



Sex and sexual orientation differences in empathizing–systemizing cognitive styles in China



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ABSTRACT

The present study examined sex and sexual orientation differences in empathizing–systemizing (E–S) in a Chinese sample of 239 heterosexual men, 266 heterosexual women, 492 gay men, and 430 lesbian women recruited via the Internet. Empathizing and systemizing were assessed using two different abbreviated 8-item scales derived from longer original scales. There was a significant sex difference in S, with heterosexual men scoring significantly higher on S than heterosexual women, but there was no significant sex difference in E. For men, there were significant sexual orientation differences in E and S. Heterosexual men scored significantly higher on S than gay men, and gay men scored significantly higher on E than heterosexual men. For women, there were no significant differences in E and S between heterosexual and lesbian women. The results indicate a cross-cultural consistency of sex differences in S, while suggesting that E is influenced by culture.

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1. Introduction

In the past ten years, an increasing number of studies have focused on sex differences in the empathizing–systemizing (E–S) cognitive traits. Empathizing is defined as the drive to identify another person's mental state and to respond with the appropriate emotion (Baron-Cohen, 2003). The empathizer intuitively identifies how people are feeling and learns how to treat people with care and sensitivity. Systemizing, on the other hand, is defined as the drive to analyze and construct rule-based systems (Baron-Cohen, Richler, Bisarya, Gurunathan, & Wheelwright, 2003; Wheelwright et al., 2006). The systemizer intuitively figures out how things work or what underlying rules control a system. Systems can be as varied as a pond, vehicle, computer, plant, library catalogue, musical instrument, math equation, or even an army unit.

Empathizing and systemizing traits are generally assessed with Empathy Quotient (EQ, Baron-Cohen & Wheelwright, 2004) and Systemizing Quotient (SQ, Baron-Cohen et al., 2003; Baron-Cohen & Wheelwright, 2004) self-report questionnaires. On average, women score higher than men do on empathizing factors, while men score higher than women do on systemizing factors (Baron-Cohen & Wheelwright, 2004; Baron-Cohen et al., 2003; Wright & Skagerberg, 2012). This E–S discrepancy describes an individual's dispositional

cognitive style and differentiates between typical men and women (Baron-Cohen, 2003; Baron-Cohen, Knickmeyer, & Belmonte, 2005).

The EQ and SQ have shown cross-cultural stability across different countries. However, the majority of studies have been conducted in the UK (Baron-Cohen & Wheelwright, 2004; Baron-Cohen et al., 2014; Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004; Manson & Winterbottom, 2012; Muncer & Ling, 2006; Sucksmith, Allison, Baron-Cohen, Chakrabarti, & Hoekstra, 2013; Wheelwright et al., 2006), Canada (Berthoz, Wessa, Kedia, Wicker, & Grezes, 2008), the US (Wright & Skagerberg, 2012), and Europe (Dimitrijevic, Hanak, Vukosavljevic-Gvozden, & Opacic, 2012; Groen, Fuermaier, Den Heijer, Tucha, & Althaus, 2015; Preti et al., 2011; Vellante et al., 2013; Von Horn, Backman, Davidsson, & Hansen, 2010; Zeyer, Boelsterli, Brovelli, & Odermatt, 2012). Only two studies examined sex differences in empathy in Asia and provided mixed results (Kim & Lee, 2010; Wakabayashi et al., 2007). In a Japanese sample, women scored significantly higher on empathy than men (Wakabayashi et al., 2007). In a Korean sample, there was no significant sex difference in empathy (Kim & Lee, 2010). Only one study examined sex difference in systemizing in Asia (Japan; Wakabayashi et al., 2007). In this study, men from both student and community samples scored significantly higher on systemizing.

These studies have confirmed that EQ and SQ show cross-cultural stability in Western countries, but studies in Asia are still lacking, and the few studies conducted in Asian countries provided mixed results. Their findings indicated that the EQ may be characterized by a lower stability and sensitivity for sex differences in Asian countries (Groen et al., 2015). It remains unclear to what extent cultural differences in the interpretation of the EQ items exist; therefore, the differences

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between Asian and Western countries might partly stem from measurement invariance (Groen et al., 2015). It is necessary to examine sex differences in E–S in other countries to document the cross-cultural stability or cultural sensitivity of E–S. The current study therefore examined sex differences in E–S in a Chinese sample.

Chinese culture differs quite considerably from Western cultures. Influenced by Confucian ideas, China is characterized by a collectivistic culture compared with the more individualistic culture of Western countries. In collectivism, the core unit is the group and individuals must fit into these groups (Oyserman & Lee, 2008). Thus, harmony is an essential value in Chinese society. To maintain the harmony within a group, Chinese individuals have to recognize the emotions of others and respond in appropriate ways. In this context, Chinese individuals' ability to recognize emotions has developed within the collectivistic society. Empathy might therefore be influenced by the Chinese collectivistic culture. As a result, both men and women might be similarly influenced by the collectivistic culture, and sex differences in empathy might be absent in China.

Given the differences in culture between China and Western nations, examining sex differences in E–S will be helpful to understand the factors related to E–S. Although some evidence indicates that E–S is related to biological factors (Chou, Cheng, Chen, Lin, & Chu, 2011; Lai et al., 2012; Sassa et al., 2012; Takeuchi et al., 2013), culture may also exert a critical influence on E–S. To the extent that sex differences prove to be consistent in Chinese and Western samples, biological explanations for such differences become then more plausible. In contrast, if sex differences in E–S vary across cultures, then biological theories become less likely, and cultural and social learning factors for such differences become more plausible (e.g., Costa, Terracciano, & McCrae, 2001).

The E–S dimension may further be associated with sexual orientation and sexual preferences, but current findings are mixed. Two studies reported that homosexual males scored higher on empathy than heterosexual males (Salais & Fischer, 1995; Sergeant, Dickins, Davies, & Griffiths, 2006). Another study found that empathy was related to the preferred sexual partner gender of the participant (Perry, Walder, Hendler, & Shamay-Tsoory, 2013). Individuals sexually attracted to men (heterosexual women and homosexual men) showed greater empathy than subjects attracted to women (heterosexual men and homosexual women). However, another study found no differences in empathizing and systemizing between heterosexual and homosexual men (Nettle, 2007). Taken together, the current literature on this topic shows an inconsistency in the relationships between E–S and sexual orientation; therefore, more studies are needed. The present study examined sexual orientation differences in E–S in a Chinese sample.

2. Method

2.1. Procedures and participants

The study was conducted online via a Chinese survey website (www.sojump.com). Several Chinese websites that cater to gay men and lesbians, including forums and QQ (a popular chat software in China) groups, were used to recruit homosexual participants. The heterosexual sample of the present study was recruited from members of the website Wenjuanxing that comprises 2.6 million members. The proportion of male and female members on Wenjuanxing is approximately equal. Members of the website are from all regions of China and engage in various occupations; more than 2000 studies have used samples from Wenjuanxing in their research. Adult members of Wenjuanxing received an e-mail containing the link to our survey website and a brief introduction of the survey. Participants interested in the survey could complete the survey on the website. Separate surveys were created for male and female respondents. Only participants who were 18 years of age or older were included in the present study.

The sample included 239 heterosexual men, 266 heterosexual women, 492 gay men, and 430 lesbian women. The mean age of the sample was 26.7 years ($SD = 6.9$; range: 18–64). Twenty-nine percent were students and 71% were full-time employees. Fifty (3.5%) participants had a junior high school education or lower, 208 (14.6%) had a high school education, 1048 (73.4%) held a bachelor's degree, and 121 (8.5%) received postgraduate education or higher. The complete socio-demographic information by sex and sexual orientation is shown in Table 1.

2.2. Measures

2.2.1. Socio-demographic variables

Participants reported their socio-demographic information including age, education, occupation, sex, and sexual orientation. Participants reported their sex via a drop-down menu that asked them to select one of two responses: male or female. Sexual orientation was assessed via one question ("What is your sexual orientation?"), with 3 response options via a drop-down menu: heterosexual, homosexual, or bisexual. Participants who described themselves as bisexual were excluded from the data analysis.

2.2.2. Empathizing-systemizing

Empathizing was assessed with an abbreviated 8-item scale used in previous studies (Zheng, Hart, & Zheng, 2015; Zheng & Zheng, 2013). Example items are "I really enjoy caring for other people" and "I can easily tell if someone else is interested or bored with what I am saying." Systemizing was assessed with an abbreviated 8-item scale used in previous studies (Zheng & Zheng, 2013; Zheng et al., 2015). Example items are "I rarely read articles or web pages about new technology" and "I am fascinated by how machines work." Both measures used 5-point scales (1 = *Not at all/disagree*; 5 = *Strongly agree*). Their Chinese versions were obtained from the Autism Research Center's website (<http://www.autismresearchcentre.com>). The original Chinese versions were developed by Cheng and Hung of National Yan-Ming University. Cronbach's alpha values for the systemizing scale for heterosexual men, heterosexual women, gay men and lesbian women were .72, .81, .71, and .71, respectively. Cronbach's alpha values for the empathizing scale for heterosexual men, heterosexual women, gay men and lesbian women were .74, .77, .71, and .73, respectively.

3. Results

3.1. Sex and sexual orientation differences in age

We conducted a 2 (sex: male vs. female) \times 2 (sexual orientation: heterosexual vs. homosexual) ANOVA to assess sex and sexual orientation differences in age. There was a significant main effect for sex, $F(1, 1423) = 33.45, p < .001, \eta^2 = .023$. Men overall reported a higher age than women ($M_{\text{men}} = 27.38, SD = 7.49$; $M_{\text{women}} = 25.94$,

Table 1
Demographic variables by sex and sexual orientation.

	HM (<i>n</i> = 239)	HW (<i>n</i> = 266)	Gay men (<i>n</i> = 492)	Lesbian women (<i>n</i> = 430)
Age (in years)				
<i>M</i>	32.2	29.7	25.1	23.6
<i>SD</i>	7.8	5.7	6.1	5.1
Educational level <i>N</i> (%)				
Junior high school or less	2 (0.8)	2 (0.8)	24 (4.9)	22 (5.1)
Senior high school	9 (3.8)	8 (3.0)	84 (17.1)	107 (24.9)
College	212 (88.7)	230 (86.5)	332 (67.5)	274 (63.7)
Postgraduate or higher	16 (6.7)	26 (9.8)	52 (10.6)	27 (6.3)
Occupation <i>N</i> (%)				
Students	18 (7.5)	25 (9.9)	204 (41.5)	167 (38.8)
Employed	221 (92.5)	241 (90.1)	288 (58.5)	263 (61.2)

Note: HM: heterosexual men, HW: heterosexual women.

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