Journal of Research in Personality 47 (2013) 135–144

Contents lists available at SciVerse ScienceDirect

Journal of Research in Personality

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

Do men vary more than women in personality? A study in 51 cultures

Peter Borkenau [a,*], Robert R. McCrae [b], Antonio Terracciano [c,d]

[a] Department of Psychology, Martin-Luther University Halle-Wittenberg, D-06099 Halle, Germany
[b] Baltimore, MD, USA
[c] Department of Geriatrics, College of Medicine, Florida State University, Tallahassee, FL, USA
[d] National Institute of Aging, Baltimore, MD, USA

ARTICLE INFO

Article history:
Available online 20 December 2012

Keywords:
Cross-cultural research
Individualism
Multilevel modeling
Sex differences
Variability

ABSTRACT

Do men vary more than women in personality? Evolutionary, genetic, and cultural arguments suggest that hypothesis. In this study we tested it using 12,156 college student raters from 51 cultures who described a person they knew well on the 3rd-person version of the Revised NEO Personality Inventory. In most cultures, male targets varied more than female targets, and ratings by female informants varied more than ratings by male informants, which may explain why higher variances for men are not found in self-reports. Variances were higher in more developed, and effects of target sex were stronger in more individualistic societies. It seems that individualistic cultures enable a less restricted expression of personality, resulting in larger variances and particularly so among men.

1. Introduction

Numerous studies have shown that men vary more than women in cognitive abilities (Arden & Plomin, 2006; Benbow, 1988; Deary, Thorpe, Wilson, Starr, & Whalley, 2003; Feingold, 1995; Hedges & Friedman, 1993; Hedges & Nowell, 1995; Humphreys, 1988). Moreover, higher intrasex variances in men have been found for heterogeneous sets of variables like birth weight, adult height, 60-m dash times, and numerous blood parameters (Lehre, Lehre, Laake, & Danbolt, 2009). Thus more variability between men than women seems to be a quite widespread phenomenon, raising the question whether this applies to personality too.

There are several reasons to expect that men vary more than women in personality. Evolutionary psychologists have argued that a larger variety of qualities is compatible with reproductive success among men, as females but not males are restricted to high parental investment strategies. This may have given rise to greater male variability in sexually selected traits (Archer & Mehdikhani, 2003).

Furthermore, there are genetic hypotheses: Candidate genes to account for larger male variability may be located on the X chromosome, on which many genes important for the nervous system have been identified (Check, 2005). As females have two X chromosomes whereas males have only one, and genetic effects on personality seem to be additive to some extent (Krueger & Johnson, 2008), the effects of two X-linked alleles may be averaged in females, resulting in less extreme phenotypes unless the female is homozygous. That holds although most regions on one of the two X chromosomes in females are inactivated, because: (a) some regions of the X chromosome escape that inactivation and (b) for the remaining regions a mosaicism is typical in human females, that is, the maternal X-linked allele remains activated in about one half of the cells and the paternal allele in the other half (Amos-Landgraf et al., 2006). This implies that some kind of averaging of maternal and paternal X-linked genetic effects may occur across cells. By contrast, males inherit one X-chromosome only, and its effects are fully expressed resulting in more extreme phenotypes and consequently higher variances.

Social-role explanations for a higher variability in men are reasonable as well: Various social norms probably are – or at least have been – stricter for women, allowing men to choose between more diverse behavioral options. But evidence to support that argument is currently sparse as research on gender roles has focused on sex differences in mean levels – e.g., that men are supposed to be more agentic whereas women are supposed to be more communal (Bosak, Sczesny, & Eagly, 2012) – not on sex differences in the diversity of behavioral options.

That men vary more than women in personality is not only reasonable; investigating that is also important. Liability-threshold or continuity models of mental disorders imply that extreme trait levels tend to be abnormal. Therefore, a higher variance in a group should result in a higher proportion of its members exceeding a "critical" threshold and being classified as abnormal (Hedges & Friedman, 1993). Thus if there were no sex differences in mean levels but men would vary more than women, the proportion of group members exceeding that threshold would be higher in men. For example, that men are strongly overrepresented among prison inmates may not mainly reflect a large sex difference in average levels

* Corresponding author.
E-mail address: p.borkenau@psych.uni-halle.de (P. Borkenau).

0092-6566/$ - see front matter © 2012 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jrp.2012.12.001

of antisocial behavior, but that more men than women manifest extreme levels of antisocial behavior, relative to their intragroup means. Moreover, effects of sex differences in mean levels and in variances on the proportion of individuals exceeding a threshold may add up (Feingold, 1995; Humphreys, 1988). Thus a moderately higher mean level (Eagly & Steffen, 1986) in combination with a possibly higher variance in men's aggressiveness may account for their disproportionate crime rate compared to that of women.

So what is the evidence on sex differences in variability in personality? There are only a few observational studies on this issue, among them a study by Mehl, Vazire, Ramírez-Esparza, Slatcher, and Pennebaker (2007). In six samples, these authors analyzed sex differences in talkativeness measured by an electronically activated recorder. They did not find systematic sex differences in average talkativeness, but the standard deviations of estimated words spoken per day were higher for men than for women in each of the six samples. If there were no sex differences in variability in the population, the probability of such a finding would be less than 2%, according to a binomial test. Thus this observational study suggests that measured talkativeness varies more among men than among women.

More evidence is available on self-reported sex differences in personality. First in the manuals of many self-report instruments, means and standard deviations are reported separately for women and for men. Second, there are several meta-analyses on sex-differences in personality, although most of them analyzed only the means and used the variances for obtaining effect size estimates only. But that is changing. For example, Cross, Copping, and Campbell (2011) published a meta-analysis on sex differences in impulsivity in adults, analyzing mean levels as well as variances. These authors expected more variability between men than between women, but did not find it except for the disinhibition facet of the Sensation Seeking Scale. The authors explain this nonconfirmation of their expectations by a sampling bias: Clinical and incarcerated samples were excluded, and given the overrepresentation of men in pathological and criminal behavior in which risk taking is a factor, this constraint may have reduced the male more than the female variance.

Another explanation, however, that Cross et al. (2011) do not discuss is that in most of the studies in their meta-analysis personality was measured by self-report, where the sex of the person being described (the target) and the sex of the person who provides the description (the informant) are entirely confounded. Effects of target sex might therefore be masked by countervailing effects of informant sex. But effects of target sex and of informant sex can be separated in descriptions by knowledgeable informants. Borkenau, Hřebíčková, Kuppens, Realo, and Allik (2013) therefore compared the intrasex variances in self-reports and in informant reports of personality, measured by either the NEO PI-R (Costa & McCrae, 1992) or the NEO PI-3 (McCrae, & Costa, 2010), in four samples from Belgium, the Czech Republic, Estonia, and Germany. Whereas self-reports did not vary more among men than among women, the variances were systematically higher for male targets in the descriptions by informants, Neuroticism constituting an exception. In addition, a countervailing effect was obtained for informant sex, in that descriptions by women varied more than descriptions by men. These opposite effects of target sex and of informant sex might explain why no higher variances are found for males in self-reports of personality.

2. The present study

The present study serves three purposes: First, to test whether the findings in the study by Borkenau et al. (2013) hold also in culturally more diverse samples because – despite various differences – the four samples in that study were all European and thus stemmed from a similar cultural background. Second, to examine whether effects of target sex and of informant sex on the intrasex variability in personality differ between samples. Finally, if there are between-sample differences, to identify culture-level predictors which requires a sizable sample of cultures. In this context, it is interesting consulting cross-cultural studies on sex differences in *mean levels* of self-reported (Costa, Terracciano, & McCrae, 2001; Schmitt, Realo, Voracek, & Allik, 2008) and informant-reported (McCrae, Terracciano, & 78 members of the personality profiles of cultures project, 2005) personality traits: Surprisingly, the sex differences in mean levels were larger in the more developed and gender-egalitarian societies. Thus it seems worthwhile studying effects of indicators of the economic and social development of societies like the *Human Development Index* or the *Gender Inequality Index* (United Nations Development Programme, 2011) to investigate whether stronger sex differences are found in more developed societies not only for means but also for variances.

The data for the present analyses were collected in a large cross-cultural project on various aspects of informant reports of personality (McCrae, Terracciano, & 78 members of the personality profiles of cultures project, 2005; McCrae, Terracciano, & 79 members of the personality profiles of cultures project, 2005). In 51 cultures,[1] a total of 12,156 college students participated. The 51 cultures included Belgium, the Czech Republic, Estonia, and Germany, but the samples from these countries differed from those in the study by Borkenau et al. (2013). The 12,156 college students were asked to describe an individual from one of four target groups: college-aged men, college-aged women, adult men (>40 years), or adult women (>40 years). Raters were randomly assigned to one of the four target conditions. Thus distributions of target age and target sex were similar across cultures. Raters could choose as a target anyone they knew well, yielding a wide age and educational range. Although college students are certainly not representative of the general population, and even less so in less affluent countries, this approach made it feasible to obtain information on a wide range of targets in a wide range of cultures. More details on the data collection procedure are reported by McCrae, Terracciano, and 78 members of the personality profiles of cultures project (2005).

Nevertheless, the data quality varied considerably across cultures. Reasons were differences in the quality of the translation of the measurement instrument, that some items developed in Western societies seem to have no counterpart in some non-Western cultures, and that some samples were administered the inventory in a second language (e.g., French in Burkina Faso). Various indicators of data quality were therefore included and aggregated into a composite score that reflected the frequency of valid responses; lack of acquiescent responding or its opposite, nay-saying; number of missing responses (reversed); the participants' knowledge of the language in which the instrument was administered; and whether the translation of the measurement instrument had been published. More details on data quality as well as the languages in which the inventories were administered are reported by McCrae, Terracciano, and 78 members of the personality profiles of cultures project (2005).

3. Method

3.1. Participants

Translation and administration of the measurement instruments constituted an international collaborative effort. Valid peer

[1] In this article, the term *culture* is used loosely, referring to either nations or to subgroups within nations. We are aware that our samples do not necessarily reflect the full cultural diversity within nations.