

Ethnicity, Gender, and the Theory of Planned Behavior: The Case of Playing the Lottery

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This study uses the theory of planned behavior (TPB) to explain why some people play the lottery, and it examines how the TPB's variables and variable relationships differ due to ethnicity, or gender, or their interaction. A telephone interview conducted in English, Cantonese, and Mandarin resulted in data on the lottery play intentions of 208 Chinese/Canadians (97 males, 111 females) and 220 British/Canadians (112 males, 108 females). When intention to play the lottery was regressed on six TPB variables, it was found that: (a) affective attitude was an important predictor for all four groups, while instrumental attitude was only important for British/Canadian males; (b) injunctive norm was an important predictor only for Chinese/Canadian males, while descriptive norm was an important predictor only for British/Canadian males; (c) controllability was an important predictor only for Chinese/Canadian females, with a negative coefficient suggesting secondary control; and (d) self-efficacy was not an important predictor for any of the groups. A follow-up mail questionnaire provided additional data on the self-reported lottery play behavior of 100 Chinese/Canadians (51 males, 49 females) and 115 British/Canadians (57 males, 58 females) 30 days after the initial telephone interview was conducted. When lottery play behavior was regressed on self-efficacy, controllability, and intention, intention was found to be an important predictor for all four groups. These findings are discussed in light of recent research on the TPB, leisure and gambling, and ethnicity and gender.

KEYWORDS: *Ethnicity, gambling, gender, leisure, theory of planned behavior.*

Introduction

Researchers have long been interested in why some people participate in certain leisure activities while others do not. Typically, studies use either proximal (e.g., attitudes, norms, motivations) or distal (e.g., race, ethnicity, gender) variables to explain similarities and differences in participation. As Mannell and Kleiber (1997) recognize, however, the former's explanatory

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ability is hampered by the lack of a "comprehensive social psychology of gender or cultural differences in leisure" (p. 27). Likewise, Hutchison (2000) holds that the latter's explanatory ability—at least in terms of ethnic and racial variation in leisure engagement—has been hindered by a lack of attention to intervening variables. As it happens, there is a framework that could address both of these issues; the theory of planned behavior (TPB) (Ajzen, 1991).

According to the theory of planned behavior (Ajzen, 1991), an individual's behavior is largely dependent on his or her intention to perform that behavior which, in turn, is determined by: (a) the person's attitudes toward the behavior, (b) the subjective norms he or she believes significant others have concerning the behavior, and (c) his or her perception of whether the behavior can be performed (i.e., perceived behavioral control). The TPB's proximal variables have been used to explain people's participation in hunting (Hrubes, Ajzen, & Daigle, 2001; Rossi & Armstrong, 1999), boating, biking, climbing, jogging, and beach activities (Ajzen & Driver, 1991, 1992), casino gambling (Oh & Hsu, 2001), drinking alcohol (Trafimow, 1996), attending dance classes (Pierro, Mannetti, & Livi, 2003), engaging in physical activity (Courneya, 1995), and playing basketball (Arnscheid & Schomers, 1996). Multiple regression results generally support the TPB. Hrubes et al., for example, found that attitudes, subjective norms, and perceived behavioral control all predicted intentions to hunt, and intentions (but not perceived behavioral control) predicted hunting behavior. Likewise, Oh and Hsu found attitudes, subjective norms, and three types of perceived behavioral control all predicted casino gambling intentions, and intentions (but not the perceived behavioral control variables) predicted casino gambling behavior. Courneya found that attitudes, subjective norms, and perceived behavioral control all predicted physical activity intentions. It should be noted, however, that none of these three studies or the other studies cited above, took into account the potential effects of race, ethnicity, or gender.

Until recently this omission was also not uncommon in social psychological research. Though rare, these contemporary studies do seem to support the theory of planned behavior's applicability across ethnic and cultural groups—while recognizing that important differences do exist. For example, Malhotra and McCort (2001) examined how Chinese and American students selected a pair of athletic shoes using the TPB's precursor, the theory of reasoned action (Fishbein & Ajzen, 1975). Multiple regression results supported the use of the theory of reasoned action cross-culturally although, as the authors expected, affective concerns were more important for the U.S. students while cognitive concerns were more important for the Hong Kong students. In another study, Blanchard et al. (2004) investigated whether ethnicity moderated the association between the TPB and physical activity. They found that while subjective norm and self-efficacy made significant and unique contributions to intention for both African-Americans and Caucasian Americans, the attitude/intention relationship was significantly stronger for African-Americans. Similarly, Godin et al. (1996) used the TPB to look at

condom usage among Latin American, South Asian, and English-speaking Caribbean immigrants to Canada. The researchers found that while attitude, subjective norm, and perceived behavioral control were significant predictors for Latin American and English-speaking Caribbean study participants, only attitudes and perceived behavioral control were significant for South Asian participants. Additionally, gender differences were also evident, with attitude not being significant for Latin American men and English-speaking Caribbean women. Finally, in a study of exercise intention, Blanchard et al. (2003) found that affective attitudes had a stronger effect for Caucasian females (vs. Caucasian males) and African-American males (vs. African-American females). On the other hand, they discovered that instrumental attitudes had a stronger effect for Caucasian males (vs. Caucasian females) and African-American females (vs. African-American males).

In conclusion, although the theory of planned behavior has often been used to explain participation in leisure activities and has exhibited cross-cultural applicability, leisure researchers have not examined how the TPB may or may not vary due to ethnicity, either alone or in conjunction with gender. In order to begin to address this research issue, seven TPB-based hypotheses are put forth to investigate why some British/Canadian and Chinese/Canadian males and females play the lottery while others do not. The decision to focus on these two ethnic groups is based on the fact that people of Chinese background are the fastest growing minority group in Canada (Statistics Canada, 2003a).¹ The decision to focus on this leisure activity is based on the prevalence of playing the lottery among British/Canadian and Chinese/Canadian males and females, a finding discussed in further detail immediately below.

Literature Review

There is little doubt that gambling generally and playing the lottery specifically are extremely popular leisure activities in North America. In the United States, for example, Welte, Barnes, Wieczorek, Tidwell, and Parker (2002) found that 82% of Americans reported having gambled in the past 12 months, with the most prevalent activity being playing the lottery (66%). Similarly, Azmier (2001) found that 72% of Canadians had gambled in the previous year, with the most popular activity once again being playing the lottery (50%). In Alberta, where this study was conducted, gambling prevalence was even higher with 83% of Albertans reporting having gambled in the past year (Smith & Wynne, 2002). Smith and Wynne found, however, that this percentage varied by gender and ethnicity. Specifically, males were significantly ($p < .01$) more likely than females to have gambled in the past year (84% vs. 80%) while, of the four European and one Aboriginal groups

¹For comparison purposes, although the largest percent of immigrants to the United States are from Mexico (27%), the second largest percentage (5%) is Chinese—specifically immigrants from Taiwan, Hong Kong, and mainland China (Camarota, 1999).

identified, British Islanders were significantly ($p < .05$) less likely than Ukrainians to have gambled (84% vs. 96%, respectively). Finally, of all of the gambling activities available to Albertans, playing the lottery was the most popular (62%).

Unfortunately there has been relatively little in-depth research on how ethnicity may affect gambling prevalence. In the case of Chinese, for example, only two studies have been conducted in the United States or Canada. In the first study, after selecting "Chinese-sounding names" from the Greater Toronto telephone book, Kwan (1997) found that 80% of his participants reported having gambled in their lifetime, with males having a higher prevalence rate than females. In the second study, a non-random sample of Chinese conducted in Montreal, Sin (1997) reported that only 32% of participants indicated that they had gambled in the previous year. For comparative purposes, these prevalence figures can be measured against two non-Canadian studies, the first conducted with Chinese living in Victoria, Australia, and the second conducted with Chinese living in Hong Kong. In the case of the former, the Cultural Partners Australia Consortium (2000) conducted a random sample telephone survey and found that 62% of Chinese had gambled in the past 12 months. Playing the lottery was the most common gambling activity, with 46% of study participants having done so. In the case of the latter, the Centre for Social Policy Studies (2002) also conducted a random sample telephone survey and found that 78% of Hong Kong Chinese had gambled in the past year. Once again, playing the lottery was the most common gambling activity (64%). It is important to add that while Hong Kong has a long gambling history (Centre for Social Policy Studies), mainland China—now the leading country of birth for immigrants to Canada (Statistics Canada, 2003b)—has only recently legalized some forms of gambling (China Daily, 2000), with playing the lottery being the most widespread and popular activity.²

Despite the lottery's popularity, only one other study has looked at this leisure activity using the theory of planned behavior. Based on a series of surveys conducted in Britain, Sheeran and Orbell (1999) found that, when multiple regression analyses were conducted, while attitudes (affective and instrumental combined) and descriptive norms predicted a person's intention to play the lottery, the self-efficacy dimension of perceived behavioral control did not, with mixed results being found for injunctive norms. According to the authors these findings are consistent with past research in that: (a) attitudes have been found to be a better predictor than injunctive norms, with the latter only being a significant predictor on occasion, and

²The lottery is not an entirely new leisure activity in mainland China, however; it was played 3,000 years old to help fund construction of the Great Wall (China Contact, 2002). Interestingly, lotteries also "enjoy an honoured place in American history as a device for raising funds for public projects, including a prominent role in financing the establishment of the first English colonies. In 1776, lotteries operated in all 13 colonies" (Alberta Gaming and Liquor Commission, 2001, p. 25).

then typically explaining only a small portion of variance (p. 2111); (b) descriptive norms are important because they "motivate the person by showing him or her what is the typical or *normal* thing to do, and what is likely to be an effective and adaptive decision" (p. 2112); and (c) the self-efficacy dimension of perceived behavioral control does not generally help predict more easily controllable intentions such as, for example, playing the lottery (p. 2122). Finally, of the original TPB variables examined in their study, only intention predicted behavior, explaining approximately 30% of the variance.

As noted earlier, the theory of planned behavior differentiates between an attitude's affective and instrumental aspects. Although usually combined, recent research (Blanchard et al., 2003; Rhodes & Courneya, 2003) suggests that these two evaluative dimensions should, in fact, be treated as separate variables. In the case of this study, for example, we believe that British/Canadians and Chinese/Canadians will have different instrumental attitudes, but similar affective attitudes, toward playing the lottery. Our rationale for these two propositions is based on previous work in leisure and gambling studies, and cognitive and cross-cultural psychology. For example, in a study conducted in Georgia, Miyazaki, Langenderfer, and Sprott (1999) found that the top two reasons non-players gave for not purchasing lottery tickets were "belief against the lottery" (40%) and "bad value" (35%). The former instrumental evaluation is likely pertinent for British/Canadians because the Anglican Church of Canada believes that large-scale lotteries are contrary to Christian beliefs (Mandal & Vander Doelen, 1999). On the other hand, it is probably less applicable for Chinese/Canadians since gambling is generally perceived as being an acceptable activity that facilitates social interactions and provides fun and excitement (Centre for Social Policy Studies, 2002; Price, 1971). Similarly, the instrumental evaluation of lotteries as being a poor investment may be more relevant for British/Canadians because they place greater emphasis on the concept of "chance" and less relevant for Chinese/Canadians because they place greater emphasis on the concept of "luck." According to Friedland (1998), chance-oriented persons

concentrate on properties of the decision problem and look for information that might help them identify possible results, and, especially, their probability of occurrence. Luck-oriented persons look, instead, for "signs" that would tell them how lucky they are or how far they can trust their luck to make the right decision. (p. 162)

Probabilistic thinking has been found to vary across cultures, with Wright and Phillips (1980) finding that Asian study participants were more likely to think nonprobabilistically compared with British participants, and Lau and Ranyard (1999) finding a similar result with Chinese and British participants. In contrast with British people's greater focus on probability and therefore chance, Chinese people appear more focused on luck. Both anecdotal evidence (e.g., British Broadcasting Company, 2004; Nepstad, 2000; Shanghai Star, 2003) and empirical support for this proposition exists. A study conducted in Australia found that the most popular reason given by Chinese for why members

of their community liked to gamble was "to test their luck" (45.3%). Finally, Chinese/Canadians may think in terms of luck and be less concerned with the instrumental aspect of taking monetary risks (such as playing the lottery). The reason for this is that Chinese are generally collectivistic (Triandis, 1995), and collectivism acts as an implicit insurance policy against catastrophic financial loss because significant others will "cushion" you if you "fall" (Weber, Hsee, & Sokolowska, 1998, p. 174).

In contrast with our contention that instrumental attitudes for playing the lottery will vary by ethnicity, we contend that affective attitude will be equally predictive for British/Canadian and Chinese/Canadian males and females. Our rationale for this contention is based on two pieces of evidence. First, Azmier (2001) found that the thrill of winning was the most important reason for why people played the lottery, more so than for any other gambling activity. Although Azmier did not examine ethnicity specifically, we have not uncovered any research that suggests this positive affective response would not also apply to Chinese. Second, because Chinese are more luck-oriented and luck-oriented people may view gambling activities in terms of skill and challenge (Friedland, 1998), and because skill and challenge are important factors that affect flow experiences and flow is usually enjoyable (Csikszentmihalyi, 1990), it follows that Chinese/Canadians will also likely report positive affect when they play the lottery. Csikszentmihalyi's discussion of flow experiences also supports this argument in that he specifically mentions flow in terms of *aleatory* games (i.e., gambling; Caillois, 1958), as well as remarking that: "it is not skills we actually have that determine how we feel, but the ones we think we have" (p. 75).

Based on the above, therefore, two hypotheses are put forth:

- H1: Affective attitude will be an important predictor of intention to play the lottery regardless of ethnicity or gender.
- H2: Instrumental attitude will be a more important predictor of intentions to play the lottery for British/Canadian males and females than for Chinese/Canadian males and females.

The theory of planned behavior also differentiates between a subjective norm's injunctive and descriptive aspects, with, as mentioned earlier, Sheeran and Orbell (1999) finding that the latter did significantly affect people's intention to play the lottery. In contrast, Sheeran and Orbell found only "mixed support" for the role of injunctive norm on these same intentions, which led them to speculate that this type of norm might only be important for people who are knowledgeable about the lottery and therefore cognizant of how significant others feel about them playing it.

Sheeran and Orbell (1999) noted that others have also found inconclusive results when using injunctive norms, although a meta-analysis conducted by Armitage and Conner (2001) contends that this finding may partly be a consequence of poor measurement practices. This inconclusiveness may also be due to interpersonal differences. Trafimow and Finlay (1996, 2001) argued that some individuals are more attitudinally controlled while others are

more injunctive normatively controlled. One macro-level factor that could potentially affect the importance a person places on an injunctive norm is ethnicity. According to Triandis (1995), injunctive norms are more influential for people in or from collectivistic cultures (e.g., China, Korea) while personal attitudes are more influential for people in or from individualistic cultures (e.g., Canada, United States). Although empirical support for this proposition exists (Chan & Lau, 2001; Park & Levine, 1999; Park, Levine, & Sharkey, 1998), it is possible that the role significant others have on a collectivist's intentions may also differ depending upon the type of intended behavior. Because some aspects of this activity can occur independent of significant others (e.g., buying the ticket; day-dreaming about what one might do with the winnings), we anticipate that injunctive norms will still affect Chinese/Canadians' lottery intentions.

The importance of injunctive norms in collectivistic cultures may also vary by gender. As Kim, Laroche, and Tomiuk (2004) stated, in Chinese culture males are at the top of the gender hierarchy and strong patriarchal family norms "provide the Chinese father and husband with enormous power over the mother and wife" (p. 10). Consequently, while Kim et al. found that acculturation did affect Chinese-Canadian wives' gender-role attitudes, it did not affect Chinese-Canadian husbands' attitudes. This led them to "speculate that [Chinese-Canadian] men benefit greatly more than [Chinese-Canadian] women from the inequities in traditional gender-role systems and may be reluctant to relinquish the traditional gender-role privileges in favour of a more egalitarian arrangement of household roles" (p. 24). Based on the above, we believe that because Chinese/Canadian males are more likely than Chinese/Canadian females to benefit from adherence to injunctive norms, the former are also more likely to report that this type of norm affected their own intention to play the lottery.

Research suggests that gender may affect not only injunctive norms but descriptive norms as well. For example, Schwalbe and Staples (1991, p. 164) discovered that U.S. men placed higher importance on social comparisons than U.S. women, noting that: "this may simply be one consequence of socialization into a competitive masculine world" (cf., Pleck, 1981; Walker, Hinch, & Weighill, 2005). Similarly, Browne and Brown (1994) found that "having friends who gamble had a stronger effect for men than for women," adding that this "finding is consistent with behavioral patterns expected of men and women in American culture because men experience fewer constraints regarding gambling than women do" (p. 345). Based on the above, two additional hypotheses are put forth:

- H3:* Injunctive norm will be an important predictor of intention to play the lottery for Chinese/Canadian males but not for Chinese/Canadian females or British/Canadian males and females.
- H4:* Descriptive norm will be an important predictor of intention to play the lottery for British/Canadian males but not for British/Canadian females or Chinese/Canadian males and females.

Finally, because playing the lottery is generally seen as an acceptable activity in Chinese culture, and because certain aspects of playing the lottery can occur independent of significant others, a fifth hypothesis is put forth:

- H5:* Affective attitude will be a more explanatory predictor of intention to play the lottery than injunctive norm for Chinese/Canadian males and females.

As mentioned earlier, the TPB also distinguishes between two aspects of perceived behavioral control: self-efficacy and controllability. Self-efficacy involves how easy or difficult a person believes engaging in an activity will be, and based on Sheeran and Orbell's (1999) finding that this variable did not have a significant effect on playing the lottery, we anticipate a similar result. Controllability, on the other hand, may have a significant effect on lottery play, particularly when ethnicity and gender are taken into account. For example, Weisz, Rothbaum, and Blackburn (1984) proposed that there are two distinct types of controllability: (a) primary control, where "individuals enhance their rewards by influencing existing realities (e.g., other people, circumstances, symptoms, or behavior problems)" (p. 955); and (b) secondary control, where "individuals enhance their rewards by accommodating to existing realities and maximizing satisfaction or goodness of fit with things as they are" (p. 955). Empirical research (Chang, Chua, & Toh, 1997; Cheng, 2000; Morling, 2000) suggests that collectivists, while they do use both, are more likely than individualists to use secondary control. In the case of Chinese, this outcome is likely because "underlying secondary control is a belief that the self can be changed. This belief is consistent with Asian values of self-reflection and self-cultivation" (Chang, Chua, & Toh, 1997, p. 114). Research in Hong Kong also suggests that secondary control may be more relevant for Chinese women than Chinese men due to different sex role expectations. For example, Hong and Chiu's (1987) study results led them to conclude: "whereas the inability to control his environment is threatening to a [Chinese] man's masculine image, behaving in a non-active or even passive way can be easily integrated into the culturally approved feminine image" (p. 671).

Based on the above, therefore, a sixth hypothesis has been developed:

- H6:* Controllability—in terms of secondary control—will be an important predictor of intention *not* to play the lottery for Chinese/Canadian females. Controllability—in terms of both primary and secondary control—will not, however, be an important predictor for Chinese/Canadian males or for British/Canadian males and females.

As noted previously, Sheeran and Orbell (1999) discovered that approximately 30% of the variance in a person's lottery play behavior could be explained by his or her intention to play. This figure compares favorably with an overall R^2 of .27 found in a recent meta-analysis of the theory of planned behavior (Armitage & Conner, 2001). Although it is possible that this relationship could be moderated by gender, (as women generally have lower earning power than men; Shaw, 1994) or ethnicity (as recent immigrants

sometimes have poor English language proficiency; Yu & Berryman, 1996), it is also likely that once someone intends to play the lottery, there is little to stop him or her from doing so. Miyazaki et al. (1999) identified two reasons why lottery players may do so, even when they know that the odds of winning are long. First, based on their finding that past or current losing has little effect on purchasing lottery tickets, Miyazaki et al. contend that this may be due to players believing that they actually have some control over what is really a random event, possibly due to their ability to choose their own ticket numbers (see also Langer, 1975). Second, playing the lottery provides the possibility of escape, both real (i.e., if one actually does win) and imaginary (i.e., "If I won, I would . . ."). The last rationale is consistent with research in leisure studies, including Iso-Ahola's (1982) contention that escape is one of two basic motivational dimensions, and Mannell's concept of self-as-entertainment, specifically the mind-play mode which "refers to a person's capacity to fill their free time by turning inward and using imagination and fantasy" (Mannell & Kleiber, 1997, p. 165). It also appears that once a person in Alberta intends to play the lottery there are relatively few constraints on him or her doing so. Lottery tickets are relatively cheap (\$2 and up) and readily accessible (approximately one retailer per 1,100 adults, and available from kiosks, gas stations, supermarkets, and drug and convenience stores across the province; Alberta Gaming and Liquor Commission, 2001).

Based on the above, a seventh and final hypothesis is put forth:

- H7:* Intention to play the lottery will be an important predictor of self-reported lottery play behavior regardless of ethnicity or gender.

Method

A quota of approximately 450 study participants was chosen *a priori*, consisting of near equal numbers of British/Canadian and Chinese/Canadian male and female participants. This decision was based on Cohen's (1992) work, specifically his calculation that with $\alpha = .05$, power = .80, and six independent variables, a multiple regression with $N = 97$ will reliably detect a medium size effect. Potential British/Canadian participants were selected using a computer-generated sample and a random digit dialing approach. Potential Chinese/Canadian participants were selected based on Yida's research on the 100 most common surnames in China (Yan, 2002), and the various alternate spellings that exist (e.g., Zhang, the third most common surname in China, can also be spelled Chang, Cheong, Cheung, Chiang, Cheung, or Teoh depending upon the dialect; Chinese Roots, 2003). A list of 881 Chinese surnames was subsequently developed, and a random sample of 4,000 listed telephone numbers having one of these surnames was obtained from a telecommunications company.

In order to assign potential study participants to one of the two groups, interviewees were asked: "Which ethnic group do you most closely identify with? Would you say English, English-Canadian, Chinese, Chinese-Canadian,

Irish, Irish-Canadian, Scottish, Scottish-Canadian, Welsh, Welsh-Canadian, Canadian, none of the above?" Respondents who selected "None of the above," chose not to answer, or didn't know their ethnicity were not eligible to participate. Respondents who selected either Chinese or Chinese-Canadian were assigned to the Chinese/Canadian quota while the remaining respondents were assigned to the British/Canadian quota. The decision to describe these participants as British/Canadian was based on Statistics Canada's (1998) British Islander ethnicity category, as well as the agency's contention (Statistics Canada, 2003a) that much of the increase in the reporting of "Canadian" in the 2001 census was done by individuals who had reported English in previous censuses. Finally, in order to ensure gender equity each ethnic group included near equal numbers of males and females.

Data were collected at the University of Alberta Population Research Lab (PRL) using its centralized Computer-Assisted Telephone Interviewing (CATI) facilities. A pre-test with 22 respondents was conducted between March 6 and March 9, 2003 to determine if there were any wording, organization, or language issues, with the main data collection phase being conducted between March 8, 2003 and April 8, 2003. Along with the English-speaking interviewers, a Cantonese-speaking interviewer and a Mandarin-speaking interviewer were typically scheduled for each shift. Respondents were offered a small monetary token for participating in the study, with 77% of British/Canadians and 67% of Chinese/Canadians accepting.

To obtain the desired number of British/Canadian study participants, 1,005 telephone numbers were called, with many of these numbers subsequently being excluded for various reasons including being ineligible (e.g., out of service, business/fax, quota full, $n = 430$), screened (e.g., refusal, incomplete, $n = 191$), unscreened (e.g., busy, no answer, answering machine, $n = 141$), or undetermined (e.g., call back, $n = 16$). In order to obtain the desired number of Chinese/Canadian study participants, 996 telephone numbers were called, with many of these numbers also being excluded for various reasons, including being ineligible (e.g., out of service, business/fax, quota full, $n = 134$), screened (e.g., refusal, incomplete, $n = 283$), unscreened (e.g., busy, no answer, answering machine, $n = 318$), or undetermined (e.g., call back, $n = 35$). Thus, the overall response rates (i.e., completed interviews divided by completed interviews and screened numbers) were 54.3% for British/Canadians and 44.4% for Chinese/Canadians. Reasons given for refusing to participate included a lack of time and/or interest, and with the Chinese/Canadian quota, various language-related issues as well (e.g., interviewee spoke Vietnamese.)

In addition to the ethnicity measure described above, gambling-related variables, theory of planned behavior variables, and background information variables were also measured. First, based on Smith and Wynne's (2002) research, participants were asked whether or not they had gambled in the last 12 months and, if they had done so, to indicate from a list of 16 gambling activity categories which games they had played, how frequently they had played each game, and how much money they had spent on each game

during an average month. Second, attitudes toward, subjective norms regarding, perceived behavioral control over, and intention to play the lottery were each measured following recommended TPB protocol (e.g., Ajzen, 2002). For example, in response to the question stem "For you, would spending money on lottery tickets in the next 30 days be. . . ?," participants reported their affective attitude in terms of three items (i.e., enjoyment, excitement, and pleasure), and their instrumental attitude in terms of three items (i.e., usefulness, wisdom, and goodness). Similar stems and items were used for injunctive norm (i.e., approval, support), descriptive norm (i.e., likelihood), and self-efficacy (i.e., easiness). All of the predictor variables were measured using a seven-point, two-step branching scale format (Krosnick & Berent, 1993). The only exception was the controllability variable, which was measured using a single four-point unipolar scale. Finally, as with other stems, intention to play the lottery was measured following Ajzen's (2002) recommendations, with participants responding to the open-ended question "In the next 30 days, how often do you intend to spend money on. . . ?" in terms of: (a) weekly and bi-weekly lottery tickets (e.g., 6/49), (b) daily lottery tickets (e.g., Pick 3), and (c) instant-win or scratch-tickets. And third, socio-demographic (e.g., age group, income and education level), origin and residency (e.g., country of birth, year permanently moved to Canada), and language preference information was collected.

Before the telephone interview concluded, participants were asked if they would be willing to complete a one-page questionnaire that would be mailed out approximately four weeks after the interview. The follow-up questionnaire included a similar open-ended stem and the same three lottery ticket categories used on the original questionnaire, thus allowing a person's intention to play the lottery over the next 30 days and his or her self-reported lottery play behavior during the same period to be compared. A cover letter and stamped self-addressed envelope accompanied the follow-up questionnaire.

Finally, all of the measures were translated from English into simplified Chinese by one individual and then a second individual—who had not seen the original English-language questionnaire—translated it from simplified Chinese back into English. The original English-language questionnaire and the translated English-language questionnaire were compared and revisions were made as necessary (i.e., back-translation; Marin & Marin, 1990). The English and simplified Chinese versions were then used to develop a traditional Chinese version of the questionnaire. The same process was used to translate the cover and information letters, the informed consent form, and the follow-up questionnaire.

In order to test the seven hypotheses two sets of multiple regressions were conducted. With the first set of multiple regressions, intentions were regressed on the six TPB predictor variables for British/Canadian males, British/Canadian females, Chinese/Canadian males, and Chinese/Canadian females. The regressors were not entered hierarchically (i.e., attitude first, subjective norm second, perceived behavioral control third; Ajzen, 1991) be-

cause, as noted in the literature review, some studies have found that the importance of these variables can differ by ethnicity and gender. With the second set of multiple regressions, behavior was regressed on intention, self-efficacy, and controllability for British/Canadian males, British/Canadian females, Chinese/Canadian males, and Chinese/Canadian females.³ For both sets of multiple regressions, the importance of a predictor variable was determined using a stepwise process, as this method deletes an already-entered regressor if its significance level exceeds the selected limit (i.e., $p < .10$; based on SAS Institute Inc., 1988, p. 820). Additionally, if a regressor did remain entered, its squared semi-partial correlation coefficient had to be sufficiently large (i.e., an f^2 equal to or greater than .02, or a small effect size; Cohen, 1992), since a probability value alone does not necessarily indicate a regressor's importance (SAS Institute Inc., p. 13). Thus, to reiterate, the criteria for determining the importance of a TPB variable was that it remained significant after all of the variables had been entered into the multiple regression *and* that it maintained, at a minimum, a small effect size.

Finally, before the multiple regressions were conducted: (a) participants' socio-demographic and gambling prevalence information were examined to determine if there were any significant differences; (b) Cronbach coefficient alphas were calculated for the two attitude and two subjective norm scales in order to ensure their reliability; and (c) ANOVAs, or MANOVAs, or both (when statistically appropriate) were performed on the TPB variables' mean scores to determine if there were any statistical differences.

Results

British/Canadian participant's who reported that their preferred language was not English, and Chinese/Canadian participants who reported that their preferred language was not English, Chinese, Cantonese, or Mandarin were deleted from the study. Thus, of the 453 individuals who did participate, 208 Chinese/Canadians (97 males and 111 females) and 220 British/Canadians (112 males and 108 females) and 208 Chinese/Canadians (97 males and 111 females) remained. Although there was no significant difference, $\chi^2 (4, N = 428) = 6.73, p = .15$, in terms of ethnicity and age group, there were significant differences in: (a) ethnicity and marital status, $\chi^2 (2, N = 425) = 15.58, p = .0004$, due mostly to the higher number of divorced/widowed British/Canadians compared with Chinese/Canadians; (b) ethnicity and income level, $\chi^2 (3, N = 367) = 30.80, p < .0001$, due largely to the higher number of Chinese/Canadians earning under \$25,000 and the higher number of British/Canadians earning more than \$75,000; and (c) ethnicity and education level, $\chi^2 (2, N = 425) = 9.34, p = .0094$, due primarily to the higher number of Chinese/Canadians who had ob-

³Although we did not expect either self-efficacy or controllability to differ due to ethnicity or gender, because the TPB holds that these two perceived behavioral control variables can affect behavior, both were included in the regressions.

tained post-bachelor degrees. The majority of British/Canadians participants were born in Canada (88%) followed by Britain (5%), while the majority of Chinese/Canadians participants were born in Mainland China (56%), followed by Hong Kong (20%) and then Canada (8%). Of the Chinese/Canadians who reported being born elsewhere, over 60% moved to Canada after 1989.

A significant difference, $\chi^2 (1, N = 428) = 20.72, p < .0001$, was found for ethnicity and gambling prevalence overall, with 81% of British/Canadians reporting having gambled during the previous 12 months compared with 62% of Chinese/Canadians. There were no significant differences in overall gambling prevalence between British/Canadian males and females (82% and 81%, respectively), $\chi^2 (1, N = 220) = 0.09, p = .76$, or between Chinese/Canadian males and females (61% and 62%, respectively), $\chi^2 (1, N = 208) = 0.04, p = .84$. There was also no significant difference, $\chi^2 (1, N = 307) = 0.68, p = .41$, in the percent of British/Canadian gamblers (77%) and Chinese/Canadian gamblers (81%) who reported playing the lottery during the previous 12 months.

After the follow-up questionnaires were returned and participant identification numbers were matched, 100 Chinese/Canadians' (51 males and 49 females) and 115 British/Canadians' (57 males and 58 females) lottery play intentions and behaviors could be compared.

As reported in Table 1, the affective attitude, instrumental attitude, and injunctive norm scales' Cronbach coefficient alphas were acceptable for British/Canadian and Chinese/Canadian males and females (Nunnally, 1967). Means and standard deviations for these scales, as well as for descriptive norms, self-efficacy, and controllability are also shown in this table, as are the means and standard deviations for intention. In the case of the last variable, it should be noted that: (a) the number of lottery tickets a person said that they intended to purchase over the next 30 days represents the sum total of weekly and bi-weekly tickets, daily tickets, and instant-win and scratch-and-win tickets; and (b) participants who reported that they intended to purchase five lottery tickets and those who reported that they intended to purchase more than five tickets were collapsed into a single group, in order to ensure a sufficient cell size. An ANOVA conducted on intention to purchase lottery tickets was not significant [$F(3, 380) = 2.59, p > .05$], indicating that all four groups intended to purchase a comparable number of tickets. A MANOVA performed on the six TPB predictor variables was significant [Wilk's $\Lambda = .88, F(18, 1061.1) = 2.74, p < .0001$], however only one of the follow-up ANOVAs was significant [$F(3, 380) = 7.53, p < .0001$], with the Tukey tests indicating that British/Canadian males were higher on controllability than Chinese/Canadian males and females, while British/Canadian females were higher on controllability than Chinese/Canadian males.

As Table 2 illustrates, the two overall multiple regression equations for intention to play the lottery were significant for British/Canadians males and females ($p < .0001$ and $p < .001$, respectively), although only the affective attitude predictor met the importance criteria (i.e., $p < .10$ and an f^2 equal

TABLE 1
Means, Standard Deviations, and Coefficient Alphas for Intention and Predictor Variables

| Variable | British/Canadians | | | | | | Chinese/Canadians | | | | | |
|-----------------------|-------------------|---------------|----------|----------|---------------|----------|-------------------|---------------|----------|----------|---------------|----------|
| | Males | | | Females | | | Males | | | Females | | |
| | <i>M</i> | (<i>SD</i>) | α | <i>M</i> | (<i>SD</i>) | α | <i>M</i> | (<i>SD</i>) | α | <i>M</i> | (<i>SD</i>) | α |
| | | | | | | | | | | | | |
| Intention | 1.50 | (2.08) | — | 1.24 | (1.84) | — | 1.36 | (1.99) | — | 0.80 | (1.46) | — |
| Predictor Variable | | | | | | | | | | | | |
| Affective attitude | 4.06 | (0.95) | .78 | 4.05 | (0.85) | .75 | 4.01 | (0.83) | .81 | 3.95 | (0.93) | .83 |
| Instrumental attitude | 3.50 | (1.19) | .84 | 3.93 | (1.02) | .82 | 3.58 | (0.94) | .73 | 3.44 | (0.99) | .77 |
| Injunctive norm | 4.28 | (1.04) | .67 | 4.30 | (1.18) | .83 | 3.92 | (0.98) | .71 | 4.26 | (1.12) | .84 |
| Descriptive norm | 4.29 | (1.86) | — | 4.40 | (2.01) | — | 4.10 | (2.24) | — | 4.12 | (1.87) | — |
| Self-efficacy | 5.75 | (1.59) | — | 5.33 | (1.68) | — | 5.66 | (1.52) | — | 5.25 | (1.58) | — |
| Controllability | 3.93 | (0.32) | — | 3.87 | (0.51) | — | 3.58 | (0.82) | — | 3.66 | (0.65) | — |

Note: British/Canadian males $n = 103$, females $n = 100$; Chinese/Canadian males $n = 86$, females $n = 95$.

TABLE 2
Multiple Regression Analyses Summary for Variables Predicting
Intentions—British/Canadians

| Variable | Males | | | | Females | | | |
|-----------------------|----------|------------|---------|----------|----------|------------|---------|----------|
| | <i>B</i> | <i>SEB</i> | β | f^{22} | <i>B</i> | <i>SEB</i> | β | f^{22} |
| Affective attitude | 0.48 | 0.26 | 0.22* | .16 | 0.67 | 0.26 | 0.31** | .23 |
| Instrumental attitude | 0.47 | 0.21 | 0.27** | .10 | 0.17 | 0.24 | 0.09 | .01 |
| Injunctive norm | 0.00 | 0.22 | 0.00 | .01 | 0.11 | 0.19 | 0.07 | .01 |
| Descriptive norm | 0.28 | 0.12 | 0.25** | .04 | -0.00 | 0.09 | -0.00 | .00 |
| Self-efficacy | -0.20 | 0.13 | -0.15 | .02 | 0.17 | 0.11 | 0.16 | .02 |
| Controllability | 0.41 | 0.66 | 0.06 | .00 | 0.18 | 0.35 | 0.05 | .00 |

Note: Males, $f^{22} = .40$ ($N = 103$, $F = 6.57$, $p < .0001$). Females, $f^{22} = .30$ ($N = 100$, $F = 4.75$, $p < .001$).

* $p < .10$. ** $p < .05$.

to or greater than .02) for both. In contrast, for British/Canadian males, the instrumental attitude and descriptive norm regressors both met the criteria.

Similarly, the two overall multiple regression equations for intention to play the lottery (Table 3) were significant for Chinese/Canadians males and females ($p < .001$ and $p < .0001$, respectively), although once again only the affective attitude predictor met the importance criteria for both. In addition, the injunctive norm regressor met the importance criteria for Chinese/Canadian males while the controllability regressor met the importance criteria for females—and it is worth noting that, unlike all of the other pre-

TABLE 3
Multiple Regression Analyses Summary for Variables Predicting
Intentions—Chinese/Canadians

| Variable | Males | | | | Females | | | |
|-----------------------|----------|------------|---------|----------|----------|------------|---------|----------|
| | <i>B</i> | <i>SEB</i> | β | f^{22} | <i>B</i> | <i>SEB</i> | β | f^{22} |
| Affective attitude | 0.84 | 0.34 | 0.35** | .20 | 0.51 | 0.20 | 0.32** | .27 |
| Instrumental attitude | -0.09 | 0.29 | -0.04 | .00 | 0.19 | 0.19 | 0.13 | .03 |
| Injunctive norm | 0.44 | 0.25 | 0.21* | .03 | -0.01 | 0.15 | -0.01 | .00 |
| Descriptive norm | -0.00 | 0.10 | -0.00 | .00 | 0.00 | 0.08 | 0.03 | .00 |
| Self-efficacy | -0.11 | 0.14 | -0.08 | .01 | 0.14 | 0.08 | 0.16 | .02 |
| Controllability | -0.15 | 0.25 | -0.06 | .00 | -0.54 | 0.22 | -0.24** | .04 |

Note: Males, $f^2 = .27$ ($N = 86$, $F = 3.59$, $p < .001$). Females, $f^2 = .43$ ($N = 95$, $F = 6.38$, $p < .0001$).

* $p < .10$. ** $p < .05$.

dictor variable regression coefficients, the last variable's coefficient was negative.

Table 4 reports the means, standard deviations, and intercorrelations for intention, self-efficacy, controllability, and behavior for British/Canadian males and females, while Table 5 reports the same information for Chinese/Canadian males and females. As with intentions, the number of lottery tickets a person reported they purchased over the previous 30 days represents the sum total of weekly and bi-weekly tickets, daily tickets, and instant-win and scratch-and-win tickets. Similarly, in order to ensure a sufficient cell size, participants who reported that they had purchased five lottery tickets and those who reported that they had purchase more than five tickets were collapsed into a single group. An ANOVA conducted on the four groups' self-reported lottery play behavior was not significant [$F(3, 211) = 0.91, p =$

TABLE 4
Means, Standard Deviations, and Intercorrelations for Behavior and Predictor Variables—British/Canadians

| Variable | Males | | | | | Females | | | | |
|--------------------|----------|-------------|-------|------|-------|----------|-------------|-------|------|------|
| | <i>M</i> | <i>(SD)</i> | 1 | 2 | 3 | <i>M</i> | <i>(SD)</i> | 1 | 2 | 3 |
| Behavior | 1.86 | (2.17) | .87** | .01 | -.27* | 1.81 | (2.07) | .79** | .23 | -.05 |
| Predictor Variable | | | | | | | | | | |
| 1. Intention | 1.40 | (2.07) | — | -.02 | -.15 | 1.41 | (2.00) | — | .29* | -.15 |
| 2. Self-efficacy | 5.67 | (1.75) | | — | .35** | 5.50 | (1.33) | | — | .10 |
| 3. Controllability | 3.91 | (0.39) | | | — | 3.91 | (0.34) | | | — |

Note: Males $n = 57$, females $n = 58$.

* $p < .05$. ** $p < .01$.

TABLE 5
Means, Standard Deviations, and Intercorrelations for Behavior and Predictor Variables—Chinese/Canadians

| Variable | Males | | | | | Females | | | | |
|--------------------|----------|-------------|-------|------|-------|----------|-------------|-------|-----|--------|
| | <i>M</i> | <i>(SD)</i> | 1 | 2 | 3 | <i>M</i> | <i>(SD)</i> | 1 | 2 | 3 |
| Behavior | 1.53 | (2.20) | .77** | .15 | -.10* | 1.27 | (1.90) | .68** | .04 | -.26 |
| Predictor Variable | | | | | | | | | | |
| 1. Intention | 1.37 | (2.14) | — | -.07 | -.02 | 0.80 | (1.29) | — | .02 | -.47** |
| 2. Self-efficacy | 5.73 | (1.43) | | — | -.04 | 5.31 | (1.66) | | — | .18 |
| 3. Controllability | 3.71 | (0.67) | | | — | 3.55 | (0.77) | | | — |

Note: Males $n = 51$, females $n = 49$.

* $p < .05$. ** $p < .01$.

.44), nor were the ANOVAs performed on intention and self-efficacy [$F(3, 221) = 1.25, p = .29$; $F(3, 221) = 0.75, p = .52$, respectively]. An ANOVA conducted on controllability among the four groups was, however, significant [$F(3, 221) = 5.2, p < .01$], with the Tukey tests indicating that British/Canadian males and females were both higher on controllability than were Chinese/Canadian females. ANOVAs were also performed within each group comparing lottery play intention and behavior. None of these ANOVAs were significant, however (British/Canadian males, $F(1, 112) = 1.32, p = .25$; British/Canadian females, $F(1, 114) = 1.10, p = .30$; Chinese/Canadian males, $F(1, 100) = 0.13, p = .72$; Chinese/Canadian females, $F(1, 96) = 2.04, p = .16$).

Finally, as Table 6 shows, the overall multiple regression equations for self-reported lottery play behavior were significant ($p < .0001$) for British/Canadian and Chinese/Canadian males and females, however only the intention predictor met the importance criteria for all four groups. (The controllability regressor's f^2 only appears to meet the small effect size cut-off for British/Canadian males because of rounding.)

Discussion

In this section, each hypothesis is restated and then discussed based on the results of the multiple regression analyses.

- H1:* Affective attitude will be an important predictor of intention to play the lottery regardless of ethnicity or gender.
- H2:* Instrumental attitude will be a more important predictor of intentions to play the lottery for British/Canadian males and females than for Chinese/Canadian males and females.

TABLE 6
Multiple Regression Analyses Summary for Variables Predicting Behavior

| Variable | Males | | | | Females | | | |
|-------------------|----------|------------|---------|-------|----------|------------|---------|-------|
| | <i>B</i> | <i>SEB</i> | β | f^2 | <i>B</i> | <i>SEB</i> | β | f^2 |
| British/Canadians | | | | | | | | |
| Intention | 0.89 | 0.07 | 0.85** | 3.17 | 0.83 | 0.09 | 0.80** | 1.63 |
| Self-efficacy | 0.10 | 0.08 | 0.08 | .01 | -0.01 | 0.14 | -0.01 | .00 |
| Controllability | -0.92 | 0.38 | -0.17* | .02 | 0.45 | 0.52 | 0.07 | .01 |
| Chinese/Canadians | | | | | | | | |
| Intention | 0.78 | 0.10 | 0.76** | 1.44 | 1.05 | 0.18 | 0.71** | .85 |
| Self-efficacy | 0.14 | 0.14 | 0.09 | .01 | 0.01 | 0.13 | 0.01 | .00 |
| Controllability | -0.25 | 0.30 | -0.08 | .01 | 0.19 | 0.32 | 0.08 | .01 |

Note: British/Canadian males, $f^2 = 3.76$ ($N = 57, F = 65.21, p < .0001$). British/Canadian females, $f^2 = 1.63$ ($N = 58, F = 29.58, p < .0001$). Chinese/Canadian males, $f^2 = 1.5$ ($N = 51, F = 23.48, p < .0001$). Chinese/Canadian females, $f^2 = .85$ ($N = 49, F = 12.89, p < .0001$).

* $p < .05$. ** $p < .0001$.

According to the regression results, affective attitude was an important predictor (i.e., $p < .10$ and an f^2 equal to or greater than .02) of intention to play the lottery for all four ethnic by gender groups, thus H1 is supported. On the other hand, instrumental attitude was an important predictor for British/Canadian males but not for British/Canadian females, so H2 is only partly supported. In the case of the first hypothesis, this finding was expected as playing the lottery like participating in many types of leisure activities can be seen in terms of positive affect, both for Anglo-North Americans (e.g., Mannell & Kleiber, 1997) and Chinese living in North America (e.g., Walker & Deng, 2003/2004; Walker, Deng, & Dieser, 2001). In the case of the second hypothesis, although we expected that instrumental attitude would not be an important predictor for Chinese/Canadians (since gambling is a culturally accepted activity and luck is more relevant than chance), unexpectedly, it was not important for British/Canadian females as well. In order to explain this result, we returned to the literature and uncovered a study (Yamaguchi, 1997; cited in Nisbett, 2003) that found that American women behaved like Japanese men and women (and differently from American men) when asked whether they were more likely to escape an unpleasant experience if they chose a lottery ticket either alone or as part of larger group. This outcome suggests that gender may affect how chance and probability are construed by Euro-North Americans; possibly, in this case, due to American and Canadian females being more collectivistic than American and Canadian males, albeit still not to the same degree as Asian males and females (e.g., Triandis, 1995; Markus & Kitayama, 1991).

- H3:* Injunctive norm will be an important predictor of intention to play the lottery for Chinese/Canadian males but not for Chinese/Canadian females or British/Canadian males and females.
- H4:* Descriptive norm will be an important predictor of intention to play the lottery for British/Canadians males but not for British/Canadian females or Chinese/Canadian males and females.

As expected, the multiple regression analyses' results indicated that injunctive norm was an important predictor of intention to play the lottery for Chinese/Canadian males, while descriptive norm was an important predictor of intention to play the lottery for British/Canadian males. Thus, both H3 and H4 are supported. Our rationale for the third hypothesis is based on research that suggests: (a) significant others' approval can be a critical regulator of people's—especially collectivists'—intentions (e.g., Chan & Lau, 2001); and (b) gender roles, power differences, and negotiation strategies must be taken into account when examining the effect of injunctive norms on people's intentions (Kim, Larouche, & Tomiuk, 2004)—especially collectivists' intentions, as hierarchy is often correlated with this type of self (Triandis, 1995). Although our fourth hypothesis was supported by the regression results and our findings are consistent with Browne and Brown's (1994) discovery that having friends who gambled had a stronger influence on American men's gambling behavior than American women's behavior, there may be another reason for this finding besides the researchers' belief that males

experience fewer gambling constraints than females. For example, British/Canadian males' may be more likely to play the lottery if significant others do so because of peer competitiveness (e.g., wanting to win more money than their friends), itself a function of either the type of individualism they hold (what Triandis, 1995, calls vertical individualism), or their need to prove their masculinity (Beneke, 1997) through gambling (Walker, Hinch, & Weighill, 2005), or both.

- H5:* Affective attitude will be a more explanatory predictor of intention to play the lottery than injunctive norm for Chinese/Canadian males and females.

The fifth hypothesis was also supported, based on examination of the two TPB variables' effect sizes. Specifically, for Chinese/Canadian males, affective attitude had an f^2 of .20 and injunctive norm had an f^2 of .03 (medium and small effects, respectively; Cohen, 1992), while for Chinese/Canadian females, affective attitude had an f^2 of .27 (a medium effect; Cohen), and injunctive norm's probability level was not significant. It should be noted that although Triandis (1995) and others (Chan & Lau, 2001; Park & Levine, 1999; Park, Levine, & Sharkey, 1998) have found that injunctive norm is often more important than affective attitude for collectivists, we felt that because gambling is generally seen as an acceptable activity in Chinese culture, and because aspects of playing the lottery can be done independent of significant others, the opposite outcome would be found. As this outcome did occur, it appears that in some domains and during certain circumstances—such as solitary leisure—collectivists may be able to emphasize the individualistic dimension of their selves and, therefore, their personal attributes. This possibility has been put forth elsewhere (Walker, Deng, & Dieser, 2005), however it appears worth restating based on the above results, as well Tafarodi, Lo, Yamaguchi, Lee, and Katsura's (2004) recent finding that Chinese university students "reported spending more free time by themselves and engaged in solitary hobbies than did Canadians, suggesting that the former enjoy more opportunity for self-expression in these specific contexts. . . . [than] in the company of parents, siblings, and extended family" (p. 114).

- H6:* Controllability—in terms of secondary control—will be an important predictor of intention *not* to play the lottery for Chinese/Canadian females. Controllability—in terms of both primary and secondary control—will not, however, be an important predictor for Chinese/Canadian males or for British/Canadian males and females.

Based on the results of the multiple regression analyses, controllability was an important predictor of intention for Chinese/Canadian women, and the negative coefficient indicates that the more control these women felt they had, the less likely they intended playing the lottery. Thus, H6 is supported. This finding suggests that Chinese/Canadian women are trying to control themselves rather than controlling the environment that encom-

passes them, and therefore they are employing secondary rather than primary control (Weisz, Rothbaum, & Blackburn, 1984). This outcome is consistent with other research that has found that secondary control is common among Chinese people (Chang, Chua, & Toh, 1997), especially Chinese women because of the sex-role expectations placed upon them (Hong & Chiu, 1987). Moreover, because Chinese/Canadian women appear to be using secondary control in order to inhibit, or possibly even prohibit, preference for this leisure activity, this type of control could be conceived of as a type of intrapersonal constraint. According to Crawford and Godbey (1987), these types of constraints include individual attributes that inhibit or prohibit the development of leisure preferences. We are not aware of any other studies that have put forth this proposition before, although, based on Scherl's (1989) work, Walker and Virden (2005) postulated that secondary control could be a way some people negotiate structural constraints of factors that intervene between leisure preferences and leisure behavior.

H7: Intention to play the lottery will be an important predictor of self-reported lottery play behavior regardless of ethnicity or gender.

The multiple regression analyses results clearly demonstrate that intention was an important predictor of self-reported lottery play behavior, with all four groups' f^2 being large effects (Cohen, 1992). *H7* is, therefore, also supported. In fact, all four groups' effects are substantially greater than those found in Sheeran and Orbell's (1999) study of lottery play in Britain, or in Armitage and Conner's (2001) recent meta-analysis of the theory of planned behavior. Although this finding could just be an artifact of who participated in the follow-up study (see below), it also appears possible that if people in Alberta intend to play the lottery, there are few constraints that stop them from doing so. This proposition is also supported by the finding that, for all four groups, the mean number of lottery tickets participants reported purchasing was actually higher—albeit not significantly—than the mean number of tickets participants reported intending to buy.

Conclusion

In conclusion, this study found that when intention to play the lottery was regressed on the six theory of planned behavior variables: (a) affective attitude was an important predictor regardless of ethnicity or gender (*H1*, supported); (b) instrumental attitude was an important predictor for British/Canadian males but not females (*H2*, partially supported); (c) injunctive norm was an important predictor for Chinese/Canadian males (*H3*, supported); (d) descriptive norm was an important predictor for British/Canadian males (*H4*, supported); (e) affective attitude was a more explanatory variable than injunctive norm for Chinese/Canadians (*H5*, supported); and (f) controllability was an important predictor for Chinese/Canadian females, with a negative coefficient suggesting secondary control (*H6*, supported). In

addition, this study also found that intention to play the lottery was an important predictor of self-reported lottery play behavior regardless of ethnicity or gender (*H7*, supported).

These findings provide additional evidence for the use of the TPB as a theoretical framework for explaining participation in leisure activities. By taking into account ethnicity, gender, and their interaction, however, this study goes beyond previous leisure research by not only providing credence to the contention that the TPB has cross-cultural applicability *overall*, but also that the variables in this theory may vary in importance among different ethnic and socio-demographic groups. By doing so, this study addresses one of the criticisms leveled at social psychological leisure research—the tendency to ignore the impact that ethnicity and gender have on leisure participation (Caldwell, 2005; Mannell, 2005; Mannell & Kleiber, 1997; Walker, Deng, & Dieser, 2005; Walker, Dieser, & Deng, 2005). Additionally, it addresses one of the criticisms leveled at race/ethnicity leisure research (Hutchison, 2000), that is this area's relative inattentiveness to the important roles intervening variables, such as attitudes, subjective norms, and perceived control, may have on leisure participation.

Finally, there are limitations to this study and, consequently, future research is necessary. One sampling problem we were not able to overcome, for example, was the exclusion of Chinese/Canadians who had non-Chinese surnames (e.g., due to an inter-ethnic relationship).⁴ Second, as a reviewer noted, the decision to group participants who self-reported "Canadian" into the British/Canadian" group could, potentially, affect study findings. Third, because only about half of our participants either chose to participate in the follow-up study, or failed to return their questionnaire if they did, there is the possibility that the relationship between these people's intentions and behaviors is different from those that did participate and respond. Fourth, although we did measure acculturation in a separate part of our questionnaire, we did not include this variable in the current study because of sample size limitations. This omission could be easily overcome in a future research study however, and therefore, we recommend the potential effect of acculturation on the TPB be examined. In addition, because similarities and differences in the TPB can occur when other leisure behaviors are studied (Ajzen, 1991; Ajzen & Driver, 1991, 1992), and we fully expect when other ethnic groups are included, replication is necessary. Moreover, future research involving ethnic groups must not only be cognizant that the meaning and structure of the theory of planned behavior variables, as well as their relationships, may vary, but because culture-specific and self-construal-related variables may also play an important role (e.g., secondary control, belief in luck), they too should be identified and incorporated into any study that

⁴Milan and Hamm (2004) have found, however, that only 16% of all Chinese unions are inter-ethnic, the second lowest percentage of any visible minority group in Canada. Moreover, Chang and Scrogin Chang (2001) state that, at least in mainland China, Chinese women often retain their maiden names for both social and legal purposes.

uses the TPB. Ajzen (1991) has, in fact, sanctioned this type of theoretical development, which is another reason why the TPB remains a popular framework for explaining a number of different behaviors—including, and of particular interest to this journal's readers, why some people participate in certain leisure activities while others do not.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). *Constructing a TpB questionnaire: Conceptual and methodological considerations*. Retrieved February 25, 2003, from http://www-unix.oit.umass.edu/~ajzen/pdf/tpb_measurement.pdf
- Ajzen, I., & Driver, B. (1991). Prediction of leisure participation from behavioral, normative, and control beliefs: An application of the theory of planned behavior. *Leisure Sciences*, 13, 185-204.
- Ajzen, I., & Driver, B. (1992). Application of the theory of planned behavior to leisure choice. *Journal of Leisure Research*, 24, 207-224.
- Alberta Gaming and Liquor Commission. (2001). *Ticket lotteries*. Retrieved June 1, 2004, from http://www.aglc.gov.ab.ca/pdf/lpr/LPR_Report_13-ticket_Lotteries.pdf
- Armitage, C., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40, 471-499.
- Arnscheid, R., & Schomers, P. (1996). Attitude and performance in groups: A test of the theory of planned behavior on basketball players. *Z. Sozialpsychol.*, 27, 61-69.
- Azmier, J. (2001). *Gambling in Canada 2001: An overview*. Calgary, AB: Canada West Foundation.
- Beneke, T. (1997). *Proving manhood*. Berkeley, CA: University of California Press.
- Blanchard, C., Rhodes, R., Nehl, E., Fisher, J., Sparling, P., & Courneya, K. (2003). Ethnicity and the theory of planned behavior in the exercise domain. *American Journal of Health Behavior*, 27, 579-591.
- Blanchard, C., Nehl, E., Rhodes, R., Baker, F., Annesi, J., Courneya, K., & Spence, J. (2004). Does ethnicity moderate the associations between the theory of planned behavior and physical activity? *International Journal of Cancer Prevention*, 1, 89-97.
- British Broadcasting Company. (2004). *Chinese New Year 2004—Year of the Monkey*. Retrieved April 27, 2004, from http://www.bbc.co.uk/wiltshire/features/chinese_new_year.shtml
- Browne, B., & Brown, D. (1994). Predictors of lottery gambling among American college students. *Journal of Social Psychology*, 134, 339-347.
- Caillois, R. (1958). *Les jeux et les hommes*. Paris: Gallimard.
- Caldwell, L. L. (2005). Self-construal in context: A response to Walker, Deng, and Diesler. *Journal of Leisure Research*, 37, 106-116.
- Camarota, S. (1999). *Immigrants in the United States—1998. A snapshot of America's foreign-born population*. Retrieved September 19, 2000, from <http://www.cis.org/articles/1999/backgrounder199/back199.pdf>. Washington, DC: Center for Immigration Studies.
- Centre for Social Policy Studies of the Department of Applied Social Sciences & the General Education Centre of the University of Hong Kong. (2002). *Report on a Study of Hong Kong People's Participation in Gambling Activities*. Retrieved April 1, 2004, from <http://www.info.gov.hk/hab/doc/report-eng.pdf>.
- Chan, R., & Lau, L. (2001). Explaining green purchase behavior: A cross-cultural study on American and Chinese consumers. *Journal of International Consumer Marketing*, 14, 9-40.
- Chang, R., & Scrogin Chang, M. (2001). *Speaking of Chinese: A cultural history of the Chinese language*. New York: W. W. Norton.

- Chang, W., Chua, W. L., & Toh, Y. (1997). The concept of psychological control in the Asian context. In K. Leung, U. Kim, S. Yamaguchi, & Y. Kashima (Eds.), *Progress in Asian Social Psychology, Vol. 1*, (pp. 95-117). Singapore: John Wiley & Sons.
- Cheng, J. (2000). *Acculturation and control strategies in Chinese-Americans*. Unpublished doctoral dissertation, Pacific Graduate School of Psychology, Palo Alto, CA.
- China Contact. (2002). *Lotteries and gambling in China: A market analysis*. Chipping Sodbury, South Gloucestershire, UK: China Contact.
- China Daily. (2000). More people willing to bet on lotteries. *China Today*, 49(6), 58.
- Chinese Roots (2003). *Surname dictionary*. Retrieved June 1, 2002, from <http://www.chineseroots.com/english/manual/surnames/search/searchDic.jsp>.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- Courneya, K. (1995). Understanding readiness for regular physical activity in older individuals: An application of the theory of planned behavior. *Health Psychology*, 14, 80-87.
- Crawford, D. W., & Godbey, G. C. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences*, 9, 119-127.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper.
- Cultural Partners Australia Consortium. (2000). *The impact of gaming on specific cultural groups*. Retrieved April, 15, 2004 from www.gambling.vcga.vic.gov.au
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Friedland, N. (1998). Games of luck and games of chance: The effect of luck- versus chance-orientation on gambling decisions. *Journal of Behavioral Decision Making*, 11, 161-179.
- Godin, G., Maticka-Tyndale, E., Adrien, A., Manson-Singer, S., Willms, D., & Cappon, P. (1996). Cross-cultural testing of three social cognitive theories: An application to condom use. *Journal of Applied Social Psychology*, 26, 1556-1568.
- Gramann, J. H., & Allison, M. T. (1999). Ethnicity, race, and leisure. In E. Jackson & T. Burton (Eds.), *Leisure studies: Prospects for the twenty-first century* (pp. 283-297). State College, PA: Venture.
- Hong, Y., & Chiu, C. (1987). Sex, locus of control, and illusion of control in Hong Kong as correlates of gambling involvement. *Journal of Social Psychology*, 128, 667-673.
- House, J. (1977). The three faces of social psychology. *Sociometry*, 40, 161-177.
- House, J. (1995). Social structure, relationships, and the individual. In K. Cook, G. A. Fine, & J. House (Eds.), *Sociological perspectives on social psychology* (pp. 387-395). Boston: Allyn and Bacon.
- Hrubes, D., Ajzen, I., & Daigle, J. (2001). Predicting hunting intentions and behavior: An application of the theory of planned behavior. *Leisure Sciences*, 23, 165-178.
- Iso-Ahola, S. E. (1982). Toward a social psychological theory of tourism motivation: A rejoinder. *Annals of Tourism Research*, 12, 256-262.
- Kim, C., Laroche, M., & Tomiuk, M. (2004). The Chinese in Canada: A study of ethnic change with emphasis on gender roles. *Journal of Social Psychology*, 144, 5-29.
- Krosnick, J. A., & Berent, M. K. (1993). Comparisons of party identification and policy preferences: The impact of survey question format. *American Journal of Political Science*, 37, 941-964.
- Kwan, K. (1997). *Gambling, alcohol and other drug uses among Chinese adults in Greater Toronto: A summary report of a telephone survey*. Toronto Chinese Family Life Services of Metro Toronto. Cited in *The Wager*. (June 23, 1998). Prevalence of gambling in Toronto's Chinese community. Retrieved June 1, 2002, from <http://www.thewager.org/Backindex/vol3pdf/w325.pdf>.
- Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311-328.

- Lau, L., & Ranyard, R. (1999). Chinese and English speakers' linguistic expression of probability and probabilistic thinking. *Journal of Cross-Cultural Psychology*, 30, 411-421.
- Malhotra, N., & McCort, J. D. (2001). A cross-cultural comparison of behavioral intention models: Theoretical consideration and an empirical investigation. *International Marketing Review*, 18, 235-269.
- Mandal, V. & Vander Doelen, C. (1999). *Chasing lightning: Gambling in Canada*. Toronto: United Church Publishing House.
- Mannell, R. C. (2005). Evolution of cross-cultural analysis in the study of leisure: Commentary on "Culture, self-construal, and leisure theory and practice." *Journal of Leisure Research*, 37, 100-105.
- Mannell, R., & Kleiber, D. (1997). *A social psychology of leisure*. State College, PA: Venture.
- Marin G., & Marin, B. (1990). *Research with Hispanic populations* (Applied Social Research Methods, Vol. 23). Newbury Park: Sage.
- Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Milan, A., & Hamm, B. (2004). Mixed unions. *Canadian Social Trends*, summer, 2-6. Retrieved June 10, 2004, from <http://www.statcan.ca/english/studies/11-008/feature/11-008-XIE20040016882.pdf>
- Miyazaki, A., Langenderfer, J., & Sprott, D. (1999). Government-sponsored lotteries: Exploring purchase and nonpurchase motivations. *Psychology & Marketing*, 16, 1-20.
- Morling, B. (2000). "Taking" an aerobics class in the U.S. and "entering" an aerobics class in Japan: Primary and secondary control in a fitness setting. *Asian Journal of Social Psychology*, 3, 73-85.
- Nepstad, P. (2000). Gods of gambling. *The Illuminated Lantern*. Retrieved December 18, 2003, from <http://www.illuminatedlantern.com/cinema/features/gambling.html>
- Nisbett, R. (2003). *The geography of thought*. New York: Free Press.
- Nunnally, J. C. (1967). *Psychometric theory* (1st ed.). New York: McGraw-Hill.
- Oh, H., & Hsu, C. (2001). Volitional degrees of gambling behaviors. *Annals of Tourism Research*, 28, 618-637.
- Park, H., & Levine, T. (1999). The theory of reasoned action and self-construal: Evidence from three cultures. *Communication Monographs*, 66, 199-218.
- Park, H., Levine, T., & Sharkey, W. (1998). The theory of reasoned action and self-construals: Understanding recycling in Hawaii. *Communication Studies*, 49, 196-208.
- Pierro, A., Mannetti, L., & Livi, S. (2003). Self-identity and the theory of planned behavior in the prediction of health behavior and leisure activity. *Self & Identity*, 2, 47-60.
- Pleck, J. H. (1981). *The myth of masculinity*. Cambridge: MIT Press.
- Price, J. (1971). Gambling in traditional Asia. *Anthropologica*, 14, 157-180.
- Rhodes, R., & Courneya, K. (2003). Investigating multiple components of attitude, subjective norm, and perceived control: An examination of the theory of planned behaviour in the exercise domain. *British Journal of Social Psychology*, 42, 129-146.
- Rossi, A. N., & Armstrong, J. B. (1999). Theory of reasoned action vs. theory of planned behavior: Testing the suitability and sufficiency of a popular behavior model using hunting intentions. *Human Dimensions of Wildlife*, 4, 40-56.
- SAS Institute Inc. (1988). *SAS/STAT user's guide, release 6.03 edition*. Cary, NC: SAS Institute Inc.
- Schwalbe, M. L., & Staples, C. L. (1991). Gender differences in sources of self-esteem. *Social Psychology Quarterly*, 54, 158-168.
- Scherl, L. (1989). Self in wilderness: Understanding the psychological benefits of individual-wilderness interaction through self-control. *Leisure Sciences*, 11, 123-135.
- Shanghai Star. (2003). *The gambling gene*. Retrieved April 27, 2004, from <http://appl.chinadaily.com.cn/star/2003/0320/cu18-1.html>

- Shaw, S. (1994). Gender, leisure, and constraint: Towards a framework for the analysis of women's leisure. *Journal of Leisure Research*, 26, 8-22.
- Sheeran, P., & Orbell, S. (1999). Augmenting the theory of planned behavior: Roles for regret and descriptive norms. *Journal of Applied Social Psychology*, 29, 2107-2142.
- Sin, R. (1997). *Gambling and problem gambling among Chinese adults in Quebec: An exploratory study*. Retrieved June 1, 2002, from http://ceris.metropolis.net/Virtual%20Library/community/RickSin1.html#_ftn1
- Smith, G., & Wynne, H. (2002). *Measuring gambling and problem gambling in Alberta*. Retrieved June 1, 2002, from http://www.abgaminginstitute.ualberta.ca/documents/research/gambling_Alberta_cpgi.pdf
- Statistics Canada. (1998). *1996 Census: Ethnic origin, visible minorities*. Retrieved June 1, 2002, from www.statcan.ca/daily/english/980217/d980217.htm.
- Statistics Canada. (2003a). *2001 Census: Analysis Series—Canada's ethnocultural portrait: The changing mosaic*.
- Statistics Canada. (2003b). *Census of population: Immigration, birthplace and birthplace of parents, citizenship, ethnic origin, visible minorities and Aboriginal peoples*. The Daily, January 21.
- Tafarodi, R., Lo, C., Yamaguchi, S., Lee, W., & Katsura, H. (2004). The inner self in three countries. *Journal of Cross-Cultural Psychology*, 35, 97-117.
- Trafimow, D. (1996). Predicting college students' intentions to drink from attitudes and subjective norms. *Journal of Applied Social Psychology*, 26, 2167-2188.
- Trafimow, D., & Finlay, K. A. (1996). The importance of subjective norms for a minority of people: Between subjects and within-subjects analyses. *Personality and Social Psychology Bulletin*, 22, 820-828.
- Triandis, H. (1995). *Individualism & collectivism*. Boulder, CO: Westview.
- Walker, G. J., & Deng, J. (2003/2004). Comparing leisure as a subjective experience with the Chinese experience of *rèmi*. *Leisure/Loisir*, 28, 245-276.
- Walker, G. J., Deng, J., & Dieser, R. (2001). Ethnicity, acculturation, self-construal, and motivations for outdoor recreation. *Leisure Sciences*, 23, 263-283.
- Walker, G. J., Deng, J., & Dieser, R. (2005). Culture, self-construal, and leisure research and practice. *Journal of Leisure Research*, 37, 77-99.
- Walker, G. J., Dieser, R., & Deng, J. (2005). "Whoa versus go!" A rejoinder to Mannell and Caldwell. *Journal of Leisure Research*, 37, 117-127.
- Walker, G. J., Hinch, T., & Weighill, A. G. (2005). Inter- and intra-gender similarities and differences in motivations for casino gambling. *Leisure Sciences*, 27, 111-130.
- Walker, G. J., & Virden, R. J. (2005). Constraints on outdoor recreation. In E. Jackson (Ed.), *Constraints to leisure*.
- Weber, E., Hsee, C., & Sokolowska, J. (1998). What folklore tells us about risk and risk taking: Cross-cultural comparisons of American, German, and Chinese proverbs. *Organizational Behavior and Human Decision Processes*, 75, 170-186.
- Weisz, J., Rothbaum, F., & Blackburn, T. (1984). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist*, 39, 955-969.
- Welte, J., Barnes, G., Wieczorek, W., Tidwell, M., & Parker, J. (2002). Gambling participation in the U.S.: Results from a national survey. *Journal of Gambling Studies*, 18, 313-337.
- Wright, G. N., & Phillips, L. D. (1980). Cultural variation in probabilistic thinking: Alternative ways of dealing with uncertainty. *International Journal of Psychology*, 15, 239-257.
- Yan, L. (2002, July 30). *Three surnames: Li, Wang, Zhang top 270 million in population*. People's Daily. Retrieved January 15, 2003, from http://english.peopledaily.com.cn/200207/29/eng20020729_100528.shtml
- Yu, P., & Berryman, D. L. (1996). The relationship among self-esteem, acculturation, and recreation participation of recently arrived Chinese immigrant adolescents. *Journal of Leisure Research*, 28, 251-273.