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The Role of Sexuality in Cervical Cancer Screening Among Chinese Women

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Objective: Chinese women have significantly lower rates of Papanicolaou (Pap) testing than Euro-Canadian women despite efforts to promote testing. Evidence suggests that Chinese women's reluctance to undergo Pap testing may be related to culture-linked discomfort with sexuality. The purpose of this study was to explore the role of sexuality in the interaction between acculturation and Pap testing. ***Design:*** Euro-Canadian ($n = 213$) and Chinese ($n = 260$) female university students completed a battery of questionnaires. ***Main Outcome Measures:*** Questionnaires assessing sexual knowledge, sexual function, acculturation, and Pap testing frequency. ***Results:*** Euro-Canadian women had significantly more accurate sexual knowledge, higher levels of sexual functioning, a broader repertoire of sexual activities, and higher Pap testing rates. Chinese women were more likely to cite embarrassment as a barrier to Pap testing. Heritage acculturation, but not mainstream acculturation, predicted Chinese women's Pap testing behavior. Mainstream acculturation was associated with more accurate sexual knowledge and greater sexual desire and satisfaction. ***Conclusion:*** The findings provide support for the hypothesis that low Pap testing rates in Chinese women may be associated with heritage acculturation, although the hypothesis that sexual function would predict Pap testing behavior was not supported.

Keywords: acculturation, reproductive health, Pap test, sexuality, Chinese

The Papanicolaou (Pap) test is a screening test for cervical cancer during which cells are removed from the cervix and then biopsied. Because the Pap test enables early detection of abnormal cells that can be treated before they develop into cancer, it is an invaluable tool in preventing cervical cancer if conducted regularly. Despite the usefulness of the Pap test in early cancer detection, research suggests it is underutilized by Chinese women (e.g., Hislopet al., 2004; Kagawa-Singer & Pourat, 2000). There has been progress in research on the low Pap testing rates among Chinese women living in North America, but our understanding of the mechanisms through which culture affects Pap testing remains incomplete. Moreover, there is evidence that culture-linked discomfort with sexuality may be related to reluctance to undergo screening of the reproductive organs, suggesting that sexuality should be a focus of study when researching health behaviors and culture (Kwok, Cant, & Sullivan, 2005). There is a great need to address this deficiency in our understanding because individuals of Chinese descent constitute one of the fastest growing minority groups in North America. Census data indicate that there are more than 3.5 million Chinese individuals in North America (Statistics Canada, 2008; U.S. Census Bureau, 2000). Furthermore, data indicate that although cervical cancer incidence is higher among Caucasian American women, mortality from cervical cancer is slightly higher among Asian American women (American Cancer Society, 2008). The growing Chinese population in North America and cervical cancer incidence and mortality rates indicate that research on the factors that affect Pap testing in Chinese women is urgently needed.

Research on ethnicity and reproductive health behaviors indicates that Asians may be slower to seek medical attention compared to individuals of European descent, which results in inequities in morbidity and mortality rates. Among the preventive cancer screening measures in women's reproductive health, it is well documented that mammography and Pap testing rates are significantly lower among women of Chinese ancestry than those of European ancestry (Kagawa-Singer & Pourat, 2000; Taylor et al., 2002; Tu et al., 2005; Yu, Wu, & Mood, 2005). Current American guidelines recommend that all women have a Pap test at least once every 3 years beginning about 3 years after sexual debut but no later than age 21 (National Cancer Institute, 2008). Canadian guidelines on Pap testing frequency correspond to American guidelines but recommend commencement of testing once a woman becomes sexually active or reaches age 18 (Health Canada, 2008).

The province of British Columbia in Canada has had an organized cervical cancer screening program in place since 1955 in which Pap tests are accessible to women at all general medical practitioners at no cost. Cervical cancer morbidity has fallen by 85%, and deaths have decreased by 75% since inception of this program (British Columbia Cancer Agency, 2005). Despite these reductions, cervical cancer continues to be a cause of illness and death among Chinese women because of low Pap testing rates (Hislop et al., 2000, 2004). In a further effort to reduce barriers to Pap testing among Chinese women in a Canadian city with a large

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Asian population, the Asian Women's Health Clinic was established in 1994, with female Chinese health care professionals providing reproductive health services and education. From 1994 to 1997, the number of new patients presenting at this clinic annually doubled from about 170 to 350 (Sent, Ballem, Paluck, Yelland, & Vogel, 1998), but data indicate that Chinese women's Pap testing rates remain below provincial rates (British Columbia Cancer Agency, 2007; Hislop et al., 2004).

What could be restraining Chinese women's motivation to submit to Pap testing? There is speculation that their low rate of Pap testing could be related to more conservative attitudes, beliefs, and behaviors toward sexuality (Kwok et al., 2005). Although some studies have alluded to the role of sexuality in cervical cancer screening (e.g., Fisher & Fisher, 1998; Tang, Solomon, Yeh, & Worden, 1999), none have empirically tested this hypothesis.

Chinese discomfort with intimate issues can be observed in numerous contexts. Talking about sex is taboo in traditional Chinese families, where older generations, having themselves received inadequate or no sex education, do not know how to bring up the topic with their children and thus prefer not to talk about it (Chang, 1997). Research has consistently found that Chinese individuals possess less sexual knowledge than North Americans (Brotto, Chik, Ryder, Gorzalka, & Seal, 2005; Chan, 1990; Meston, Trapnell, & Gorzalka, 1998). Studies of sexual behavior have also routinely found Chinese individuals to be less sexually experienced than those of European descent (Durex, 2005; Forrest & Singh, 1990; Weisberg, North, & Buxton, 1992). Although there have been significant sociopolitical and economic changes in China since the 1980s, sexual knowledge among Chinese youth continues to be limited and attitudes toward sexuality continue to be conservative by Western standards as a clear tension between traditional Chinese views and Western attitudes toward sex persists (Gao, Lu, Shi, Sun, & Cai, 2001; Higgins & Sun, 2007; Higgins, Zheng, Liu, & Sun, 2002).

It is therefore apparent that there are significant cultural differences in sexual attitudes, knowledge, and behavior, with Chinese people demonstrating more conservative attitudes, less knowledge, and less sexual experience compared to Euro-Canadians. However, although Chinese conservativeness across diverse domains of sexuality is well documented in the sexuality literature and the persistently low occurrence of Pap testing among Chinese women is well established in the literature on health behaviors, culture-linked sexual conservativeness has never been empirically studied as a potential barrier to engaging in cervical cancer screening.

With the increasing Chinese population in North America and much of this increase due to immigration from Asia (Statistics Canada, 2001; U.S. Census Bureau, 2000), research on the role of acculturation in cervical cancer screening is urgently needed. When an individual moves to North America and attempts to integrate into the new culture, a process of acculturation occurs as values of the new culture are incorporated into one's self-identity. Attention to acculturation is crucial given individual differences in the extent to which each person assimilates the new country's values, as well as maintains affiliation with their culture of upbringing, and could provide valuable information to health care practitioners and policymakers that is missed by focusing exclusively on ethnic group membership.

Ryder, Alden, and Paulhus (2000) define *heritage culture* as an individual's culture of birth or upbringing and *mainstream culture* as the predominant culture in the new setting. In support of taking into account acculturation rather than merely examining ethnic group differences, research has found that Chinese Canadian students were more sexually experienced and knowledgeable than Chinese students in Hong Kong, but less experienced and knowledgeable than Euro-Canadian students (Chan, 1986; Meston, Trapnell, & Gorzalka, 1996; Meston et al., 1998). These findings would have been obscured if ethnic group had been the only measure of culture employed. Monumental changes have occurred over the past 2 decades or so with globalization and increasing openness of Chinese society to Western ideas. Consequently, more recent research has found that acculturating Asian students in North America have adopted more open attitudes toward sexuality, although they remain sexually conservative in relation to Western norms (Leiblum, Wiegel, & Brickle, 2003).

The current study is unique in that a bidimensional measure of acculturation, the Vancouver Index of Acculturation (VIA; Ryder et al., 2000), was used. The VIA is a self-report instrument that measures mainstream and heritage acculturation independently. This study adopts the bidimensional approach to assess acculturation because it allows for the possibility that individuals may continue to maintain ties with the values, beliefs, and behaviors of their heritage culture while adopting aspects of the mainstream culture, thereby providing more rich information than the unidimensional approach (Berry, 1980). The finding by Brotto et al. (2005) that mainstream and heritage acculturation interact significantly in predicting sexual attitudes, with Westernization having little effect on sexual attitudes if a woman maintained strong heritage ties, is an example of a fascinating effect that would not have been detected with a unidimensional measure of acculturation.

The primary aim of this study was to explore the role of sexuality and acculturation in Chinese women's cervical cancer screening behaviors. Although it makes intuitive sense that the reluctance of Chinese women to submit to Pap testing could be connected to discomfort with sexuality and embarrassment, and some studies have alluded to conservative sexuality as a potential barrier to screening, we sought to test this hypothesis empirically with a view toward developing culturally appropriate interventions to increase Pap testing rates in this group. First, because studies have demonstrated a robust relationship between sexual attitudes and sexual function such that a more open attitude is strongly associated with greater sexual function (Athanasiou & Shaver, 1971; Schmidt, Sigusch, & Meyberg, 1969), we hypothesized that higher sexual function would be linked to greater likelihood of Pap testing. Second, among the Chinese women, we hypothesized that higher mainstream acculturation and lower heritage acculturation would be associated with higher likelihood of Pap testing.

Method

Participants

Female undergraduate students at a large Canadian university who were enrolled in psychology courses offering extra credit for research participation were eligible to take part in this study. Of 584 women who returned their questionnaire packages, 260 self-identified as Chinese and 213 self-identified as Euro-Canadian. Among the Chinese group, 40% were born in North America, with

the remainder born abroad. The remaining 111 women self-identified as other ethnic groups and were excluded from further analyses for the purposes of this study. Some of the data on ethnic group differences in Pap testing rates have been published elsewhere (Brotto, Chou, Singh, & Woo, 2008); however, they will be analyzed further in the current paper.

Demographic data are presented in Table 1. The Euro-Canadian participants were significantly older, $t(318) = -4.88$, $p < .001$, and had significantly more years of education than the Chinese group, $t(468) = -2.99$, $p < .01$.

Procedure

The study was publicized using the university's online research participation management system. Interested students collected a questionnaire package, completed it at home (90 min), and returned it to the research laboratory in a sealed envelope. All participants gave written informed consent and received course credit for their participation. All procedures were approved by the university's Behavioral Research Ethics Board.

Measures

Vancouver Index of Acculturation (VIA). The VIA (Ryder et al., 2000) was used to assess the mainstream and heritage dimensions of acculturation separately in keeping with a bidimensional model of acculturation. More Westernization is reflected by higher scores on the mainstream dimension, and higher affiliation with one's heritage culture is reflected by higher scores on the heritage dimension. The VIA consists of 20 items, with 10 domains. One heritage and 1 mainstream item is keyed to each domain: cultural traditions, marriage partner, social activities, comfort in professional relationships, entertainment, behavior, maintenance or development of cultural practices, values, humor, and social relationships. Both dimensions of the VIA were found to have good internal consistency in the Chinese validation sample (Cronbach's alphas = .92 for heritage acculturation and .85 for mainstream acculturation).

Sexual Beliefs and Information Questionnaire (SBIQ). The SBIQ (Adams et al., 1996) is a 25-item inventory that assesses beliefs and knowledge about sexual functioning. Participants select "True," "False," or "Don't Know" in response to each item. The total score is computed by summing the number of items that were answered correctly and reflects the accuracy of sexual knowledge. The SBIQ has good internal consistency (Cronbach's alpha = .82) and satisfactory test–retest reliability ($r = .82$, $p < .001$).

Female Sexual Function Index (FSFI). The FSFI (Rosen et al., 2000) is a self-report measure of sexual function and consists of six subscalse: Desire, Arousal, Lubrication, Orgasm, Satisfaction, and Pain. The total FSFI score is obtained by summing the scores from the individual domains. Test–retest reliability is high for each domain ($r = .79$ to .86) and internal consistency is high (Cronbach's alpha values were .82 and higher).

Women's Health Questionnaire (WHQ) and Health Beliefs Questionnaire (HBQ). The WHQ (Barroetavena, 2005) and HBQ (Woo, 2005) are unpublished questionnaires developed for this study to assess participants' cancer screening practices, beliefs about cancer, and barriers to cancer screening. At the time of this study, no published questionnaire assessing beliefs and behaviors relating to Pap testing was available.

Data Analysis

The data were analyzed in two sequential steps: First, the Euro-Canadian women were compared to the Chinese women to examine the effect of ethnic group membership on sexuality variables such as sexual knowledge and sexual function and on cancer screening variables such as Pap testing behaviors and knowledge. Next, the data for the Chinese women only were analyzed to examine the role of acculturation on these variables. To analyze the ethnic group differences, we conducted chi-square tests, *t* tests, and a logistic regression. In analyzing the data for the Chinese women, we conducted a logistic regression and Pearson *r* correlations. Data analysis was carried out using SPSS version 13.

Table 1
Demographic Variables in Chinese and Euro-Canadian Female University Students

Variable	Chinese ($n = 260$)	Euro-Canadian ($n = 213$)
Mean (*SD*) age (years)***	20.53 (2.62)	22.28 (4.65)
Place of birth (%)***		
Canada or United States	40.0	87.8
China, Hong Kong, or Taiwan	55.4	0.0
Southeast Asia	4.2	0.5
Europe	0.0	7.1
Other	0.4	4.6
Mean (*SD*) education (years)**	14.70 (1.46)	15.11 (1.45)
Currently in a relationship (%)**	51.5	64.7
Marital status (%)***		
Unmarried	97.7	89.1
Married	1.2	9.5
Divorced	0.4	0.9
Mean (*SD*) acculturation score		
Mainstream	68.45 (10.91)	
Heritage	69.04 (11.24)	

** $p < .01$. *** $p < .001$.

Results

Effects of Self-Identified Ethnic Group (Euro-Canadian vs. Chinese) on Measures of Sexuality

Data on relationships and sexual activity are presented in Table 2. There were significantly more Euro-Canadian women (65%) compared to Chinese women (52%) who reported being in a relationship, $\chi^2(1) = 8.41$, $p < .01$, $\varphi = -.13$. Among the women who were in a relationship, relationship length was significantly longer in the Euro-Canadian women ($M = 2.50$ years) compared to the Chinese women ($M = 1.86$ years), $t(234) = -1.96$, $p = .05$.

In regard to the sexuality measures, the Euro-Canadian women scored significantly higher on the SBIQ, $t(468) = -8.36$, $p < .001$, indicating more accurate knowledge about sexuality (Euro-Canadian $M = 19.15$, $SD = 2.70$; Chinese $M = 16.73$, $SD = 3.59$). Scores on all subscales of the FSFI were significantly higher in the Euro-Canadian relative to the Chinese group: Desire, $t(471) = -6.50$, $p < .001$; Arousal, $t(470) = -8.48$, $p < .001$; Lubrication, $t(470) = -7.80$, $p < .001$; Orgasm, $t(464) = -7.63$, $p < .001$;

Table 2
Comparisons of Chinese to Euro-Canadian Female University Students on Relationship Length and Sexual Activity Among Those Who Reported Being in a Current Relationship

Variable	Chinese (n = 134)	Euro-Canadian (n = 138)
Mean (*SD*) length of relationship (years)*	1.86 (2.07)	2.50 (3.19)
Recently engaged in hugging, kissing, or holding hands (%)*	94.0	99.3
Recently engaged in touching with clothing removed (%)***	83.6	97.1
Recently touched their partner's genitals (%)***	78.4	97.1
Recently performed oral sex on their partner (%)***	58.2	89.9
Recently had oral sex performed on them by their partner (%)***	46.3	87.0
Recently engaged in vaginal–penile intercourse (%)***	67.9	92.0

* $p < .05$. *** $p < .001$.

Satisfaction, $t(396) = -3.63$, $p < .001$; Pain, $t(471) = -6.67$, $p < .001$, indicating higher levels of sexual response in each of these domains. The Euro-Canadian women also had higher FSFI total scores, $t(382) = -7.73$, $p < .001$, indicating higher levels of sexual response in the Euro-Canadian women (Euro-Canadian $M = 26.01$, $SD = 7.75$; Chinese $M = 18.75$, $SD = 10.87$).

On measures of types of sexual activities among the women who were in a relationship, the Euro-Canadian women were more likely to have engaged in kissing, hugging, and holding hands, $\chi^2(1) = 5.85$, $p < .05$, $\varphi = -.15$; more likely to have touched with clothing removed, $\chi^2(1) = 14.37$, $p < .001$, $\varphi = -.23$; more likely to have touched a partner's genitals, $\chi^2(1) = 22.40$, $p < .001$, $\varphi = -.29$; more likely to have performed oral sex on a partner, $\chi^2(1) = 35.62$, $p < .001$, $\varphi = -.36$; and more likely to have had oral sex performed on them, $\chi^2(1) = 50.84$, $p < .001$, $\varphi = -.43$. In addition, the Euro-Canadian women were significantly more likely to have had vaginal–penile intercourse, $\chi^2(1) = 24.85$, $p < .001$, $\varphi = -.30$.

Effects of Self-Identified Ethnic Group (Euro-Canadian vs. Chinese) on Measures of Cancer Screening Beliefs and Behaviors

Significantly more Euro-Canadian women than Chinese women reported ever having had a pelvic exam, $\chi^2(1) = 136.56$, $p < .001$, $\varphi = -.54$, and having had a Pap test in the past 2 years, $\chi^2(1) = 152.41$, $p < .001$, $\varphi = .57$. Results reported by Brotto et al. (2008) indicate significant ethnic differences in Pap testing rates but no differences in time elapsed since last Pap test among women who reported having had at least one Pap test. However, the Euro-Canadian women had significantly more Pap tests in the previous 5 years, $t(302) = -13.09$, $p < .001$.

Euro-Canadian women and Chinese women did not differ on whether they had a regular family doctor, $\chi^2(1) = 2.20$, $p > .05$, $\varphi = .05$. However, Chinese women were significantly less likely to have a female primary care provider compared to the Euro-Canadian women, $\chi^2(2) = 27.90$, $p < .001$, Cramér's $V = .24$, and significantly more Euro-Canadian women had ever been told by their doctors that they should have a Pap test done, $\chi^2(1) = 100.39$, $p < .001$, $\varphi = .46$. Data on cervical cancer screening behaviors and primary health care are presented in Table 3.

There were no ethnic group differences in the proportion of women who correctly endorsed the statement "Pap tests can prevent cancer," $\chi^2(1) = 0.28$, $p > .05$, $\varphi = .024$. However, significantly fewer Chinese women correctly endorsed the statements "A woman needs to continue having Pap tests after menopause," $\chi^2(1) = 6.88$, $p < .01$, $\varphi = .12$, and "Pap tests are necessary even if a woman has no symptoms," $\chi^2(1) = 16.75$, $p < .001$, $\varphi = .19$. Chinese women were also more likely to state that embarrassment, $\chi^2(1) = 39.50$, $p < .001$, $\varphi = -.29$, concerns about pain or discomfort, $\chi^2(1) = 57.38$, $p < .001$, $\varphi = -.35$, and fear of finding cancer, $\chi^2(1) = 22.72$, $p < .001$, $\varphi = -.22$, were deterrents to Pap testing. The two groups did not differ in their belief that some cancers can be cured if they are detected early, $\chi^2(2) = 2.87$, $p > .05$, Cramér's $V = .08$.

Effects of Self-Identified Ethnic Group (Euro-Canadian vs. Chinese) and Measures of Sexuality on Cancer Screening Behaviors and Knowledge

A logistic regression was conducted to assess whether ethnicity, sexual knowledge, sexual function, and beliefs about cervical cancer screening could predict whether a woman had ever had a Pap test. The overall model was found to be significant, $\chi^2(10) = 325.74$, $p < .001$, and revealed that self-reported ethnicity and sexual activity were both significantly associated with ever having had a Pap test, such that Euro-Canadian women and women who were sexually active were more likely to have ever had a Pap test. In addition, women for whom embarrassment was a barrier to Pap testing and women who had never been told by their doctors to get a Pap test were less likely to report ever having had a Pap test. Women who were concerned about pain were less likely to have ever had a Pap test. Notably, sexual knowledge was not predictive of ever having had a Pap test, and whether or not she believed that Pap tests were necessary in the absence of symptoms was not significantly associated with ever having had a Pap test. Gender of physician and fear of finding cancer were also not predictors of Pap testing behavior. Results of the full model are presented in Table 4.

Table 3
Comparisons of Chinese to Euro-Canadian Female University Students on Cervical Cancer Screening Behavior and on Their Primary Health Care Providers

Variable	Chinese (n = 260) %	Euro-Canadian (n = 213) %
Have ever had a pelvic exam***	18.8	72.3
Have had a Pap test in the previous 2 years***	18.1	74.6
Have a regular primary care provider	80.8	75.1
Have a female primary care provider***	39.1	60.2
Have ever been told by their doctor to have a Pap test***	20.5	66.2

*** $p < .001$.

Table 4
Odds of Ever Having Had a Pap Test: Chinese and Euro-Canadian Women

Variable	Odds ratio
Self-reported ethnic group*** (Reference = Euro-Canadian)	4.92
Sexual knowledge (SBIQ score)	1.05
Sexual function (FSFI score)	1.03
Gender of doctor (Reference = Male)	1.73
Has been told by their doctor to have a Pap test*** (Reference = Has not been told)	14.84
Whether or not sexually active (Reference = Yes)***	0.15
Believes that Pap tests are necessary even when there are no symptoms (Reference = Does not believe)	2.65
Is prevented from getting a Pap test by embarrassment** (Reference = Not prevented)	0.19
Is prevented from getting a Pap test by concerns about pain** (Reference = Not prevented)	0.42
Is prevented from getting a Pap test by fear of finding cancer (Reference = Not prevented)	0.73

Note. SBIQ = Sexual Beliefs and Information Questionnaire; FSFI = Female Sexual Function Index.
** $p < .01$. *** $p < .001$.

Effects of Acculturation and Measures of Sexuality on Cancer Screening Behaviors (Chinese Women Only)

Mainstream but not heritage acculturation was significantly correlated with SBIQ scores such that more Westernized women had more accurate sexual knowledge, $r(260) = .18$, $p < .01$. Mainstream acculturation was also significantly correlated with FSFI Desire, $r(285) = .16$, $p < .05$, such that women with higher mainstream acculturation reported greater sexual desire.

A logistic regression was conducted to bring together acculturation, sexual knowledge, sexual function, and cervical cancer screening variables in the prediction of whether Chinese women had ever had a Pap test. The overall model was significant, $\chi^2(8) = 118.07$, $p < .001$, and showed that among the Chinese women, doctor's recommendation and being sexually active significantly predicted a higher likelihood of a woman's ever having had a Pap test. Heritage acculturation trended toward significance ($p = .07$) such that lower heritage acculturation was linked to higher odds of having ever had a Pap test. Results are presented in Table 5.

Discussion

Culture and Sexuality

Chinese thought and culture have been most heavily influenced by the teachings of Confucius, who viewed sex as being good as long as it did not lead to social instability or damage interpersonal relationships. However, the Neo-Confucians of the Song Dynasty (960 to 1276 A.D.) gave the Confucian classics strict interpretations when Confucianism was declared the official state doctrine. From this time on, Confucianism became sexually suppressive; sexual behavior was reserved for marriage and was viewed as serving a purely procreative role. This long history of sexual suppression appears to form the foundation for traditional Chinese attitudes toward sexuality (Ng & Lau, 1990).

Against this backdrop of centuries of sexual repression in Chinese culture, it is not surprising that individuals of Chinese descent hold more conservative attitudes toward sex, possess less sexual knowledge, and are less sexually experienced than their Euro-Canadian counterparts (Brotto et al., 2005; Brotto, Woo, & Ryder, 2007; Meston et al., 1998). Consistent with this, the current study found that Euro-Canadians had more accurate sexual knowledge and higher levels of sexual functioning. Among those who were in a relationship, the Euro-Canadian women also had a broader repertoire of sexual activities, with more of the Euro-Canadian women having engaged in kissing, hugging, and holding hands; touching with clothing removed; touching a partner's genitals; giving and receiving oral sex; and vaginal–penile intercourse.

Culture, Sexuality, and Cancer Screening Practices

In analyses of the Euro-Canadian and Chinese women together, contrary to our first hypothesis, neither sexual knowledge nor sexual function was predictive of whether or not a woman had ever had a Pap test. On the other hand, sexual activity, ethnicity, concerns about pain, embarrassment, and doctor's advice regarding Pap testing were all significant predictors of whether a woman had ever had a Pap test. In fact, doctor's recommendation had the largest effect on Pap testing likelihood, a result that is consistent with prior research on health behaviors (e.g., Coughlin, Breslau, Thompson, & Benard, 2005; Ling, Klein, & Dang, 2006). Arguably, the variable that is most within the control of public health agencies and education programs is the recommendations that doctors make to their patients. Taken together with the finding that significantly more Euro-Canadian women than Chinese women had ever been told by their doctor to have a Pap test, education of doctors to discuss reproductive health with all female patients may be a first step toward reducing the persistent disparity in Pap testing rates.

It is interesting that, among the Chinese women, heritage acculturation trended toward significance in predicting Pap testing likelihood such that those who continued to affiliate strongly with traditional Chinese culture were less likely to have ever had a Pap test. Although not quite reaching statistical significance, the odds ratio of 0.66 suggests that heritage acculturation may merit attention when seeking to understand Chinese women's Pap testing behavior. On the other hand, mainstream but not heritage accul-

Table 5
Odds of Ever Having Had a Pap Test: Chinese Women Only

Variable	Odds ratio
Heritage acculturation	0.66
Mainstream acculturation	1.35
Sexual knowledge (SBIQ score)	1.01
Sexual function (FSFI score)	1.05
Has been told by their doctor to have a Pap test*** (Reference = Has not been told)	15.06
Gender of doctor (Reference = Male)	1.14
Whether or not sexually active (Reference = Yes)*	0.12
Age	1.18

Note. SBIQ = Sexual Beliefs and Information Questionnaire; FSFI = Female Sexual Function Index.
* $p < .05$. *** $p < .001$.

turation was correlated with sexual knowledge and sexual function. It therefore appears that although acculturation may be implicated in both sexuality and Pap testing behaviors, different dimensions of acculturation are important to each, which was an unexpected finding. Why might mainstream acculturation be associated only with sexual knowledge and function, whereas heritage acculturation is only linked to Pap testing behavior? This may be due to different processes that occur during acculturation. Sexual knowledge may become more accurate as acculturating Chinese women come into contact with aspects of Western culture such as portrayals of sexuality in the media. In so doing, sexual openness may increase as suggested by the higher sexual response scores. However, if a woman continues to adhere strongly to her heritage culture, Chinese cultural beliefs may hamper willingness to undergo Pap testing. Research suggests that in Chinese culture, gynecological services are viewed as necessary only in relation to reproduction or when symptoms of illness become intolerable (Jackson et al., 2002; Lee, Lee, & Stewart, 1996). Pap tests are also seen as unnecessary prior to marriage as sexual activity supposedly does not occur outside marriage (National Asian Women's Health Organization, 1995). Thus, unmarried Chinese women may be discouraged from accessing these health services for fear of social denunciation.

Our hypothesis that discomfort with sexuality and embarrassment with having one's genitals examined play a central role in Chinese women's reluctance to submit to Pap testing is supported by the present findings. Embarrassment was more likely to be a barrier to Pap testing for Chinese women than for Euro-Canadian women. Given conservative Chinese views of sex, and the incursion into areas of the body normally exposed only during sexual activity that is necessitated by a Pap test, it is understandable that asymptomatic Chinese women would be disinclined to actively seek out and voluntarily submit to a Pap test even though the vast majority of them (89.2%) acknowledged that Pap tests are necessary even in the absence of symptoms.

The findings of this study that Euro-Canadian women had had more Pap tests than Chinese women in the previous 5 years and that more Euro-Canadian women than Chinese women had ever had a pelvic exam and had had a Pap test in the previous 2 years conform to the well-documented finding of low rates of Pap testing among Chinese women. However, it is interesting that Brotto et al. (2008) found no significant ethnic difference in the time elapsed since a woman's last Pap test among women who reported having ever had a Pap test. This indicates that among women who have overcome initial barriers to Pap testing, the two groups were comparable in terms of compliance with recommendations on Pap testing frequency (Health Canada, 2008; National Cancer Institute, 2008). This is important because it suggests that if a Chinese woman can be convinced to have her first Pap test, she may be likely to undergo regular screening, which greatly reduces her odds of developing and dying from cervical cancer.

This study has some limitations that must be addressed. First, our university sample is significantly younger, more educated, more fluent in English, and has higher socioeconomic status than would be presumably found among Chinese women in the general population. Hislop et al. (2000) found that these were all factors that predicted lower Pap testing rates among women in the community. Thus, the results of this study may not be generalizable to the general population. Furthermore, because our sample was relatively young, we are unable to ascertain whether the ethnic and acculturation differences in Pap testing behavior become more pronounced as women age. Another limitation of the current study is the use of unvalidated questionnaires (Barroetavena, 2005; Woo, 2005) to assess Pap testing behaviors and knowledge because no validated measures existed at the time of data collection. However, this limitation may be mitigated by considering that the WHQ (Barroetavena, 2005) has been used in prior studies of Pap testing behaviors in Chinese women (e.g., Hislop et al., 2004; Tu et al., 2005).

To conclude, the rapid growth in the Chinese population in Canada and the United States has lent greater urgency to the search for sound theories that can account for the reluctance of women of this ethnic group to seek potentially life-saving preventive health services. Chinese women are more conservative in their sexual beliefs, attitudes, and behaviors than Euro-Canadian women. Compared to Euro-Canadian women, Chinese women also lag behind in terms of knowledge about sexuality, risk factors for cervical cancer, and general information on the importance of the Pap test. The results of this study underscore the importance of encouraging physicians to discuss the Pap test and any concerns surrounding the Pap test with their Chinese patients, replicating results from numerous other studies of Pap testing behaviors in Asian women. In addition, the finding that lower heritage acculturation trended toward being linked to higher odds of ever having had a Pap test suggests that this dimension of acculturation may play a role in Chinese women's decisions in regard to cervical cancer screening. Thus, although the results of this study did not support our first hypothesis that higher sexual function would be associated with increased Pap testing behavior, the results provide preliminary support for our second hypothesis that acculturation may play a role in Pap testing behavior.

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