



Application and Testing the Reliability and Validity of a Modified Version of Herek's Attitudes Toward Lesbians and Gay Men Scale in China

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The present study was the first attempt to test the reliability and validity of Herek's Attitudes Toward Lesbians and Gay Men Scale (ATLG; Herek, 1988) in the Chinese population. Participants ($n = 2,391$ for the field trials and $n = 200$ for test–retest reliability) were asked to complete the translated, slightly modified version of the ATLG. The resulting ATLG has a two-dimensional factor structure as well as good validity and reliability in the Chinese culture. ATLG scores followed distinct patterns according sex and level of education that were consistent with previous studies in other populations. The significance of these findings in Chinese culture is discussed.

KEYWORDS *lesbians and gay men, attitude, scale, homosexuality, China*

The present research describes the psychometric properties of the Attitudes Toward Lesbians and Gay Men scale (ATLG), which consists of two subscales: the Attitudes Toward Lesbians scale (ATL) and the Attitudes Toward

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Gay Men scale (ATG). Herek et al. (1984, 1988, 1994) have shown that the ATLG is psychometrically sound for assessing heterosexuals' attitudes toward homosexuals in the United States. Up to now, the ATLG has been translated and validated in samples from various populations and countries, such as Holland (Bas, Bob, & Albert, 2003) and Chile (Cardenas & Barrientos, 2008).

Although there are previous studies focused on Chinese people's attitudes toward homosexuals, instruments used for measuring attitudes were self-designed and their reliability and validity were not tested. Additionally, these studies exclusively interviewed college students (H. Wang, 2007) and medical staff (Tao, Zhou, & Liu, 2001). It is, therefore, impossible to meaningfully compare the results of these studies with international studies. The current study is the first attempt to test the reliability and validity of Herek's Attitudes Toward Lesbians and Gay Men Scale in a Chinese population.

BACKGROUND

In the 1970s, researchers quickly shifted their focus from trying to modify gay and lesbian individuals' sexual orientation to studying the negative attitudes of heterosexual individuals toward homosexuals (Lester, Wright, Henry, & Adams, 1999). Many instruments for testing the attitudes toward lesbians and gay men have been published in English literature. Societal attitudes toward homosexuals is extremely important and can greatly influence homosexuals well being.

In 134 B.C., Dong Zhongshu (179 B.C.–104 B.C.), a famous Confucian scholar, proscribed non-Confucian schools of thought and advocated Confucianism as the orthodox state ideology. Since then, Confucianism has deeply influenced all aspects of Chinese society, both political and cultural. Common beliefs in traditional Confucian ideology—such as “a man should get married upon coming of age, and so should a girl”; “the more sons, the more blessings”; and “there are three forms of unfilial conducts, of which the worst is to have no descendants”—are focused on producing offspring. Inevitably, all these notions have influenced social attitudes toward homosexual.

Zhang (2002) estimates that in China there are 20 million male homosexuals and 10 million female homosexuals between the ages of 15 to 65. The Ministry of Health estimated that sexually active gay men account for approximately 2–4% (5–10 million) of the all sexually active men in China (Tong, 2005). However, homosexuality in Chinese culture is still regarded as a psychopathy or a kind of unhealthy personality. Homosexuals still experience tremendous psychological pressure from society, and homosexual behavior is widely stigmatized and discriminated against (Yu, 2007). The dilemmas homosexuals face in China are described below.

- a. Due to social discrimination, Chinese homosexuals often feel panic and confusion because of their homosexual behaviors. As such, their activities have to be hidden and can severely jeopardize reporting and identifying HIV/AIDS and other sexually transmitted diseases (STDs) among homosexuals and may accelerate the transmission of STDs and HIV in the whole society.
- b. Relationships between homosexuals are kept secretive and have minimal support from friends and family. Without support many homosexuals can feel depressed and ostracized from their own family. Social discrimination can deeply affect homosexuals' self-confidence, particularly within their relationships and with their partners. In order to hide their sexual orientation, most homosexuals may marry a heterosexual, thus, forcing their partner to feel secondary and unimportant. At the same time, because of a lack of heterosexual sexual desires, both the husband and wife in the "traditional" marriage can suffer from extreme sexual frustration; which in turn finds most (see Y. G. Wang, 2001) gay men and lesbians continue engaging in high-risk sexual behavior with same-sex partners after marriage, opposing the Confucian value of loyalty while endangering the individuals personal health. By having to keep their relationships and feelings secretive, homosexuals in China can suffer mental and sexual distress.
- c. Chinese traditional culture encourages people to get married and have children—especially boys. As Chinese homosexuals grow older, many begin to feel pressure from their family and society to have children. According to Li (2002), in Western countries only one fifth of gay men and one third of female homosexuals are married to heterosexuals. In China, however, due to familial and societal pressures, fewer homosexuals choose to be unmarried. It is estimated that many of them have married heterosexuals, and many of the rest have been ready to.
- d. Stress stemming from family and society is known to be a potential risk factor for the mental health of lesbians and gay men (Wang, 2001). Depression and suicide are prevalent among gay and lesbians. Many studies have demonstrated that sexual orientation directly correlates with depression, suicide and stress. Zheng et al. (2004) investigated 231 MSM and found 45.5% suffered from anxiety and 57.5% from depression. Liu et al. (1999) recruited 51 male and female homosexuals and reported that 33% had showed suicidal behavior in the past.

STATEMENT OF THE PROBLEM

The purpose of this study is to test if the ATLG is a suitable instrument to measure prejudice towards homosexuality in Chinese society. This study was conducted with three primary objectives: a) to examine psychometric

properties of the ATLG scale; b) to explore the factor structure of the scale; and c) to explore the relationship between sex and educational attainment and ATLG scores. It was hypothesized that attitudes toward lesbians and gay men would be related to gender (Herek, 1988, 2002; Herek & Capitano, 1999) and levels of educational attainment (Herek, 1984; Herek & Capitano, 1995; Loftus, 2001; Treas, 2002).

METHODS

Participants

In total, 2,391 participants from Hunan College of Information ($n = 851$), Hunan Business College ($n = 650$), an urban community ($n = 563$), and a medical examination center of Xiangya Hospital ($n = 327$) in Changsha were recruited into this study; 196 invalid questionnaires were eliminated from the analysis. As a result, the present sample consisted of 2,195 participants. Among them, 1,201 were men (54.72%) and 994 (45.28%) were women; age of participants ranged from 16 to 71 years ($M = 33.13$, $SD = 16.47$); 820 (37.36%) subjects came from a urban family and 1,275 (58.09%) from a rural family (another 100 (4.55%) subjects did not report their family origins); 182 (8.29%) subjects received less than college education, 1,050 (47.84%) subjects received junior college education, 904 (41.18%) subjects held a bachelor degree, and 59 (2.69%) subjects held a master's or doctoral degree; 1,799 (81.96%) participants were single and 396 (18.04%) were married; 569 (25.92%) subjects claimed to have a job, 27 (1.23%) were unemployed, and 1,599 (72.85%) were students.

Translation of the ATLG Scale

All translation processes followed Garyfallos et al. (1991) model of translation for maintaining equivalence: forward-and back-translation, evaluation of the translated version by a panel, testing of the translated version with bilingual students, and validating by an expert panel that is bilingual.

In order to be faithful to the original scale, the items were translated from English into Chinese, and then back-translated to English by researches who had never previously read the ATLG scale. Small adjustments to the content of some items were made based on specific Chinese situations (e.g., item 6, "The growing number of lesbians indicates a decline in North American morals" was revised to "The growing number of lesbians indicates a decline in social morals"). These alterations were only minor and the Chinese version is comparable to the English version.

Questionnaires

A demographic questionnaire was employed to obtain demographic information of the participants, including age, sex, educational background, marital status, and employment status.

In this study, the translated ATLG scale is comprised of two subscales, Attitudes Toward Lesbians (ATL) and Attitudes Toward Gay Men (ATG), each having 10 items. There are 7 items (2, 4, 7, 11, 15, 17, 20) are reverse-keyed items. The responses to the Likert-type statements used anchors of 1 (*strongly disagree*) to 5 (*strongly agree*). With 5-point responses, the score of each subscale ranges from 10 to 50 and the score of the combined ranges from 20 (*extremely positive attitude*) to 100 (*extremely negative attitude*). The value of 60 is a neutral attitude and a high score indicates a negative attitude toward lesbians and gay men.

Data Collection

For all participants, the questionnaire was put into an envelope that addressed the purpose and importance of the study. For student participants, the questionnaire was distributed collectively. All student participants were additionally asked to write their student identification, major, and grade on their questionnaires. For community participants, the questionnaire was distributed individually and they were not asked to provide any form of identification. Ten days after the first investigation, 200 students were asked to complete the questionnaire for studying the retested reliability of the questionnaire. Generally, participation required 10 to 15 minutes for completing the questionnaire.

In order to avoid possible exposure to people who helped in the process of data collection, all participants were asked to seal the envelope themselves as soon as they completed the questionnaire. All participants were treated in accordance with the ethical principles of the American Psychological Association (APA, 2002).

Data Analysis

Stability, internal consistency reliability, structure validity, and Cronbach's alpha were used to estimate the internal consistency reliability. Stability was assessed using a repeated measure design with a 10-day interval by Pearson correlations. Construct validity was assessed by principal components analysis and confirmatory factor analysis.

EpiData 3.0 was used to build the database. SPSS 17.0 and AMOS18.0 were used to analyze data. Statistic tests included confirmatory factor analysis, correlation analysis, independent sample *t* test, and principal

components analysis. A *P* value of less than 0.05 was considered statistically significant.

RESULTS

Psychometric Properties of the ATLG Scale

We divided the sample randomly into two halves with over 1,097 cases in each half. Three principal components analyses were conducted (see Table 1), revealing similar results for men, women, and a combined sample. For each analysis, the 20 items loaded on three factors and accounted for 54.42% (eigenvalue = 7.80), 49.75% (eigenvalue = 7.38), and 53.79% (eigenvalue = 8.00) of the total variance, respectively. The ATLG scale yielded high levels of internal consistency [$\alpha = 0.91$ ($n = 579$) for men, 0.91 ($n = 617$) for women, and 0.87 for ATL, 0.88 for ATG, and 0.92 ($N = 1196$) for ATLG]. The test-retest coefficients (10 days interval; 200 participants) of subscales were 0.94 (ATL), 0.95 (ATG), and 0.97 (whole scale).

Confirmatory Factor Analyses

Confirmatory factor analysis was used to examine the fit of this model in the second half of the ATLG data set. Based on the factor structure of the English version (ATL and ATG), the maximum likelihood to confirmatory factor analysis was used. It shows that $\chi^2/df = 1.28$, GFI (Goodness of Fit Index) = 0.94, AGFI (Adjusted Goodness of Fit Index) = 0.92, RMSEA (Root

TABLE 1 Factor Loadings of the Attitudes Toward Lesbians and Gay Men Scale

	Man ($n = 579$)	Woman ($n = 617$)	Total ($n = 1196$)
ITEM 1	0.585	0.499	0.559
ITEM 2	0.412	0.352	0.423
ITEM 3	0.633	0.659	0.656
ITEM 4	0.577	0.522	0.542
ITEM 5	0.734	0.733	0.750
ITEM 6	0.666	0.640	0.671
ITEM 7	0.534	0.466	0.533
ITEM 8	0.623	0.526	0.597
ITEM 9	0.711	0.765	0.742
ITEM10	0.661	0.641	0.658
ITEM11	0.606	0.508	0.595
ITEM12	0.697	0.668	0.704
ITEM13	0.646	0.597	0.638
ITEM14	0.700	0.696	0.722
ITEM15	0.583	0.524	0.576
ITEM16	0.562	0.600	0.603
ITEM17	0.365	0.383	0.381
ITEM18	0.688	0.709	0.715
ITEM19	0.680	0.765	0.727
ITEM20	0.678	0.671	0.699

TABLE 2 Mean Scores and *t* Tests for Effect of all Subjects' Attitudes Toward Lesbians and Gay Men, Respectively

	<i>n</i>	ATL	ATG	<i>t</i>	<i>P</i>
Male	1208	28.26 ± 7.00	35.34 ± 7.38	-30.675	<.001
Female	994	25.08 ± 5.69	31.06 ± 6.34	-28.691	<.001
Total	2195	26.84 ± 6.64	33.43 ± 7.25	-40.555	<.001

TABLE 3 Mean Scores and *t* Tests for Effect of Male and Female Subjects' Attitudes Toward Lesbians and Gay Men, Respectively

	Male (<i>n</i> = 1208)	Female (<i>n</i> = 994)	<i>t</i>	<i>P</i>
ATL	28.26 ± 7.00	25.08 ± 5.69	10.212	<.001
ATG	35.34 ± 7.38	31.06 ± 6.34	12.720	<.001
ATLG	63.60 ± 12.94	56.15 ± 11.14	12.638	<.001

Mean Square Error of Approximation) = 0.03, which indicates the model can be accepted (Wu, 2009) and confirmed the two-factor structure of the ATLG. In conclusion, the modified version of ATLG includes two factors: ATL (items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10) and ATG (items 11, 12, 13, 14, 15, 16, 17, 18, 19, 20).

Sex and Educational Attainment Differences in ATLG Scores

Independent sample *t* tests were conducted to determine whether heterosexual men and women differed in their attitudes toward lesbians and gay men (ATLG). Results are presented in Tables 2 and 3. As predicted, results indicated that men ($M = 63.60$, $SD = 12.94$) had significantly more negative attitudes toward lesbians and gay men than women ($M = 56.15$, $SD = 11.14$), $t(2195) = 12.37$, $p < .001$.

Additionally, participants who received less than a college education had significantly more negative attitudes toward lesbians and gay men ($M = 65.17$, $SD = 13.30$) than those who received a junior college education ($M = 62.38$, $SD = 11.44$) or those who held a bachelor's degree or higher ($M = 57.89$, $SD = 13.53$), $F(2195) = 28.32$, $p < .001$ (Table 4). After age differences among the three groups are controlled, the researchers found a "significant" and "consistent" link between levels of educational attainment and attitudes toward lesbians and gay men, OR = 2.64 (95% confidence interval: 2.08–3.34), $p < .001$.

DISCUSSION

In many prior studies attitudes toward homosexuals were considered without differentiating male or female homosexuals. When homosexuality or homosexuals are mentioned, people often only think of male homosexuality

TABLE 4 Mean Scores and *F* Tests for Effect of Different Educational Background Subjects' Attitudes Toward Lesbians and Gay Men, Respectively

	Less than college (<i>n</i> = 182)	Junior college (<i>n</i> = 1050)	Bachelor degree or higher (<i>n</i> = 963)	<i>F</i>	<i>P</i>
ATL	28.75 ± 6.90	27.63 ± 6.08	25.94 ± 7.08	14.562	<.001
ATG	36.42 ± 7.45	34.74 ± 6.57	31.95 ± 7.63	33.890	<.001
ATLG	65.17 ± 13.30	62.38 ± 11.44	57.89 ± 13.53	28.315	<.001

or gay men (Black & Stevenson, 1984). Currently, however, there is mounting evidence that stark differences exist between attitudes toward lesbians and attitudes toward gay men (D'Augelli & Rose, 1990; Herek & Capitano, 1999, 2002; Kite, 1984; LaMar & Kite, 1998). Collectively, researches indicate that sex is perhaps the greatest predictor of heterosexual attitudes toward lesbians and gay men. Different from other scales, the ATLG developed by Herek is a self-rating scale that can investigate attitudes toward both lesbians and gay men.

This article reports the reliability and validation process of the full ATLG with a Chinese sample. It is found that these scales have high internal consistency, and the subscales are well correlated. Generally, test-retest coefficients >0.7 and Cronbach's alpha >0.8 demonstrates the scale have a good reliability (Gronbach, 1990). The Chinese version of ATLG, therefore, is psychometrically stable and reliable.

In this study, confirmatory factor analysis shows that the ATLG have two factors—attitude toward lesbian and attitude toward gay men—which perfectly met the structure of the original English version of the scale.

The study found a link between sex, levels of educational attainment, and attitudes toward lesbians and gay men. Three reasons can be called upon to explain that relationships:

- a. The gender belief system perspective can be used to explain differences in ATLG scores by gender. Deaux and Kite (1987) defined the gender belief system as “a set of beliefs and opinions about males and females and about the purported qualities of masculinity and femininity.” Kite and Whitley (1996, 1998) drew on the concept of a generalized gender belief system to explain the results of their meta-analysis. This belief system includes such factors as stereotypes about men and women, attitudes toward appropriate roles for women and men, and perceptions of those who presumably violate the traditional pattern of gender roles, including lesbians and gay men. Without a doubt, gender belief systems also exist in the Chinese culture. Heterosexuals' attitudes toward lesbians and gay men are linked to their beliefs about the characteristics that heterosexual women and men should exhibit. For thousands of years, the idea of “man

is superior to woman” has been instilled deep into Chinese culture. Male stereotypes, such as confidence, strength, directness, and courage, are common in Chinese society. Consequently, dislike of lesbians and gay men is particularly strong among people who hold traditional gender-role attitudes because homosexuality poses an especially strong threat to their system of gender beliefs (Kite & Whitley, 1996, 1998).

- b. Male homosexuals are an HIV high-risk group. On November 22, 2006, the Ministry of Health of the People’s Republic of China reported that the infection rate of HIV in gay men is 1–4%, second only to injection drug users (Ding & Xu, 2007). The proportion and overall number of Chinese women infected with HIV has also increased year by year with women accounting for 19.4% of all HIV cases in 2000 to 39.0% in 2004 (UNAIDS, 2004). There still remains, however, a lack of data showing how many women were infected through having sex with other women. For this reason, the public attitude towards gay men is inevitably harsher than public attitude toward lesbians.
- c. Education is known to change people’s beliefs and values (Astin, 1977; Chickering, 1970; Feldman & Newcomb, 1969). Individuals with greater levels of education are less disapproving of homosexual relations than are less-educated persons (Herek, 1984; Herek & Capitanio, 1995; Loftus, 2001; Treas, 2002). This trend holds true not only for the United States but also for other Western nations (Scott, 1998). Our study shows that those individuals with a higher educational level are also more tolerant toward homosexuality. We argue that there are at least two reasons for explaining this phenomenon. First, education may promote tolerance of homosexual sex by teaching support of nonconformity. Second, schooling may promote greater cognitive sophistication and complex reasoning, thus, enabling individuals to better evaluate new ideas.

As a conclusion, the Chinese version of the Attitudes Toward Lesbians and Gay Men Scale is a reliable and valid tool for assessing attitudes toward lesbians and gay men in China.

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APPENDIX

Attitudes Toward Lesbians and Gay Men Scale (ATLG)

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1. Lesbians just can't fit into our society.
 2. A woman's homosexuality should not be a cause for job discrimination in any situation.*
 3. Female homosexuality is detrimental to society because it breaks down the natural divisions between the sexes.
 4. State laws regulating private, consenting lesbian behavior should be loosened.*
 5. Female homosexuality is a sin.
 6. The growing number of lesbians indicates a decline in social morals.
 7. Female homosexuality in itself is no problem, but what society makes of it can be a problem.*
 8. Female homosexuality is a threat to many of our basic social institutions.
 9. Female homosexuality is an inferior form of sexuality.
 10. Lesbians are sick.
 11. Male homosexual couples should be allowed to adopt children the same as heterosexual couples.*
 12. I think male homosexuals are disgusting.
 13. Male homosexuals should not be allowed to teach school.
 14. Male homosexuality is a perversion.
 15. Just as in other species, male homosexuality is a natural expression of sexuality in human men.*
 16. If a man has homosexual feelings, he should do everything he can to overcome them.
 17. I would not be too upset if I learned that my son were a homosexual.*
 18. Homosexual behavior between two men is just plain wrong.
 19. The idea of male homosexual marriages seems ridiculous to me.
 20. Male homosexuality is merely a different kind of lifestyle that should not be condemned.*
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Note. The first 10 items make up the Attitudes Toward Lesbians (ATL) subscale, and the next 10 items make up the Attitudes Toward Gay Men (ATG) subscale. Items with an asterisk require reverse scoring. Response key: 1 = *strongly disagree*; 2 = *disagree somewhat*; 3 = *neither agree nor disagree*; 4 = *agree somewhat*; 5 = *strongly agree*.