

ABSTRACT

Title of Document: THE ROLES OF FAMILY AND CULTURE IN THE CAREER INTERESTS AND CHOICE GOALS OF ASIAN AMERICAN COLLEGE STUDENTS: A TEST OF SOCIAL COGNITIVE CAREER THEORY.

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Although family and cultural influences in the career development of Asian Americans have been widely documented, theory-driven research on this topic remains sparse and dated. The present study examined culturally relevant factors that may contribute to Asian Americans' career considerations in the overrepresented (e.g., science, technology, engineering) and underrepresented (e.g., education, social science) professions. Drawing from social cognitive career theory (SCCT), a culture-specific, social cognitive model of career interests and choice was tested across Holland's Investigative (I) and Social (S) themes. A large, diverse sample of undergraduate Asian American students ($N = 802$) from a Mid-Atlantic university participated in the study. The current findings provided initial empirical support for the hypothesized culture-specific model of interest and choice for both I and S themes, and confirmed the cross-cultural validity of SCCT for this population.

Social cognitive variables (family support, self-efficacy, outcome expectations, and interest) accounted for a substantial amount of variance in Asian American college students' career consideration in both themes. Most of the hypothesized relations among the social cognitive variables were consistent with the theory. In addition, this study examined specific indirect and moderation effects of the culture-specific construct (adherence to Asian values) relative to the interest-choice relation. Findings highlighted the varied roles of family support and adherence to Asian values in participants' career development. For example, family support may directly encourage participants' Social career choice consideration while Asian values may promote Investigative career choice consideration in part through greater family support. Gender was also linked to choice consideration directly (I theme) as well as indirectly through self-efficacy (in both themes).

Finally, multi-group invariance tests suggested that the model fit the data comparably well regardless of gender and generation group status. Hence, the model may be generalizable across the grouping variables (i.e., males and females, foreign born and U.S. born students). Together, these findings extend prior work applying SCCT to Asian American samples and may help to inform career counseling services for this population.

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SOCIAL COGNITIVE CAREER THEORY

By

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CHAPTER I

Introduction

According to the U.S. Census Bureau (2010), approximately 15.5 million Asian Americans live in the United States, which comprises about 5% of the total U.S. population. Asian Americans, as a group, also constitute the fastest growing minority group in number and diversity. By 2050, the projected number of U.S. residents who self-identify as Asian will rise to 40.6 million. Despite their overall high educational attainment and median annual household income, 12.5% (1.75 million) of Asian Americans currently live below the poverty level and 17.6% of Asian Americans live without health insurance coverage (U.S. Census Bureau, 2008). Nearly 30% of Vietnamese Americans and 20% of Korean Americans are employed in low-paid, low-skilled laborer occupations relative to 12.3% of White Americans (Leong & Gupta, 2007).

The career development process of Asian Americans is an important yet understudied topic. A recent study by Fox and Stallworth (2005) found that workplace hostility and discrimination still widely persist among racial minorities, including Asian Americans. Specifically, 57% of Asian Americans reported being targets of racial bullying at work, the highest prevalence rate among all racial groups. The emotional strain associated with racial bullying was also found to be significantly higher among Asian Americans than Whites (Fox & Stallworth, 2005). Furthermore, scholars have noted that occupational segregation remains a persistent social phenomenon affecting many Asian Americans' career development.

Occupational segregation refers to the over- or under-representation of specific groups (by race, ethnicity, or gender) in certain occupations relative to their proportion of the U.S. population. Since the 1970s, research has documented a limited and segregated occupational choice pattern among Asian Americans. It has been argued that, historically, Asian immigrants settled for occupations that were not consistent with their interests, educational levels, or previous work experiences due to language and systemic barriers (Woo, 2000). Currently, occupational segregation is still apparent in Asian Americans' occupational choices, although the prestige level of their choices has substantially increased. According to the U.S. Bureau of the Census (2007), Asian Americans (who comprise about 5% of the total population) represent 30% of medical scientists, 25% of computer engineers, 17% of physicians, and 14% of dentists in the United States. Interestingly, however, Asian Americans represent only 1% of those in social services occupations.

Statement of the Problem

Occupational segregation is a problem for Asian Americans because it may perpetuate occupational stereotypes that Asian Americans are less qualified for careers in which they are less represented (Kwong & Mutkow, 2010; Leong & Serafica, 1995). Teachers, advisors, or career counselors may also, intentionally or unintentionally, help to convey stereotypes that Asian Americans are more likely to succeed in mathematics and scientific careers when compared to other careers (Leong & Chou, 1994). Limited representations in various occupations may be partly due to a lack of role modeling by Asian Americans. Further, research has shown that internalized stereotypes also create a sense of powerlessness and low self-esteem,

which further inhibit exploration and access to different occupational opportunities (Leong & Hayes, 1990).

While Asian Americans have expressed an increasing need for career guidance, the empirical literature on Asian Americans' career development is somewhat sparse and dated (Leong & Chou, 1994; Leong & Gupta, 2007). Existing findings suggest that family influences, cultural values, occupational stereotyping, acculturation, and gender socialization are important and relevant to Asian Americans' career development, including formation of interests, decision-making, and goal pursuits (e.g., Lent, Brown, & Hackett, 2000; Leong, 1985; Leong & Chou, 1994; Tang, Fouad, & Smith, 1999).

A recent literature review by Leong and Gupta (2007, 2008) also highlighted gaps in the career literature on Asian Americans and pointed to the need to conduct an individual- and group-level analysis of factors contributing to their career choices. On the individual level, Leong and colleagues (Leong, 1991; Leong & Chou, 1994) argued that Asian Americans may not choose their careers based on personal factors such as interests and self-efficacy beliefs, even though they may show interests in both science and non-science subjects similar to their peers. Leong (1991) suggested that other factors such as prestige and extrinsic values associated with the occupations may help guide Asian Americans' career aspirations. Hardin, Leong, and Osipow (2001) indicated that the existing measurement of career choice maturity, which is grounded in White middle-class norms, may not be valid for less acculturated Asian Americans who may be more interdependent and collectivistic in their decision-making.

On the group level, contextual variables such as parental influence (Fouad et al., 2007; Tang et al., 1999), gender role socialization (Kwong & Mutkow, 2010) and cultural influence (Leong & Chou, 1994; Leong, 2001; Tang et al., 1999), have received increasing empirical attention relative to Asian Americans' career choices. For example, family and cultural values emerged as the two most significant themes across all 12 participants' career choices and decision-making processes in Fouad et al.'s (2007) qualitative study. Some participants reported that their parents had communicated different achievement expectations regarding their daughters' and sons' career choices. Tang et al. (1999) reported that less acculturated individuals (i.e., those who strongly adhere to traditional Asian values such as filial piety and deference to authority) were more likely to choose careers that are more traditional or similar to their parents' wishes.

Gender differences in career interest and choice have long been observed in the U.S. population, particularly regarding the disproportionate representation of men in Holland's (1997) Realistic theme and women in the Social theme (Fouad, 2002). However, very little research has examined the effect of gender on career interest and choice among Asian Americans. In one relevant study, Asian American men reported significantly higher interests, outcome expectations, and goal intentions for math and science subjects than Asian American women, while women reported significantly higher self-efficacy and interests in arts, social studies, and English than men (Kelly, Gunsalus, & Gunslus, 2009).

Although scholars have noted the need to examine the cultural validity of existing career development theories, most studies of Asian Americans' career

development have been atheoretical in nature (Leong & Gupta, 2007). One exception was Tang et al.'s (1999) study. Tang et al. tested social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994) and found partial support for the model when applied to an Asian American sample. Consistent with Leong and Chou's (1994) argument, their findings also provided empirical evidence that contextual factors (i.e., acculturation, family background), along with personal factors (i.e., self-efficacy), may have a stronger bearing on Asian Americans' choice aspirations than do interests alone. By contrast, studying an ethnically homogenous sample of Korean Americans, Kelly et al. (2009) found that career interests accounted for significant variance in science career goal intentions for both women and men, and career interests also accounted for significant variance in nonscience (e.g., social studies, arts) career goal intentions for men. Further, positive outcome expectations were found to be the most robust predictor of choice goal intentions across gender and career domains.

In conclusion, the inconsistent and limited findings in the current career literature imply the need for more research on the contribution of personal and contextual factors that are culturally specific to Asian Americans' career interests and choice aspirations. In particular, there remains a dearth of theory-driven research on family and cultural influences on Asian Americans' career choices and development (Leong & Gupta, 2007). Furthermore, additional studies are necessary to examine mediator and moderator variables relative to interest-choice relations among Asian Americans. Such research can help scientists and practitioners address the why, how, when, and for whom questions in the career development process of Asian

Americans, and effectively respond to the need for culturally appropriate career guidance in this population.

Purpose of the Study

The current study seeks to extend Tang et al.'s (1999) and Kelly et al.'s (2009) research on Asian American college students' career interests and choices. Drawing on Lent et al.'s (1994, 2000) social cognitive career models of interest and choice, the current study investigated the models' hypothesized relations of self-efficacy and outcome expectation to career interests and choice goals. Specifically, the study focused on two Holland themes –Investigative and Social– that are, respectively, overrepresented and underrepresented in the career choices of Asian Americans. In addition, family influence and individuals' adherence to Asian cultural values were included as culture-specific contextual and person input variables in the SCCT models' prediction of interest and choice. Finally, given differences in the gender role socialization of women and men, the study explored the role of participants' gender relative to interest and choice in each occupational theme.

In sum, the general purpose of the study was to examine the roles of gender, family, and cultural values within SCCT's models of interest and choice – and, more specifically, to use SCCT as a basis for understanding the stereotypic and non-stereotypic career choices of Asian American college students. The current study, therefore, addressed the following research questions:

Question 1: How well does the culture-specific SCCT model, with the addition of cultural and family variables (i.e., family influence, one's adherence to

Asian cultural values), account for Asian Americans' career choice goals within Holland's Investigative (I) and Social (S) themes?

Question 2: To what extent do self-efficacy and outcome expectation relate to Asian American participants' career interests and choice goals across I and S themes?

Question 3: In what ways does family support relate to participants' career interests and choice goals within Holland's I and S themes? How does family support relate to the other social cognitive variables?

Question 4: In what ways do culture-specific person-input factors (i.e., participants' adherence to Asian cultural values) relate to participants' career interests and choice goals within I and S themes? How does adherence to Asian values relate to the other social cognitive predictors?

Question 5: Through what paths does participants' gender relate to their career interests and choice aspirations within I and S themes?

CHAPTER II

Literature Review

The first section of this chapter provides an overview of Asian Americans' occupational choice patterns as well as the cultural similarities and differences within Asian Americans' career interests and choices. The second section provides an introduction to Lent, Brown, and Hackett's (1994) social cognitive career theory (SCCT), particularly the interest and choice models. The third section presents empirical studies of SCCT's major interest and choice hypotheses, along with more recent findings on the roles of person input and contextual factors relative to interests and choice. The fourth section reviews studies that have examined the cross-cultural validity of SCCT with Asian Americans, including family and cultural factors relevant to Asian Americans' career interests and choices. The final section presents the specific research questions and hypotheses of the current study.

Occupational Segregation and Choice Patterns in Asian Americans

Asian Americans present an interesting pattern of occupational segregation. In particular, they show a high rate of representation in medical science, technology, and engineering, but a low rate of representation in social science and artistic careers (Chun, 1980; Leong, 1985; Leong & Gupta, 2007, 2008). Data from the National Science Foundation (2004) indicate that Asian Americans students are more likely to enroll in mathematics, biology, chemistry, and physics courses than are students in other ethnic groups. While comprising 5% of the overall U.S. population, only 1% of employed Asian Americans worked in social services occupations between year 2008 and 2010. In contrast, approximately 13% of employed Asian Americans worked in

computer, mathematical, and engineering industries. Nearly 14% worked in the life science, physical science, and healthcare industry. About 16% worked in management, business, and financial operations occupations (U.S. Bureau of Labor Statistics, 2011).

In her recent study, Ma (2011) examined data on academic achievement, attitudes, course enrollment, and occupational participation on a sample of over 14,000 respondents using the NELS (National Education Longitudinal Study, 1988-1994) and PUMS (Public Use Microdata Sample, 1990) data sets. Ma observed a distinct pattern of academic major and occupational choice among Asian Americans as compared to White, Black, and Hispanic participants. Specifically, Ma found that Asian males and females were the least likely to major or work in social science or education fields compared to other racial/ethnic groups. Consistent with findings in other occupational participation reports, Asian Americans were also more segregated in their occupations and college major distributions compared to Whites, Hispanics, and Blacks.

Although occupational segregation persists among Asian Americans, research has shed little light on the factors that contribute to this phenomenon. Similar to the challenges observed in women's career development, scholars have speculated that Asian Americans may suffer from restrictive access to certain occupations; for example, Asian Americans as a group may be perceived as more qualified for science and technical careers and less qualified for social careers and leadership positions (Leong & Serafica, 1995). Leong and Hayes (1990) measured three dimensions of stereotypes (probability of success, qualifications for training, and acceptance by

others) by asking 194 White college participants to rate 16 occupations identified in the literature as representative of Asian and White Americans. They found significant race and gender differences on the ratings for training qualification and probability of success in certain occupations. In particular, Asians were rated as less likely to succeed as insurance salespersons (who require verbal, persuasive, and social communication ability), while more likely to succeed as engineers (who require math and science ability).

Cultural Differences and Similarities in Interests and Choices

Traditional career theories posit that one's academic and career choice is an expression of personal interests and personality traits (e.g., Holland, 1985, 1997). D.W. Sue and colleagues provided several early studies of Asian Americans' career interests and aspirations (Sue & Frank, 1973; Sue & Kirk, 1972, 1973). They found that Chinese American males showed higher interests than Japanese American males in physical science, technical trades, and business occupations. On the other hand, Chinese American men reported less interest in the Social theme, which included social service and verbal-linguistic occupations. Similar to Chinese males, Chinese females exhibited more interest in technical-applied fields, and biological and physical sciences, and less interest in artistic fields, social sciences, and verbal-linguistic careers compared to Japanese females.

Leung, Ivey, and Suzuki (1994) found a somewhat different occupational choice pattern among Asian Americans. Comparing the career choice considerations of 124 Asian American college students and 246 White American college students based on Holland's occupational themes, Leung et al. found that the two groups

reported similar levels of choice consideration across most occupational themes; however, Asian American participants reported a higher level of consideration of Investigative occupations than did Caucasian American participants. Leung et al. suggested that the prestige value of a career may explain Asian Americans' relatively greater consideration of the Investigative theme, as most of them came from immigrant families, who often hold strong beliefs about upward social mobility through career or educational achievement.

Fouad (2002) examined the between-group and within-group differences in career interest within a sample of 3,637 students and 2,876 professionals (nearly 28% self-identified as Asian Americans). MANOVA findings revealed significant but small differences in career interests, as measured by the Strong Interest Inventory, among the five racial/ethnic groups (Caucasian, American Indian, Asian, Hispanic, and Black), $F(6, 6439) = 18.48, p < .001, \eta^2 = .02$. Asian Americans reported interests that were similar to other racial/ethnic groups in most areas. However, they did report somewhat higher interests in the Investigative theme compared to the other racial groups.

While interest has been found to be a robust predictor of occupational choice goals in studies with general college student samples (see Sheu et al., 2010), inconsistent findings have been observed among Asian Americans. For example, Tang et al. (1999) found that interest was not significantly correlated with occupational choice in their Asian American sample. In a dissertation study of 249 Asian Americans, Qin (2010) found that congruence between interest and choice was significantly lower in the Realistic, Investigative, and Enterprising majors, which are

over-represented among Asian Americans, as compared to Artistic and Social majors, which are under-represented.

Most studies have found that males report higher Realistic and Investigative interests and choice consideration than women, whereas women exhibit higher interests and consideration in Artistic, Social, and Conventional careers (e.g., Ma, 2011). Fouad (2002) found a significant gender group difference in the six Holland's themes on the Strong Interest Inventory, with a large effect size, $F(6, 6439) = 248.62$, $p < .001$, $\eta^2 = .19$. Women continue to score higher on the Social and Artistic interest themes and lower on the Realistic theme when compared to their male counterparts across the five ethnic groups.

Interestingly, Asian women tend to show greater choice consideration of non-traditional or male-dominated career options (e.g., Investigative, Realistic careers) when compared to Caucasian women (Leung et al., 1994). Song and Glick (2004) found that Chinese, Filipino, and Southeast Asian women were more likely to choose non-traditional or male-dominated college majors than were White women, controlling for other demographic factors. For instance, in their sample of 4,470 college women, 36% of Filipino and 34% of Southeast Asian women were in medical or health-related majors (e.g., dentistry), compared to 13% of White women. Song and Glick speculated that such trends may be related to the immigration history of Filipinos in the 1980s, when a shortage of medical professionals in the U.S. prompted a significant increase in working visas granted to healthcare professionals from the Philippines, who then served as role models for the next generation of Filipinos.

In summary, previous studies indicate that interest alone does not fully explain Asian Americans' career aspirations and choice behaviors. Rather, findings suggest that the predictive utility of interests relative to career choice may differ by gender and occupational themes. While career choice is often viewed as a reflection of personal interest and self-concept in traditional career theories (e.g., Holland, 1997), Fouad (2002) noted that there may be cultural variations in the role of vocational interests relative to choice within different ethnic groups. For many Asian Americans, scholars suggest that career choice may be more a means of providing for and fulfilling one's responsibility to one's family than a means of satisfying personal needs for self-actualization (Leong & Serafica, 1995). Sue and Okazaki's (1990) "functional realism" theory also explains that educational pursuit or career choice may serve as an opportunity for upward mobility and survival, which reflect Asian families' values regarding prestige and social status. Further research is needed to examine the roles of culture-specific factors in guiding Asian Americans' career choices.

Social Cognitive Career Theory

The lack of theory-driven research has been a long-standing critique of the career literature on Asian Americans (Leong, 1985; Leong & Gupta, 2007, 2008). In a recent literature review, Leong and Gupta (2007) noted that many of the studies on Asian Americans' career development were descriptive in nature, while less is known about (a) the cross-cultural validity of the Western-based career theories, and (b) the predictive nature of the theoretical constructs relative to Asian Americans' career outcomes. Leong and colleagues have asserted that the development of a culturally

relevant career theory for Asian Americans would require expansion and modification of existing career theories (Leong & Brown, 1995; Leong & Tang, 2002).

Social cognitive career theory (SCCT) offers much potential as a culturally relevant model in explaining Asian Americans' career development, particularly because it integrates both personal and environmental variables that are salient to three phases of the career development process: the formation of academic and career interests, selection of academic majors and career paths, and performance and persistence in the pursuit of academic and career goals (Lent, Brown, & Hackett, 1994). Furthermore, newer additions to the theory shed light on individuals' satisfaction, well-being, (Lent & Brown, 2008) and self-management (Lent & Brown, 2013) in the context of education and work. The current study applied SCCT's interest and choice models with Asian American college students. In the next section, an overview of SCCT's interest and choice models is presented (see Figure 1), followed by a review of empirical findings that tested SCCT's hypotheses.

Consistent with the basic tenets of social cognitive theory (Bandura, 1986), SCCT emphasizes the dynamic interactions among three key person-cognitive variables (e.g., self-efficacy, outcome expectations, goals) in predicting one's career interest and choice. While most career theories generally assume that individuals are likely to gravitate towards occupational activities that are congruent with their interests, Lent et al. (1994, 2000) acknowledged that many people may not be able to choose their careers solely based on interests. It is, therefore, necessary to recognize the influence of additional factors, such as one's contextual affordances (e.g., parental support, barriers) and personal characteristics (e.g., age, gender, race), in order to

provide a more comprehensive career choice and development framework (Lent, Brown, & Hackett, 2000; Lent, Brown et al., 2001).

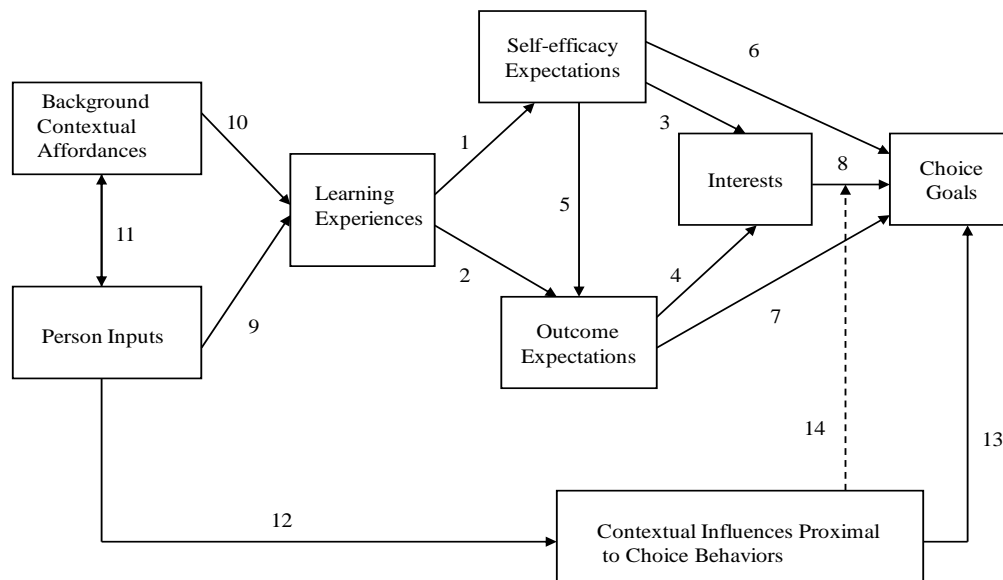


Figure 1. Social cognitive career theory

As shown in Figure 1, interest is considered a joint function of self-efficacy (path 3) and outcome expectations (path 4). Specifically, *interest* refers to one's pattern of likes and dislikes regarding particular activities, academic subjects and majors, and occupations. *Self-efficacy*, defined as individuals' beliefs in their abilities to successfully perform particular behaviors or courses of action, is assumed to influence interest directly, and indirectly through its pathway to *outcome expectations* (path 5), which is defined as one's beliefs about the consequences of performing particular behaviors or courses of action. In the process of career development, Lent et al. hypothesized that individuals establish their career-related self-efficacy beliefs and outcome expectations through different learning experiences (paths 1 and 2,

respectively). These learning experiences include performance feedback (e.g., self or others' evaluations), vicarious learning (e.g., role models, peer influence), physiological and affective states (e.g., positive affect), and social persuasion (e.g., perceived approval or disapproval from teachers and family).

According to SCCT's interest-choice model, individuals are more likely to develop *interests* in a particular domain if they hold strong beliefs that (a) they have the capabilities to successfully perform the tasks and activities in that domain, and (b) the potential outcomes generated through engaging in these tasks and activities are favorable. Further, self-efficacy (path 6) and outcome expectations (path 7) each affect one's career choice (i.e., goal intentions to pursue a particular career path) both directly and indirectly through their relation to interest (path 8).

Additionally, individuals' interests and career choices are assumed to be influenced by person input factors and contextual variables (paths 9-14). In accordance with SCCT, the contribution of person-input variables (e.g., dispositional traits, gender, race/ethnicity) on individuals' interests and choice is considered indirect rather than direct. These variables are assumed to affect individuals' formal and informal learning experiences (path 9) as well as perceptions of their contexts (paths 11, 12), which in turn, shape individuals' self-efficacy beliefs and outcome expectations in performing certain tasks (Lent et al., 1994).

Meanwhile, contextual factors are assumed to have both direct and indirect effects on choice. These factors are categorized into two types, *distal/background affordances* and *proximal contextual influences*, depending on their effects within different phases of career development (Lent et al., 2000). During early development,

the *distal/background affordances* (e.g., cultural socialization, gender role expectations, access to career role models, skill development opportunities) along with person-input factors, are assumed to indirectly affect interests (path 10) through the differential learning experiences (e.g., career resources, role models, and access to opportunities) that they make possible. These learning experiences help determine individuals' self-efficacy beliefs and outcome expectations regarding various career-related activities, and in turn, shape their interests and choice goals (Lent et al., 2000).

The second contextual pathway, *proximal contextual influence*, becomes critical when individuals are actively involved in educational or career decision-making. Variables such as perceived barriers and environmental supports are assumed to directly influence people's choice options (path 13); they may also moderate or override personal aspirations (path 14). For example, Lent et al. (2000) noted that in collectivistic cultures where group interests and collectivistic decision-making are valued, individuals' career choices might be prescribed by influential others, such as parents. Further, SCCT suggests that contextual support and barriers may moderate the process by which people translate their career interests into choice goals and their goals into actions. For example, the relationship between interests and choice may be stronger either in the presence of positive social support, or in the relative absence of perceived social disapproval (Lent et al., 2000).

Empirical Studies of SCCT's Interest and Choice Models across Holland

Themes

Studies utilizing SCCT have mainly examined the predictive nature of social cognitive variables (self-efficacy, outcome expectation) relative to interests and goals,

particularly in Holland's Realistic (R) and Investigative (I) themes (e.g., math, science, engineering). Fewer empirical studies have tested SCCT's interest and choice hypotheses in relation to Artistic (A), Social (S), Enterprising (E), and Conventional (C) themes (Flores, Robitschek, Celebi, et al., 2010; Lent et al., 2003b, 2010). In addition, the majority of these studies were conducted with predominantly White college student samples (see Sheu, Lent, Brown, Miller, Hennessy, & Duffy, 2010). The following literature review will focus on empirical studies of SCCT's interest and choice models specifically within Holland's I and S themes, given their relevance to the central research questions of the current study.

To explore the nature of relations among the contextual and person-cognitive variables in the integrated interest-choice model (note that the interest model is subsumed by the choice model), Sheu, Lent, et al. (2010) recently conducted a meta-analytic path analysis of 40 published and unpublished empirical studies between 1981 and 2008 that tested SCCT's hypotheses. Using structural equation modeling, Sheu et al. examined the model-data fit of a 6-variable (support, barrier, self-efficacy, outcome expectation, interest, choice goal) model for the R, I, and E themes and a 4-variable (self-efficacy, outcome expectation, interest, choice goal) model for the A, S, and C themes. Results of the fit indices suggested that the interest-choice model adequately fit the data across all six themes, and accounted for a substantial portion of the variance in career interest ($R^2 = .42$ and $.67$ for I and S themes, respectively) and choice goals ($R^2 = .56$ and $.69$ for I and S themes, respectively).

Basic predictions of interest and choice. Studies of SCCT have primarily focused on math and science domains (i.e., the I theme). Of the 40 studies included

in Sheu et al.'s meta-analysis, only 4 studies examined the S theme whereas 22 studies examined the I theme. With regard to empirical findings testing specific SCCT hypotheses, Sheu et al. found that for the I theme, the person-cognitive variables (i.e., self-efficacy, outcome expectation) produced significant paths to interest and choice. Consistent with the theory, interest was jointly predicted by self-efficacy (.43) and outcome expectation (.27). Self-efficacy also produced a significant path to outcome expectation (.37). Results indicated that self-efficacy (.08), outcome expectations (.27), and interest (.35) each produced a direct path to choice goals. In addition, the indirect effects of person-cognitive variables to choice goals were partly mediated by interest. Sheu et al. noted that whereas the relation of outcome expectations to choice goals was mostly direct, much of the effect of self-efficacy was indirect (through outcome expectation and interest).

For the S theme, Sheu et al. found theory-consistent direct paths from person-cognitive variables to interest and choice goals. Specifically, self-efficacy produced a direct path to outcome expectation (.63) and these two variables jointly predicted interest with a medium to large effect size (.58 and .31 for outcome expectation and self-efficacy, respectively). Consistent with the theory, self-efficacy (.06), outcome expectations (.29), and interest (.55) each produced significant direct paths to choice goals. Sheu et al. also found support for the mediation hypothesis of the person-cognitive variables to choice goals (via interest). Similar to the findings for the I theme, interest was also the most robust predictor of choice goals. Further, the relation of self-efficacy to choice goals was largely indirect (via outcome expectations and interest) rather than direct.

The roles of contextual factors relative to career interests and goals.

Although scholars have advocated for the importance of examining contextual factors in relation to career theories (Blustein, 2001; Lent et al., 2000), relatively little is known about the contextual influences in relation to interest and goals in Holland's S theme when compared to the I theme.

For the I theme, Sheu et al. showed that the partial indirect model (which assumes both direct and indirect paths of the contextual variables to choice goals) produced a significantly better fit than alternative models (direct, indirect). In other words, contextual variables relate to choice goals both directly and indirectly, through self-efficacy and outcome expectations. Sheu et al. also highlighted the predictive utility of the indirect paths between contextual variables and choice goals, as they tend to produce larger path coefficients and, thus, are more meaningful than the direct paths. For the S theme, a recent study by Lent et al. (2010) with a Portuguese high school sample revealed that the relations of social support and barriers to Social choice goals were indirect, rather than direct—a finding that is similar to the predictions of the I theme but contradicts SCCT's hypotheses. Specifically, the contextual influence of social support to choice was found to be mediated by self-efficacy, outcome expectations, and interest.

Overall, research on SCCT provides consistent evidence for the theory's major hypotheses among college student samples. However, additional studies are required to test the model using longitudinal designs and across various populations. More studies are also needed to shed light on the roles of cultural, contextual, and

person input factors (e.g., age, ethnicity, gender) relative to interest and choice goals (Sheu et al., 2010).

Cross-cultural Validity of SCCT

SCCT appears to be a relevant and useful framework for examining career interest and choice goals within minority populations, given its emphasis on the contextual and sociocultural influences throughout one's career development process. Early cross-cultural studies of SCCT focused on the predictive nature of the core person-cognitive variables relative to choice goals in specific racial or ethnic samples (e.g., Black and Latino students; Fouad & Smith, 1996), without examination of the social-contextual variables. Other studies examined SCCT's predictive utility in cultural groups outside of the United States (e.g., Portuguese high school students; Lent, Paixão et al., 2010). Support for the model's hypotheses was found in Latino/a American high school student samples (e.g., Flores & O'Brien, 2002), African American college samples (e.g., Gainor & Lent, 1998), Asian American college samples (e.g., Tang et al., 1999), and European high school student samples (e.g., Lent, Brown, Nota, & Soresi, 2003). These findings provide evidence for the cultural validity of self-efficacy and outcome expectations in the prediction of interest and choice across race, ethnicity, and nationality.

In recent years, there has been a growing body of cross-cultural research examining the roles of contextual and cultural factors relative to choice goals within SCCT. For example, Byars-Winston et al. (2010) applied SCCT's choice model in examining minority college students' interests and goal commitment in biological science and engineering majors (i.e., Holland's I and R themes). Their sample

included 223 African American, Latino (a), Asian American, and Native American college students from two predominantly White colleges in the Midwest. Campus climate and ethnic identity variables were included to test the cultural and contextual component of SCCT. Path analysis revealed that the hypothesized model fit the data well and supported most of SCCT's core hypotheses. Further, the cultural identity variable (other group orientation) was found to be linked to science-related goals indirectly, rather than directly, through self-efficacy beliefs and interests. Support was also found for an indirect relationship between perceived campus climate and academic goals via self-efficacy.

In another study, Flores, Robitschek, Celebi et al. (2010) examined the model-data fit of SCCT across Holland's RIASEC themes in a sample of 393 Mexican American college students, including several relevant contextual variables (familism, Mexican/Anglo cultural orientation, expressivity/instrumentality). Results from structural equation analysis revealed that the hypothesized SCCT model generally fit the data well across occupational themes. For the cultural/contextual predictions of the model, results indicated that Mexican cultural orientation was linked to participants' career self-efficacy in four out of six themes across gender. Career self-efficacy, in turn, generated direct paths to career interests, with large path coefficients ranging from .73 to .87.

Overall, these findings highlight the relevance of cultural and contextual factors to the career interests and goals of racial/ethnic minority samples. Additionally, previous cross-cultural studies tend to reveal an indirect, rather than direct relationship of contextual and cultural variables to choice interests and goals—

a finding that contradicts SCCT's original hypotheses (Lent & Sheu, 2010). Despite SCCT's growing popularity in multicultural research, more studies are needed to examine how different aspects of culture operate along with the social cognitive variables in predicting the interests and choices of racial-ethnic minority persons.

Empirical Studies Specific to Asian Americans' Career Interests and Choices

The career literature on Asian Americans' interests and choices continues to be relatively limited (Leong & Gupta, 2007). In reviewing studies from the 1970s to the first half of 2012, I was only able to locate seven empirical studies (3 published in peer-reviewed journals, 4 dissertation studies) that tested SCCT's interest and choice models in Asian American samples. Most of these studies incorporated an emic approach, testing SCCT's original hypotheses with the addition of person-input and/or contextual factors (e.g., cultural orientation, family influence) that are considered salient to Asian Americans. In this section, I will summarize the findings of each of these studies, followed by a rationale for choosing the contextual variables to be included in the current study.

Tang et al. (1999) were the first researchers to test SCCT's choice model in their investigation of occupational segregation among Asian Americans. The study consisted of 187 Asian American participants from eight Midwest and Northeast universities. Path analysis was performed to test the validity of the model and the predictive nature of social cognitive variables in relation to Asian Americans' interests and choice. Findings showed that contextual variables (i.e., acculturation, family involvement) and a cognitive-person variable (i.e., self-efficacy) each produced a significant direct path to choice traditionality, as measured by Hsia's

(1988) Representation Index (RI). Specifically, family involvement was predictive of higher choice traditionality (.30). Participants' acculturation (i.e., degree of assimilation to Western culture) was predictive of less traditional or stereotypical career interest (-.53) and choice (-.27). Contrary to SCCT's basic interest hypothesis, interest was not predictive of choice. Tang et al.'s findings provided an initial test of the cross-cultural validity of SCCT with Asian Americans, and identified contextual variables (family involvement, acculturation) as relevant to this population.

Catellino (2005) replicated Tang et al.'s (1999) study with a homogeneous sample of South Asian Americans. Catellino tested the model-data fit of (a) Tang et al.'s original model and (b) a more parsimonious modified model by constraining the non-significant paths in the original model to 0. In addition to acculturation, Catellino tested the relevance of a cultural variable—adherence to caste value (i.e., respect for family and social hierarchy)—to career interest and choice. Results revealed that the modified model, which included caste value, significantly improved Tang et al.'s model. Similar to Tang et al.'s findings, choice traditionality was predicted by acculturation and self-efficacy but not interest. Acculturation was also linked to career choice indirectly through self-efficacy. Additionally, significant direct paths were found between background contextual variables (i.e., family SES, family involvement, and caste values) and traditional career choice.

Similarly, Bui (2005) tested SCCT's contextual hypotheses, with cultural and family factors, in relation to the career self-efficacy and choice traditionality of 216 Vietnamese Americans from local communities in Southern California. Bui coded the traditionality of career choice using the Representation Index (Hsia, 1988) and

U.S. Census Bureau data (2000). Using hierarchical regression analysis, Bui provided empirical support for SCCT's contextual hypotheses. Specifically, Bui found that cultural and family variables accounted for additional variance in career choice above and beyond self-efficacy. Further, cultural and family factors also served as an important source of career self-efficacy. Contrary to the author's predictions, participants' family SES, welfare history, and adherence to Asian cultural values were not significantly related to career self-efficacy or traditionality of career choice.

Ferry, Fouad, and Smith (2000) examined the relations of family background and person input variables to Asian Americans' learning experiences, self-efficacy, outcome expectations, and interests and goals in math and science subjects. Seven hundred and ninety one Asian American psychology undergraduates from two universities participated in the study. Contrary to SCCT's original hypothesis, a background contextual variable (parental encouragement in math and science) was indirectly linked to interests and goals through its relations to learning experiences (.35) and outcome expectations (.23). Positive learning experiences also produced direct paths to self-efficacy (.35) and outcome expectations (.07) in math and science. Consistent with the theory, Ferry et al. found both direct and indirect paths from self-efficacy to choice goals via outcome expectations. Math and science interests were also jointly predicted by self-efficacy (.40) and outcome expectations (.30). Moreover, interest produced a significant direct path to choice goals (.47)—a finding that is contrary to Tang et al.'s results but consistent with SCCT.

More recently, Kelly, Gunsalus, and Gunsalus (2009) examined the relations of background contextual variables (ethnic identity) and social cognitive predictors to science and non-science choice goals with a sample of 251 Korean American college students. Overall, hierarchical regression analysis revealed that the social cognitive variables, particularly outcome expectations, explained a significant amount of variance in the career goals of Korean American men and women ($R^2 = .48$ to $.63$). Additionally, partial support for SCCT's contextual hypotheses was found, with a differential pattern of relations among the variables across gender and the two career domains. Specifically, ethnic identity predicted women's but not men's non-science career goal intentions ($\beta = -.18$). Female participants with stronger identification with Korean culture were less likely to choose non-science careers (e.g., arts, social science).

Using SCCT as his conceptual framework, Au (2008) examined person input (i.e., locus of control, social anxiety, and intolerance of ambiguity) and cultural factors (adherence to Asian cultural values) in relation to the science and non-science career self-efficacy and interests of 688 Asians/Asian American college student participants. Hierarchical regression analyses showed partial support for SCCT's hypotheses. Overall, the model accounted for a significant amount of variance in science and non-science interests ($R^2 = .32$ and $.26$, respectively). Consistent with prior studies, self-efficacy was found to be the most robust predictor of interests for both science ($\beta = .57$) and non-science careers ($\beta = .50$). In addition, Au found that adherence to Asian cultural values significantly moderated the relationship between a

person input factor (i.e., intolerance of ambiguity) and self-efficacy for non-science occupations.

Chang (2010) investigated the relations of contextual factors (family support and role models; perceived educational and career barriers) and dispositional characteristics (positive/negative affect, pessimism/optimism) to the career self-efficacy and decidedness of Hmong Americans (N = 182) as compared to Caucasian American college students (N = 198). Between and within group differences by gender and ethnicity were examined with a multivariate analysis of variance (MANOVA). Overall, results showed that Hmong American participants reported greater perceived educational and career-related barriers as well as lower family support and career decision-making self-efficacy than their Caucasian American peers. In particular, female Hmong participants reported the highest level of perceived contextual barriers and the lowest self-efficacy for coping with educational barriers and for making career decisions. Additionally, Chang found that social support (e.g., inspiration and guidance from role models) was positively correlated with female Hmong Americans' career self-efficacy and career decidedness, whereas family support was linked to male participants' career decision self-efficacy and female participants' career decidedness across ethnic groups.

In sum, these studies provide support for the cross-cultural validity of SCCT for Asian Americans, particularly the predictive utility of self-efficacy. The findings regarding contextual variables in relation to interest and choice goals also highlight the importance of social support, particularly from families, in Asian Americans' career development. Further, there are a growing number of studies that have

attempted to unpack the relationship between culture and career choice using SCCT, with mixed findings. This may imply the need for more nuanced investigations, for example, examining the potential moderator and mediator effects of cultural variables within SCCT. Finally, previous studies have examined the relevance of personality traits (a person-input factor in SCCT) to Asian American's career choice. These correlations tend to be small and sometimes non-significant. Other aspects of person-input factors (e.g., racial/cultural identity, gender) may, therefore, deserve greater study.

Cultural and Family Factors Relative to Asian Americans' Career Choices

In this section, I review additional, non-SCCT-based studies that have examined the contribution of contextual and cultural factors relative to Asian Americans' career development. Specifically, I present the conceptualization and operationalization of these constructs in prior research, and illustrate how the present study addressed gaps in the current literature on Asian Americans' career development. Although most of these studies are atheoretical in nature, they offer important empirical leads for the current research.

Culture consists of "values and behaviors that are learned and transmitted within an identifiable community" (Atkinson, 2004, p. 10). Cultural norms are believed to influence Asian Americans' psychological and social functioning (Kim, 2007), including aspects of their career development (Miller & Kerlows-Myer, 2009). Given the immigration histories of Asian Americans, the process and outcome of acculturation to the mainstream Western culture have received much attention in the literature on Asian Americans' career development (e.g., Leong & Chou, 1994;

Leong & Gim-Chung, 1995). Specifically, scholars have speculated that the degree to which one subscribes to the values and behaviors of the mainstream culture (i.e. *acculturation*) or native Asian culture (i.e., *enculturation*) may have a bearing on his or her career behavior, particularly during the decision-making phase (Leong, 2001; Leong & Chou, 1994).

Leong and Chou (1994) proposed a culture-specific model of career choice for Asian Americans, which incorporated the acculturation process and cultural identity constructs. According to Leong and Chou, individuals who are more assimilated to Western culture, and identify less with their native Asian culture, are assumed to have career paths similar to those of European Americans. Thus, they may be less susceptible to “traditional” or “stereotypical” occupational choice (e.g., science and engineering). However, for those who strongly adhere to their native Asian cultural values (e.g., collectivism, filial piety), the collective needs and interests of the family and society may take precedence over their personal desires in their career decision-making and goal pursuits (Lent & Sheu, 2010; Leong & Chou, 1994; Sue & Sue, 2003). Leong and Chou hypothesized that these individuals are more likely to consider occupations that are traditional for Asian Americans, as they may view occupational segregation and stereotypes as valid expectations of their career choice.

In reviewing the acculturation research within the career literature, Miller and Kerlow-Myers (2009) conducted a content analysis of 26 empirical studies. Eleven of these studies focused on the relations between acculturation and career outcomes in Asian Americans ($n = 2,112$), including career and academic choice (Hansen & Lee,

2007; Song & Glick, 2004) and career interest and values (Leong, Kao, & Lee, 2004; Leong & Tata, 1990; Park & Harrison, 1995; Tang et al., 1999).

A majority of the studies reviewed supported Leong and Chou's cultural hypothesis and were based on the unilinear model of acculturation (Miller & Kerlow-Myers, 2009). The unilinear model assumes that the greater the individual identifies with Western culture, the less he or she will subscribe to Asian cultural norms. In general, findings revealed that higher acculturation to Western culture (or lower adherence to Asian culture) was linked to greater non-traditional career choice (Leong et al., 2004; Park & Harrison, 1995; Tang et al., 1999). One exception was Hansen and Lee's (2007) study, which found no significant correlation between acculturation and occupational interests in their sample of 319 Asian American college students.

Prior studies have also examined the moderation effect of acculturation on the relationship between interest and choice. For example, Hansen and Lee (2007) tested acculturation as a moderator of the predictive validity of Strong Interest Inventory (SII) scores relative to Asian Americans' major choice. By examining participants with the 50 highest and 50 lowest scores on the SL-ASIA (Suinn et al., 1987), a measure of acculturation, results of a chi-square comparison showed no significant difference between levels of acculturation and the predictive accuracy of the SII scores relative to major choice—a finding that is inconsistent with Tang et al.'s (1999) results, where higher career choice traditionality (i.e., I theme) were observed among participants with low versus high levels of acculturation to Western culture.

Overall, findings regarding the relationship between cultural orientation and career outcomes seem to be limited and inconsistent. Based on the unilinear model of acculturation, most findings tend to suggest that individuals with higher acculturation (or lower adherence to Asian culture) are more likely to exhibit a wider range of career interests and less traditional career consideration (e.g., Tang et al., 1999) than those who are less acculturated (or who strongly adhere to Asian culture). However, Miller and Kerlow-Myers (2009) cautioned that the unilinear conceptualization and operationalization of acculturation can lead to misleading interpretations of career findings. They also noted that recent empirical studies have confirmed the bilinear nature of acculturation among Asian Americans (see Miller, 2007, 2010).

To further understand cultural influence on career development, Miller and Kerlow-Myers asserted that enculturation (i.e., the process by which an individual subscribes to his or her culture of origin) should be examined separately from acculturation (i.e., the process of assimilation to the dominant culture), as suggested by the bilinear model. Another significant gap in the literature is the limited understanding of the role of cultural values (i.e., the cognitive dimension of culture) relative to the career development of Asian Americans (Leong & Gupta, 2007, 2008).

Previous studies have tended to operationalize acculturation as the degree to which one identifies with the behaviors and customs of Western culture (e.g., English language fluency, social affiliation). Only a handful of studies have examined the value or cognitive dimension of culture in relation to different career outcomes, and findings of these studies have been mixed. For example, Kantamneni and Fouad (in press) found that cultural values (individualism and collectivism) significantly

predicted South Asian Americans' interests in Holland's Social theme. By contrast, Gupta and Tracey (2005) did not find any significant relation of traditional Indian cultural values ("Dharma") to career exploration or interest-choice congruence in a sample of 83 Asian Indian American college students.

In addition to cultural orientation variables (e.g., acculturation, enculturation), recent qualitative and quantitative studies shed light on the complex relationship between cultural and family variables, and the joint operation of these two variables in Asian Americans' career outcomes. For instance, Fouad, Kantamneni et al. (2007) conducted a qualitative study using a consensual qualitative research (CQR) design to understand the ways in which a group of Asian American professionals ($N = 12$) constructed meaning in their career development. The authors reported that cultural and family expectations emerged as the two most important factors perceived as influencing all 12 participants' career exploration and decision-making experiences. Some participants reported that the desire to be a role model or to break the stereotype of their ethnic groups was part of their motivations for pursuing a specific career, while others mentioned the importance of preserving the legacy of their families/culture and not bringing shame to their families when choosing a career.

Qin (2010) examined acculturation and family factors in relation to interest-choice congruence in a sample of 249 Asian American college students. Qin's was the first and only study (to my knowledge) to test the acculturation-choice link using a bilinear model of acculturation. Specifically, Qin found that adherence to Asian culture was positively related to interest-choice congruence ($r = .39$) for male participants, whereas adherence to American culture was negatively associated with

interest-choice congruence for female participants ($r = -.20$). In other words, male participants with stronger adherence to *Asian* culture were more likely to choose their careers based on interests whereas female participants with stronger adherence to *American* culture were less likely to choose their careers based on interests.

Additionally, Qin observed a differential pattern of relations between aspects of family influence and interest-choice congruence across I and S themes. For those who enrolled in Investigative majors, interest-choice congruence was negatively linked to perceived family obligation ($r = -.21$) whereas for Social majors, intergenerational cultural conflicts (i.e., difference between the parents and children in their cultural orientation) was negatively linked to interest-choice congruence ($r = -.42$). These findings are generally consistent with prior studies that examined the relations of family variables to choice goals (e.g., Bright, Duefield, & Stone, 1989; Tang et al., 1999).

In summary, both qualitative and quantitative investigations highlight the relevance of cultural and family influence to Asian Americans' career interests and choices. Lent et al. (2000) have also noted that Asian Americans may choose majors that meet their cultural or family expectations, rather than relying on their own interests, self-efficacy, or outcome expectations. Despite a growing number of studies on this topic, more research is needed to examine the nature of the relations of cultural values and family influence relative to Asian Americans' interests and choices. Moreover, prior research is often limited by the use of inconsistent definitions of family and culture and by insufficient theoretical grounding. The current study aimed at addressing these gaps in the literature by (a) examining the

relations of the cognitive dimension of culture (i.e., adherence to Asian cultural values) and family influence to domain specific (I, S theme) interest and goals; and (b) testing the moderating and mediating effects of culture and family influence relative to interest and choice goals.

Research Questions and Hypotheses

The current study sought to extend Tang et al. (1999) and Kelly et al. (2009)'s research on Asian Americans' career interests and choice goals, using SCCT (Lent et al., 1994, 2000) as its conceptual framework. In particular, this study attempted to address the following five questions related to Asian American college students' career interests and choices. Specific hypothesized paths within the model are represented in Figure 2.

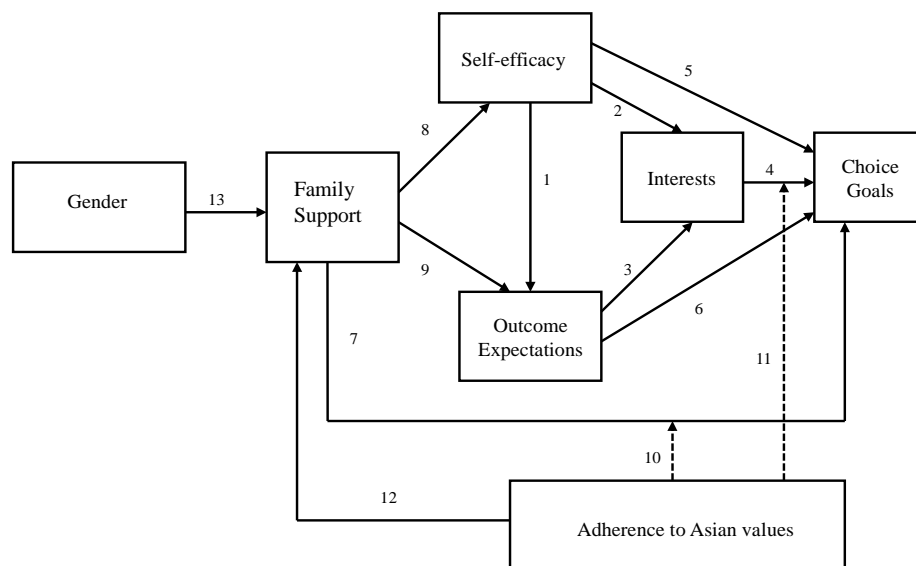


Figure 2. A culture-specific path model of Asian Americans' career interests and choice goals, adapted from SCCT.

Question 1: How well does the culture-specific SCCT model, with the addition of cultural and family variables (i.e., family support, one's adherence to Asian cultural values), account for Asian Americans' career choice goals within Holland's Investigative (I) and Social (S) themes?

Question 2: To what extent do self-efficacy and outcome expectations relate to Asian American participants' career interests and choice goals across I and S themes?

In examining questions 1 and 2, the study tested SCCT's original hypotheses separately for Holland's I and S themes. Specifically, it was hypothesized that:

Hypothesis 1. The culture-specific SCCT model (i.e., with the addition of gender, cultural, and family variables) would produce adequate model-data fit in the (a) I theme and (b) S theme choice domains.

Hypothesis 2. Self-efficacy would relate positively to outcome expectations (path 1) in the (a) I theme and (b) S theme domains.

Hypothesis 3. Interests in each domain would be jointly predicted by (a) self-efficacy and (b) outcome expectations (paths 2 and 3, respectively).

Hypothesis 4. Choice goals in each domain would be jointly predicted by interests (path 4) as well as by self-efficacy (path 5) and outcome expectations (path 6). In other words, self-efficacy and outcome expectations were hypothesized to link to choice goals both (a) directly and (b) indirectly, through interests.

Question 3: In what ways does family support relate to participants' career interests and choice goals within Holland's I and S themes? How does family support relate to the other social cognitive variables?

Question 4: In what way does the cultural factor, participants' adherence to Asian cultural values, relate to participants' career interests and choice goals within I and S themes? How does adherence to Asian cultural values relate to the other social cognitive variables?

In addressing questions 3 and 4, the current study focused on family support as a way to operationalize the contribution of culture-specific contextual factors to Asian Americans' career interests and choice goals within SCCT. Family support was defined as one's perception of his or her parents' or family members' approval of and wishes regarding one's career pursuits. It was hypothesized that:

Hypothesis 5. Family support would relate to choice goals (a) directly (path 7) as well as (b) indirectly, through self-efficacy (path 8) and outcome expectations (path 9) in each domain.

To clarify the relations of cultural and family variables to interest and choice for Asian Americans, the current study tested several moderation and mediation hypotheses based on Lent et al.'s (1994, 2000) theory. In particular, it was expected that individuals' adherence to Asian cultural values (e.g., filial piety, collectivism) – which could be conceptualized as a person-input variable in SCCT – would function as follows:

Hypothesis 6. Adherence to Asian cultural values would (a) strengthen the relation of family support to choice goals (path 10) and (b) weaken the relation of interests to choice (path 11) in each domain. In other words, across both I and S themes, there would be a stronger relationship of family support to choice goals when the individual also has a strong adherence to Asian cultural values. By contrast, there

would be a weaker relationship between interest and choice goals for individuals who adhere more strongly to Asian cultural values.

Hypothesis 7. Family support would mediate the relation of adherence to Asian values to choice goals across I and S themes (path 12). Specifically, it was expected that adherence to Asian values would predict stronger perceived family support which, in turn, would lead to greater choice goals in I or S themes.

Question 5: Through what paths does participants' gender relate to their career interests and choice aspirations within I and S themes?

To address the final question, the current study examined the role of gender to Asian Americans' career choice goals. Consistent with SCCT, it was assumed that the relation of gender to choice goals would be indirect, rather than direct.

Specifically, it was hypothesized that:

Hypothesis 8. The linkage between gender and choice goals would be fully mediated by family support (path 13) and its relation to the other social cognitive variables (i.e., self-efficacy, outcome expectations, and interest) in both the I and S themes.

Based on prior findings (e.g., Leung et al., 1994; Ma, 2011), significant mean differences in interests by gender were expected, such that:

Hypothesis 9. Female participants would be likely to express greater interest in S theme than in I theme activities.

Hypothesis 10. Male participants would be likely to express greater interest in I theme than in S theme activities.

However, given contextual and cultural influences on career choice (Leong & Gupta, 2007, 2008), it was expected that participants would generally be more likely to gravitate towards Investigative careers as compared to Social careers, regardless of their personal interests.

Hypothesis 11. The overall mean levels of choice goals for the I theme would be greater than the S theme across females and males.

Hypothesis 12. Female and male participants would report comparable (i.e., not significantly different) mean levels of choice goals within the I theme.

CHAPTER III

Method

Participants

Participants were currently enrolled undergraduate students from a Mid-Atlantic university who self-identified as Asian or Asian Americans. Of the 802 participants, 348 (43%) were males and 454 (57%) were females. Participants' age ranged between 18 and 35 ($M = 19.91$, $SD = 1.64$) years. One hundred seventy six (22.2%) were freshmen, 206 (25.8%) were sophomores, 193 (24.3%) were juniors, and 223 (27.9%) were seniors. Approximately 32% (or 262) of the participants reported that they were first-generation Asian Americans (i.e., born in a foreign country), 65% (or 526) were second-generation (i.e., born in the U.S. but at least one of their parents were born in Asia or outside of the U.S.), 1% (or 8) were third-generation (i.e., born in the U.S., both parents were born in the U.S., and all grandparents were born in Asia or a country outside of the U.S.), and 0.6% (or 5) were fourth-generation (i.e., born in the U.S. with both parents and at least one of their grandparents being born in the U.S.). Participants represented a wide range of ethnic groups, with the largest groups being Chinese (37.1%), Korean (18.7%), Asian Indian (14.6%), Taiwanese (8.7%), Vietnamese (6.2%), Filipino (3.1%), and Pakistani (3.1%). The average annual combined household income of participants was \$113,369 (median = \$100,000, $SD = \$123,467.90$; $n = 604$). For father's occupation, the most frequently reported occupation categories were computer and mathematical (17.6%, $n = 141$), management (11%, $n = 88$), and architecture and engineering (10.7%, $n = 86$). For mother's occupation, the most frequently reported

occupation categories were business and financial operations (9.7%, $n = 78$), computer and mathematical (9%, $n = 72$), and healthcare practitioners and technicians (8.7%, $n = 70$).

Procedure

After obtaining approval from the Institutional Review Board (IRB) at the University of Maryland, an initial recruitment letter (see Appendix A) was sent to all currently enrolled self-identified Asian and Asian American undergraduate students ($N = 3614$) through an email listserv generated by the University registrar. Data were gathered at the beginning of Spring semester, 2013. Three email reminders, spaced one week apart, were sent to participants who had not completed the survey.

Participants were given a link to a secured online survey website that was created for the study and maintained by Qualtrics.com. Before administration of the measures, all potential participants were asked to read a statement about the purpose of the study, age requirements, instructions on how to complete the questionnaire, and the rights of research participants (see Appendix B). Participants were informed that their responses would be anonymous and voluntary, and that they would be allowed to withdraw from the study at any time by closing the window of the website. Participants also provided their consent on an electronic form before proceeding to the questionnaire.

In addition to demographic information, the questionnaire contained the following self-report measures (see Appendices C to I): Self-efficacy Questionnaire (Lenox & Subich, 1994); RIASEC Interest Marker Scale – form A (Armstrong, Allison & Rounds, 2008); Outcome Expectation Scale (adapted from the Engineering

Outcome Expectation Scale by Lent et al., 2003b); Occupational Consideration Scale (Lent et al., 2003a); Asian Values Scale – Revised (Kim & Hong, 2004); Family Support Scale (adapted from the contextual measures developed by Lent et al., 2003b, and the Family Influence Scale by Fouad et al., 2010). The time required to complete the survey ranged between 10 to 30 minutes. Upon completion of the survey, participants were given the opportunity to enter a raffle to win one of fifty \$20 Amazon.com gift certificates. To ensure anonymity of participants' identities, interested participants were directed to a separate website to enter their contact information.

Measures

Prior SCCT research has sometimes assessed student's career self-efficacy, outcome expectations, interests, and choice aspirations with the use of a common set of occupational titles. Lent and Brown (2006) have noted that such linked measurement procedures may artificially elevate the relations among the predictor and criterion variables. Lent et al. (2010) also noted that the use of occupational titles and linked measures may not be the ideal way to assess students' vocational percepts across Holland's themes because students may have had uneven exposure to and knowledge of different occupational paths. To minimize the problem of linked measurement, the current study adapted psychometrically sound measures that draw on college students' academic and other life experiences. Specifically, items of the self-efficacy, outcome expectation, and interest measures focused on different academic and extracurricular activities that represent Holland's Investigative (I) and Social (S) themes.

Self-efficacy (Appendix C). Participants' perception of their abilities to complete activities corresponding to I and S themes were measured with the two subscales of the Career Self-efficacy Questionnaire (CSEQ; Lenox & Subich, 1994) that reflect Holland's Investigative (I) and Social (S) themes. The original CSEQ has six subscales, each containing five items that represent activities of one of Holland's RIASEC themes. Participants were asked to rate their levels of confidence in completing various career-related activities on a 10-point scale ranging from *completely unsure* (1) to *completely sure* (10). Sample items are "perform a scientific experiment or survey" (I theme) and "help people who are upset or troubled" (S theme). Scores for each occupational theme were derived by summing item responses and dividing by 5. Higher scores reflect stronger confidence in one's ability to complete activities characteristic of each Holland theme.

Previous studies have reported adequate internal consistency estimates for the CSEQ subscales in a college sample, with Cronbach's alpha ranging from .82 to .83 for the I theme and .70 to .81 for the S theme (Betz & Gwilliam, 2002; William & Subich, 2006). Convergent validity of the CSEQ was estimated by Betz and Gwilliam (2002) using multitrait-multimethod analysis, in which the RIASEC subscale scores were positively associated ($r = .59 - .81$) with the corresponding subscale scores of the Skills Confidence Inventory (SCI; Betz, Borgen, & Harmon, 1996). Betz and Gwilliam (2002) also correlated CSEQ subscale scores and SCI subscale scores within the heteromethod non-adjacent trait pairs (e.g., Investigative/Social, Artistic/Enterprising). These pairs showed much smaller

correlations ($r = .15 - .42$) than did the corresponding CSEQ and SCI subscale pairs, which provided evidence of discriminant validity.

Outcome expectations (Appendix D). Outcome expectations regarding both I and S themes were assessed with an adapted version of Lent et al.'s (2003b) Engineering Outcome Expectations Scale. The adapted scale contains nine positive outcomes that could result from going into an occupation within the I and S themes (e.g., “earn an attractive salary,” “get respect from other people,” “do exciting work”). Participants were first presented a brief description of the skills involved in each occupational theme, followed by nine identical outcome items for each theme. For example, the instructions for the S theme read: “Going into an occupation that involves human relations, social, or educational skills (e.g., teacher, counselor, social worker) would allow me to...” Participants responded by indicating how strongly they agreed that entering an occupation that involves skills related to the I and S theme would allow them to obtain each positive outcome, using a 10-point Likert scale ranging from 0 (*strongly disagree*) to 9 (*strongly agree*). Item responses for each occupational theme was summed over items and divided by 9, with higher scores indicating more positive outcome expectations regarding I and S type careers. The original version of the outcome expectation measure produced a coefficient alpha above .80 and yielded positive correlations with other social cognitive measures, including engineering self-efficacy, interest, and choice goals (Lent et al., 2003b, 2007).

Interests (Appendix E). Participants' career interests were assessed with the Investigative and Social interest subscales (8 items per theme) of the RIASEC Interest

Marker Scale (form A), developed by Armstrong, Allison, and Rounds (2008). Participants were asked to rate on a 5-point Likert scale (1 = *not very much* to 5 = *very much*) the degree to which they would like to perform eight different activities corresponding to Holland's I and S themes. Sample items are "do research on plants or animals" (Investigative) and "teach children how to read" (Social). Scores for each occupational theme were derived by summing item responses and dividing by 8, with higher scores indicating greater interest in the activities of each theme.

The original RIASEC Interest Marker Scale (Armstrong et al., 2008) was developed from the Interest Profiler scales (Lewis & Rivkin, 1999). The scale has two forms (A and B) and each form has eight non-identical items representing one of Holland's RIASEC themes (i.e., 48 items in total). Armstrong et al. tested and validated the scale with two large college samples from two Midwestern universities. Internal consistency coefficients (α) ranged between .89 and .91 for the I theme, and between .80 and .85 for the S theme. In terms of convergent validity, the RIASEC Interest Markers Scale scores were found to correlate positively and strongly ($r = .59 - .61$ and $.67 - .72$, for I and S themes, respectively) with parallel scales of the Strong Interest Inventory (SII; Harmon, Hansen, Borgen, & Hammer, 1994).

Choice goals (Appendix F). Participants' occupational choice consideration regarding the I and S themes were assessed with the 7-item Occupational Consideration Scale used by Lent et al. (2003a). Specifically, participants were asked to indicate how seriously they have considered choosing each of 14 occupations representing the I and S themes (e.g., geologist for Investigative theme; high school teacher for Social theme). Responses were obtained along a 10-point scale ranging

from *not very seriously* (0) to *very seriously* (9). Scores for each occupational theme were derived by summing item responses and dividing by 7. A higher score on the scale reflects more serious consideration of the occupations within a specific Holland theme.

The instructions and items of Lent et al.'s Occupational Consideration Scale were adapted from Gore and Leuwerke's (2000) 84-item Outcome Expectations Scale (OE), with six subscales (14 items each) representing each of Holland's RIASEC themes. To create a brief version of the Occupational Consideration Scale, Lent et al. selected the highest loading seven items from each of the original OE scales. Adequate internal consistency estimates were obtained across Holland's themes ($\alpha = .80$ and $.94$, for Social and Investigative themes, respectively). The scale scores were found to be related to self-efficacy, outcome expectations, and interests in theory-consistent ways (Gore & Leuwerke, 2000; Lent et al., 2003a).

Adherence to Asian cultural values (Appendix G). Participants' adherence to Asian cultural values were assessed with Kim and Hong's (2004) Asian Values Scale – Revised (AVS-R). The AVS-R is a shortened version of the original 36-item Asian Values Scale (AVS; Kim, Atkinson, & Yang, 1999). The AVS-R contains 25 items representing six domains of Asian cultural values, including collectivism, conformity to norms, deference to authority figures, emotional control, filial piety, hierarchical family structure, and humility (Kim & Hong, 2004). Twelve of the items are reverse scored.

Participants were asked to indicate the degree to which they identify with statements regarding cultural values associated with Asian Americans (e.g., “one

should consider the needs of others before considering one's own needs"). Responses were obtained along a 4-point scale ranging from *strongly disagree* (1) to *strongly agree* (4). Scores for the AVS-R were derived by summing item responses and dividing by 25. The higher the score, the greater the individual's adherence to Asian cultural values. The AVS-R scores produced adequate internal reliability estimates (α) in prior research, ranging from .73 to .80 (Iwamoto & Liu, 2010; Kim & Hong, 2004; Miller et al., 2011). A two-week test-retest reliability value (.83) was also reported for the original AVS (Kim et al., 1999). Regarding discriminant validity, a small correlation was found between the AVS-R and the Anglo Orientation Subscale (ARSMA-II, Cuéllar, Arnold, & Maldonado, 1995), a measure of behavioral acculturation (Miller et al., 2011). The AVS-R was found to be highly correlated with the original AVS ($r = .93$).

Family support (Appendix H). Participants' perception of their family's support for their career choices was assessed with the Family Support Scale, which was developed for this study. This six-item scale was adapted from Lent et al.'s (2003b) measure of contextual support and barriers for career choice and the family expectation subscale of Fouad et al.'s (2010) Family Influence Scale (FIS). Four items of Lent et al.'s scale and two items of the FIS family expectation subscale were selected and modified for this study. Participants were asked to indicate how they believe their parents/guardians or family members would feel about their decision to go into two different types of occupational paths, corresponding to Holland's I and S themes.

Participants were first presented a brief description of an occupational cluster corresponding to either the Investigative or Social theme, before responding to the six-item questionnaire. For example, “How do you believe your parents/guardians or family members would feel about you choosing an occupation that involves scientific or mathematical skills (e.g., biologist, medical doctor, engineer)?” Sample items for the family support scale are “They would support my decision to enter such an occupation”, “They would be proud of me for making this decision.” Participants indicated the degree to which they agree with each statement along a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). Scores for each occupational theme were derived by summing item responses and dividing by 6. Higher scores reflect greater perceived family support for pursuing an I or S type of career. The original contextual supports and barriers scale by Lent et al. (2003b) produced adequate internal consistency estimates, with Cronbach’s alpha ranging from .72 to .83 for the I theme, and .77 to .81 for the S theme. Confirmatory factor analysis provided support for the structural validity of the scale. The scale scores were positively correlated with other social cognitive measures, including self-efficacy and choice goals (Lent et al., 2003b, Lent et al., 2010).

Fouad et al.’s (2010) FIS was originally designed to assess family influence on one’s career and work decisions. Four factors (informational support, family expectation, financial support, and values/beliefs) emerged from exploratory and confirmatory factor analyses. Validity findings indicated that the total scale score correlated positively with measures of parental attachment, well-being, and career decision-making self-efficacy. FIS scores also demonstrated adequate reliability

estimates, with Cronbach's alphas between .82 and .89. Fouad et al. found that Asian American students reported higher Family Expectation subscale scores than did African American and White American students. The original family expectations subscale of FIS consists of six items that reflect family approval/disapproval of one's career choices. Items are rated on a 6-point scale (1 = *strongly disagree*; 6 = *strongly agree*). To modify the scale for use in this study, I eliminated items that were redundant with Lent et al.'s measure and then adapted two of the unique items into the current measure: "My family expects people from our culture to choose certain careers," and "My family is only willing to support me financially if I choose a career of which they approve." To fit the I and S theme structure of the other measures, the two family expectation items were rephrased as "They expect people from our culture to choose this sort of career" and "They would only be willing to support me financially if I choose to enter this type of occupation."

Demographic information (Appendix I). In addition to measures of the theoretical constructs, participants were asked to indicate their race/ethnicity, age, year of birth, generation status, citizenship status, year in college, current GPA, socioeconomic status, father's and mother's occupation, and current academic major and occupational consideration.

CHAPTER IV

Results

Preliminary Analyses

Missing data and data cleaning. A total of 1,016 students visited the online survey website and completed some or all of the items on the questionnaire (response rate = 28%). Findings from the missing value analysis using SPSS 19.0 indicated that missing data ranged from a low of 9.1% for items on the self-efficacy scales to a high of 18.0% for items on the family support scales. Results of the Little's MCAR test yielded a chi-square value of 857.53, $df = 835$, $p = .287$, suggesting that the data were missing completely at random. Of the 1,016 respondents, 181 respondents started but did not complete the entire survey. They were removed due to severe missing data (i.e., more than 15% missing items in the questionnaire). In addition, participants who did not report their biological sex ($n = 10$) as well as those who self-identified with more than one racial group ($n = 23$) were removed from the main analyses. The final sample size included 802 participants with complete data.

Descriptive statistics. Tables 1 and 2 present means, standard deviations, bivariate correlations, and internal consistency reliability estimates of the measured variables for the total sample within the I and S themes, respectively. All of the scale scores were found to yield internal consistency reliability estimates (α) of .77 and above. The correlations also indicated theory-consistent relations among the social cognitive variables. In addition, the culture-specific contextual variable, family support, was significantly and positively related to interests and choice goals in the I and S theme. In contrast, the culture-specific person-input variable, adherence to

Asian values, was significantly and positively related to interest and choice goals in the I theme but not the S theme. In addition, being female was negatively related to self-efficacy and choice goals in the I theme (i.e., women had lower I theme self-efficacy and choice scores than did men), and positively related to self-efficacy, outcome expectations, interest, and choice goals in the S theme.

Table 1.

Means, Standard Deviations, Internal Consistency Estimates, and Correlations (Investigative)

Variable	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>	α
1. SEX	–							–	–	–
2. SE-I	-.24**	–						7.10	1.76	.80
3. OE-I	-.03	.38*	–					8.02	1.36	.88
4. INT-I	-.04	.27**	.31**	–				3.06	.93	.89
5. FS-I	.02	.17**	.36**	.13**	–			5.79	1.03	.78
6. AVS	-.01	.08**	.18**	.12**	.14**	–		2.48	.30	.77
7. OC-I	-.15**	.33**	.30**	.63**	.14**	.10**	–	3.89	2.03	.87

** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Note. OCI = Investigative Occupation Consideration (goal); AVS = Asian Value Scale; SEI = Investigative Self-efficacy; OEI = Investigative Career Outcome Expectation; INTI = Investigative Career Interest; FSI = Family Support for Investigative Career Choice; for the sex variable, 1 = male, 2 = female; *N* = 802

Table 2.

Means, Standard Deviations, Internal Consistency Estimates, and Correlations (Social)

Variable	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>	α
1. SEX	–							–	–	–
2. SE-S	.13**	–						7.67	1.55	.83
3. OE-S	.13**	.40**	–					7.13	1.47	.90
4. INT- S	.17**	.45**	.46**	–				3.40	.79	.85
5. FS-S	.00	.16**	.36**	.25**	–			4.16	1.33	.86
6. AVS	-.01	-.03	.00	.03	-.07*	–		2.48	.30	.77
7. OC-S	.11**	.25**	.40**	.54**	.26**	.01	–	3.83	2.00	.89

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Note. OCS = Social Occupation Consideration; AVS = Asian Values Scale; SES = Social Self-efficacy; OES = Social Career Outcome Expectation; Social Career Interests; FSS = Family Support for Social Career Choice; 1 = male, 2 = female; *N* = 802

Non-normality. A multivariate normality test using LISREL 8.80 (Jöreskog & Sörbom, 2009) was conducted to examine the normality of the data. Results indicated that the assumption of a multivariate normal data distribution was violated for continuous variables within the I theme ($\chi^2 = 178.18, p < .01$) and the S theme ($\chi^2 = 250.29, p < .01$). Therefore, robust maximum likelihood estimations and the Satorra-Bentler chi-square (SB χ^2) were used to adjust for the presence of non-normality in the data (Satorra & Bentler, 2001).

Research Questions and Hypotheses

The main purpose of the study was to test the culture-specific SCCT model for Asian Americans' career choices within Holland's Investigative (I) and Social (S) themes. In addition, the study examined two culture-specific variables, adherence to Asian cultural values and family support, and their relations to participants' career interests and choice goals in the I and S themes. Specifically, the following research

questions were examined by testing separate observed variable path models for the I and S themes (see Figure 2). Specific hypotheses related to each research question are reproduced, below.

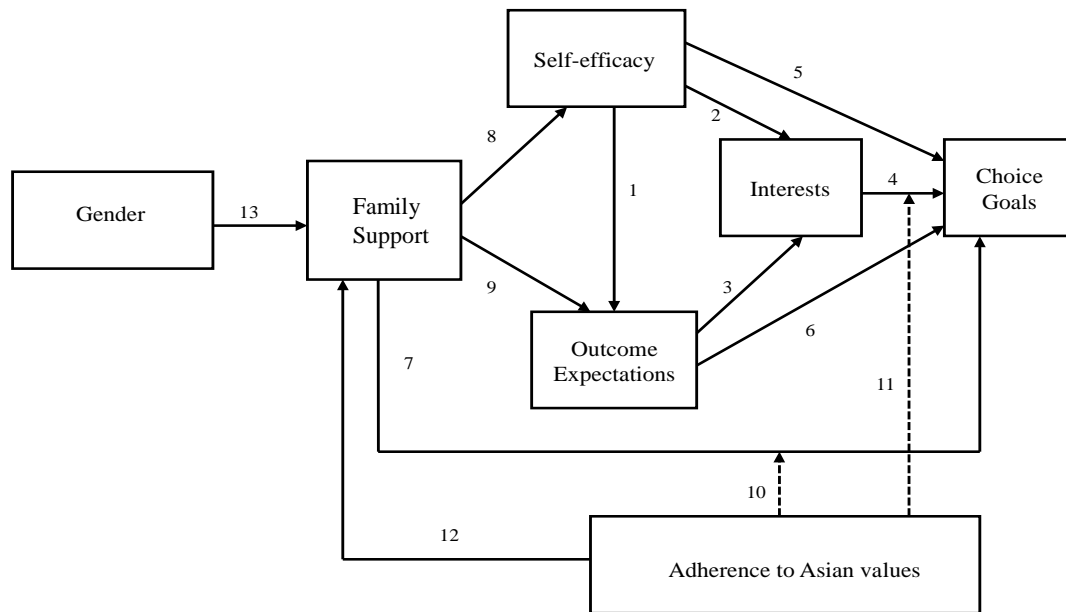


Figure 2. A culture-specific model of career choice for Asian American college students based on SCCT.

Question 1: How well does the culture-specific SCCT model, with the addition of cultural and family variables (i.e., family support, adherence to Asian cultural values), account for Asian Americans' career choice goals within Holland's Investigative (I) and Social (S) themes?

Question 2: To what extent do self-efficacy and outcome expectation relate to Asian American participants' career interests and choice goals across I and S themes?

In examining Questions 1 to 2, it was hypothesized that:

Hypothesis 1. The culture-specific SCCT model would produce adequate model-data fit in the I theme and S theme choice domains.

Hypothesis 2. Self-efficacy would relate positively to outcome expectations (path 1) in the I theme and S theme domains.

Hypothesis 3. Interests in each domain would be jointly predicted by self-efficacy (path 2) and outcome expectations (path 3) in the I theme and S theme domains.

Hypothesis 4. Choice goals in each domain would be jointly predicted by interests (path 4), self-efficacy (path 5) and outcome expectations (path 6). In other words, self-efficacy and outcome expectations were hypothesized to link to choice goals both (Hypothesis 4a) directly and (Hypothesis 4b) indirectly, through interests in each domain.

Question 3: In what ways does family support relate to participants' career interests and choice goals within Holland's I and S themes? How does family support relate to the other social cognitive variables?

Hypothesis 5. Family support would relate to choice goals (Hypothesis 5a) directly (path 7) as well as (Hypothesis 5b) indirectly, through self-efficacy (path 8) and outcome expectations (path 9) in each domain.

Question 4: In what ways do culture-specific person-input factors (i.e., participants' adherence to Asian cultural values) relate to participants' career interests and choice goals within I and S themes? How does adherence to Asian values relate to the other social cognitive variables?

In examining Questions 4, the current study tested several moderation and mediation hypotheses based on Lent et al.'s (1994, 2000) theory to clarify the relations of cultural and family variables to interest and choice for Asian Americans. Specifically, it was hypothesized that:

Hypothesis 6. Adherence to Asian cultural values would (Hypothesis 6a) strengthen the relation of family support to choice goals (path 10) and (Hypothesis 6b) weaken the relation of interests to choice (path 11) in each domain. In other words, across both I and S themes, there would be a stronger relationship of family support to choice goals when the individual also has a strong adherence to Asian cultural values. By contrast, there would be a weaker relationship between interest and choice goals for individuals who adhere more strongly to Asian cultural values.

Hypothesis 7. The relation of adherence to Asian values to choice goals would be mediated by family support across I and S themes (path 12). Specifically, it was expected that adherence to Asian values would predict stronger perceived family support which, in turn, would lead to greater choice goals in I or S themes.

Question 5: Through what paths does participants' gender relate to their career interests and choice aspirations within I and S themes?

Consistent with SCCT, it was assumed that the relation of gender to choice goals would be indirect, rather than direct. Specifically, it was hypothesized that:

Hypothesis 8. Participants' gender and choice goals would be indirectly linked through family support (path 13) and other social cognitive variables (i.e., self-efficacy, outcome expectations, and interest) in both the I and S themes.

Data Analysis Strategies

Testing the observed variable path models. Hypotheses 1 was tested by assessing the model-data fit of the hypothesized culture-specific SCCT model for the I and S themes. The culture-specific SCCT model contained two exogenous variables (adherence to Asian cultural values, gender) and five endogenous variables (family support, self-efficacy, outcome expectations, interests, and choice goals). Separate covariance matrices for each occupational theme were created to test the hypothesized path models using LISREL 8.80 (Jöreskog & Sörbom, 2009) software, with robust maximum likelihood estimation. The Satorra-Bentler chi-square (SB χ^2) was likely to be significant given the large sample size and the number of variables and paths examined in the current models. Therefore, model-data fit was assessed with three primary goodness-of-fit criteria: (a) a comparative fit index (CFI) near or above .95 (Kline, 2005); (b) a standardized root-mean-square residual (SRMR) value of .08 or below, and (c) a root mean square error of approximation (RMSEA) value of .06 or below (Hu & Bentler, 1999). In addition, path coefficients were used to determine the magnitudes of (a) the direct relations of the culture-specific and social cognitive variables to interests and choice as well as (b) the relations among the social cognitive and culture-specific variables, as proposed in Hypotheses 2 to 5.

Test of moderation effects. Hypothesis 6 involves a test of moderation effects of the cultural variable, adherence to Asian values, on the relationship of (a) family support to choice goals and (b) interest to choice goals within the I and S themes. This hypothesis was tested using Jaccard and Wan's (1995) method for estimating interaction effects in SEM. Jaccard and Wan's (1995) method is one of

the most effective in terms of minimizing Type I and Type II errors and maximizing power (see Moulder & Algina, 2002). Jaccard and Wan recommended mean centering the main effect variables (i.e., gender, family support, adherence to Asian cultural values, self-efficacy, outcome expectations, and interests) before computing the product term indicators (i.e., adherence to Asian cultural values \times interests; adherence to Asian cultural values \times family support). Mean centering reduces the collinearity between the main effects variables and the interaction terms.

Similar to the path model analysis procedures used to test the basic SCCT models (i.e., without the interaction terms), LISREL 8.80 (Jöreskog & Sörbom, 2009) software was used to test the moderation hypotheses within the hypothesized culture-specific SCCT model for each occupational theme. The covariance matrices included both the main effects and interaction terms, and robust maximum likelihood estimation was used. In testing the moderation effects, the interactions terms were modeled as exogenous variables (Cortina, Chen, & Dunlap, 2001), with the addition of two direct paths from the interaction terms (adherence to Asian cultural values \times interests; adherence to Asian cultural values \times family support) to choice goals (this is conceptually similar to the dashed paths in Figure 2). As before, three primary fit indices (CFI, SRMR, RMSEA) were used to assess model-data fit. Standardized path coefficients ($p < .05$) were used to determine the statistical significance of the main effects and the moderation effects. The path coefficients of the main effect variables were expected to be very close to the values obtained in a model without the interaction terms (Jaccard, Turrisi, & Wan, 1990).

Testing the significance of indirect effects. To test the indirect effects posited by Hypotheses 4b, 5b, 7, and 8, the test of joint significance was employed (TJS; Mallinckrodt et al., 2006). MacKinnon et al. (2002) compared 14 methods of mediation tests and found that the TJS exhibited the best balance of Type I error and statistical power. Using this method, an indirect effect is established when the coefficients of the paths from the predictor to the mediator and from the mediator to the outcome variable are both statistically significant. Several advantages of TJS over bootstrapping methods have been noted by statisticians, particularly its ease of use and better performance with respect to Type I error (see Mallinckrodt, Abraham, Wei, & Russell, 2006).

Test of the Culture-Specific SCCT Model of Investigative Theme Choice

Full model test. Table 3 presents a summary of the fit-statistics of tested models. This model included the moderating effects of adherence to Asian values (AVS) on the relation of interest to choice goals and of family support to choice goals (see Figure 3). Contrary to prediction, Model 1A produced non-optimal fit to the data, CFI = .89, RMSEA = .09, SRMR = .08, SB χ^2 (17, $N = 802$) = 136.72, $p < .01$. The path coefficients of the interaction terms (AVS \times Family Support; AVS \times Interests) were not significant, suggesting that AVS did not moderate the relationship between interest and choice goals, nor did it moderate the relationship between family support and choice goals.

Table 3. Summary of fit indices for the Culture-Specific Social Cognitive Models

Model	$SB\chi^2$	df	p -value	CFI	SRMR	RMSEA
<i>Investigative</i>						
Hypothesized moderation [1A]	136.75	17	<.01	0.89	0.08	0.09
Non-moderation alternate [1B]	76.18	9	<.01	0.94	0.07	0.10
Modified non-moderation [1C]	20.3	7	<.01	0.99	0.04	0.05

Note. CFI = comparative fit index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation.

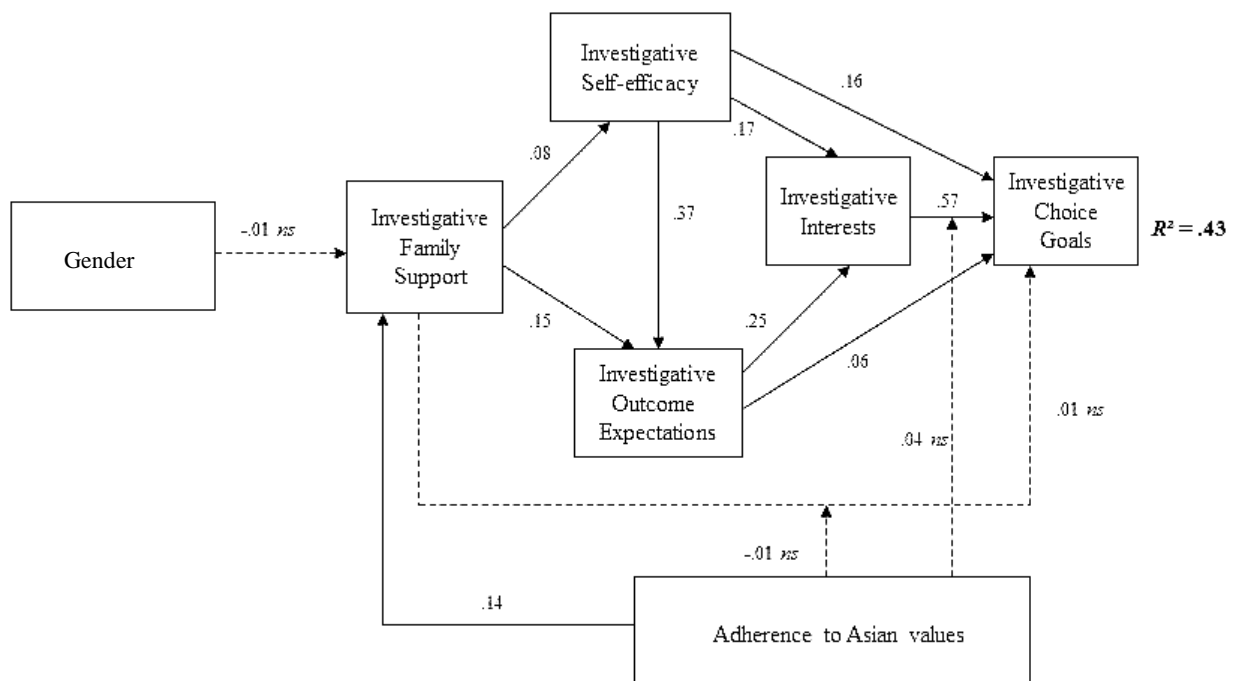


Figure 3. Hypothesized moderation model of investigative interest and choice goals (model 1A). All path coefficients are standardized. Dashed lines indicate non-significant paths.

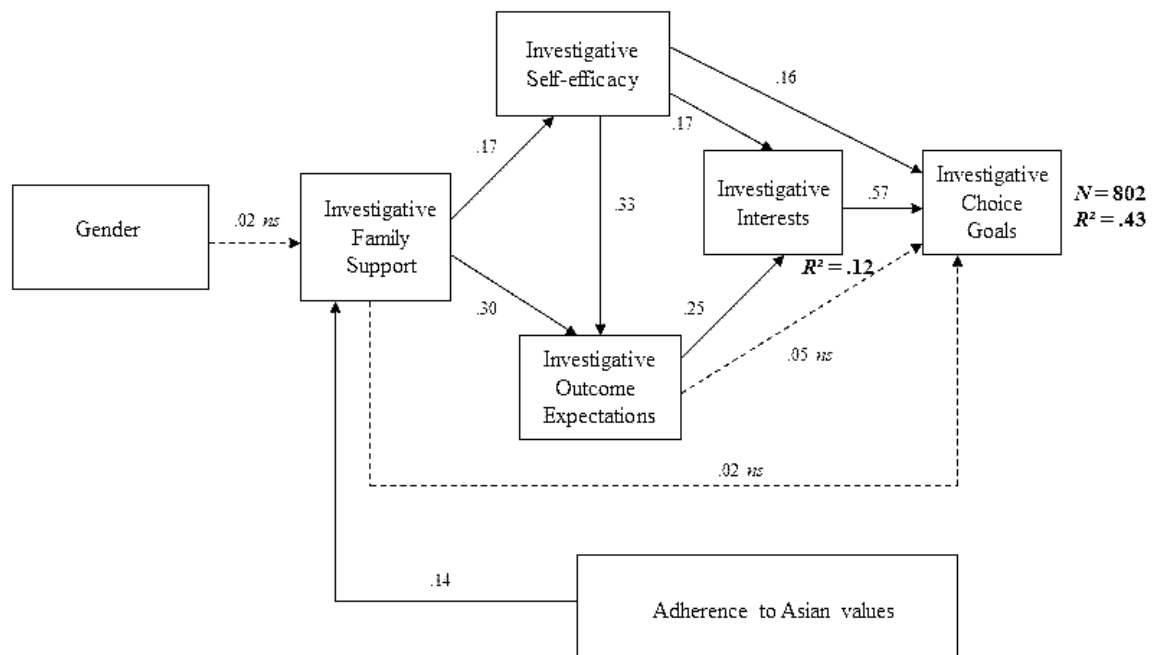


Figure 4. Non-moderation alternate model of investigative interest and choice goals (model 1B). All path coefficients are standardized. Dashed lines indicate non-significant paths.

Next, I tested a more parsimonious version of the culture-specific SCCT model by removing the non-significant moderation paths in Model 1A (see Figure 4). Results indicated that this culture-specific non-moderation model (Model 1B) yielded somewhat less than optimal model-data fit, CFI = .94, SRMS = .07, RMSEA = .10, $SB \chi^2(9, N = 802) = 76.18, p < .01$.

Model modification. Given the non-optimal fit of Models 1A and 1B, LISREL's model modifications indices were examined. They suggested adding two paths to reduce the chi-square estimates. These changes were allowed given that they could be justified on theoretical and empirical grounds (MacCallum, Roznowski, and Necowitz, 1992). Specifically, we added (a) a path from gender to self-efficacy and (b) a path from gender to choice goals because prior SCCT research has shown

significant gender differences in career choice and self-efficacy in the science and mathematics domain (Sadker & Sadker, 1994; Zeldin & Pajares, 2000). The modified non-moderation culture-specific model (Model 1C) was then re-run in LISREL 8.80 with these two additional paths (see Figure 5). Results indicated excellent model-data fit, CFI = .99, SRMR = .04, RMSEA = .05, SB χ^2 (7, $N = 802$) = 20.30, $p < .01$ (see Table 3 for a summary of the fit-statistics of models 1A, 1B, and 1C). Comparison of the two nested models (1B and 1C) using the Satorra-Bentler χ^2 difference test indicated that the direct paths from gender to self-efficacy and choice goals significantly improved model fit (Δ SB $\chi^2 = 62.17$, Δ *d.f.* = 2, $p < .001$). Model 1C was, therefore, retained as the best-fitting model.

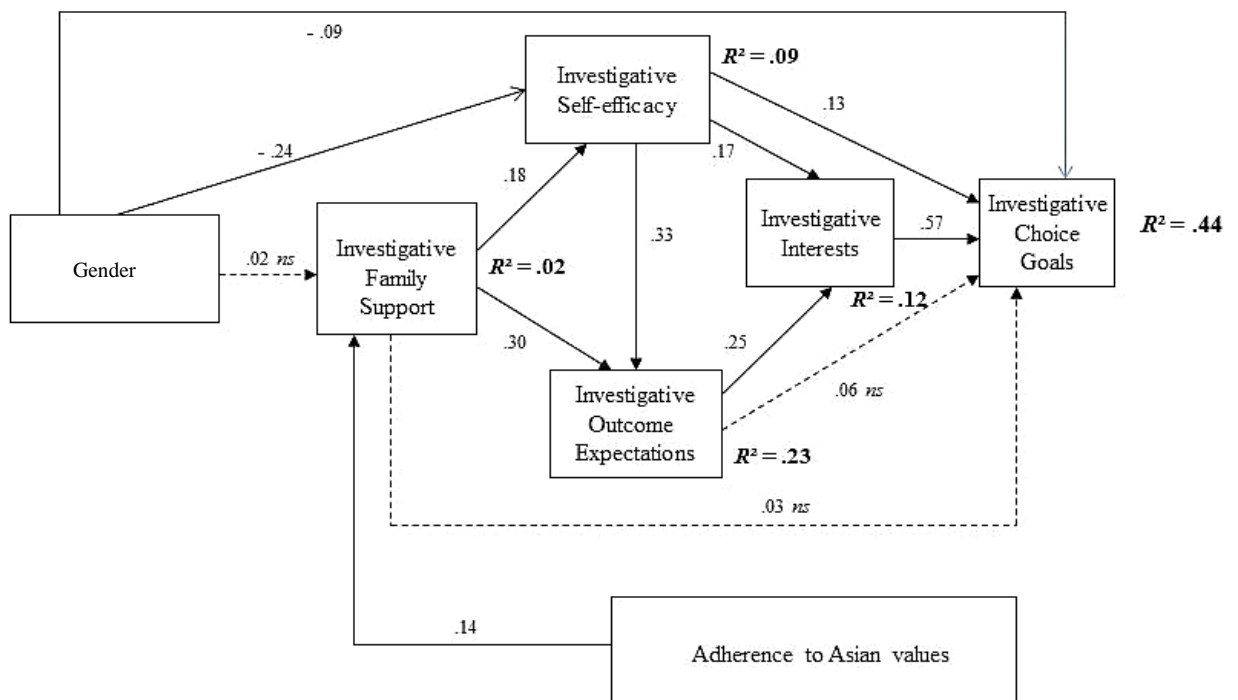


Figure 5. Modified non-moderation culture-specific social cognitive model of investigative interest and choice goals (model 1C). All path coefficients are standardized. Dashed lines indicate non-significant paths.

Figure 5 presents the path coefficients of the final modified culture-specific model. Findings indicated that the path coefficients of the social cognitive variables to interests and choice goals were generally consistent with the theory's hypotheses (#2 to 4). In particular, interest was the strongest predictor of choice goals among self-efficacy, outcome expectation, and the other contextual and person-input variables. Self-efficacy and interest each produced direct positive paths to choice goals, with small to large effect sizes. Contrary to prediction (H#4a), however, the direct path from outcome expectations to goals was not significant. Contrary to prediction (H#5a), family support was not directly related to choice goals. Overall, Model 1C explained 12% of the variance in investigative interest and 44% of the variance in choice goals.

The test of joint significance (TJS) was used to determine the significance of the proposed indirect effects (Mallinckrodt et al., 2006) of Model 1C. Specifically, this study tested the indirect effects of the contextual and person-input variables, family support, gender, and adherence to Asian values (AVS), to participants' investigative choice goals (i.e., H#4b, 5b, 7, and 8). Consistent with Hypothesis 4b, self-efficacy and outcome expectations were indirectly related to choice goals via interests. In addition, as proposed in Hypothesis 5b, findings indicated significant theory-consistent indirect relations between family support and choice goals via self-efficacy, outcome expectations, and interests. In other words, greater family support was related to higher investigative self-efficacy and outcome expectations which, in turn, were related to interests and/or choice consideration for investigative careers.

Additionally, it was found that AVS was related to career interest and choice goals indirectly through family support and other social cognitive variables, thus providing partial support for hypothesis #7. Specifically, those with strong adherence to Asian values were more likely to perceive greater family support, which then predicted greater investigative self-efficacy, outcome expectations, interests, and choice goals in investigative careers. Finally, the results indicated that gender is both *directly* and *indirectly* related to choice goals via self-efficacy, outcome expectations, and interests. The two additional, significant negative path coefficients suggested that females were more likely to report lower levels of self-efficacy and choice consideration in relation to investigative careers. This finding is contrary to the hypothesis #8 and SCCT that the relation between gender and choice goals would be indirect only.

Invariance across gender. A one-way multivariate analyses of variance was first conducted to examine potential differences in the social cognitive variables and Asian values as a function of gender. Participants were divided into male and female groups based on their self-reported gender. Three hundred and forty eight participants self-identified as males whereas 454 participants self-identified as females. Findings indicated a significant gender difference across the variables within the I-theme (Wilks' $\Lambda = .92$, $F(5, 796) = 13.15$, $p < .01$, $\eta = .08$). Specifically, there were significant gender differences in investigative self-efficacy, $F(1, 801) = 48.32$, $p < .01$, $\eta = .06$ (univariate effect size) and in choice goals, $F(1, 801) = 17.07$, $p < .01$, $\eta = .02$. Male participants reported higher investigative self-efficacy and

investigative career choice consideration than their female peers, with small effect sizes.

Since gender differences were observed in the social cognitive variables within the I theme model, the modified non-moderation culture-specific SCCT model (1C) was then examined to address whether the paths of the model vary across gender (i.e., whether gender moderates the relations among variables in the model). A multiple-group analysis was performed using separate covariance matrices for male and female participants (Kline, 2005). The procedure involves analyzing the hypothesized culture-specific SCCT model across both samples at the same time and testing restrictive parameter sets in three steps. First, multi-group path analyses using LISREL 8.80 were conducted to compare both samples on the same model parameters without any constraints. Next, I ran the analysis on the same model while constraining all parameters to be equal across both samples. Finally, I compared the non-constrained chi-square statistics with the equality-constrained chi-square statistics for the multiple group analysis. If the chi-square difference statistic does not reveal a significant difference between the unconstrained and the equality-constrained models, then the constrained model can be retained and invariance of model fit across groups can be assumed. The modified culture-specific model consists of five predictor variables (adherence to Asian values, family support, self-efficacy, outcome expectations, and interests) and the outcome variable (domain choice goals). AVS was modeled as the exogenous variable, with other social cognitive variables as endogenous variables.

Table 4 presents the SB χ^2 statistics of the multi-group models with and without constraints for the I theme. Results of the SB χ^2 difference test of the constrained and unconstrained models did not reveal a significant difference. Thus, the more parsimonious equality-constrained model was retained. That is, the I-theme model can be considered as invariant across gender.

Table 4. *Fit-Statistics for the Multi-group Invariance Test across Gender.*

Model	SB χ^2	Normal χ^2	df	Δ SB χ^2	Δ df	p-value
<i>Investigative</i>				17.83	10	0.06
Model with no constraints	19.44	22.08	10			
Model with constraints	37.36	40.12	20			

Invariance across generation status. A one-way multivariate analyses of variance was conducted to examine potential differences in the social cognitive variables and Asian values as a function of generational status. Participants were divided into two generation groups based on their self-reported generation status. US born refers to participants who indicated that they were second generation or above (n = 539); foreign born refers to those who were first generation (n = 262). Findings indicated a significant generation status difference across the variables for the I domain (Wilks' $\Lambda = .96$, $F(6, 794) = 5.34$, $p < .01$, $\eta = .04$), although the effect sizes were small. Specifically, there were significant generation status differences in self-efficacy, $F(1, 799) = 4.88$, $p < .05$, $\eta = .006$, and family support, $F(1, 799) = 4.17$, $p < .05$, $\eta = .005$. Foreign born Asian Americans reported higher investigative self-efficacy, whereas U.S. born Asian Americans reported greater family support in the pursuit of *investigative* careers compared to foreign born Asian Americans.

To address whether generation status moderates the relations among variables in the hypothesized modified non-moderation culture-specific model (model 1C), a

multiple-group analysis was conducted using separate covariance matrices for U.S. born and foreign born participants (Kline, 2005). Table 5 presents the $SB\chi^2$ statistics of the multi-group models with and without constraints for the I-theme domain. Results from the SB chi-square difference test of the constrained and unconstrained models did not reveal a significant difference ($p > .05$). Thus, the more parsimonious equality-constrained model was retained. That is, the I-theme model can be considered as invariant across generation groups (foreign born and U.S. born).

Table 5. *Fit-Statistics for the Multi-group Invariance Test across Generation Status.*

Model	SB χ^2	Normal χ^2	df	$\Delta SB\chi^2$	Δdf	p-value
<i>Investigative</i>				15.49	13	0.28
Model with no constraints	21.96	24.35	14			
Model with constraints	37.67	40.11	27			

Test of the Culture-Specific SCCT Model of Social Theme Choice

Full model test. Table 6 presents a summary of the fit-statistics of tested models. This model included the moderating effects of adherence to Asian values (AVS) on the relation of interest to choice goals and of family support to choice goals (see Figure 6). The model (2A) produced adequate model fit, $SB\chi^2$ (17, N = 802) = 36.43, $p = .004$, CFI = .98, SRMR = .05, RMSEA = .04. However, contrary to prediction, the coefficients of the two interaction terms (AVS \times family support; AVS \times interests) were not significant.

Table 6. Summary of fit indices for the Hypothesized Culture-Specific Social Cognitive Model

Model	$SB\chi^2$	<i>df</i>	<i>p</i> -value	CFI	SRMR	RMSEA
<i>Social</i>						
Hypothesized moderation [2A]	36.43	17	<.01	0.98	0.05	0.04
Non-moderation alternate [2B]	37.90	9	<.01	0.98	0.06	0.06
Modified non-moderation [2C]	24.48	7	<.01	0.98	0.03	0.06

Note. CFI = comparative fit index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation.

Consistent with the Investigative theme model test, I removed the non-significant moderation paths in Model 2A and tested the revised culture-specific SCCT model (i.e., model 2B). Results indicated an adequate model fit, $SB\chi^2$ (9, N = 802) = 37.90, $p < .01$, CFI = .98, SRMR = .06, RMSEA = .06. Thus, the more parsimonious Model 2B is chosen over Model 2A (see Figure 7).

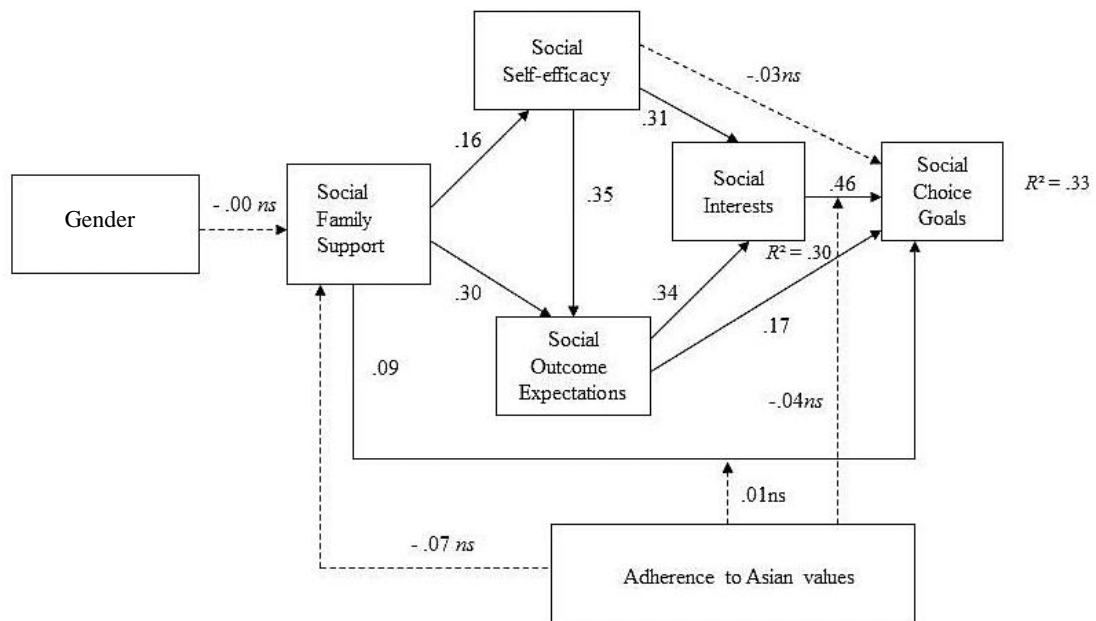


Figure 6. Moderation model of social interest and choice goals (model 2A). All path coefficients are standardized. Dashed lines indicate non-significant paths.

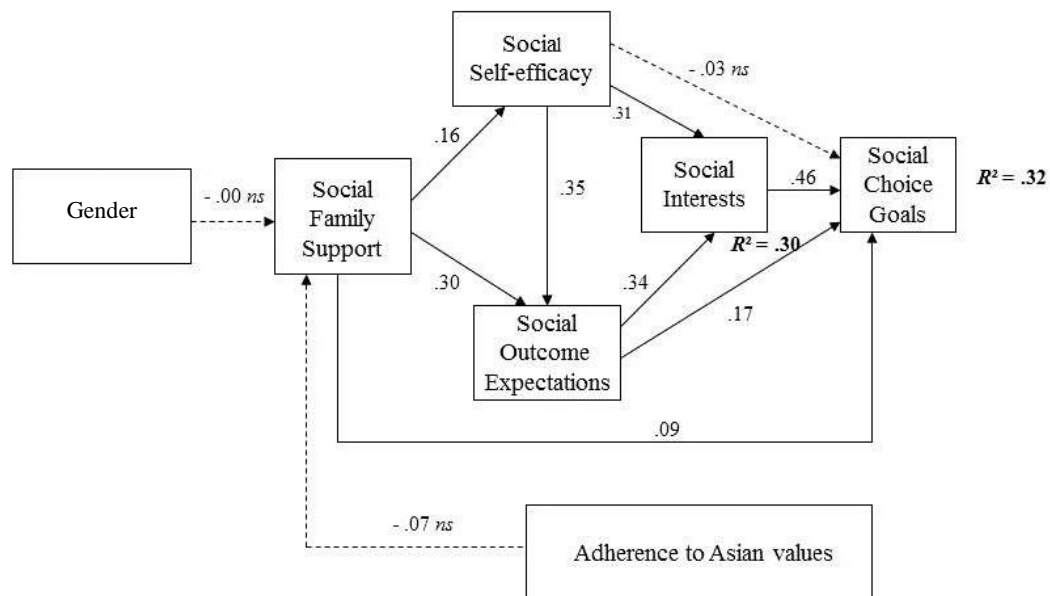


Figure 7. Hypothesized non-moderation alternate model of social interests and choice goals (model 2B). All path coefficients are standardized. Dashed lines indicate non-significant paths.

Model modification. Although models 2A and 2B produced adequate fit to the data, a third model was analyzed in order to examine the alternate paths by which gender might relate to choice goals and the other predictors. Consistent with the Investigative theme test, I added a path from (a) gender to self-efficacy and (b) gender to social choice goals, which was expected to significantly reduce the chi-square estimate. The modified non-moderation culture-specific model (Model 2C) was then re-examined in LISREL 8.80 (see Figure 8). Results indicated excellent model-data fit, CFI = .98, SRMR = .03, RMSEA = .06, $SB\chi^2(7, N = 802) = 24.48, p < .01$. Comparison of the two nested models (2B and 2C) using the $SB\chi^2$ difference test indicated that adding the two direct paths significantly improved model-data fit ($\Delta SB\chi^2 = 14.16, \Delta d.f. = 2, p < .001$). Model 2C was, therefore, considered the most plausible model.

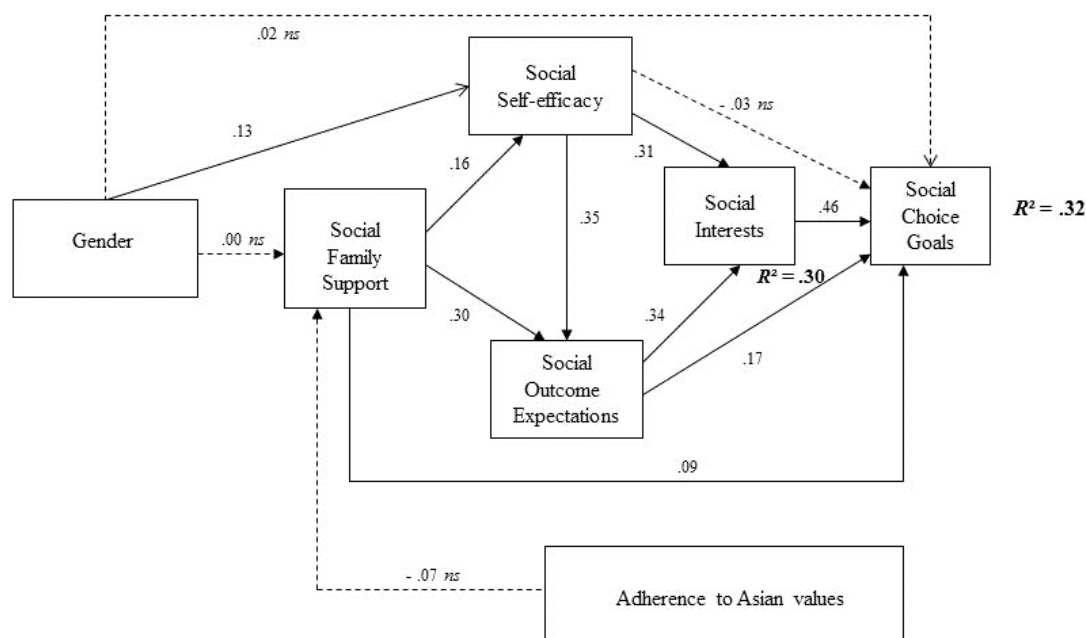


Figure 8. Modified non-moderation culture-specific social cognitive model of social interest and choice goal. All path coefficients are standardized. Dashed lines indicate non-significant paths.

Figure 8 represents the path coefficients of the modified non-moderation culture-specific model (2C) based on SCCT. Findings indicated that the path coefficients of the social cognitive variables to interest and choice goals were generally consistent with the theory's hypotheses (#2 to 4a), except for the non-significant direct path from self-efficacy to choice goals. As predicted, outcome expectations and interests each produced direct positive paths to choice goals, with small to medium effect sizes. Similar to the findings with the investigative choice model, interest was the strongest direct predictor of choice goals for the social-theme career domain. Consistent with Hypothesis 5a, family support produced direct positive paths to choice goals, with small effect size. Overall, Model 2C explained 30% of the variance in social interest and 32% of the variance in choice goals.

Results from the joint significance test generally support the hypothesized indirect effects. As predicted in hypothesis 4b, self-efficacy and outcome expectations were indirectly related to choice goals via interests. Consistent with hypothesis 5b, indirect effects were observed between family support and choice goals. Specifically, positive family support was indirectly linked to choice goals through its relations with self-efficacy, outcome expectations, and interests. In other words, greater perceived support from families to pursue social careers were linked to higher social self-efficacy and more positive outcome expectations towards social careers, which in turn linked to greater interests in and choice consideration for social-theme careers. Contrary to prediction (H#7), adherence to Asian values (AVS) was not significantly related to family support, although family support was directly and indirectly linked to choice goals. Thus, there was no significant indirect effect

observed between AVS and choice goals. Finally, participants' gender was indirectly related to choice goals, as proposed in Hypothesis 8. Being female was linked to higher levels of social career self-efficacy which, in turn, was linked to outcome expectations, interests, and choice consideration relative to social careers. Unlike the I-theme model, no direct link was observed between gender and social career choice.

Invariance across gender. Similar to the test of the I-theme model, a one-way multivariate analyses of variance was first conducted to examine potential differences in the social cognitive variables and Asian values as a function of gender groups. Participants were divided into two groups based on their self-reported gender (male $n = 348$, female $n = 454$). Findings indicated a significant gender difference across the variables in the S domain (Wilks' $\Lambda = .96$, $F(5, 796) = 6.48$, $p < .01$, $\eta = .04$). Specifically, there were significant gender differences in social self-efficacy, $F(1, 801) = 14.51$, $p < .01$, $\eta = .02$, outcome expectations, $F(1, 801) = 13.67$, $p < .01$, $\eta = .02$, interests, $F(1, 801) = 23.86$, $p < .01$, $\eta = .03$, and choice goals in social careers, $F(1, 799) = 10.30$, $p < .01$, $\eta = .01$. Female participants reported higher levels of self-efficacy, outcome expectations, interests, and choice goals than their male counterparts, with small effect sizes. No gender difference was found in the culture-specific variable, adherence to Asian values.

Given the gender differences observed in the social cognitive variables within the S theme model, the modified culture-specific SCCT model (2C) was examined to address whether gender moderates the relations among variables in the model. A multiple-group analysis was performed using separate covariance matrices for male and female participants (Kline, 2005). Table 7 presents the $SB\chi^2$ statistics of the

multi-group models with and without constraints for the S theme. Results from the $SB\chi^2$ difference test of the constrained and unconstrained models did not reveal a significant difference. Thus, the more parsimonious equality-constrained model was retained. That is, the S-theme model can be considered as invariant across.

Table 7. *Fit-Statistics for the Multi-group Invariance Test across Gender.*

Model	SB χ^2	Normal χ^2	df	$\Delta SB\chi^2$	Δdf	p-value
<i>Social</i>				17.75	10	0.06
Model with no constraints	14.82	17.80	10			
Model with constraints	32.40	36.81	20			

Invariance across generation status. Next, a one-way multivariate analyses of variance was conducted to examine potential differences in the social cognitive variables and Asian values as a function of generational status. Participants were divided into two generation groups based on their self-reported generation status: US born ($n = 539$) and foreign born ($n = 262$). For the S theme, Wilks' $\Lambda = .96$, $F(6, 794) = 5.34$, $p < .01$, $\eta = .04$. Specifically, there were significant generation status differences in family support for *social* careers, $F(1, 799) = 5.25$, $p < .05$, $\eta = .007$. Foreign born Asian American participants reported greater family support in the pursuit of social careers compared to US born Asian Americans. In addition, foreign born Asian American participants reported greater adherence to Asian values compared to US born Asian Americans, $F(1, 799) = 17.866$, $p < .01$, $\eta = .022$.

To address whether generation status moderates the relations among variables in the modified culture-specific model (models 2C), a multiple-group analysis was conducted using separate covariance matrices for U.S. born and foreign born participants (Kline, 2005). Table 8 presents the $SB\chi^2$ statistics of the multi-group models with and without constraints for the S-theme domain. Results from the chi-

square difference test of the constrained and unconstrained models did not reveal a significant difference ($p > .05$). Thus, the more parsimonious equality-constrained model was retained. That is, the S-theme model can be considered as invariant across generation groups (foreign born and U.S. born).

Table 8. *Fit-Statistics for the Multi-group Invariance Test across Generation Status.*

Model	SB χ^2	Normal χ^2	df	ΔSB χ^2	Δdf	p-value
<i>Social</i>				8.76	12	0.72
Model with no constraints	30.32	34.14	16			
Model with constraints	39.65	43.33	28			

Testing Gender Differences in Career Interests and Choice Goals

Based on the gender socialization of males and females, females tend to be involved in caregiving, interpersonally-oriented, feminine roles whereas males tend to be involved in sports, science, and masculine roles. Williams and Subich (2006) also found that women reported more learning experiences in the Social domain and men reported more learning experiences in the Realistic and Investigative domain, and that these differential learning experiences were predictive of self-efficacy and outcome expectations related to the corresponding occupational themes. Thus, it was hypothesized that:

Hypothesis 9. Female participants would be more likely to express interest in S theme than in I theme activities.

Hypothesis 10. Male participants would be more likely to express interest in I theme than in S theme activities.

However, considering the familial and cultural influences on the career choices of Asian Americans (Leong & Gupta, 2007, 2008), it was expected Asian

Americans would generally be more likely to gravitate towards Investigative careers as compared to Social careers, and that individuals' personal interests are *less* informative in their career decision-making than are external factors such as family support and the prestige level of different careers. Thus, it was hypothesized that:

Hypothesis 11. The overall mean levels of choice goals for the I theme would be greater than the S theme for both gender groups.

Hypothesis 12. Female and male participants would report comparable (i.e., not significantly different) mean levels of choice goals within the I theme.

A paired-sample t-test was conducted to compare mean differences in *career interests* (I and S themes) within gender groups. Consistent with hypothesis 9, results indicated that female participants expressed greater interest in S theme ($M = 3.52$, $SD = .74$) than in I theme activities ($M = 3.03$, $SD = .93$, $t = 9.61$, $p < .001$, Cohen's $d = .58$). However, contrary to Hypothesis #10, male participants also expressed higher interest in S theme ($M = 3.25$, $SD = .82$) than in I theme activities ($M = 3.09$, $SD = .93$, $t = 2.87$, $p < .01$, Cohen's $d = .18$).

In testing hypotheses 11, a paired-sample t-test was used to compare mean differences in career *choice goals* (I and S themes) for each gender group. The hypothesis that both male and female participants would report a higher level of choice goals for the I theme than the S theme was only partially supported. Male participants were more inclined to choose occupations in the investigative theme ($M = 4.23$, $SD = 2.07$) than the social theme ($M = 3.57$, $SD = 2.03$, $t = 5.47$, $p < .001$, Cohen's $d = .32$), even though they expressed higher interest in S theme than in I theme activities. Contrary to prediction (H11), female participants were more likely

to choose careers in the social theme ($M = 4.02$, $SD = 1.96$) than in the investigative theme ($M = 3.63$, $SD = 1.96$, $t = 3.28$, $p < .01$, Cohen's $d = .20$), which was congruent with their interests (that is, they also reported greater social activity interests). Thus, females' choices were more interest-congruent than those of their male peers.

For hypothesis 12, bivariate correlations indicated significant relationships between gender and career choice goals within I ($r = -.15$) and S themes ($r = .11$). Male participants were more likely than females to consider investigative careers, whereas female participants were more likely than males to consider social careers. This finding contradicts hypothesis 12, which predicted that males and females would report comparable levels of investigative choice goals. Finally, a post-hoc independent sample t-test for the full sample showed that the mean difference between social and investigative choice goals was non-significant. In other words, the students did not differ in their consideration of investigative and social careers, and they did not show a strong preference for investigative careers – a finding that is contrary to the cultural assumption about Asian Americans' career behaviors.

CHAPTER V

Discussion

The present study examined the contribution of social cognitive and culturally-specific contextual factors to Asian American students' career interests and choice aspirations. Drawing from Lent et al.'s (1994, 2000) social cognitive career models of interest and choice (SCCT), the present study extended Tang et al.'s (1999) research on Asian American college students' career interests and choices.

Specifically, two Holland themes –Investigative and Social– that are, respectively, overrepresented and underrepresented in the career choices of Asian Americans were the primary focus of the study. Finally, this study explored the role of participants' gender relative to interest and choice in the I and S themes given differences in the gender role socialization and family expectations of Asian men and women. In the following section, the findings will be discussed, along with the study's limitations, future research directions, and recommendations for career counseling practice.

The Culture-Specific Social Cognitive Model of Interests and Choice Goals

The current findings provide initial empirical support for the culture-specific social cognitive model of interest and choice for Asian American college students in both I and S themes (see Figures 5 and 8). In particular, the model fit the data well and accounted for substantial portions of the variance in the traditional (investigative) and non-traditional (social) career domains. Similar to Tang et al.'s (1999) study, path analysis demonstrated excellent model-data fit of the culture-specific social cognitive career model, suggesting the tenability of the model in accounting for variation in interests and choice goals in both themes.

The current findings are also consistent with recent cross-cultural research that examined the roles of contextual and cultural factors relative to choice goals within SCCT, for example, Byars-Winston et al.'s (2010) study with minority college students in biology and science majors, and Flores et al. (2010)'s study with Mexican American college students' career choices across Holland themes. As in the current study, the findings of these studies indicated that the person-cognitive variables, with the addition of the cultural-contextual components, produced excellent model-data fit in predicting academic and career choice goals. Furthermore, the contextual and cultural variables were found to be largely indirectly predictive of career choice goals via self-efficacy and other social cognitive variables.

The Relations of Social Cognitive Variables to Interests and Choice Goals

The relations of the social cognitive predictors to domain choice goals were generally consistent with theoretical expectations, except for the path coefficients from self-efficacy to choice goals in the social theme, and from outcome expectation to choice goals in the investigative model. The relations among the social cognitive variables and their joint relations to choice goals are largely consistent with Sheu et al.'s (2010) meta-analysis with general college student samples. Specifically, Sheu et al. and the current study both found that much of the effect of self-efficacy to choice goals was indirect (through interests in the I theme and through outcome expectations and interests in the S theme).

The relation of family support to choice goals was largely mediated by self-efficacy, outcome expectations, and interests in both traditional (I theme) and non-traditional (S theme) career domains. The indirect role of family support in Asian

Americans' career choice corresponds to previous quantitative (e.g., Ferry, Fouad, & Smith, 2000) and qualitative (Fouad et al., 2007) findings. It may be that family support serves to inform both self-efficacy and outcome expectations, for example, by helping students to interpret performance feedback and to anticipate the outcomes of involvement in particular career domains. In addition, at least in the social domain, the results suggested that family support may directly encourage participants' choice consideration. These findings highlight the varied role of family support in career development, especially in relation to careers in which Asian Americans are underrepresented.

In the present study, interest was found to be the most robust predictor of choice in both I and S themes. Although this finding is consistent with most SCCT studies with college students in general (see Sheu et al., 2010), it contradicts Leong and Chou's (1994) argument that interests and personal desire may not be as influential as cultural or contextual variables in directing the career choices of Asian Americans. On the one hand, some findings have suggested that one's self-efficacy and contextual factors, such as acculturation level and family constructs, may have stronger bearings on Asian Americans' career choices than do personal interests (e.g., Catellino, 2005; Tang et al., 1999). On the other hand, a relatively strong link between interest and choice has previously been observed in other studies with Asian American samples. For example, Ferry et al. (2000) indicated that interest produced a significant direct path to math and science choice goals, with a large path coefficient of .47. Kelly, Gunsulas, and Gunsulas (2009) also found that interest in science and math significantly predicted goal intentions in science careers among both males and

females; similarly, non-science (art, social science) interests substantially predicted non-science career goal intentions, though only among males.

One explanation for the inconsistency in the interest-choice relation could be the varied approaches that have been taken to conceptualizing and operationalizing career choice goals in these studies. For example, Tang et al. (1999) asked participants to provide their top three career choices and then converted the choices to a Representative Index (i.e., how representative that choice was for Asian Americans), based on U.S. Bureau of Labor statistics. In contrast, Ferry et al. (2000) and the present study assessed the degree to which participants' had considered occupational titles corresponding to Holland's I and S themes, which reflects the more domain-specific approach favored by SCCT (Lent & Brown, 2006). It is still unknown, however, whether the inconsistent findings in the interest-choice relations were an artifact of methodology, an issue that deserves examination in future research.

The Role of Asian Cultural Values relative to Career Interests and Choice Goals

The findings did not support the cultural moderation hypotheses. That is, Asian cultural values were not found to moderate family support-choice or interest-choice relations in either career domain. However, there was mixed support for an indirect path of Asian cultural values to choice via family support. Specifically, there was a small but significant positive path between adherence to Asian values and family support for choosing investigative careers. That is, those with more traditional values (e.g., filial piety, importance of education and career achievement) were more likely to perceive support for them to pursue science-related careers; such careers

represent a more traditional (over-represented) choice path among Asian Americans. Given the high level of prestige attributed to STEM professions, Asian Americans who strongly adhere to Asian cultural values may see the potential to improve their family's social status or preserve family legacy by engaging in these professions (e.g., see Fouad et al., 2007; Leong & Chou, 1994; Sue & Okazaki, 1990).

By contrast, adherence to Asian values was negatively related to family support for pursuit of social careers, suggesting that those who identify with traditional Asian values may perceive less family support for selecting social careers – which are less traditional (under-represented) options among Asian Americans. This negative relation was, however, significant at the bivariate level but not in the context of the path analysis.

The Role of Gender in relation to Choice Goals

Paralleling other findings with more general college student samples (e.g., DiDonato & Strough, 2013; Ma, 2011), the correlational findings indicated that gender was significantly related to consideration of I and S careers in this Asian American sample. In particular, men expressed greater consideration of I careers, while women expressed greater consideration of S fields. The effect sizes ($r = -.15$ and $.11$, respectively) were, however, quite small. Interestingly, women also expressed more interest in social careers than did men – which implies that their interests were congruent with their choices. By contrast, men did not report greater interest in I careers than women, though they did express greater choice consideration of these careers. This implies that men's choices were less congruent with their

interests and may, therefore, have been motivated more by non-interest considerations, such as family and traditional cultural values.

The path analysis findings suggest that the social cognitive variables fully mediated the relation of gender to social theme choice consideration. In particular, women's greater consideration of social careers appeared to be explained by their greater self-efficacy for S careers. However, the relation of gender to investigative career consideration was only partly mediated by self-efficacy. Although men reported greater self-efficacy for I careers, this alone did not account for the gender-choice relationship; there remained a small yet significant direct path from gender to I career consideration when controlling for self-efficacy. Therefore, there may have been additional mediators, such as men's and women's differential learning experiences and access to role models in I careers, that were not included in this study (see Williams & Subich, 2006). This is an issue that merits further study.

Although it had been anticipated that male and female students would report differential family support for I and S careers, this hypothesis was not supported. The gender-support correlation was essentially null in both choice domains. This means that students did not view their family members as conditionally supportive of their I and S choices based on their gender. Moreover, family support did not mediate the relation of gender to self-efficacy in either choice domain (i.e., there was a significant path between gender and self-efficacy that did not diminish when family support was controlled). There may, therefore, have been unexplored variables that could have mediated this relationship, such as differential encouragement from peers or teachers for engaging in gender-typed activities or considering gender-typed career options.

(For discussions of how gender role socialization can affect self-efficacy, see Hackett & Betz, 1981, and Lent et al., 1994). Inclusion of Bandura's (1997) four sources of efficacy information in future research may shed additional light on the mechanisms underlying male-female differences in self-efficacy for I and S themes.

Model Invariance across Gender and Generation Status

Post-hoc multi-group invariance tests were conducted to assess the predictive utility of the culture-specific social cognitive model across gender and generation status. Findings indicated that the model fit the data comparably well regardless of gender and generation group status. In other words, gender and generational status did not moderate the specified relations among the variables, suggesting that the model may be generalizable across the grouping variables (i.e., males and females, foreign born and U.S. born students) included in this study. This issue of model invariance by gender and generational status extends prior work applying SCCT to Asian American samples. The gender invariance findings are consistent with recent results in other samples (e.g., predominantly white and black samples of engineering and computer students, see Lent et al., 2005; Lent, Lopez, Lopez, & Sheu, 2008). The generation status invariance findings are not consistent, however, with earlier findings (e.g., Tang et al., 1999) or conceptual arguments (Leong & Chou, 1994; Leong & Gupta, 2007) that foreign born or first generation Asian American students would be less likely to rely on their personal interests, and more susceptible to family influence, when compared to more acculturated Asian American students (i.e., U.S. born, second generation or above) in selecting career paths.

Limitations and Future Research Directions

The study's findings need to be interpreted in light of its limitations. First, it should be noted that the current models were tested with cross-sectional data. Thus, the study's design cannot support causal inferences regarding the determinants of Asian Americans' career interests and choice goals. In addition, the focus of the study was on career choice consideration rather than actual choice behaviors, such as selection of particular majors or persistence at chosen careers. To address these limitations, future studies might (a) use longitudinal methods to shed light on the temporal interplay among the variables in the model over time, (b) use experimental methods to increase confidence in the directionality of the relationships, and (c) explore the utility of the model in predicting choice of, and persistence at, actual career options.

Second, participants' cultural orientations were only represented by adherence to Asian values. Given the small relations of the cultural variable (AVS) to I and S choice consideration (.10 and .01, respectively), and the lack of support for the AVS as a moderator of support-choice and interest-choice relations, future research might include other culturally relevant constructs to explore the potential roles of culture relative to both traditional and non-traditional career choices. For example, it is possible that specific cultural values (e.g., collectivism) have a stronger impact on Asian Americans' career development than does an aggregation of "Asian values." Thus, future studies testing culture-specific versions of SCCT might examine the subscales within the Asian Values Scale and their differential relations to career choice goals. In addition, future research might include indicators of acculturation and

enculturation in the model to further explore their unique and joint contributions to choice goals (e.g., Flores, Robitschek et al., 2010).

Third, this study only examined a single aspect of SCCT's contextual affordances construct, namely, family support. While examining one aspect of family influence reduces model complexity, it would be beneficial to include additional contextual attributes (e.g., presence of social barriers) in future research on Asian Americans' career interests and choice goals. Fourth, more research is needed on the role of gender in social and investigative self-efficacy, given the limited research on this topic with Asian Americans. For example, Williams and Subich (2006) suggested that gender-based socialization experiences such as formal or informal career exposure or performance feedback may help explain gender differences in career self-efficacy, outcome expectations, and interest formation.

Finally, while the large sample size is a strength of this study, the sample consisted of college students at a predominately White public university. Another limitation of the current study is the response rate (28%) and lack of information about the representativeness of the sample's characteristics (e.g., gender, age, SES) relative to the larger population at the campus where the data were gathered. Thus, efforts to generalize the current findings to Asian Americans in this or other university settings should be made with caution. Future research may also consider testing the social cognitive model with individuals of lower socioeconomic status given the relatively high average annual combined household income of the current sample.

Practical Implications

Consistent with prior SCCT studies within the Holland domains with Latino samples (e.g., Flores, Robitschek et al., 2010) and Asian American samples (e.g., Ferry et al., 2000), the present study found support for the direct relation of self-efficacy to career interest in both I and S themes. Interests in non-traditional careers may be cultivated via interventions that enhance Asian American students' self-efficacy beliefs in particular career domains. For example, educational and extracurricular activities that allow Asian American students to utilize different skills related to a broad range of career domains (e.g., communication, analytic, organizational, leadership) may facilitate informal learning and performance feedback, which may serve as sources of self-efficacy according to the theory (Lent et al., 1994).

The current findings also suggest that gender and cultural values may have an indirect impact on Asian American students' career considerations in the I-theme career. Interestingly, our male participants were more likely to want to pursue I careers (e.g., engineering, biomedical science) despite holding higher interest in S-theme careers. It may be that their career choices were reflective of traditional Asian values and perceived family support. Those who strongly identify with traditional cultural values are likely to come from traditional families that value the educational and career accomplishments of their children (particularly for sons), and thus may favor well-respected, high prestige careers such as those in the STEM fields. Hence, in the process of career exploration, it may be helpful to assess Asian American

clients' cultural orientation, particularly how traditional cultural values may relate to their perceptions of parental support relative to traditional career choices.

Similar to previous studies (e.g., Ferry et al., 2000; Tang et al., 1999), the current study found that support from family (e.g., financial support, verbal encouragement) play an indirect role in the development of career interests through self-efficacy and outcome expectations. Lent et al. (2003b) also noted that parental support serves as an important source of self-efficacy and outcome expectation beliefs. Counselors may want to explore the client's perception of the type of support he or she is receiving from the family, along with ways to gain access to needed resources, either within the family or in other support networks. Moreover, given the limited availability of role models for them in social careers, interventions that help to broaden exposure to less explored careers may help Asian Americans to select from a wider array of career options.

Conclusion

This study contributes to understanding of the mechanisms through which cultural values and family support operate, along with other social cognitive variables, in predicting choice goals in different occupational domains. Future studies are needed to further understanding of the roles of culture, family, and gender in relation to Asian Americans' career paths.

APPENDIX A

Participants Recruitment Letter

Dear Participant,

I am writing to request your participation in a brief online questionnaire which investigates factors influencing Asian Americans' career interests and choice. The study should take about 15-20 minutes of your time. Upon completion of the survey, you can enter a raffle to win **one of fifty \$20 Amazon.com gift certificates**. Your participation is voluntary and your responses will be kept confidential.

If you are interested, please go to _____.

This study is being conducted by Kayi Hui, a graduate student in counseling psychology, under the supervision of Prof. Robert W. Lent at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #). If have any questions about this study, you may contact Kayi Hui at kayihui@umd.edu

Thank you for your consideration.

APPENDIX B

Informed Consent Form

Investigator Identification: This study is being conducted by Kayi Hui, under the supervision of Dr. Robert W. Lent, Department of Counseling, Higher Education, and Special Education, at the University of Maryland, College Park.

Study Description: The purpose of this study is to better understand factors that influence Asian/Asian American college students' career interests and choices. Results of this study may enable career counselors and college student personnel to better assist future Asian/Asian American students who are exploring and deciding on their college majors or career paths. You will be asked to complete a brief survey today, which should require about 15 to 20 minutes of your time.

Possible Risks and Benefits: There are no known risks associated with participating in this study. Although there is no explicit personal benefit from filling out the questionnaire, the results of the study may help the investigators better understand factors that guide Asian/Asian American students' career interests and choices. The results may also assist counselors and others to promote Asian/Asian American students' career development.

Participant Information: Participation is completely voluntary. You may decide not to participate in the study at any time without penalty by closing the window. You may also choose to not answer any question(s) that you do not wish to, for any reason.

Confidentiality: You will not be asked to place your name on the survey. After completing the survey, if you wish to enter the raffle to **win one of 20 gift certificates (\$10 each) from amazon.com**, you will be asked to enter your first and last name on a separate web page. To protect your confidentiality, your name and contact information will not be connected in any way with your survey responses. In addition, the findings will only contain statistical summaries for the group instead of information about individual participants. All data will be stored in password-protected computer files.

Questions or Concerns: If you have any questions about this study, please contact Kayi Hui at kayihui@umd.edu. If you have questions about your rights as a research participant or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland, 20742; (email) irb@deans.umd.edu; (telephone) 301-405-0678.

Electronic Consent: Please indicate your choice below. Clicking on the “Continue” button below indicates that you are **at least 18 years old** and have read and understand the terms of this study and thus voluntarily agree to participate. If you do NOT wish to participate or are not at least 18 years old, please decline participation by closing the window.

APPENDIX C

Self-efficacy Questionnaire

DIRECTIONS: Read each of the statement carefully. Indicate on the scale below each question the degree to which you believe you have the abilities to complete the activities stated. Do this by circling one of the ten numbers on the scale. A response of “1” indicates that you are completely UNSURE of your abilities to complete the activities. A response of “10” indicates that you are completely SURE of your abilities to complete the activities. When answering, DO NOT take into account whether you have actually performed the activity in the past or have been trained to perform the activity

1	2	3	4	5	6	7	8	9	10
Completely Unsure									Completely Sure

Indicate on the scale below your degree of confidence in activities that require you...

1. to use algebra to solve mathematical problems
2. to perform a scientific experiment or survey
3. to interpret simple chemical formulae
4. to use logarithmic tables
5. to program a computer to study a scientific problem
6. to help people who are upset or troubled.
7. to plan entertainment for a party
8. to explain things to others
9. to talk to all kinds of people
10. to participate in charity or benefit drives

APPENDIX D

Outcome Expectation Scale

Instructions: Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements.

Going into an occupation that involves **scientific or mathematical skills** (e.g., biologist, medical doctor) would allow me to:

	Strongly Disagree		Disagree			Unsure		Agree		Strongly Agree	
	0	1	2	3	4	5	6	7	8	9	
1. receive a good job offer	0	1	2	3	4	5	6	7	8	9	
2. earn an attractive salary	0	1	2	3	4	5	6	7	8	9	
3. get respect from other people	0	1	2	3	4	5	6	7	8	9	
4. do work that I would find satisfying	0	1	2	3	4	5	6	7	8	9	
5. increase my sense of self-worth	0	1	2	3	4	5	6	7	8	9	
6. do work that can "make a difference" in people's lives	0	1	2	3	4	5	6	7	8	9	
7. go into a field with high employment demand	0	1	2	3	4	5	6	7	8	9	
8. do exciting work	0	1	2	3	4	5	6	7	8	9	
9. have the right type and amount of contact with other people (i.e., "right" for me)	0	1	2	3	4	5	6	7	8	9	

(continued next page)

Going into an occupation that involves **human relations, social, or educational skills** (e.g., teacher, counselor) would allow me to:

	Strongly Disagree		Disagree			Unsure		Agree		Strongly Agree	
1. receive a good job offer	0	1	2	3	4	5	6	7	8	9	
2. earn an attractive salary	0	1	2	3	4	5	6	7	8	9	
3. get respect from other people	0	1	2	3	4	5	6	7	8	9	
4. do work that I would find satisfying	0	1	2	3	4	5	6	7	8	9	
5. increase my sense of self-worth	0	1	2	3	4	5	6	7	8	9	
6. do work that can "make a difference" in people's lives	0	1	2	3	4	5	6	7	8	9	
7. go into a field with high employment demand	0	1	2	3	4	5	6	7	8	9	
8. do exciting work	0	1	2	3	4	5	6	7	8	9	
9. have the right type and amount of contact with other people (i.e., "right" for me)	0	1	2	3	4	5	6	7	8	9	

APPENDIX E

RIASEC Interest Marker Scale –Form A

INSTRUCTIONS: Please indicate how much you would like to engage in the following activities by rating the number that most closely represents how interested you feel about each activity.

	Strongly Dislike	Dislike	Neutral	Like	Strongly Like
1. Study the structure of the human body	1	2	3	4	5
2. Study animal behaviors	1	2	3	4	5
3. Do research on plants and animals	1	2	3	4	5
4. Develop a new medical treatment or procedure	1	2	3	4	5
5. Conduct biological research	1	2	3	4	5
6. Study whales and other types of marine life	1	2	3	4	5
7. Work in a biology lab	1	2	3	4	5
8. Make a map of the bottom of an ocean	1	2	3	4	5
9. Give career guidance to people	1	2	3	4	5
10. Do volunteer work at a non-profit organization	1	2	3	4	5
11. Help people who have problems with drugs or alcohol	1	2	3	4	5
12. Teach an individual an exercise routine	1	2	3	4	5
13. Help people with family related problems	1	2	3	4	5
14. Supervise the activities of children at a camp	1	2	3	4	5
15. Teach children how to read	1	2	3	4	5
16. Help elderly people with their daily activities	1	2	3	4	5

APPENDIX F

Occupational Consideration Scale

INSTRUCTIONS: For each occupation listed below, please indicate how seriously you would consider it as a possible career for yourself. Use the 0-9 scale, below, to show how seriously you would consider each occupation.

Occupation	How seriously would you consider becoming a(n):									
	Not Very Seriously Very Seriously									
Biologist	0	1	2	3	4	5	6	7	8	9
Astronomer	0	1	2	3	4	5	6	7	8	9
Anthropologist	0	1	2	3	4	5	6	7	8	9
Chemist	0	1	2	3	4	5	6	7	8	9
Writer of Scientific Articles	0	1	2	3	4	5	6	7	8	9
Geologist	0	1	2	3	4	5	6	7	8	9
Scientific Research Worker	0	1	2	3	4	5	6	7	8	9
Sociologist	0	1	2	3	4	5	6	7	8	9
High School Teacher	0	1	2	3	4	5	6	7	8	9
Juvenile Delinquency Expert	0	1	2	3	4	5	6	7	8	9
Marriage Counselor	0	1	2	3	4	5	6	7	8	9
Social Science Teacher	0	1	2	3	4	5	6	7	8	9
Youth Camp Director	0	1	2	3	4	5	6	7	8	9
Social Worker	0	1	2	3	4	5	6	7	8	9

APPENDIX G

Asian Values Scale – Revised

INSTRUCTIONS: Use the scale below to indicate the extent to which you agree with the value expressed in each statement.

Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
---------------------------	---------------	------------	------------------------

- _____ One should not deviate from familial and social norms.
- _____ Children should not place their parents in retirement homes.
- _____ One need not focus all energies on one's studies.
- _____ One should be discouraged from talking about one's accomplishments.
- _____ Younger persons should be able to confront their elders.
- _____ When one receives a gift, one should reciprocate with a gift of equal or greater value.
- _____ One need not achieve academically in order to make one's parents proud.
- _____ One need not minimize or depreciate one's own achievements.
- _____ One should consider the needs of others before considering one's own needs.
- _____ Educational and career achievements need not be one's top priority.
- _____ One should think about one's group before oneself.
- _____ One should be able to question a person in an authority position.
- _____ Modesty is an important quality for a person.
- _____ One's achievements should be viewed as family's achievements.
- _____ One should avoid bringing displeasure to one's ancestors.
- _____ One should have sufficient inner resources to resolve emotional problems.
- _____ The worst thing one can do is to bring disgrace to one's family reputation.
- _____ One need not remain reserved and tranquil.
- _____ One should be humble and modest.
- _____ Family's reputation is not the primary social concern.
- _____ One need not be able to resolve psychological problems on one's own.
- _____ Occupational failure does not bring shame to the family.
- _____ One need not follow the role expectations (gender, family hierarchy) of one's family.
- _____ One should not make waves (or cause conflict).
- _____ One need not control one's expression of emotions.

APPENDIX H

Family Support Scale

Instructions: This part of the questionnaire asks you to indicate how you believe your parents/guardians or family members would feel about you going into two different types of occupational path. Using the 1-7 scale, below, indicate how strongly you agree or disagree with the statements related to each occupational path.

1. How do you believe your parents/family members would feel about you choosing an occupation that involves scientific or mathematical skills (e.g., biologist, medical doctor, engineer)?	Strongly Disagree						Strongly Agree
They would support my decision to enter such an occupation	1	2	3	4	5	6	7
They would probably be happy if I went into this sort of occupational path	1	2	3	4	5	6	7
They expect people from our culture to choose this sort of career	1	2	3	4	5	6	7
They would be proud of me for making this decision	1	2	3	4	5	6	7
They would only be willing to support me financially if I choose to enter this type of occupation	1	2	3	4	5	6	7
They would encourage me to continue to pursue this sort of occupational path	1	2	3	4	5	6	7
2. How do you believe your parents/family members would feel about you choosing to enter an occupation that involves human relations, social, or educational skills (e.g., teacher, counselor, social worker)?	Strongly Disagree						Strongly Agree
They would support my decision to enter such an occupation	1	2	3	4	5	6	7
They would probably be happy if I went into this sort of occupational path	1	2	3	4	5	6	7
They expect people from our culture to choose this sort of career	1	2	3	4	5	6	7
They would be proud of me for making this decision	1	2	3	4	5	6	7
They would only be willing to support me financially if I choose to enter this type of occupation	1	2	3	4	5	6	7
They would encourage me to continue to pursue this sort of occupational path	1	2	3	4	5	6	7

APPENDIX I

Demographic Questionnaire

1. Gender: Male ____ Female ____ Transgender ____
2. Year of birth
3. Asian ethnic background (e.g., Chinese, Korean, Indian, etc.)

4. Are you an international student? Yes ____ No ____
5. Please indicate your generation status:
 - a. 1st generation = I was born in Asia or a country outside of the U.S.
 - b. 2nd generation = I was born in the U.S. but at least one of my parents were born in Asia or a country outside of the U.S.
 - c. 3rd generation = I was born in the U.S. and both of my parents were born in the U.S., and all grandparents were born in Asia or a country outside of the U.S.
 - d. 4th generation = I was born in the U.S., both of my parents were born in the U.S., and at least one of my grandparents were born in the U.S.
6. If you were born in a country outside of the U.S., please indicate the age at which you moved to the U.S. _____
7. Are you the first one in your family to attend college?
8. Year in college:
 - a. Freshmen
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Other (please specify)
9. What is your cumulative GPA?
10. Please indicate your average annual combined household income.
11. Please indicate your father's occupation.
12. Please indicate your mother's occupation.
13. Please indicate the occupation that you are most seriously considering at present (please be as specific as you can about the field or sub-field you hope to enter)
14. Please indicate your current (or intended) academic major

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