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# A Behavioral Genetic Study of Humor Styles in an Australian Sample

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The present study investigated the extent to which individual differences in humor styles are attributable to genetic and/or environmental factors in an Australian sample. Participants were 934 same-sex pairs of adult twins from the Australian Twin Registry (546 monozygotic pairs, 388 dizygotic pairs) who completed the Humor Styles Questionnaire (HSQ). The HSQ measures four distinct styles of humor — affiliative, self-enhancing, aggressive, and self-defeating. Results revealed that additive genetic and non-shared environmental factors accounted for the variance in all four humor styles, thus replicating results previously obtained in a sample of twins from the United Kingdom. However, a study conducted with a U.S. sample produced different results and we interpret these findings in terms of cross-cultural differences in humor.

■ **Keywords:** Humor styles, Twin study, Genetic and Environmental contributions to individual differences

Humor was initially viewed as a unidimensional construct associated with positive effects on health and well being (e.g., Lefcourt, 2001). In more recent investigations, however, researchers typically define humor as a multidimensional construct consisting of both adaptive and maladaptive styles of humor use (Ruch, 1996). To date, relatively few behavioral genetic (BG) studies have been conducted to estimate the extent to which individual differences in humor are attributable to genetic and/or environmental factors. Among those that have been conducted, results have varied depending on how humor is operationalized and measured.

Humor can be defined in terms of an aesthetic response, as measured by funniness ratings of cartoons and jokes. When humor is described in this way, studies have typically found that shared and non-shared environmental factors account for the variance in humor appreciation (Cherkas et al., 2000; Nias & Wilson, 1977; Wilson et al., 1977). In contrast, studies in which self-report measures of humor are administered have yielded results indicating the presence of a genetic contribution to individual differences in humor. For example, Loehlin and Nichols (1976) asked twins to rate the degree to which they felt they had a ‘good sense of humor’, noting that individual differences in these self-reflections were primarily attributable to genetic and non-shared environmental factors. Manke (1998) found similar results when twins were asked to rate the frequency

with which they typically engage in humorous interactions with their mothers and siblings. However, humorous interactions with close friends were influenced solely by shared and non-shared environmental factors (Manke, 1998). It thus seems that genetic factors contribute to some aspects of humor but not to others.

Given the shift toward a multidimensional characterization of humor, recent BG investigations have investigated the etiology of humor styles using the Humor Styles Questionnaire (HSQ; Martin et al., 2003). The HSQ assesses four styles of humor, two of which are positive (affiliative and self-enhancing) and two of which are negative (aggressive and self-defeating). Affiliative humor involves the use of jokes and witticisms to amuse others in an attempt to facilitate interpersonal relationships. Self-enhancing humor refers to maintaining a humorous outlook on life, as well as minimizing the impact of everyday stressors as a coping strategy. Aggressive humor is used for the purpose of manipulating and criticizing others. Forms of this humor

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style include sarcasm, teasing, ridicule, and offensive comments. Finally, self-defeating humor involves an attempt to entertain others by laughing at oneself while being ridiculed and entertaining others at one's own expense (Martin et al., 2003).

Vernon et al. (2008b) used a sample of 300 monozygotic (MZ) and 156 same-sex dizygotic (DZ) adult twin pairs from the United States (U.S.) to conduct a BG investigation of humor styles, as measured by the HSQ. The researchers found that individual differences in the positive humor styles were influenced by genetic and non-shared environmental factors, whereas individual differences in the negative humor styles were accounted for solely by shared and non-shared environmental factors. Subsequently, Vernon et al. (2008a) conducted a similar study with over 1,000 same-sex adult twin pairs from the United Kingdom (UK). Results showed that both positive and negative humor styles were influenced by additive genetic and non-shared environmental factors. Vernon et al. (2008a) proposed that cultural differences in what are deemed to be acceptable uses of humor may have elicited the unique pattern of results obtained in their study versus that of Vernon et al. (2008b).

Differences in humor preference between the U.S. and UK are evident in the content of television comedies originating from the two countries. For instance, sitcoms in the UK appear to contain humor that is both dryer and more sarcastic than the humor depicted in U.S. television programs. A good example of this difference can be illustrated via the television program *The Office*, which is featured in both the U.S. as well as the UK. While the U.S. version of the sitcom centers upon a kind-hearted boss and his predominantly energetic staff, its UK counterpart depicts these same characters as being cynical and sarcastic (Griffin, 2008). As a further demonstration of these cultural differences in humor, a study investigating television advertising found that commercials in the UK contained a significantly larger proportion of puns, irony, and satire than did those in the U.S. (Weinberger & Spotts, 1989).

The present study sought to examine individual differences in humor styles, and to contribute to a greater cross-cultural understanding of humor by assessing humor styles in the context of an Australian twin sample. As a result of Australia's transition from a British colony into a multicultural society (Wall, 2006), Australian society can be considered an eclectic integration of various cultures. As one example, popular American television sitcoms such as *The Office* and *Friends*, as well as British shows such as *Fawlty Towers* and *Blackadder* have been aired on Australian television (McConchie & Vered, 2003). According to an Australian newspaper review, the U.S. version of *The Office* has 'moved some way from the British original. But in the process it has evolved into something just as good, only different' (*The Sydney Morning Herald*, *The Office*, Tuesday 2011, 5 April), implying that Australians enjoy the humor

in both the U.S. and UK versions of *The Office*. Given that Australians are exposed to a wide range of humor, it is likely that their humor preferences reflect aspects of both the U.S. and the UK. It will therefore be interesting to see whether the contribution of genetic and/or environmental factors to individual differences in Australians' humor styles reflects the patterns that were observed in the U.S. or in the UK.

## Method

### Participants

Participants were 934 adult same-sex twin pairs (546 MZ pairs, 388 DZ pairs) recruited through the National Health and Medical Research Council Australian Twin Registry (ATR). For this study, twins born between 1972 and 1979 were recruited to participate in the present study using a two-tiered process, as required by the ATR's ethics committee. First, the ATR contacted twins by mail and subsequently by telephone. Contacted individuals were asked whether they would be willing to have their name and contact details forwarded to the Queensland Institute of Medical Research (QIMR) for potential participation in an interview- and questionnaire-based study of substance use and mental health funded by the National Institute of Health. Contact details of those who provided consent were then forwarded to QIMR, who made separate attempts to (re)contact potential subjects, explain the purposes of the study to them, and enroll them in the study. Initial recruitment letters were sent to 3,925 families. At least one twin from 2,405 families responded, thus giving a family participation rate of 61%. In the second stage of recruitment, 3,186 twins completed the questionnaires (84% response rate), 3,348 (89%) completed the interview, and 3,130 (83%) completed both the interview and questionnaire.

Informed consent for participation was obtained from all participants prior to data collection. Ethics approval for this study was provided by the Institutional Review Board at Washington University School of Medicine, the QIMR Human Research Ethics Committee, and the ATR's ethics committee.

### Materials

**HSQ.** The HSQ (Martin et al., 2003) consists of 32 items measuring four styles of humor: affiliative, self-enhancing, aggressive, and self-defeating. Participants are asked to rate the degree to which they agree with various self-reflective statements pertaining to the different uses of humor in everyday life as measured on a 7-point Likert scale (1 = *disagree completely*, 7 = *agree completely*). Consequently, higher scores reflect a greater endorsement of the particular style of humor being measured. Example items include: 'I laugh and joke a lot with my friends' (affiliative); 'Even when I'm by myself, I'm often amused by the absurdities of life' (self-enhancing); 'If someone makes a mistake, I will often tease them about it' (aggressive); and 'I let people

**TABLE 1**  
Inter-Scale Correlations by Sex

	Affiliation	Self-enhancement	Aggressive	Defensive
Affiliation	1	0.45**	0.18**	0.06
Self-enhancement	0.52*	1	0.08*	0.08*
Aggressive	0.12**	0.05*	1	0.30**
Defensive	0.07*	0.02	0.38**	1

Note: Males are above the principal diagonal.

\* $p < .05$ , \*\* $p < .01$ , two-tailed.

laugh at me or make fun at my expense more than I should' (self-defeating).

### Procedure

Data collected by the QIMR was obtained via both a computer-assisted telephone interview, derived from the Semi-Structured Assessment for the Genetics of Alcoholism, as well as through a battery of questionnaires, which included the HSQ. For the purpose of the present study, only the data obtained from the HSQ were used. Respondents were offered two methods for completing the questionnaire: either by filling out a 'paper-and-pencil' survey and returning it to QIMR via post, or by completing the survey over the Internet after logging on with a unique participant ID and password, supplied by QIMR. Response rates for the questionnaire were excellent: 93.5% of those interviewed also completed the questionnaire, with an additional 56 twins completing the questionnaire alone. Seventy-five percent of those completing the questionnaire did so using the Internet version.

### Results

Cronbach's reliability coefficients for each HSQ subscale reached acceptable levels: affiliative (0.86), self-enhancing (0.82), self-defeating (0.82), and aggressive (0.70). These alpha coefficients are similar to those reported by Martin et al. (2003).

Correlations among the HSQ subscales are reported separately for males and females in Table 1. Consistent with

previous studies (Martin et al., 2003), affiliative and self-enhancing humor are moderately positively correlated, as are aggressive and self-defeating humor. Also consistent with Martin et al. (2003), there is a small positive correlation between affiliative and aggressive humor. These patterns of correlations are found among both males and females.

Independent sample  $t$  tests were run to examine sex differences on the HSQ subscales. Consistent with Martin et al. (2003), males scored higher than females on all four subscales although, also in line with Martin et al. (2003) the mean differences on affiliative and self-enhancing humor were quite small (but reached significance owing to the large sample sizes). The largest sex difference, as expected, was on aggressive humor where males scored 28.60, on average ( $s = 7.55$ ), and females scored 23.20 ( $s = 6.74$ ) and for which  $t = 17.18$ . Males also engaged in somewhat more self-defeating humor.

Item-level factor analysis of the HSQ yielded results very similar to those in Martin et al. (2003). Focusing on loadings of 0.30 or larger (in absolute value), all items loaded on the subscale they were designed to measure and showed trivial loadings on the other subscales. We can thus be confident that the HSQ is behaving as it should be in the present sample.

As shown in Table 2, MZ correlations for all subscales of the HSQ were larger than DZ correlations, indicating the presence of genetic influences. Full ACE and reduced AE univariate BG model-fitting analyses were run, and the results of these analyses are also reported in Table 1. For each HSQ subscale, an AE model did not provide a significantly poorer fit than did the full ACE model (CE and E only models were significantly poorer), and therefore the AE model was deemed most parsimonious in accounting for variance in the assessed humor styles. That is, individual differences in all four humor styles were entirely attributable to additive genetic (A) and non-shared environmental (E) effects, with heritability estimates ranging from 0.30 to 0.47. All of these effects were significant at  $p < .05$ .

**TABLE 2**  
Twin Correlations, ACE, and AE Model-Fitting Results for the HSQ

HSQ Subscale	Correlations ( $r$ )		Parameter estimates [95% CI]		
	MZ	DZ	$a^2$	$c^2$	$e^2$
Affiliative	0.44	0.23	0.32 [0.09, 0.48] 0.42 [0.36, 0.48]	0.10 [0.00, 0.30]	0.58 [0.52, 0.65] 0.58 [0.52, 0.64]
Self-enhancing	0.31	0.17	0.23 [0.00, 0.37] 0.30 [0.23, 0.37]	0.07 [0.00, 0.28]	0.70 [0.63, 0.78] 0.70 [0.63, 0.77]
Aggressive	0.49	0.25	0.36 [0.14, 0.52] 0.47 [0.41, 0.52]	0.10 [0.00, 0.29]	0.54 [0.48, 0.60] 0.53 [0.48, 0.59]
Self-defeating	0.46	0.30	0.31 [0.10, 0.50] 0.47 [0.41, 0.52]	0.15 [0.00, 0.33]	0.54 [0.48, 0.61] 0.53 [0.48, 0.59]

Note: HSQ = Humor Styles Questionnaire; MZ = monozygotic; DZ = dizygotic;  $a^2$  = additive genetic effects;  $c^2$  = shared environmental effects;  $e^2$  = non-shared environmental effects. First line represents the ACE model-fitting results, followed by the AE model-fitting results below. All effects are significant at the  $p < .05$  level. Values in brackets are 95% confidence intervals.

## Discussion

The present study investigated cross-cultural differences in humor styles from a BG perspective. Results indicated that individual differences in both positive and negative humor styles in Australian twins were accounted for by additive genetic and non-shared environmental factors, thus replicating previous results found with a British sample (Vernon et al., 2008a). However, the results of the present study were not consistent with those obtained in Vernon et al.'s (2008b) sample of U.S. twin pairs.

To date, cross-cultural research on the four HSQ dimensions has been quite limited. Prominent use of affiliative humor has typically been found among individuals in collectivistic cultures, while those in individualistic cultures tend to score higher on aggressive humor (Kazarian & Martin, 2004; Kalliny et al., 2006). These findings may reflect differences placed on the expression of humor among these cultures. With this in mind, it is interesting that previous studies of humor styles (Vernon et al., 2008a, 2008b) as well as this particular investigation have assessed participants from individualistic cultures (UK, U.S., Australia), but have noted different patterns of genetic and environmental influences on variation in these traits. This observation may suggest that humor styles are too complex to be looked at via broad comparisons between individualist and collectivist cultures. Perhaps research should focus more specifically on comparisons between nations.

This recommendation notwithstanding, future researchers may also wish to conduct similar BG studies with the HSQ in various collectivist cultures. For example, satirical humor is seen as an inferior expression of one's emotions in Chinese cultures (Nevo et al., 2001). A previous study on Singaporean and American humor revealed that humor in Singapore contained less aggressive and sexual content. Also, Singaporean participants did not use humor as a coping mechanism (Nevo et al., 2001). It is likely that a very different pattern of genetic and environmental influences in positive and negative humor styles exists between collectivist cultures.

A minor limitation of the present study was that almost 60% of our sample consisted of MZ twin pairs. Furthermore, the sample consisted of over 70% females. However, previous studies on the subject have also employed samples comprising a larger proportion of MZ twins and females (Vernon et al., 2008a, 2008b). Therefore, sex and zygosity biases are not factors contributing to variability in the results. Future investigations of humor may wish to employ a more diverse sample to ensure that findings are generalizable to both sexes.

In summary, our series of cross-cultural studies have not only extended the limited amount of research on cultural differences in humor using the HSQ, but also add to the few BG studies on humor that have been conducted. Further cross-cultural research with the HSQ is recommended to determine whether these humor styles differ in other na-

tions and the extent to which genetic and/or environmental factors contribute to them. In particular, it would be interesting to examine variation in humor among nations with a collectivist cultural orientation.

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