recruited primarily via newspaper advertisements from across Canada and the United States. A total of 62 pairs (all MZ) were recruited at the 2006 Twinsburg, Ohio, Twins Day Festival. Over 95% of the twins who were initially contacted agreed to take part and subsequently returned their completed questionnaires.

Measures

The HSQ contains 32 items designed to measure four styles of humor: affiliative, self-enhancing, aggressive, and self-defeating. Participants rate the extent to which they agree with different statements about their sense of humor on a 7-point Likert scale (1 = *disagree completely*, 7 = *agree completely*). Examples of items for each humor style are: "I laugh and joke a lot with my friends" (affiliative), "If I am feeling depressed, I can usually cheer myself up with humor" (self-enhancing), "If I don't like someone, I often use humor or teasing to put them down" (aggressive), and "I let people laugh at me or make fun at my expense more than I should" (self-defeating).

The TEIQue consists of 153 items predicated on trait EI theory and providing a comprehensive coverage of the trait EI domain (see, e.g., Freudenthaler et al., 2008; Petrides & Furnham, 2003). As mentioned in the introduction, it yields scores on 15 distinct facets, four factors, and overall or global trait EI. Participants respond on a 7-point Likert scale, ranging from *completely disagree* to *completely agree*. We focused our analyses on the global trait EI score and the four factor scores in order to align the results to those of Study 2 and Greven et al. (2008).

Procedure

Twins responded to newspaper advertisements about the study either by phone or by email. At this first contact the study was described and, if they agreed to participate, they were sent a package of questionnaires, which included a letter of information and consent form, the HSQ and TEIQue, a zygosity questionnaire (Nichols & Bilbro, 1966) if they were same-sex twins, and a number of other questionnaires which are not pertinent to the present report. When the participants had completed the questionnaires they retuned them in an enclosed stamped, self-addressed envelope. Upon receipt of their completed questionnaires,

each twin was sent US $20 to compensate them for their time and their names were entered into a draw for one of ten US $100 prizes.

Analyses

In the great majority of cases, both twins in a pair completed and returned their questionnaires. If only one twin returned their completed questionnaires, their co-twin was sent a reminder, but, if this co-twin still did not return their questionnaires, then data from the first twin were not entered into the statistical analyses. Most twins completed all items on both questionnaires, but a few twins left one or two items blank. To account for missing items, total raw scores on the questionnaires were divided by the number of completed items to yield mean raw scores on each questionnaire. MZ and DZ variance/covariance matrices were computed from these scores and used in the following analyses using unweighted least squares. Given the wide age range of the sample and the uneven numbers of males and females, all data were corrected for age and sex using McGue and Bouchard's (1984) regression approach prior to the main analyses.

In multivariate behavioral-genetic model-fitting, MZ and DZ cross-correlations are computed to estimate the extent to which one twin's score on one variable correlates with his or her co-twin's score on another variable. In the actual model-fitting, what is referred to as a "full model" provides estimates of the extent to which common genetic (A), shared environmental (C), and nonshared environmental (E) factors contribute to correlations between variables. As is the case in univariate model-fitting, reduced models can also be fitted to see whether any of the A, C, or E factors can be dropped without a significant worsening of fit. Thus, an AE model tests whether shared environmental factors can be dropped and a CE model tests whether a purely environmental model can account for the data without a significant worsening of fit. In our analyses, we first fitted full ACE models to the data and then tested reduced models. The final models were then used to compute genetic and environmental correlations between the two variables, which estimate the extent to which their phenotypic (observed) correlations are attributable to the fact that the same genes and/or the same environmental factors contribute to both. All analyses were performed with the software package Mx (Neale, Boker, Xie, & Maes, 1999).

To readers less familiar with multivariate behavioral-genetic analyses it might seem unlikely that nonshared environmental factors could contribute to correlations between variables, because these nonshared factors, at the univariate level, only contribute to *differences* between twins. At the multivariate level, however, one twin may experience something in his or her environment that their co-twin may not experience, and this environmental factor may enhance (or diminish) the manifestation of two or more behavioral traits in the twin who experienced it. For example, one twin may experience some traumatic event, which makes them both more anxious and more depressed. If their co-twin does not experience the same event then this nonshared environmental event will contribute to a correlation between anxiety and depression. An excellent reference for readers who would like to learn more about behavioral genetic procedures is Neale and Cardon (1992).

Results

As mentioned previously, Vernon, Martin, Schermer, and Mackie (2008) reported that individual differences in the two positive humor styles measured by the HSQ in this sample were attributable to genetic and nonshared environmental factors, whereas individual differences in the two negative humor styles were primarily attributable to shared and nonshared environmental factors (see Vernon, Martin, Schermer, & Mackie, 2008, Table 1). With respect to the TEIQue, Vernon, Petrides et al. (2008) reported that individual differences in all of its facets and factors were attributable to genetic and nonshared environmental factors, with heritabilities for the factors ranging from .35 (for Emotionality) to .49 (for Sociability) (see Vernon, Petrides et al., 2008, Table 4).

Shown in Table 1 are the phenotypic correlations (rp) between the four HSQ humor styles and the five TEIQue variables (global score plus the four factors); to ensure independence of observations these phenotypic correlations were computed using just one randomly-selected twin from each pair. Also shown in Table 1 are the results of the multivariate model-fitting analyses. These include genetic correlations (rg) as well as shared (rc) and nonshared (re) environmental correlations between the variables, along with their 95% confidence intervals.

First, at the phenotypic level, after Bonferroni corrections significant correlations exist between all HSQ and TEIQue variables, with the exceptions of affiliative humor and self-control (rp = .01), aggressive humor and sociability (rp = .08), and self-defeating humor and sociability (rp = –.07). The largest phenotypic correlations are between self-enhancing humor and well-being (rp = .47, $p < .01$), between self-enhancing humor and global trait EI (rp = .45, $p < .01$), and between affiliative humor and sociability (rp = .40). The average of the absolute values of the 20 phenotypic correlations reported in Table 1 is .24. Self-enhancing humor is significantly and positively correlated with all five TEIQue variables; aggressive humor is significantly and negatively correlated with all TEIQue variables, except sociability, with which it has a significant (albeit low) positive correlation. As predicted, and consistent with the findings of Greven et al. (2008), there is a very pronounced trend for the two positive humor styles (affiliative and self-enhancing) to have positive correlations and for the two negative humor styles (aggressive and self-defeating) to have negative correlations with the TEIQue variables.

Second, the multivariate model-fitting results indicate that, with just one exception, the phenotypic correlations

Table 1. Phenotypic, genetic, and environmental correlations between humor styles and trait EI in Study 1

	Trait EI variables				
Humor styles	Well-being	Self-control	Emotionality	Sociability	Global trait EI
Affiliative	rp = .25*	rp = .01	rp = .32*	rp = .40*	rp = .30*
	rg = .10 (–.13 to .31)	rg = –.19 (–.40 to .01)	rg = .29 (.07 to .48)	rg = .43 (.26 to .58)	rg = .17 (–.06 to .36)
	rc = –	rc = –	rc = –	rc = –	rc = –
	re = .36 (.24 to .47)	re = .19 (.06 to .32)	re = .33 (.21 to .44)	re = .35 (.23 to .46)	re = .39 (.27 to .50)
Self-enhancing	rp = .47*	rp = .27*	rp = .32*	rp = .34*	rp = .45*
	rg = .60 (.42 to .76)	rg = .31 (.10 to .50)	rg = .40 (.18 to .60)	rg = .50 (.32 to .66)	rg = .61 (.43 to .77)
	rc = –	rc = –	rc = –	rc = –	rc = –
	re = .36 (.25 to .47)	re = .24 (.11 to .36)	re = .26 (.13 to .37)	re = .20 (.08 to .32)	re = .33 (.21 to .44)
Aggressive	rp = –.13*	rp = –.27*	rp = –.23*	rp = .08	rp = –.20*
	rg = –.10 (–.32 to .12)	rg = –.45 (–.26 to –.63)	rg = –.30 (–.08 to –.50)	rg = .12 (–.07 to .31)	rg = –.27 (–.05 to –.47)
	rc = –	rc = –	rc = –	rc = –	rc = –
	re = –.13 (–.26 to .01)	re = –.10 (–.23 to .02)	re = –.18 (–.05 to –.30)	re = .04 (–.09 to .17)	re = –.13 (–.01 to –.26)
Self-defeating	rp = –.20*	rp = –.24*	rp = –.13*	rp = –.07	rp = –.20*
	rg = –.35 (–.12 to –.57)	rg = –.50 (–.31 to –.70)	rg = –	rg = –.08 (–.28 to .13)	rg = –.40 (–.17 to –.62)
	rc = –	rc = –	rc = –.24 (–.48 to .01)	rc = –	rc = –
	re = –.10 (–.22 to .02)	re = –.05 (–.17 to .08)	re = –.07 (–.18 to .04)	re = –.06 (–.19 to .06)	re = –.07 (–.20 to .05)

rp = Phenotypic (observed) Correlation; rg = Genetic Correlation; rc = Common Environmental Correlation; re = Environmental Correlation; numbers in parentheses represent the 95% confidence interval values; *p < .004.

described above are entirely attributable to correlated genetic and correlated nonshared environmental factors. The one exception is the correlation between self-defeating humor and emotionality, which is attributable to correlated shared and nonshared environmental factors. Of the 20 phenotypic correlations in Table 1, significant genetic correlations exist in 13 cases (statistical significance is indicated by confidence intervals that do not contain zero). The absolute values ranged between .27 and .61. Significant nonshared environmental correlations exist in 12 of 20 cases, ranging between .13 and .39 in absolute values.

Discussion

Study 1 replicated previous research showing significant correlations between dimensions of trait EI and sense of humor. In this study, positive humor styles (affiliative and self-enhancing) correlated positively with the five trait-EI variables, while negative humor styles (aggressive and self-defeating) typically correlated negatively.

Going beyond previous research, our Study 1 used samples of twins, which enabled us to investigate the extent to which phenotypic correlations between humor and trait EI are themselves attributable to correlated genetic and/or correlated environmental factors. Our multivariate behavioral-genetic analyses revealed that, in 19 of 20 cases, humor styles and trait EI were associated as a result of correlated genetic and correlated, nonshared environmental factors. Only the correlation between self-defeating humor and emotionality was from correlated shared and nonshared environmental factors. Study 1 provides a powerful demonstration of the etiology of relationships between sense of humor and trait EI. However, our samples, while not small, are also not as large as those that are increasingly used in studies of the behavioral genetics of personality. Consequently, Study 2 sought to replicate those findings on a larger sample and with the short form of the TEIQue.

Study 2

Method

Participants

A total of 1,073 pairs of adult MZ twins (967 female pairs, 106 male pairs) and 895 pairs of same-sex adult DZ twins (835 female pairs, 60 male pairs) took part in this study. The twins ranged in age from 17–90 years (M = 56.1, SD = 13.2) and were participants in an ongoing twin study conducted by The Twin Research and Genetic Epidemiology Unit at St Thomas' Hospital in London. This study mails out questionnaires to approximately 9,000 individual twins about once a year. The twins' zygosity has been previously established either by genome scans (100% accurate), DNA tests (99.5% accurate), or via their responses to the "Peas in the Pod" zygosity questionnaire (95% accurate).

Measures

Twins in Study 2 completed the same HSQ that was used and described in Study 1. They also completed the TEIQue-

Table 2. Phenotypic, genetic, and environmental correlations between humor styles and trait EI in Study 2

	Trait EI variables				
Humor styles	Well-being	Self-control	Emotionality	Sociability	Global trait EI
Affiliative	rp = .32*	rp = .17*	rp = .34*	rp = .39*	rp = .38*
	rg = .30 (.31 to .47)	rg = .17 (.08 to .26)	rg = .45 (.37 to .53)	rg = .51 (.44 to .58)	rg = .45 (.38 to .52)
	re = .27 (.22 to .32)	re = .18 (.13 to .24)	re = .26 (.21 to .31)	re = .29 (.24 to .34)	re = .33 (.28 to .38)
Self-enhancing	rp = .45*	rp = .36*	rp = .28*	rp = .31*	rp = .45*
	rg = .58 (.50 to .65)	rg = .48 (.39 to .56)	rg = .31 (.21 to .40)	rg = .44 (.35 to .52)	rg = .53 (.46 to .60)
	re = .37 (.33 to .42)	re = .28 (.23 to .33)	re = .26 (.20 to .31)	re = .24 (.19 to .29)	re = .39 (.35 to .44)
Aggressive	rp = –.06*	rp = –.14*	rp = –.20*	rp = .02	rp = –.14*
	rg = –.03 (–.13 to .07)	rg = –.18 (–.08 to –.27)	rg = –.35 (–.26 to –.45)	rg = .06 (–.04 to .15)	rg = –.15 (–.06 to –.22)
	re = –.08 (–.02 to –.13)	re = –.11 (–.06 to –.16)	re = –.11 (–.05 to –.17)	re = –.01 (–.06 to .05)	re = –.12 (–.07 to –.17)
Self-defeating	rp = –.14*	rp = –.27*	rp = –.14*	rp = –.16*	rp = –.23*
	rg = –.21 (–.11 to –.30)	rg = –.43 (–.34 to –.52)	rg = –.28 (–.18 to –.38)	rg = –.21 (–.11 to –.30)	rg = –.34 (–.25 to –.43)
	re = –.10 (–.04 to –.15)	re = –.18 (–.12 to –.23)	re = –.06 (–.01 to –.12)	re = –.13 (–.08 to .19)	re = –.16 (–.21 to –.10)

rp = phenotypic (observed) correlation; rg = genetic correlation; re = environmental correlation; numbers in parentheses represent the 95% confidence interval values; *$p < .004$.

SF, which contains 30 items each responded to on a 7-point Likert scale. This form was designed to provide a global trait EI score, but can also be used to provide scores on the four trait-EI factors: emotionality, sociability, self-control, and well-being.

Procedure

Approximately 9,000 individual twins were mailed a package of questionnaires that included the HSQ and a number of other questionnaires that are not pertinent to the present report. Approximately 5,000 individual twins (56%) returned the completed questionnaires and, of these, a total of 3,936 made up the 1,073 MZ and 895 DZ same-sex twin pairs who comprised our sample. Twins completed the questionnaires on their own time at their homes and then returned them to St Thomas' Hospital.

Analyses

As in Study 1, multivariate behavioral-genetic analyses were performed using Mx (Neale et al., 1999). Full and reduced models were fit to the data to see whether any parameters could be dropped without resulting in a significant worsening of fit.

Results

As mentioned previously, Vernon, Martin, Schermer, Cherkas et al. (2008) reported that individual differences in both the two positive and the two negative humor styles measured by the HSQ in this sample were attributable to genetic and nonshared environmental factors (see Vernon, Martin, Schermer, Cherkas et al., 2008, Table 1, p. 46). With respect to the TEIQue, univariate behavioral genetic analyses showed that individual differences in all five trait EI variables (global score plus the four factor scores) in this sample were also attributable to genetic and nonshared environmental factors, with heritabilities ranging from .36 (for emotionality and well-being) to .43 (for global trait EI).

Shown in Table 2 are the phenotypic correlations (rp) between the four HSQ humor styles and the five TEIQue variables. Also shown in this table are the results of the multivariate model-fitting analyses. These include the genetic correlations (rg) and shared (rc) and nonshared (re) environmental correlations between the variables, along with their 95% confidence intervals.

First, at the phenotypic level, after Bonferroni corrections significant correlations exist between all HSQ and all TEIQue-SF variables, with the exception of aggressive humor and sociability (rp = .02). As was the case in Study 1, the largest phenotypic correlations are between self-enhancing humor and well-being (rp = .45, $p < .01$) and between self-enhancing humor and global trait EI (rp = .45, $p < .01$). The average of the absolute values of the 20 phenotypic correlations reported in Table 2 is .25. Also replicating the results of Study 1, there is a very pronounced trend in the data for the two positive humor styles (affiliative and self-enhancing) to have positive correlations with the TEIQue-SF variables, and for the two negative humor styles (aggressive and self-defeating) to have negative correlations.

Second, the multivariate model-fitting results indicate that, without exception, the phenotypic correlations in Table 2 are entirely attributable to correlated genetic and correlated nonshared environmental factors. Of the 20 phenotypic correlations in Table 2, significant genetic correlations exist in 18 cases, ranging between .15 and .58 in absolute values. Significant nonshared environmental correlations also exist in 18 of 20 cases, ranging between .06 and .39 in absolute values.

Discussion

Study 2 looked at relationships between humor styles and trait EI, but did so using a substantially larger sample of twins. Overall, the results of Study 2 replicated those of Study 1. Thus, significant phenotypic correlations were found between humor styles and all trait EI variables. Positive humor styles correlated positively, and negative humor styles correlated negatively, with trait EI. All observed phenotypic correlations between humor and trait EI were entirely attributable to correlated genetic and correlated nonshared environmental factors.

With a few, relatively minor, exceptions, the phenotypic correlations found in Study 2 are similar in magnitude to those found in Study 1. The largest difference is the phenotypic correlation between affiliative humor and self-control, which was .01 and not significant in Study 1, but which rose to .17 and was significant in Study 2. The great majority of the 19 other phenotypic correlations reported in both studies are, however, remarkably similar in magnitude and represent a strong and replicated pattern of results. This is all the more impressive when we take into account that, at 30 questions, the TEIQue-SF is barely a fifth of the length of the full form of the inventory.

There is a similar level of consistency with respect to the genetic and environmental correlations, which, with only a few exceptions, were very similar across Studies 1 and 2. Given the sample-size differences between the two studies, and the fact that they were drawn from different continents, it would be reasonable to conclude that the minor discrepancies observed can be attributed to sampling differences.

General Discussion

This article reports the first studies to investigate the genetic and environmental components of the correlations between humor styles and trait EI. In both studies, significant phenotypic correlations were found between the four styles of humor (affiliative, self-enhancing, aggressive, and self-defeating) and the five trait-EI variables (well-being, self-control, emotionality, sociability, and global trait EI). These correlations were, themselves, found to be largely attributable to correlated genetic and correlated nonshared environmental factors.

As noted previously, the concept of correlated nonshared environmental factors may strike some readers as odd because the nonshared environment – consisting of things that one twin experiences, which his or her co-twin does not experience – only contributes to differences between twins and never to correlations between them. At the multivariate level, however, as discussed above, it is entirely feasible for nonshared environmental factors to contribute to correlations between *variables* and that is precisely what was found in our two studies.

One possible limitation to our study is the self-report nature of the questionnaire data that we collected. While this is a limitation shared by many studies investigating personality, it may have contributed to the correlations that we observed (and to their genetic and environmental basis).

Overall, however, these findings lend considerable support to our hypothesis of a link between humor styles and trait EI. Individuals who use humor appropriately to facilitate relationships and manage emotions (affiliative and self-enhancing humor, respectively) also tend to be ones who have greater emotional awareness and expressiveness, emotional self-control, sociability, and well-being, all of which are integrated into the trait EI construct. On the other hand, those who use humor inappropriately, in hostile or excessively self-disparaging ways (aggressive and self-defeating humor), also tend to be lower on these EI traits. Indeed, one might hypothesize that the skillful use of humor is one of the mechanisms by which individuals who are high on trait EI endeavor to regulate emotion and enhance relationships and well-being. These findings also have implications for clinical practice. For example, therapeutic interventions could focus on teaching clients appropriate self-enhancing and affiliative uses of humor for regulating emotions, improving emotional well-being, and enhancing relationships. On the other hand, therapy clients might also benefit from learning to recognize and modify their more detrimental uses of humor, which may be interfering with emotional control and psychosocial well-being.

Furthermore, the results of our studies indicate that the phenotypic correlations that are observed between sense of humor and trait EI are, in part, attributable to the fact that those genes that contribute to individual differences in humor styles also contribute to individual differences in trait EI. This finding is important because it suggests that, in an evolutionary sense, styles of humor and general emotional functioning have been coselected for. It is also interesting that, in many cases, the genetic correlations between humor and trait EI were larger than the corresponding (nonshared) environmental correlations, which also lends credence to an evolutionary interpretation.

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