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Dialectical Thinking and Smoking Outcomes in Asian Americans

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Biography

Amber T. Pham was born in Fort Smith, Arkansas, on January 16, 1993. She graduated from Southside High School and received her Bachelor of Arts degree with honors from the University of Arkansas in 2015. Amber began the Clinical-Community Ph.D. program at DePaul University in 2015.

Table of Contents

List of Tables

List of Figures

Abstract

Cigarette smoking is the leading health problem in the United States. Recent literature has discussed risk perception and acculturation as possible protective factors against this risky health behavior. However, there is little research regarding dialectical thinking as a potential barrier for smoking cessation. The current study examined smoking outcomes, which include expectancies, attitudes, and intentions in Asian American males. Specifically, we examined acculturation and dialectical thinking as major factors influencing smoking outcomes. We hypothesized that dialectical thinking mediates the relationship between acculturation and smoking outcomes. We also hypothesized that Asian Americans who were primed to think dialectically would hold more positive and negative beliefs, and endorse more intentions to smoke than Asian Americans who were not primed to think dialectically. Significant findings include an indirect effect of dialectical thinking, specifically the cognitive change subscale, on the relationship between behavioral acculturation and smoking intention. Results indicate those who report less behavioral acculturation endorsed more dialectical thinking which relates to more smoking intention. Results showed participants who were primed to think dialectically did not endorse more positive and negative beliefs or have a higher likelihood of endorsing smoking intention than those who were not primed to think dialectically. The present study adds to the current literature on smoking in Asian Americans by exploring their cultural thought processes, which has received little empirical attention thus far.

Dialectical Thinking and Smoking Outcomes in Asian Americans

Perceptions of negative consequences generally predict lower engagement in risky health behaviors such as smoking (Flay, Snyder, & Petraitis, 2009). However, little attention has been focused on dialectical thinking, a cognitive style in which individuals tolerate contradictory beliefs, and its relationship to risky health behaviors. In the current study, we explored dialectical thinking as a possible predictor of smoking outcomes among Asian American males. We also explored the role of acculturation in this relationship.

Cigarette Smoking

Cigarette smoking is the leading cause of preventable disease and death in the United States and continues to be a significant health problem (Centers for Disease Control and Prevention (CDC), 2014). In 2016, the national prevalence of smoking was 15.5% (CDC, 2018). Cigarette smoking is responsible for over 480,000 American deaths each year, which is one of every five deaths (U.S. Department of Health and Human Services, 2014). Smoking leads to many health consequences, some of which include increased risk for cancer, chronic obstructive pulmonary disease (COPD), strokes, and heart disease (U.S. Department of Health and Human Services, 2014).

Although heart disease is the leading cause of death in the United States, for Asian American populations, lung and bronchus cancer are the leading cause of death, possibly due to cigarette smoking and/or secondhand smoke exposure (Heron, 2007). The CDC reports that Asian Americans have the lowest prevalence of cigarette smoking (10.9%) compared to all other racial/ethnic

groups in the United States (Substance Abuse and Mental Health Services Administration (SAMHSA), 2015). However, this statistic does not represent the whole truth. Reported low rates of smoking could be due to grouping all subgroups together or only examining English language surveys (Chae, Gavin, & Takeuchi, 2006). Therefore, within group differences need to be examined to capture the whole truth. This includes looking at ethnicity, language, gender, and country of origin. Two-thirds of Asian Americans are immigrants to the United States and research shows high prevalence of smoking specifically among men throughout Asia (World Health Organization, 2013). According to the CDC (2014), 20% of Korean Americans, 16.3% of Vietnamese Americans, 12.6% of Filipino Americans, 10.2% of Japanese Americans, and 7.6% of Chinese Americans reported smoking in the past month, while only 9.5% of Asian Americans overall reported smoking in the past month.

Asian American College Students

Asian Americans are often studied as an aggregated group, but Asian Americans represent a heterogeneous group comprised of many differences. According to the US Census 2010, Asian refers to individuals with origins in East Asia, Southeast Asia, or the Indian subcontinent (Hoeffel, Rastogi, Kim, & Hasan, 2012). Asia includes more than 40 countries, and there are more Asian ethnicities than countries (Justice, 2011). Asian American college students can vary with respect to ethnicity, levels of acculturation, and cultural values.

Chinese Americans were the first to migrate to the United States in the 1850s to work in the gold mines and railroads, while Korean Americans came to

the United States in the 1900s to become contract laborers (Takaki, 1988). According to Kim, Yang, Atkinson, Wolfe, and Hong (2001), Chinese Americans and Korean Americans have been found to share similar cultural values of collectivism, conformity to norms, emotional self-control, family recognition through achievement, filial piety, and humility. These shared cultural values may be due to both cultures being heavily rooted in the Buddhist and Confucian philosophies (Kim et al., 2001).

Cigarette smoking among Asian and Asian American college students is an important health problem as this group is one of the fastest growing racial groups in the United States (Hoeffel et al., 2012), as well as on college campuses (Cook & Cordova, 2006). In the academic year of 2014-2015, over 50% of United States international students were from Asia, with the top three subgroups being 31.2% from China, 13.6% from India, and 6.5% from South Korea (Farrugia, 2016). According to the CDC (2014), Chinese and Korean American males both had higher rates of smoking compared to overall Asian American males.

In the United States, men are reported to smoke more than women (CDC, 2005). This same pattern has been found for Asian Americans, who demonstrate the largest gap in smoking rates between genders, with 17.5% males and only 6.5% females smoking (CDC, 2005). Again, this same pattern is apparent in Asian American college students, with 23.5% males and 14.9% females reporting smoking (Hsia & Spruijt-Metz, 2007).

Despite the "model minority" myth, Asian American college students are at risk for cigarette smoking and its consequences, as smoking rates for Asian American college students increased from 16.7% in 1995 to 21.9% in 2000 (Shumacher & Koumjian, 2001). In addition, Bowen and Kurz (2011) reported that Asian American college students scored significantly higher on a measure of nicotine dependence than other racial groups despite similar smoking patterns. Myers, Doran, Trinidad, Klonoff, and Wall (2009) found that 25% of Chinese American and Korean American college students in their sample tried their first cigarette in college. Also, of those who tried their first cigarette, 37% became established smokers. College smoking is important to target as it can lead to a lifetime habit (Emmons, Wechsler, Dowdall, & Abraham, 1998).

Theory of Triadic Influence

Flay and Petraitis' (1994) Theory of Triadic Influence (TTI) is useful to better understand tobacco use (Flay & Petraitis, 1993). The TTI proposes that tobacco use can be influenced by three streams of influences: cultural environmental, intrapersonal, and social (Flay et al., 2009). See Figure 1 in Appendix A.

First, cultural environmental influences refer to "multiple sociocultural macro- environmental factors that contribute to attitudes toward specific behaviors" (Flay et al., 2009, p. 453). These macro-environmental factors include immediate surroundings such as local crime and employment rates, poor career and academic options, media depictions of cigarette smoking, and culture. Other factors include knowledge, expectancies, and attitudes toward cigarette smoking.

Second, social influences refer to "the social situation/context or microenvironment that contribute to social normative beliefs about specific behaviors" (Flay et al., 2009, p. 453). Social influences include relationships with peers, parents, and immediate and extended family members. Third, intrapersonal influences refer to "characteristics that contribute to one's self efficacy regarding specific behaviors" (Flay et al., 2009, p. 453). Characteristics can include: self-efficacy, social skills, depression, and stress. For each stream of influence, there are two sub-streams: affective and cognitive. The cognitive domain focuses on perceived consequences and benefits of a health behavior. The affective domain relies more on emotions and how a person feels regarding a health behavior (Flay et al., 2009). In this proposed study, we will be focusing on the cultural stream of the TTI.

Petraitis, Flay, and Miller (1995) explained that there are risk factors for developing positive attitudes towards cigarette smoking. This is why it is important to look at an individual's expectations and evaluations of the costs and benefits of smoking. Chun (2015) examined attitudes towards smoking and found that it was a significant influence of smoking in South Koreans. Chun (2015) reported that negative attitudes towards smoking needs to increase while positive attitudes need to decrease in order to lower smoking rates. Chun (2015) reported that while controlling for social and intrapersonal factors, 15% of variance was accounted for when looking at cultural factors. Grenard et al. (2005) also found significant predictors of smoking in the cultural stream of the TTI in a Chinese sample. When looking specifically at Chinese males, meaning of smoking

significantly predicted smoking. Grenard et al. (2005) reported that while controlling for social and intrapersonal factors, 20% of variance was accounted for when looking at cultural factors. Using the TTI, some cultural factors have been found to be important in predicting smoking in China (Zhu et al., 1998), but further study is warranted.

Research has found the TTI is useful to understanding health behaviors like substance use (Flay & Petraitis, 1993). Given that cultures vary in their thinking and reasoning styles, it is hypothesized that cultural thinking style would be related to smoking expectancies and behaviors. Therefore, it is important to examine the cultural stream of the TTI as a potential predictor of smoking outcomes in Asian American males.

Dialectical Thinking

Cognitive dissonance theory states individuals attempt to maintain consistency across thoughts and behaviors. When their thoughts and behaviors do not match, they experience an unpleasant feeling which motivates them to change their thought or behavior to match the other, to reduce the unpleasant feeling (Festinger, 1962). Dialectical thinking is the tolerance for holding contradictory beliefs (Peng & Nisbett, 1999). People who engage in dialectical thinking are tolerant of cognitive dissonance and do not feel the need to reduce dissonance. Dialectical thinking is based on three primary principles, which include principle of contradiction, principle of change, and principle of holism (Nisbett, Peng, Choi, & Norenzayan, 2001). The principle of contradiction states that change is constant, therefore contradiction is constant. The principle of change states that

reality is changeable. Lastly, the principle of holism states that nothing in life is independent, but rather everything is related (Nisbett et al., 2001).

Peng, Spencer-Rogers, and Nian (2006) refer to dialectical thinking in East Asians as naïve dialecticism, stemming from folk versions of Taoism. They argue that dialectical thinking is innate in individuals with East Asian heritage. In a series of studies, Peng and Nisbett (1999) found that East Asians engage in more dialectical thinking than Westerners. Peng and Nisbett (1999) found that the Chinese often endorsed both sides of an argument that North Americans viewed as incompatible. Peng and Nisbett (1999) also found that the Chinese preferred dialectical proverbs more than Americans.

Recent research has shown a relationship between dialectical thinking and health behaviors among Chinese people. Jiang, Lu, Hou, and Yue (2013) examined the relationship between dialectical thinking and health behaviors. They found that belief in connection and acceptance of change positively predicted health behaviors whereas acceptance of contradiction negatively predicted health behaviors. Overall, dialectical thinking can relate to health behaviors in both a positive or negative way. Since dialectical thinking is an East Asian way of thinking, there is reason to believe that acculturation will influence Asian Americans to think more analytically, possibly leading to lower rates of smoking intention and expectancies.

Acculturation

Acculturation allows individuals to identify with their host culture or their ethnic culture, by adopting new values and beliefs to fit in and survive in their

new homes (Chen, Benet-Martinez, Wu, Lam, & Bond, 2012). Asian Americans can be referred to having a "double identity" due to their biculturalism that develops in relation to two contrasting cultural belief systems (Ryder, Alden, & Paulhus, 2000). Biculturalism for Asian Americans refers to adopting American values such as autonomy and independence, while continuing to preserve Asian values such as collectivism and mutual dependence. This bicultural self allows Asian Americans to adjust to different situations when needed (Ryder et al., 2000). For example, a study reported that priming Chinese Americans to an American identity resulted in mentioning more individualism than collectivism (Hong, Ip, Chiu, Morris, & Menon, 2001).

Currently, there are mixed findings on acculturation and health behaviors. Hsia and Spruijt-Metz (2007) found that Asian American college students, both males and females, engaged in more smoking when they had less contact with American culture. Since they engaged less with American culture, they retained their Asian culture, which encourages social smoking. Asian American college students who were more open to American culture, which is less accepting of smoking compared to their home countries, reported smoking less for social reasons. Social smoking can be influenced by the surrounding environment and people. Similarly, Zhang and Wang (2008) found that Asian American men who are more acculturated tend to smoke less overall. Again, this is due to the different norms regarding smoking in different countries. However, other research has reported that U.S. immigrants often adopt unhealthier behaviors as they become more acculturated (Abraido-Lanza, Chao, & Florez, 2005; Zhang &

Wang, 2008). Findings may differ based on gender, health behaviors, acculturation measures, and types of acculturation.

Similar to acculturating to health norms, Asian Americans may acculturate to cognitive thinking styles as well. Asian Americans who have acculturated to Western culture in many other ways may start to think more analytically than dialectically, allowing them to experience cognitive dissonance more.

Current Study

Cigarette smoking remains a health problem, especially among Asian Americans, a group that is understudied in this area. It is important to target Asian American males as they are likely to initiate smoking in college (Myers et al., 2009) and are prone to nicotine dependence (Bowen & Kurz, 2011) when compared to other racial groups. The TTI proposes that cultural factors, like cognitive thinking styles, may predict or better understand risky health behaviors like smoking. Dialectical thinking is a cognitive thinking style that is more prominent in East Asian culture. However, there has been no research examining the role of dialectical thinking on smoking outcomes in Asian American males, specifically Chinese American and Korean American males. Both are considered East Asians, have high smoking rates, and similar cultural values. This study examined the influence dialectical thinking has on acculturation and smoking outcomes through a cross-sectional survey study and an experimental study.

Hypotheses

Study 1 tested these hypotheses (see Figure 2):

i. Acculturation will be negatively related to dialectical thinking.

ii. Acculturation will be negatively related to smoking outcomes.

iii. Dialectical thinking will be positively related to smoking outcomes.

a. Higher scores on the Contradiction subscale will be related to more smoking intentions and less negative smoking outcomes.

b. Higher scores on the Behavioral and Cognitive Change subscale will be related to less smoking intentions and less positive smoking outcomes.

iv. Dialectical thinking will mediate the relationship between acculturation and smoking outcomes.

In addition, I hypothesized that there will be ethnic differences on certain variables of interest. Specifically, I hypothesized that:

v. Chinese Americans will engage in more dialectical thinking than Korean Americans given that dialectical thinking is posited to originate from Chinese Taoist traditions.

Study 2 primed dialectical thinking and tested the following hypothesis:

vi. Increased dialectical thinking will be related to greater positive beliefs about smoking.

STUDY 1

Overview

The primary goal of Study 1 was to examine the relationship between acculturation and smoking outcomes, specifically smoking beliefs and attitudes

and intentions, and the possible mediating effect of dialectical thinking on this relationship. This goal was achieved through the use of a cross-sectional online survey in English.

Method

Participants

Participants were 162 Asian American males. To determine sample size, we ran a statistical power analysis, using G*Power, based on data from Spencer-Rodgers, Peng, and Wang (2010). The effect size in Spencer-Rodgers, Peng, and Wang (2010) detecting differences based on acculturation and dialectical thinking was considered small. We used an effect size of .1, power of .95, significance level of .05, and one-sided tail for an a priori F test. The sample size needed was 158 participants. Inclusion criteria included being 18 to 35 years old, identifying as male, identifying as Chinese American or Korean American, and having tried at least one cigarette in their lifetime.

Recruitment Sites

DePaul University is a private university with 15,961 undergraduate students. Forty-seven percent of undergraduates are male and 8.5% of undergraduates are Asian American (DePaul University, 2016). Participants were recruited from the DePaul psychology subject pool. Participants from the psychology subject pool completed a prescreening survey in order to determine eligibility. University of Nevada, Las Vegas is a public state university with 23,801 undergraduate students. Forty-four percent of undergraduates are male and approximately 16% of undergraduates are Asian American (University of Nevada, Las Vegas, 2016). Participants were recruited from the UNLV

psychology subject pool. Participants were also recruited using flyers posted throughout UNLV campus. Participants were also recruited from the community via electronic flyers and email listservs. Targeted email listservs included Asian American organizations such as university clubs, churches, cultural centers, and health associations. The majority of participants were recruited via convenience sampling through Qualtrics, an online participant pool. Qualtrics recruited participants from multiple resource panels.

Procedure

Interested participants were given a link to participate in the study on Qualtrics. Those recruited from the two psychology subject pools and email listservs were first screened to ensure that they met the eligibility criteria; those recruited though the Qualtrics-administered resource panels were pre-screened by Qualtrics and therefore proceeded directly to the study. Participants consented to participate, then were administered questionnaires online in English. Data were collected between May 2017 and June 2018. Following completion of the survey, participants recruited from subject pools received course credit and participants recruited from the email listservs or resource panels received a $5 gift card as compensation. Study procedures were approved by DePaul's and UNLV's Institutional Review Boards.

Measures

All measures used in Study 1 can be found in Appendix A.

Demographic variables. Participants were asked to report their age, race/ethnicity, and languages spoken at home.

Smoking. Participants who endorsed smoking were asked to answer questions regarding their current smoking behaviors, including how often they smoke, who they smoke with, where they smoke, approximately how many cigarettes they have had in the past 30 days, what age they started smoking, and the number of times they have tried to quit smoking.

Nicotine dependence. Nicotine dependence was assessed for those who smoke using the Fagerstrom Nicotine Dependency Survey (Heatherton et al., 1991). This survey consists of six multiple choice questions. High scores indicate very high dependence while low scores indicate very low dependence. Nicotine dependence may be a confounding variable; therefore, it must be assessed to better understand the results. This scale has been validated with Asian American populations. Internal consistency could not be computed for this scale as it validated reliability assumptions. The coding scheme did not have the same meaning for each question.

Acculturation. Asian American participants' behavioral acculturation was analyzed. Behavioral acculturation was assessed using the Acculturating Rating Scale for Mexican Americans (ARSMA) II (Cuellar, Arnold, & Maldonado, 1995). Although this scale originally measured acculturation for Mexican Americans, it has been modified for use with Asian Americans (Lee, Yoon, Liu-Tom, 2006). This scale is a 30-item, bidimensional acculturation scale. It uses a 5-point scale (1 = *Not at all*; 5 = *Extremely often or almost always*). Participants were asked to indicate how much they agree to the statements (e.g. "I like to identify myself as Asian American"). This scale yields three different scores.

First, it provides the Asian Orientation Scale (AOS) which measures how much participants identify with Asian orientation. Second, it provides the Western Orientation Scale (WOS) which measures how much participants identify with Western orientation. Higher scores represent more cultural orientation to Western and Asian culture. Last, this scale provides a total score, which measures which culture participants identify with more. The total score can be used as a unidimensional measure of acculturation. This scale has been validated and has an internal consistency score of .83 and a test-retest reliability score of .94. Internal consistency Cronbach's alpha in the current study for the total scale was .83. Internal consistency Cronbach's alpha in the current study for the AOS scale was .92 and .8 for the WOS scale.

Smoking intentions. Intention to smoke was assessed with a scale adapted from Choi, Gilpin, Farkas, and Pierce (2001). This questionnaire has three items rated on a 10-point scale (0 = *Definitely not*, 10 = *Definitely yes*). Scores were averaged; higher scores indicate stronger intentions to smoke. Internal consistency Cronbach's alpha in the current study was .93.

Smoking beliefs and attitudes. Attitudes regarding smoking were assessed using the Smoking Consequences Questionnaire Short Form (Myers, MacPherson, McCarthy, & Brown, 2003). This questionnaire has 21 items rated on a 10-point scale (0 = *Completely unlikely*; 9 = *Completely likely*). Participants were asked to assess the consequences of smoking (e.g. "Smoking is taking years off my life"). This scale measures four subscales: negative consequences, negative reinforcement, positive reinforcement, and weight control. Only the

negative consequences, negative reinforcement, and positive reinforcement subscales will be examined. Higher scores indicate greater endorsement of attitudes. This scale has been validated and has reliability ranging from .84 to .93. Cultural beliefs were adapted from a study by Saw and colleagues (2015). Participants were asked which common beliefs apply to them. Sample items include: "If I quit all at once, I might get sick. It will upset my health balance" and "Cigarettes from China are healthier with added herbs like ginseng and special ingredients like antioxidants." Responses are reported rated on a 10-point scale (0 = *Completely unlikely*; 9 = *Completely likely*). This scale has not been validated with Asian American populations yet. Internal consistency Cronbach's alpha in the current study for the total scale was .95. Internal consistency Cronbach's alpha in the current study for the subscales are as follows: negative consequences (.87), negative reinforcement (.96), positive reinforcement (.9), and weight control (.96).

Dialectical thinking. Asian American participants' cognitive thinking style was assessed using the Dialectical Self Scale (Spencer-Rodgers, Srivastava, Boucher, English, Paletz, & Peng, 2015). This scale has 32 items rated on a 7-point scale (1 = *Strongly disagree*; 7 = *Strongly agree*). Participants were asked to rate how much they agree to the statements (e.g. "When I hear two sides of an argument, I often agree with both"). This scale measures three components of dialectical thinking, contradiction, cognitive change, behavioral change, which serve as subscales. Scores are averaged and higher scores indicate more engagement in dialectical thinking. This scale has not been validated yet, but

reliability ranges from .71 to .86 with Asian American populations. Internal consistency Cronbach's alpha in the current study for the total scale was .86. Internal consistency Cronbach's alpha in the current study for the subscales are as follows: contradiction (.42), cognitive change (.6), behavioral change (.46).

Statistical Analysis

Regression analyses were performed using SPSS Statistics 24. The hypothesis for Study 1 was tested by means of mediation analyses. We used PROCESS, a macro for SPSS developed by Hayes (2013) to test the mediation. We used 1000 bootstrap estimates for 95% confidence intervals (Shrout & Bolger, 2002). We ran independent-samples *t* tests to compare ethnic differences.

Results

Tables displaying results can be found in Appendix B.

Demographics. Participants were 18 to 35 years old with a mean age of 24.62 (*SD* = 5.1). Approximately 22.2% identified as Korean American and 77.8% identified as Chinese American. One hundred percent of participants identified as males and reported smoking at least one cigarette in their lifetime. About 27% of participants reported being born outside of the US while about 12% identified as international students. Regarding sexual orientation, 82.7% identified as heterosexual, 6.2% as gay/lesbian, 9.9% as bisexual, and 1.2% as other. The majority of participants (52%) identified as second generation. About 82% of participants reported they preferred to speak English compared to Asian languages. The mean scores, standard deviations, and frequencies of demographic variables are presented in Table 1.

Smoking. About 53% of the sample reported smoking in the past 30 days, 21% of the sample reported smoking every day, 48.1% smoking some days, and 30.9% not smoking at all. Frequencies regarding smoking demographics are displayed in Table 2.

Nicotine dependence. Fifty participants identified as current smokers and were asked questions about nicotine dependence. The average FTND score was 3.63 (range 1-10), *SD* = 1.37. On average, participants rated themselves as low to moderate dependence. Only one participant reported high dependence.

Acculturation. For behavioral acculturation, scores ranged from -5 to 5. The average acculturation score was .58 (*SD* = 1.08). The ARSMA has two subscales. Average scores were calculated for the AOS (*M* = 3.32, *SD* = .83) and WOS (*M* = 3.89, *SD* = .57). Scores ranged from 1 to 5.

Smoking intentions. Participants who endorsed not smoking at all (*n* = 50) were asked three questions regarding smoking intentions. Scores range from 1 to 10. Average scores were calculated (*M* = 2.17, *SD* = 1.8). About 64% of participants reported they would definitely not try a cigarette any time soon; 62% of participants reported they would definitely not smoke a cigarette in the next year; 58% of participants reported they would definitely not accept a cigarette if their best friend offered them one.

Smoking beliefs and attitudes. Scores for the SCQSF were summed and ranged from 0 to 171. The total SCQSF score on average was 86.42, *SD* = 37.36. The SCQSF was broken down into three subscales. For negative consequences, scores ranged from 0 to 36 (*M* = 25.73, *SD* = 9.27). For negative reinforcement,

scores ranged from 0 to 72 (M = 34.44, SD = 20.68). For positive reinforcement, scores ranged from 0 to 63 (M = 26.25, SD = 16.13).

Dialectical thinking. Dialectical thinking was measured using the Dialectical Self Scale (DSS), which has three subscales: contradiction, cognitive change, behavioral change. Scores on the DSS and subscales were averaged and ranged from 1 to 7. Higher scores indicate engagement in more dialectical thinking. The average score on the DSS was 3.89, SD = .46. Average scores for the subscale were as follows: contradiction (M = 4.1, SD = .52), cognitive change (M = 3.7, SD = .66), behavioral change (M = 3.79, SD = .69).

Manipulation checks. All participants answered all manipulation check questions correctly.

Independent t-tests for ethnic differences on dialectical thinking. Independent t-tests showed there were no ethnic differences on dialectical thinking. This does not support the hypothesis that Chinese Americans are more likely to engage in dialectical thinking than Korean Americans. Since there were no ethnic differences, subsequent analyses combined the two groups.

Bivariate correlations. Smoking intention was positively and significantly correlated with smoking beliefs and attitudes (r = .33, p = .02) and with two SCQSF subscales, positive reinforcement (r = .47, p = .00) and negative reinforcement (r = .32, p = .02). Smoking intention was positively and significantly correlated with two dialectical thinking subscales, cognitive change (r = .29, p = .04) and behavioral change (r = .35, p = .01). Behavioral acculturation was positively and significantly correlated with cognitive change (r

= .16, p = .04). Western orientation was negatively and significantly correlated with Asian orientation (r = -.18, p = .02) and behavioral acculturation (r = -.66, p = .00). Western orientation was also positively and significantly correlated with negative consequences (r = .18, p = .02). Asian orientation was negatively and significantly correlated with behavioral acculturation (r = -.86, p = .00). All correlations are displayed in Table 3. These results do not support the first three hypotheses regarding relationships between acculturation, dialectical thinking, and smoking outcomes.

Mediation analyses. Regression analyses were used to investigate the hypothesis that dialectical thinking mediates the relationship of acculturation on smoking outcomes. The ARSMA's two subscales, Asian orientation and Western orientation, were used in mediation models as independent variables, however, there was no significance for partial or full mediation.

Smoking beliefs and attitudes. Mediation models examining smoking beliefs and attitudes as the outcome variable did not produce significance. Direct and indirect effects are shown in Table 4.

Smoking intention. Results indicated behavioral acculturation was not significantly associated with overall dialectical thinking, b = -.07, SE = .06, p = .22, and dialectical thinking was not significantly associated with smoking intentions, b = .82, SE = .5 p = .11. There was not a direct effect of acculturation on smoking intentions but there was an indirect effect of acculturation on smoking intentions (see Figure 3 and Table 5). These results support the hypothesis that

dialectical thinking mediates the relationship between behavioral acculturation and smoking intention.

A multiple mediation analysis using the three subscales of dialectical thinking showed behavioral acculturation was not significantly associated with contradiction (b = .06, SE = .07, p = .42) or behavioral change (b = -.11, SE = .09, p = .23). However, behavioral acculturation was significantly associated with cognitive change (b = -.2, SE = .08, p = .01). The three subscales were not significantly associated with smoking intention. There was not a direct effect between behavioral acculturation and smoking intention, but a significant indirect effect was found. Results are listed in Table 5 (see Figure 4).

Discussion

There has been a lack of research regarding how dialectical thinking influences Asian Americans to engage in smoking behaviors. The aim of this study was to understand relationships between acculturation, dialectical thinking, and smoking outcomes in East Asian Americans. We hypothesized that dialectical thinking would mediate the relationship between acculturation and smoking intention. Our results are consistent with what we expected. We also hypothesized that acculturation would be negatively related to dialectical thinking, acculturation would be negatively related to smoking outcomes, and dialectical thinking will be positively related to smoking outcomes. Contrary to our hypotheses, we did not find significant relationships between these variables. Lastly, we predicted that Chinese Americans would engage in more dialectical thinking than Korean Americans, but we did not find support for this prediction.

The most important finding this study revealed is that there is an indirect only mediation of dialectical thinking on the relationship between behavioral acculturation and smoking intention. Furthermore, this study revealed an indirect effect of the cognitive change subscale on the relationship between behavioral acculturation and smoking intention. These results confirmed our hypothesis that dialectical thinking mediates the relationship between acculturation and smoking outcomes. However, there were not specific hypotheses made regarding which type of acculturation, which subscale of dialectical thinking, and which smoking outcome was to be predicted. As results were inconsistent when considering all variables used, further investigation is warranted for future studies.

Baron and Kenny (1986) described specific criteria that must be met to establish a mediation effect. The criteria include: 1) the independent variable being significantly related to the dependent variable, 2) the independent variable being significantly related to the mediator, 3) the mediator being significantly related to the dependent variable, and 4) controlling for the mediator reduces the previously significant relationship between the dependent and independent variable. Based on Baron and Kenny (1986), these results do not yield a mediation effect because they do not meet the first three criteria. However, Zhao, Lynch Jr., and Chen (2010) and Hayes (2009) report there does not need to be an initial significant direct effect to yield mediation. Zhao, Lynch Jr., and Chen (2010) argue there are three patterns of mediation, and in an indirect only mediation, only the indirect effect needs to be significant. They also argue that the effect is due to the hypothesized mediator and it is unlikely there was an

omitted mediator. Hayes (2009) and MacKinnon, Krull, & Lockwood (2000) stated that two or more indirect paths can carry the effect from the independent variable through the dependent variable and those paths can operate in opposite directions which would cancel each other out, resulting in a significant indirect effect. These results based on Zhao, Lynch Jr. and Chen (2010) and Hayes (2009) support the hypothesis that dialectical thinking, specifically cognitive change, mediates the relationship between behavioral acculturation and smoking intention. At this time, there is more support for the explanation given by Hayes (2009).

As Hayes (2009) suggests, there are other possible direct effects and indirect effects at play, meaning there could be confounding variables that influenced the mediation effect. Possible confounding variables can include age, occupation, living arrangements, and social networks. Age could be a possible confounding variable that may have a direct effect on smoking intention. Rigotti, Lee, and Wechsler (2000) discuss how younger participants who are just starting college may be more inclined to try new things, such as drinking alcohol or smoking cigarettes. Participants who are older may have already tried smoking and do not feel the need try smoking again. Research also shows that tobacco industries often use adults 18 to 24 years of age as the target age group for marketing their products (Rigotti, Lee, & Wechsler, 2000). Age could also have a direct effect on how fast an individual acculturates. Chueng, Chudeck, and Heine (2011) found that younger immigrants reported acculturating at a faster rate. The sample used for this study had many participants who were not born in the US (26.5%) or are international students (11.7%). The age of when they moved to

the US could affect their acculturation levels in this study, which could also indirectly affect their levels of dialectical thinking. Occupation could serve as a confounding variable as research supports that jobs that are more stressful are a risk factor for smoking (Kouvonen, Kivimaki, Virtanen, Pentti, & Vahtera, 2005). Participants who work in bars, casinos, or places that allow smoking may be more against smoking as they are exposed to second hand smoke, which causes health harms (Wan & Pilkington, 2009; Pilkington, Gray, Gilmore, & Daykin, 2006). Many participants identified as college students, and research has found that levels of stress in college could also lead participants to consider smoking as a stress reliever (Nichter, Nichter, Carkoglu & Tobacco Etiology Research Network, 2007). Living arrangements and social network may also affect acculturation, dialectical thinking, and smoking intention. Depending on who participants live with and socialize with, they may feel the need to conform to acculturating more or less, engage in a certain way of thinking, or smoking (Kelman, 1958; Pearson & Michell, 2009; Tang, Wu, & Sun, 2013). Forty-eight percent of participants reported their father currently smokes. This could affect participants' attitudes towards smoking.

The most surprising findings from this study were the correlations between some of the variables. Contrary to our first hypothesis, acculturation was not significantly negatively related to dialectical thinking. The relationship between behavioral acculturation and the Western orientation was negatively related to dialectical thinking, but the relationships were not strong enough to be considered significant. This could be due to many participants being born in the

US (73%) or living in the US for quite some time, leading to higher levels of acculturation and therefore less engagement in dialectical thinking. Researchers should consider to what extent does acculturation require dialectical thinking. It is possible that engaging in dialectical thinking makes it easier to individuals to acculturate, because to some extent, there is contradiction with holding both American and Asian values and beliefs. This might explain why there was not a correlation between dialectical thinking and acculturation.

Behavioral acculturation was positively and significantly correlated with cognitive change. The more acculturated participants rated themselves, the more they endorsed cognitive change. These results do not support the hypothesis that acculturation would be negatively related to overall dialectical thinking. These results do not align with previous research. This could be due to potential noise happening in the background. Participants had the freedom to take this survey in any environment, meaning environmental factors could have influenced results.

Inconsistent with our second hypothesis, acculturation was not significantly negatively related to smoking outcomes. This goes against previous research which states acculturated Asian American men are likely to smoke less (Choi, Rankin, Stewart, & Oka, 2008). The relationships between acculturation and smoking outcomes were overall negative, but not strong enough to be significant. There were also no results to support the hypothesis that Chinese Americans will engage in more dialectical thinking than Korean Americans. This could be due to having an unequal sample of Chinese and Korean Americans. The samples in previous studies examining acculturation, smoking, or dialectical

thinking in Asian Americans differ from this sample. Previous studies use samples consisting of older, less educated immigrant men.

Two of the dialectical thinking scales, cognitive change and behavioral change, were positively and significantly correlated with smoking intention. The more cognitive and behavior change participants endorsed experiencing, the more intention participants had to smoke. These results do not support our hypothesis that higher scores on the behavioral and cognitive change subscale will be related to less smoking intention and less positive smoking outcomes. If dialectical thinking is at play, it is possible that participants reported they would smoke, but later, change their minds. There were no significant results to support the hypothesis that higher scores on the contradiction subscale will be related to more smoking intentions and less negative smoking outcomes. Spencer-Rodgers and Peng (2015) disclaimed that the Dialectical Self Scale should not serve as a measure of general dialectical thinking. The Dialectical Self Scale assesses dialectical thinking in the domain of self-perception. Participants may perceive themselves as engaging in dialectical thinking, but their perception may not match the actual level of dialecticism. This could explain why there is not a stronger detection of dialectical thinking correlating with other variables.

Finally, there were results that were not surprising due to existing research and data. Smoking beliefs and attitudes, and its subscales, positive reinforcement and negative reinforcement, were positively and significantly correlated with smoking intention. In other words, the more participants endorsed reasons to smoke, based on positive and negative reinforcement, the more they endorsed

intention to smoke. This aligns with Chun (2015), which reported positive attitudes with smoking need to decrease in order to lower smoking rates. These results are also consistent with Tomkins (1966) and Brandon and Baker (1991) in which they report smokers smoke to produce positive emotional states and to reduce negative emotional states. Western orientation was negatively correlated with the Asian orientation. This means the more participants identified with Western culture, they less they identified with Asian culture. Western orientation was positively correlated with negative consequences. The more participants identified with Western culture, the more they associated smoking with negative consequences. As previously discussed, acculturated Asian American men are likely to smoke less (Choi et al., 2008). Not only that, Asian Americans who learn more knowledge about tobacco from living in the US are less likely to have positive attitudes towards smoking (Battle, Lee, & Antin, 2010).

Research examining thought processes in smokers found current and heavy smokers experienced more cognitive dissonance than former or light smokers (Halpern, 1994; McMaster & Lee, 1991). Smokers can identify health consequences associated with smoking, yet still engage in smoking, which can produce cognitive dissonance. This supports the cognitive domain of the cultural stream of the TTI. Participants in the studies mentioned were primarily European American. Therefore, there is some overlap regarding thought processes and smoking, however, cultural factors should be examined at a deeper level. These results add to the existing literature as dialectical thinking has not been examined with smoking behaviors. Results indicate an underlying relationship with

dialectical thinking and smoking, but more research is needed to explain this relationship in order to be able to understand the role of dialectal thinking and how it affects smokers.

This study has a few limitations. First, environmental factors were not controlled. Standard lab studies may better control for noise and produce clearer results. Wang, Hempton, Dugan, and Komives (2008) reported that Asian Americans are more likely to select midpoint answers rather than extreme answers on Likert scales. All measures used in this study are Likert scales. This may explain why there are not stronger significant correlations between the variables. Further research may examine the differences between behavioral and values acculturation to see if certain types of acculturation affect certain behaviors or attitudes. Cognitive dissonance should also be examined in future studies, as well as other factors that might play a role in decision to smoke, such as risk perception.

Study 1 found evidence that dialectical thinking mediates the relationship between acculturation and smoking intention. Since results indicate there is an effect of dialectical thinking, but we are not clear how strong the effect is or if there are other influential factors, we next examined dialectical thinking through a priming paradigm to see if dialectical thinking affects thoughts and attitudes towards smoking.

STUDY 2

Overview

Study 2 examined the effect of dialectical thinking on smoking expectancies using a priming paradigm in which dialectical thinking is manipulated. We predicted that increased dialectical thinking will be related to more positive and more negative beliefs regarding smoking. We examined psychological discomfort as dialectical thinking reportedly does not result in feelings of discomfort, like cognitive dissonance does.

Method

Participants

To determine sample size, we ran a statistical power analysis, using G*Power, based on data from Cheng (2009). The effect size in Cheng (2009) detecting dialectical thinking was considered small. We used an effect size of .3, power of .95, significance level of .05, and one-sided tail for an a priori F test. The sample size needed is 78 participants. Inclusion criteria included being 18 to 35 years old, identifying as male, identifying as Chinese American or Korean American, and having tried at least one cigarette in their lifetime. For this study, there were 122 participants.

Recruitment Sites

Participants were recruited from the same sites as Study 1.

Procedure

Procedure is the same as Study 1.

Measures

Demographic variables. Participants were asked to report their age, sex, race/ethnicity, and languages spoken at home.

Smoking. Participants who endorsed smoking were asked to answer questions regarding their smoking behaviors, including how often they smoke, approximately how many cigarettes they have had in their lifetime, at what age they started smoking, and the number of times they have tried to quit smoking.

Smoking intentions. Intention to smoke was assessed with a scale adapted from Choi et al. (2001). This questionnaire has three items rated on a 10-point scale (0 = *Definitely not*, 10 = *Definitely yes*). Scores were averaged; higher scores indicate stronger intentions to smoke. Internal consistency Cronbach's alpha in the current study was .94.

Nicotine dependence. Nicotine dependence was assessed for those who smoke using the Fagerstrom Nicotine Dependency Survey (Heatherton et al., 1991). This survey consists of six multiple choice questions. High scores indicate very high dependence while low scores indicate very low dependence. Nicotine dependence may be a confounding variable; therefore, it must be assessed to better understand the results. This scale has been validated with Asian American populations. Internal consistency could not be computed for this scale as it validated reliability assumptions. The coding scheme did not have the same meaning for each question.

Priming manipulation. In this experiment, participants were randomly assigned via Qualtrics to either the experimental or control condition. Thinking

style was manipulated by asking participants to read a prompt developed by Spencer-Rodgers and colleagues (2004), with some revisions to the control passage. This scale has been validated with Asian American populations. In the experimental condition, participants read the passage below, then were prompted to write about their thoughts. They were reminded that there are no right or wrong answers.

> Life can be full of contradiction and uncertainty. We would like you to reflect, in writing, on a time in your life when it was full of contradiction and uncertainty. . . . We would like you to recall experiences in which you were very aware of both the pros and cons of the situations and there were no right answers. The situations or experiences had positive outcomes and consequences for you (and the people you care about) as well as equally negative outcomes or consequences for you (and the people you care about). Think about these contradictory experiences. . . . Describe how you thought through all of the facts and possible perspectives, including the opposing ones.

In the control condition, participants were asked to read the passage below, then write about their thoughts. They were reminded that there are no right or wrong answers.

> Tourism is an important source of income to New York City. We would like you to think about, in writing, the tourism industry in New York City. We would like you to think about what brings in tourists to New York City, that is, why is New York City one of the world's leading tourism destination and what enhances tourists' experience when they visit the city. Describe how you thought about all the possible reasons tourists are attracted to New York City.

To ensure that participants are paying close attention to the priming task, they were told in advance to pay attention as they will be tested on how well they remember the passage at the end of the study. Three questions were asked regarding the passages after measuring smoking beliefs and attitudes. Participants were asked if they saw the words "opposing," "tourists," and "hassle" in the passages.

Smoking beliefs and attitudes. Attitudes regarding smoking was assessed using the Smoking Consequences Questionnaire Short Form (Myers et al., 2003). This questionnaire has 21 items rated on a 10-point scale (0 = *Completely unlikely*; 9 = *Completely likely*). Participants were asked to assess the consequences of smoking (e.g. "Smoking is taking years off my life"). This scale measures four subscales: negative consequences, negative reinforcement, positive reinforcement, and weight control. Only the negative consequences, negative

reinforcement, and positive reinforcement subscales will be examined. Higher scores indicate greater endorsement of attitudes. This scale has been validated and has reliability ranging from .84 to .93. Cultural beliefs were adapted from a study by Saw and colleagues (2015). Participants were asked which common beliefs apply to them. Sample items include: "If I quit all at once, I might get sick. It will upset my health balance" and "Cigarettes from China are healthier with added herbs like ginseng and special ingredients like antioxidants." Responses are reported rated on a 10-point scale (0 = *Completely unlikely*; 9 = *Completely likely*). This scale has not been validated with Asian American populations. Internal consistency Cronbach's alpha in the current study for total scale was .95. Internal consistency Cronbach's alpha in the current study for the four subscales are as follows: negative consequences (.85), negative reinforcement (.96), positive reinforcement (.91), weight control (.93).

Psychological discomfort. Affect regarding the priming task was assessed using Elliot and Devine's (1994) measures of affect from a study looking at psychological discomfort. This measure has 24 items were asked to describe how they are feeling right now. Only the uncomfortable and uneasy items were analyzed. Internal consistency Cronbach's alpha in the current study was .91.

Statistical Analysis

The hypothesis for Study 2 was tested by performing two two-way multiple analysis of variances (MANOVAs) and one univariate analysis of variance (ANOVA) to compare posttest variables between the experimental and control groups, and between current smokers and nonsmokers. The MANOVAs

examined the three smoking beliefs and attitudes subscales and two feelings of psychological discomfort. The ANOVA examined smoking intention. Bivariate correlations were performed with all dependent variables.

Results

Results presented in tables can be found in Appendix B.

Demographics. There was a total of 122 participants included in this study (M_{age} = 27.34, SD_{age} = 5). Sixty-three participants were randomly assigned to the control condition with a mean age of 26.78, *SD* = 5.15, and ethnicity as follows: 60.3% Chinese American, 36.5% Korean American. Fifty-nine participants were randomly assigned to the experimental condition with a mean age of 27.93, *SD* = 4.72, and ethnicity as follows: 59.3% Chinese American, 39% Korean American. Overall, 59.8% identified as Chinese American and 37.7% identified as Korean American. One hundred percent of participants identified as males and reported ever smoking a cigarette in their lifetime. About 31% of participants reported they were not born in the US while 5.7% identified as international students. Regarding sexual orientation, 91% identified as heterosexual, 3.3% identified as gay/lesbian, and 5.7% identified as bisexual. Most of participants identified as second generation (47.5%). Lastly, 92.6% of participants reported they prefer to speak English overall. The mean scores and standard deviations of demographic variables based on the condition of participants are shown in Table 6.

Smoking. About 52% of the sample reported smoking in the past 30 days, 23.8% of the sample reported smoking every day, 37.7% smoking some days, and

38.5% not smoking at all. Descriptive statistics for smoking demographics can be found in Table 7.

Smoking intentions. Participants who endorsed not smoking at all (n = 47) were asked three questions regarding smoking intentions. Scores range from 1 to 10, with higher scores indicating more smoking intentions. Average scores were calculated (M = 2.02, SD = 1.63). About 68% of participants reported they would definitely not try a cigarette any time soon; 64% of participants reported they would definitely not smoke a cigarette in the next year; 60% of participants reported they would definitely not accept a cigarette if their best friend offered them one.

Nicotine dependence. Seventy-five participants identified as current smokers and were asked questions about nicotine dependence. Scores ranged from 1 to 10, with higher scores indicating greater nicotine dependence. The average FTND score was 2.97, SD = 1.33. On average, participants rated themselves as low to moderate dependence. No participants reported high dependence.

Smoking beliefs and attitudes. Scores for the SCQSF were summed and ranged from 0 to 171. The total SCQSF score on average was 80.2, SD = 35.73. The SCQSF was broken down into three subscales. For negative consequences, scores ranged from 0 to 36 (M = 25.52, SD = 9.12). For negative reinforcement, scores ranged from 0 to 72 (M = 30.98, SD = 20.22). For positive reinforcement, scores ranged from 0 to 63 (M = 23.7, SD = 16.06). Higher scores align with endorsing more beliefs and attitudes regarding those subscales.

Manipulation checks. All participants answered all manipulation check questions correctly. Participants were also asked to answer three questions regarding the passages they read. Participants in the control and experimental condition answered most questions correct, indicating they were paying attention to the passage they read.

Bivariate correlations. The correlational analysis is reported in Table 8. Results indicate feeling uneasy positively correlated with feeling uncomfortable ($r = .66$, $p < .01$) and negatively correlated with negative consequences ($r = -.2$, $p < .05$). Feeling uncomfortable was negatively correlated with negative consequences ($r = -.24$, $p < .01$) and positively correlated with smoking intentions ($r = .66$, $p < .01$). Negative consequences were negatively correlated in small magnitude with smoking intentions ($r = -.43$, $p < .01$). Negative reinforcements were positively and significantly correlated with positive reinforcements ($r = .83$, $p < .01$) and smoking intentions ($r = .41$, $p < .01$). Lastly, positive reinforcements were positively and significantly correlated with smoking intentions ($r = .51$, $p < .01$).

MANOVA analyses. Participants were randomly assigned to a control ($n = 63$) or experimental ($n = 59$) group and were identified as nonsmokers ($n = 47$) or smokers ($n = 75$). Participants in the experimental group were primed to think dialectically. We then tested the hypothesis that dialectical thinking influences more smoking outcomes with a multivariate analysis of variance (MANOVA) using subscales of the SCQSF as dependent variables. The MANOVA revealed there was not a significant difference between the control and experimental group

in their SCQSF subscale scores: Negative Consequences $F(1,120) = .94$, $p = .42$; Negative Reinforcement $F(1,120) = .94$, $p = .42$; Positive Reinforcement $F(1,120) = .94$, $p = .42$. This indicates those who were primed to think dialectically did not hold more contradicting beliefs about smoking. However, the MANOVA revealed there was a significant difference between smokers and nonsmokers in that nonsmokers endorsed more negative consequences, $F(1,120) = 61.62$, $p = .00$, and less negative, $F(1,120) = 61.62$, $p = .00$, and positive reinforcement, $F(1,120) = 61.62$, $p = .00$, than smokers. The results of the MANOVA analysis for the SCQSF subscales are shown in Table 9. The univariate ANOVA also showed no significant differences between the control and experimental groups (see Table 10). Descriptive statistics for the SCQSF can be found in Table 11.

We also tested the hypothesis that dialectical thinking is related to less psychological discomfort with a multivariate analysis of variance (MANOVA) using the "uneasy" and "uncomfortable" feelings of the Psychological Discomfort Scale as dependent variables. The results of the MANOVA analysis for the Psychological Discomfort feelings are shown in Table 12. The MANOVA revealed there was not a significant difference between the control and experimental group in their psychological discomfort: uneasy $F(1,120) = 2.09$, $p = .13$; uncomfortable $F(1,120) = 2.09$, $p = .13$, nor between smokers and nonsmokers. This indicates those who were primed to think dialectically did not report feeling more or less psychological discomfort than the control group. The univariate ANOVA showed a marginally significant difference between the control and experimental group for feeling uneasy $F(1, 121) = 4$, $p = .05$ (see

Table 13). Descriptive statistics for psychological discomfort can be found in Table 11.

ANOVA analysis. Participants who endorsed not smoking at all (n = 47) were asked three questions regarding smoking intentions. Participants were randomly assigned to a control (n = 27) and experimental (n = 20) group. We tested the hypothesis that dialectical thinking is related to more intention to smoke with a univariate analysis of variance (ANOVA). The results showed there was not a significant difference between the control and experimental group in their intent to smoke $F(1, 45) = .64$, $p = .43$. Results of the ANOVA analysis are shown in Table 14.

Discussion

The overarching goal of this study was to examine the relationship between dialectical thinking, smoking beliefs, and psychological discomfort. We predicted dialectical thinking would influence more contradicting beliefs and feelings of psychological discomfort, specifically, feeling uneasy and uncomfortable. Surprisingly, we found results inconsistent with our hypothesis.

First, this study revealed dialectical thinking does not influence smoking outcomes nor feelings of psychological discomfort. Participants who were primed to think dialectically did not endorse having more contradicting beliefs, feeling less psychological discomfort, or endorse more smoking intentions than participants in the control condition. This is an understudied area so there are no other dialectical thinking and smoking studies to compare these results with at this time.

Three cultural belief questions adapted from a study by Saw and colleagues (2015) were added to the SCQSF. Items included, "If I quit all at once, I might get sick. It will upset my health balance," "Cigarettes from China are healthier with added herbs like ginseng and special ingredients like antioxidants," and "I know someone who smoked and lived to an old age." These questions were developed for Chinese immigrants and participants in this study were majority US born. This could explain why few participants endorsed these items, which could contribute to the overall SCQSF subscale scores and result in no effect. About 39% of participants endorsed they were likely to believe "If I quit all at once, I might get sick. It will upset my health balance." Twenty-seven percent of participants endorsed they were likely to believe "Cigarettes from China are healthier with added herbs like ginseng and special ingredients like antioxidants." About 29% of participants endorsed they were likely to believe "I know someone who smoked and lived to an old age."

There was not an effect of dialectical thinking on feelings of psychological discomfort. The Psychological Discomfort scale had 24 items, however only two items were used for analyses. If participants endorsed feeling uneasy or uncomfortable, that is likely to indicate they experienced cognitive dissonance. It is possible the priming passage was not strong enough to induce feelings of discomfort. Other variables, such as mood, could have affected how participants felt when completing the Psychological Discomfort scale. There was no time limit or required minimum response length for the priming passage. Participants who answered the priming passage in a fast manner may not have had the chance

to fully think about contradiction and to experience feelings associated with contradiction.

Less than half of participants were eligible to answer questions regarding smoking intentions. These participants reported they were currently "not smoking at all." If participants have not been smoking at all for a long period of time, they may already feel strongly about the negative consequences of smoking, and therefore endorsed more negative consequences and fewer positive and negative reinforcements. Again, it is possible dialectical thinking did not have an effect because participants who answered the priming passage in a fast manner may not have had the chance to fully think about contradiction.

Second, this study revealed significant correlations between the dependent variables. Feeling uneasy positively correlated with feeling uncomfortable. Uneasy and uncomfortable are similar feelings, therefore the more a participant feels uneasy, the more likely they are to endorse feeling uncomfortable as well. This finding was not surprising. Negative consequences were negatively correlated with feeling uneasy and uncomfortable. This means the more participants reported they believed in negative consequences, the more uneasy and uncomfortable they felt. Negative consequences were negatively correlated in small magnitude with smoking intentions. This means the more negative consequences participants associated with smoking, the less likely they were to intend smoke. Believing that smoking will take years off one's life and be hazardous to one's health may lead participants to have less inclinations to smoke. Brandon and Baker (1991) reported participants were less likely to smoke based

on the likelihood that negative consequences were going to occur. Negative reinforcements were positively and significantly correlated with positive reinforcements and smoking intentions. The more participants endorsed negative reinforcements, the more likely they were to also endorse positive reinforcements. Positive reinforcements were also positively and significantly correlated with smoking intentions. Believing in both positive and negative reinforcements regarding smoking is more likely to lead participants to smoke. In other words, participants who reported smoking to have a positive affect were also likely to have reported smoking to get rid of negative affect, and the combination of these may lead to more smoking intention. This is also consistent with findings from Brandon and Baker (1991).

If the priming effect were to influence participants' smoking beliefs and attitudes, there would be a higher level of endorsement in the experimental group versus the control group. There was only a positive correlation between negative reinforcements and positive reinforcements, which is to be expected. Therefore, the correlations show the priming effect was not strong enough. Research comparing online experiments and standard lab experiments found both types produced consistent results (Dandurand, Shultz, & Onishi, 2008). Furthermore, Horton, Rand, and Zeckhauser (2010) replicated a priming effect from a lab study to an online study and found there was a prime effect. This shows that online studies with priming effects can still produce valid results. However, different types of primes may require different needs. It may be that more specific instructions should be displayed at the beginning of the survey to ensure

participants are supposed to do what they are asked. Investigations regarding the survey specifics are warranted.

Although results were not significant, this study shows there is more work to be done. If dialectical thinking does not play a role in Asian Americans' smoking behavior, what is the reason for high rates of smoking in the Asian American population? Could it be that dialectical thinking only influences a certain sample of the population? This study should be replicated in a similar manner with an immigrant population to determine if dialectical thinking is a factor that affects smoking behaviors.

Limitations for this study include not having a time limit or a required minimum answer length for the priming passage. Future studies using this prime may consider having participants think about their answer for a certain amount of them before they can respond and move on to the next part of the study. Having participants write their responses instead of typing their responses could also lead to a more effective strategy for engagement in dialectical thinking. This could ensure they think about contradiction in a deep manner. Researchers may want to use the Dialectical Self Scale from Spencer-Rodgers et al (2015) after the priming passage to verify a priming effect. Future studies could also use a pre- and post-test to confirm a priming effect, or a scale to confirm engagement in cognitive dissonance. Lastly, a standard lab study may be able to better control environmental factors than an online study. If possible, future studies should be conducted in a lab where environment factors can be controlled and accounted for.

General Discussion

The overarching goal of this study was to examine the relationships between dialectical thinking, acculturation, and smoking outcomes in Asian American males, an area in which there is little empirical research.

Study 1 results show that there was an indirect effect of dialectical thinking, specifically the cognitive change subscale, on the relationship between acculturation and smoking intention. This relationship is still not fully understood, so more research should be conducted to understand it at a deeper level. These results imply there is an underlying relationship between all the variables, but the true relationship is still not clear, and should be further explored. Previous research by Spender-Rodgers, Peng, and Wang (2010) indicate a relationship between acculturation and dialecticism. However, the samples in their studies differ from the sample in this study. Different types of acculturation measures (unidimensional, bi-dimensional, multi-dimensional, behavioral, values, etc) should be considered as it could lead to different results. Study 1 results do not align with prior research by Zhang and Wang (2008), which found that Asian American men who are more acculturated tend to smoke less overall. Study 1 indicates that those who are more acculturated have more intention to smoke. However, that aligns with other research reporting Asian Americans often adopt unhealthier behaviors as they become more acculturated (Abraido-Lanza, Chao, & Florez, 2005; Zhang & Wang, 2008).

Contrary to the hypothesis, Study 2 results show there was not a relationship between dialectical thinking and smoking outcomes and feelings of

psychological discomfort. At this time, there is no previous research to which to compare these results. These results raise the question of possible differences in population. Previous research exploring dialectical thinking have used participants who were born or live in Asia (Spencer-Rodgers, Boucher, Peng, & Wang, 2009; Spencer-Rodgers et al., 2004), while this study explores dialectical thinking in Asian Americans living in the US. There is a lot of heterogeneity in the Asian American population, therefore certain factors such as time in the US, ethnicity, and country of origin should be accounted for in future studies. Furthermore, previous studies using the same dialectical thinking prime found a priming effect (Cheng, 2009; Spencer-Rodgers, Peng, & Wang, 2010), while this study did not. Future research should find alternative ways to enhance the prime, such as playing Asian or American music while participants complete the study.

Although Bowen and Kurz (2011) reported that Asian American college students scored significantly high on a measure of nicotine dependence, and Myers, Doran, Trinidad, Klonoff, and Wall (2009) found that of those who tried their first cigarette, 37% became established smokers, these results show that many Asian American students are not engaged in smoking and are not nicotine dependent. Future studies should also explore use of other tobacco products, such as cigars, dip, hookahs, electronic tobacco, and second-hand smoke exposure.

The TTI proposes that tobacco use may be influenced by the cultural stream. These findings do not fully support that proposal, however, more research is warranted to better understand how culture influences tobacco use. These findings contribute to the existing data by showing there is an underlying

relationship between dialectical thinking, acculturation, and smoking. This research allows researchers to troubleshoot and continue investigating the role of dialectical thinking on smoking in Asian Americans. It remains important to study this topic to attempt to decrease smoking behaviors which will in turn decrease health issues. This research also allows for opportunities to examine other health behaviors in relation to dialectical thinking in Asian Americans. These results also indicate East Asian Americans may have high smoking rates due to other reasons than dialectical thinking. There is much room for further investigation.

As previously mentioned, there is little research examining dialectical thinking and smoking behavior. Although there was little significance, these results still provide a foundation to investigate dialectical thinking with other behaviors, such as alcohol drinking and gambling. It is important to continue to learn how dialectical thinking affects unhealthy behaviors as well as investigate different reasons for smoking in this population, in order to implement prevention and intervention of those behaviors. If more research confirms an effect of dialectical thinking, this information could be used to implement smoking programs to inform smokers of the extent to which they think dialectically and how it plays a role in their smoking.

Limitations & Future Research Directions

The current studies have a few limitations. First, our findings may be limited by our small sample size (Study 1, $n = 162$; Study 2, $n = 122$). Second, environmental factors can influence survey results. Therefore, a controlled

environment may produce clearer results that account for noise. Third, both samples included participants who were born in the US or have lived in the US for many years and are enrolled in college or graduate school. Due to their acculturation and education levels, they may already know the health harms of smoking. Not only that, the inclusion criteria for both studies required participants to have smoked at least one cigarette in their life. Over 30% percent of participants in each study reported they currently were not smoking at all. Future studies should aim to recruit participants from the community, who currently smoke and are less likely to be acculturated and educated about the health harms of smoking. Lastly, dialectical thinking originates from Chinese Taoist traditions, so a sample of all Chinese Americans may produce significant results compared to a sample of mixed East Asian ethnicities.

Conclusion

In sum, our findings contribute to the existing body of work on smoking in Asian Americans by taking the first step into investigating how dialectical thinking, considered a cultural style of thinking, is related to smoking behaviors and attitudes. Study 1 found dialectical thinking plays a role in smoking intention, but possibly through other direct and indirect effects that were not examined. Study 2 found dialectical thinking does not cause participants to endorse contradicting smoking beliefs and attitudes and smoking intention. Although not all hypotheses were fully supported, these two studies provide insight on dialectical thinking and smoking in East Asian Americans. Overall, these findings call for more work to be done in this area in order better understand

dialectical thinking, beliefs and attitudes towards smoking, and to create prevention and intervention programs that target smoking in this population.

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Appendix A.

Figure 1. Theory of Triadic Influence.

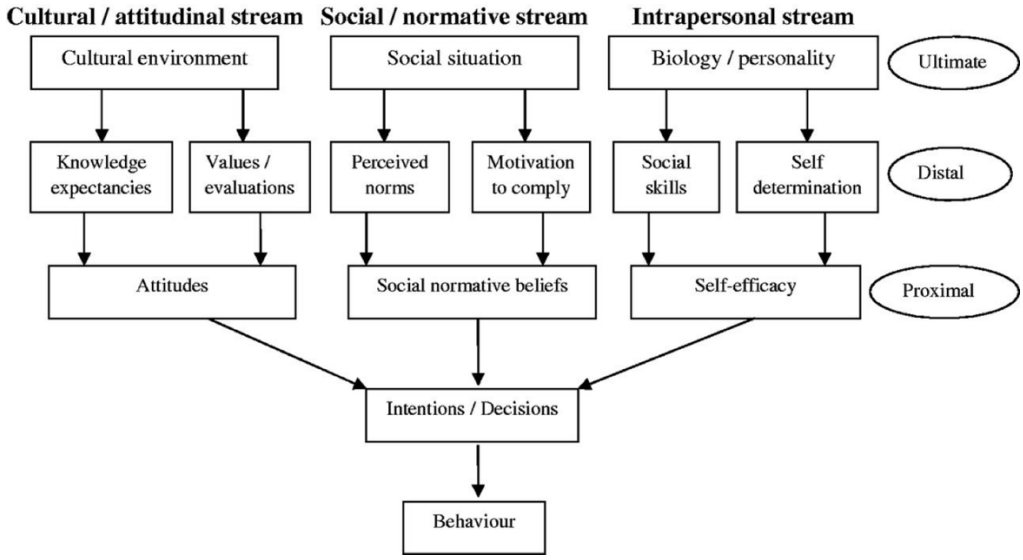
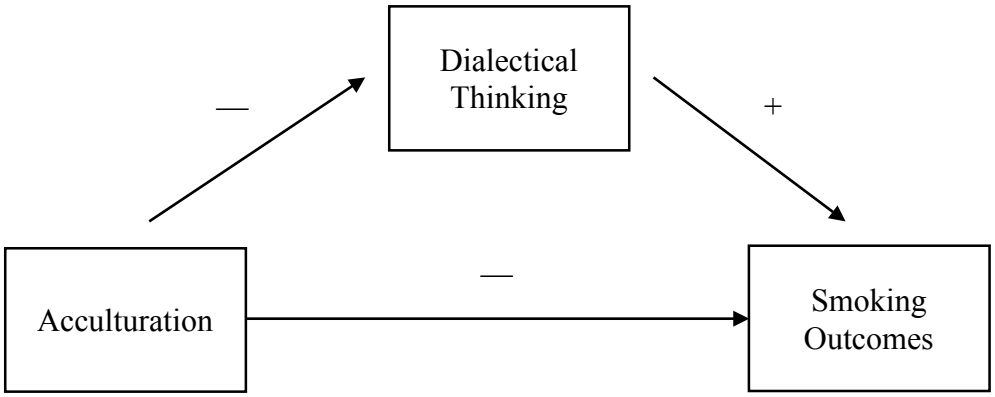


Figure 2. Model for Study 1.



Fagerstrom Test for Nicotine Dependence

1. How soon after you wake up do you smoke your first cigarette?
    a. After 60 minutes
    b. 31-60 minutes
    c. 6-30 minutes
    d. Within 5 minutes

2. Do you find it difficult to refrain from smoking in places where it is forbidden (e.g., in church, at the library, cinema, etc.)?
    a. No
    b. Yes

3. Which cigarette would you hate most to give up?
    a. First one in the morning
    b. All others

4. How many cigarettes a day do you smoke?
    a. 10 or less
    b. 11 to 20
    c. 21 to 30
    d. 31 or more

5. Do you smoke more frequently during the first hours after waking than during the rest of the day?
    a. Yes
    b. No

6. Do you smoke if you are so ill that you are in bed most of the day
    a. Yes
    b. No

Acculturating Rating for Scale for Mexican Americans – 2nd Edition

1 = Not at all
2 = Very little or not very often
3 = Moderately
4 = Much or very often
5 = Extremely often or almost always

1. I speak an Asian language.
2. I speak English.
3. I enjoy speaking an Asian language.
4. I associate with Caucasians.
5. I associate with Asians and/or Asian Americans.
6. I enjoy listening to Asian language music.
7. I enjoy listening to the English language music.
8. I enjoy Asian language TV.
9. I enjoy English language TV.
10. I enjoy English language movies.
11. I enjoy Asian language movies.
12. I enjoy reading in an Asian language (e.g., books).
13. I enjoy reading in the English language (e.g., books).
14. I write in an Asian language (e.g., letters).
15. I write in the English language (e.g., letters).
16. My thinking is done in the English language.
17. My thinking is done in an Asian language.
18. My contact with an Asian country has been _____.
19. My contact with the United States has been _____.
20. My father identifies or identified himself as “Asian.”
21. My mother identifies or identified herself as “Asian.”
22. My friends, while I was growing up, were of Asian descent.
23. My friends, while I was growing up, were of Caucasian/European descent.
24. My family cooks Asian foods.
25. My friends are of Caucasian/European descent.
26. My friends now are of Asian descent.
27. I like to identify myself as Caucasian.
28. I like to identify myself as Asian American.
29. I like to identify as Asian.
30. I like to identify myself as an American.

Smoking Consequences Questionnaire-Short Form

Below is a list of statements about smoking. Each statement contains a possible consequence of smoking. For each of the statements below, please rate how LIKELY or UNLIKELY you believe each consequence is for you when you smoke. **If you have never smoked**, you are to answer according to your personal beliefs about the consequences when smoking, regardless of what other people might think.

If the consequence seems UNLIKELY to you, circle a number from 0 to 4. If the consequence seems LIKELY to you, circle a number from 5 to 9. That is, if you believe that a consequence would never happen, circle 0; if you believe a consequence would happen every time you smoke, circle 9. Use the guide below to aid you further. For example, if a consequence seems completely likely to you, you would circle 9. If it seems a little unlikely to you, you would circle 4.

0 – Completely Unlikely
1 – Extremely Unlikely
2 – Very Unlikely
3 – Somewhat Unlikely
4 – A Little Unlikely
5 – A Little Likely
6 – Somewhat Likely
7 – Very Likely
8 – Extremely Likely
9 – Completely Likely

1. Smoking is taking years off my life.
_____ 2. Cigarettes taste good.
_____ 3. When I'm angry a cigarette can calm me down.
_____ 4. Smoking helps me control my weight.
_____ 5. Smoking is hazardous to my health.
_____ 6. I enjoy the taste sensations while smoking.
_____ 7. Cigarettes help me deal with anger.
_____ 8. Smoking keeps my weight down.
_____ 9. The more I smoke, the more I risk my health.
_____ 10. When I smoke, the taste is pleasant.
_____ 11. Smoking helps me deal with anxiety or worry.
_____ 12. Cigarettes keep me from eating more than I should.
_____ 13. By smoking I risk heart disease and lung cancer.
_____ 14. I will enjoy the flavor of a cigarette.
_____ 15. Smoking calms me down when I feel nervous.
_____ 16. Smoking controls my appetite.
_____ 17. Smoking helps me deal with depression.
_____ 18. I enjoy feeling a cigarette on my tongue and lips.
_____ 19. Cigarettes help me reduce or handle tension.

_____ 20. Cigarettes keep me from overeating.

_____ 21. When I'm upset with someone, a cigarette helps me cope.

If I quit all at once, I might get sick. It will upset my health balance.

_____ 22. If I quit all at once, I might get sick. It will upset my health balance.

_____ 23. Cigarettes from China are healthier with added herbs like ginseng and special ingredients like antioxidants.

_____ 24. I know someone who smoked and lived to an old age. Smoking keeps up your energy and health.

Instructions

Listed below are a number of statements about your thoughts, feelings, and behaviors. Select the number that best matches your agreement or disagreement with each statement. Use the following scale, which ranges from 1 (strongly disagree) to 7 (strongly agree). There are no right or wrong answers.

1----------2----------3----------4----------5----------6----------7

Strongly disagree Neither agree nor disagree Strongly agree

DT1	I am the same around my family as I am around my friends.
DT2	When I hear two sides of an argument, I often agree with both.
DT3	I believe my habits are hard to change.
DT4	I believe my personality will stay the same all of my life.
DT5	I often change the way I am, depending on who I am with.
DT6	I often find that things will contradict each other.
DT7	If I've made up my mind about something, I stick to it.
DT8	I have a definite set of beliefs, which guide my behavior at all times.
DT9	I have a strong sense of who I am and don't change my views when others disagree with me.
DT10	The way I behave usually has more to do with immediate circumstances than with my personal preferences.
DT11	My outward behaviors reflect my true thoughts and feelings.
DT12	I sometimes believe two things that contradict each other.
DT13	I often find that my beliefs and attitudes will change under different contexts.
DT14	I find that my values and beliefs will change depending on who I am with.
DT15	My world is full of contradictions that cannot be resolved.
DT16	I am constantly changing and am different from one time to the next.
DT17	I usually behave according to my principles.
DT18	I prefer to compromise than to hold on to a set of beliefs.
DT19	I can never know for certain that any one thing is true.
DT20	If there are two opposing sides to an argument, they cannot both be right.
DT21	My core beliefs don't change much over time.
DT22	Believing two things that contradict each other is illogical.
DT23	I sometimes find that I am a different person by the evening than I was in the morning.
DT24	I find that if I look hard enough, I can figure out which side of a controversial issue is right.
DT25	For most important issues, there is one right answer.
DT26	I find that my world is relatively stable and consistent.
DT27	When two sides disagree, the truth is always somewhere in the middle.
DT28	When I am solving a problem, I focus on finding the truth.

DT29	If I think I am right, I am willing to fight to the end.
DT30	I have a hard time making up my mind about controversial issues.
DT31	When two of my friends disagree, I usually have a hard time deciding which of them is right.
DT32	There are always two sides to everything, depending on how you look at it.

Smoking Intentions

1---------2---------3---------4---------5-------6--------7---------8----------9---------10

Definitely not Definitely yes

1. Do you think you will try a cigarette anytime soon?
2. Do you think you will smoke a cigarette anytime in the next year?
3. If one of your best friends offered you a cigarette, would you smoke it?

Priming Manipulation

Dialectical Prime Passage:

Read the passage below then write about your thoughts. There are no right or wrong answers.

> Life can be full of contradiction and uncertainty. We would like you to reflect, in writing, on a time in your life when it was full of contradiction and uncertainty. . . . We would like you to recall experiences in which you were very aware of both the pros and cons of the situations and there were no right answers. The situations or experiences had positive outcomes and consequences for you (and the people you care about) as well as equally negative outcomes or consequences for you (and the people you care about). Think about these contradictory experiences. . . . Describe how you thought through all of the facts and possible perspectives, including the opposing ones.

Control Passage:

Read the passage below then write about your thoughts. There are no right or wrong answers.

> Tourism is an important source of income to New York City. We would like you to think about, in writing, the tourism industry in

New York City. We would like you to think about what brings in tourists to New York City, that is, why is New York City one of the world's leading tourism destination and what enhances tourists' experience when they visit the city. Describe how you thought about all the possible reasons tourists are attracted to New York City.

Passage Memorization

1. Was the word “opposing” in the passage?
    a. Yes
    b. No
2. Was the word “tourists” in the passage?
    a. Yes
    b. No
3. Was the word “hassle” in the passage?
    a. Yes
    b. No

Psychological Discomfort Scale

Below are words that can describe different types of feelings. For each word, please indicate how much it describes how you are feeling right now by circling a number on the scales. "1" means "does not apply at all", and "7" means "applies very much" to how you are feeling right now. Don't spend much time thinking about each word, just give a gut-level response.

		does not apply at all						applies very much
1.	content	1	2	3	4	5	6	7
2.	uncomfortable	1	2	3	4	5	6	7
3.	angry at myself	1	2	3	4	5	6	7
4.	shame	1	2	3	4	5	6	7
5.	uneasy	1	2	3	4	5	6	7
6.	negative	1	2	3	4	5	6	7
7.	friendly	1	2	3	4	5	6	7
8.	disgusted with myself	1	2	3	4	5	6	7
9.	concerned	1	2	3	4	5	6	7
10.	embarrassed	1	2	3	4	5	6	7
11.	bothered	1	2	3	4	5	6	7
12.	optimistic	1	2	3	4	5	6	7
13.	annoyed at myself	1	2	3	4	5	6	7
14.	frustrated	1	2	3	4	5	6	7
15.	tense	1	2	3	4	5	6	7
16.	disappointed with myself	1	2	3	4	5	6	7
17.	happy	1	2	3	4	5	6	7
18.	guilty	1	2	3	4	5	6	7
19.	anxious	1	2	3	4	5	6	7
20.	self-critical	1	2	3	4	5	6	7
21.	energetic	1	2	3	4	5	6	7
22.	distressed	1	2	3	4	5	6	7
23.	regretful	1	2	3	4	5	6	7
24.	good	1	2	3	4	5	6	7

Demographics

1. What is your gender?
    A. Male
    B. Female
    C. Transgender

2. What is your age?_____

3. What year are you in school?
    A. Freshman
    B. Sophomore
    C. Junior
    D. Senior

4. Do you consider yourself to be:
    A. Straight or heterosexual
    B. Gay or lesbian
    C. Bisexual

5. What is your total household income?
    A. Less than $10,000
    B. $10,000 to $19,999
    C. $20,000 to $29,999
    D. $30,000 to $39,999
    E. $40,000 to $49,999
    F. $50,000 to $59,999
    G. $60,000 to $69,999
    H. $70,000 to $79,999
    I. $80,000 to $89,999
    J. $90,000 to $99,999
    K. $100,000 to $149,999
    L. $150,000 or more

6. What is your mother's highest level of education?
    A. No schooling completed
    B. Nursery school to 8th grade
    C. 9th, 10th or 11th grade
    D. 12th grade, no diploma
    E. High school graduate - high school diploma or the equivalent (for example: GED)
    F. Some college credit, but less than 1 year
    G. 1 or more years of college, no degree
    H. Associate degree (for example: AA, AS)
    I. Bachelor's degree (for example: BA, AB, BS)

J. Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
K. Professional degree (for example: MD, DDS, DVM, LLB, JD)
L. Doctorate degree (for example: PhD, EdD)

7. What is your father's highest level of education?
   A. No schooling completed
   B. Nursery school to 8th grade
   C. 9th, 10th or 11th grade
   D. 12th grade, no diploma
   E. High school graduate - high school diploma or the equivalent (for example: GED)
   F. Some college credit, but less than 1 year
   G. 1 or more years of college, no degree
   H. Associate degree (for example: AA, AS)
   I. Bachelor's degree (for example: BA, AB, BS)
   J. Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
   K. Professional degree (for example: MD, DDS, DVM, LLB, JD)
   L. Doctorate degree (for example: PhD, EdD)

8. Does your father smoke cigarettes?
   A. Yes
   B. No

9. Does your mother smoke cigarettes?
   A. Yes
   B. No

10. How do you identify your race?
    A. Asian or Asian American
    B. Other or Mixed Race
       1. Please explain: _____

11. How do you identify your ethnicity?
    A. Chinese
    B. Korean
    C. Other
       1. Please explain:

12. Which best represents your identity?
    A. Asian
    B. Asian American
    C. Chinese

D. Korean
E. Chinese American
F. Korean American
G. Other
    1. Please explain:

13. Are you a U.S. citizen?
    A. Yes
    B. No

14. Were you born in the United States?
    A. Yes
    B. No

15. How many years have you resided in the United States? _____

16. Are you an international student?
    A. Yes
    B. No

17. What generation do you identify with?
    A. 1st generation: Born outside the U.S.
    B. 1.5 generation: Born outside the United States but moved to the U.S. at a young age (before teen years)
    C. 2nd generation: Born in the U.S. with at least one foreign born parent
    D. 3rd generation: Born in the U.S. with at least one U.S. born parent and one foreign born grandparent
    E. Other:
        1. Please explain:

18. What language(s) can you speak?
    A. English (fluently)
    B. English (somewhat)
    C. Korean (fluently)
    D. Korean (somewhat)
    E. Cantonese (fluently)
    F. Cantonese (somewhat)
    G. Mandarin (fluently)
    H. Mandarin (somewhat)
    I. Other: _____

19. What language do you prefer to speak at home?
    A. English
    B. Korean
    C. Cantonese

D. Mandarin
E. Other: _____

20. What language do you prefer to speak at school?
    A. English
    B. Korean
    C. Cantonese
    D. Mandarin
    E. Other: _____

21. What language do you prefer to speak with friends?
    A. English
    B. Korean
    C. Cantonese
    D. Mandarin
    E. Other: _____

22. What language do you prefer to speak with family members?
    A. English
    B. Korean
    C. Cantonese
    D. Mandarin
    E. Other: _____

23. What language do you prefer to speak overall?
    A. English
    B. Korean
    C. Cantonese
    D. Mandarin
    E. Other: _____

Smoking Status

1. Do you currently smoke cigarettes?
   A. Yes
   B. No

2. In your entire life, have you smoked at least 100 cigarettes?
   A. Yes
   B. No

3. Do you smoke…?
   A. Every day
   B. Some days
   C. Not at all

4. In the past 30 days, have you smoked cigarettes?
   A. Yes
   B. No
5. On how many of the past 30 days did you smoke cigarettes? _____

6. If you have not smoked in the past 30 days, about how long has it been since you last smoked regularly?
   #:
   Units: Days, weeks, months, years

7. Do you prefer to smoke…?
   A. Alone
   B. With others

8. Who do you often smoke with?
   A. Alone
   B. Friends
   C. Family
   D. Significant other
   E. Strangers
   F. Other: _____

9. Where do you smoke?
   A. Inside my home
   B. Inside my car
   C. Inside my work
   D. Outdoors
   E. Other: _____

10. If you are married/in a relationship, does your partner smoke cigarettes?
    A. Yes

B. No

11. What best describes your intentions regarding quitting?
    A. Already quit
    B. Planning to quit in the next 30 days
    C. Thinking about quitting in the next 6 months
    D. May quit in the future, but not in the next 6 months
    E. Do not intend to quit

12. How old were you when you first started smoking regularly? _____

13. How many times have you tried to quit smoking (no smoking over for at least 24 hours)? _____

Appendix B.

Table 1

Study 1 - Demographics

	(n = 162)	
Source	*M*	*SD*
Age	*24.62*	*5.06*
Age started smoking	*17.94*	*3.15*
Years in US	*21.01*	*7.76*
Generation	*%*	
1st	*10.5*	
1.5	*19.8*	
2nd	*56.2*	
3rd	*11.7*	
Other	*1.9*	
Sexual Orientation	*%*	
Heterosexual	*82.7*	
Gay/Lesbian	*6.2*	
Bisexual	*9.9*	
Other	*1.2*	

Table 2

Study 1 – Smoking Demographics

Smoked 100 cigarettes in lifetime?	
Yes	*54.3%*
No	*45.7%*
Social smoker?	
Yes	*59.3%*
No	*40.7%*
Smokes with…	
Alone	*17.3%*
With others	*19.1%*
Equally alone and with others	*22.8%*
Quit intentions	
Already quit	*14.2%*
Plan to quit in the next 30 days	*13%*
Thinking about quitting in next 6 months	*15.4%*
May quit in the future	*14.8%*
Do not intend to quit	*10.5%*

Table 3

Study 1 - Intercorrelations among Variables (n = 162)

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*11*	*12*	*13*
1. Smoking intentions	--											
2. SCQSF Total	*.33**	--										
3. Negative Consequences	*-.1*	*.39***	--									
4. Negative Reinforcement	*-.32**	*.94***	*.19**	--								
5. Positive Reinforcement	*-.47***	*.89***	*.08*	*.79***	--							
6. Dialectical Thinking Total	*.26*	*-.08*	*-.09*	*-.08*	*.04*	--						
7. Contradiction	*-.01*	*-.16**	*-.09*	*-.15*	*-.12*	*.73***	--					
8. Cognitive Change	*.29**	*-.08*	*-.1*	*-.08*	*-.03*	*.83***	*.36***	--				
9. Behavioral Change	*.35**	*.07*	*-.01*	*.07*	*.08*	*.74***	*.27***	*.51***	--			
10. ARSMA	*-.25*	*-.03*	*.04*	*-.03*	*-.05*	*-.09*	*.05*	*-.16**	*-.09*	--		
11. AOS	*.16*	*.09*	*.07*	*.08*	*.07*	*.08*	*-.03*	*.12*	*.1*	*-.86***	--	
12. WOS	*-.28*	*.09*	*.18**	*.06*	*.01*	*-.05*	*.05*	*-.14*	*-.02*	*.66***	*-.18**	--

Note. * denotes significance at $p < 0.05$ level, ** denotes significance at $p < 0.01$ level

Table 4

Direct and Indirect Effects for SCQSF

	Effect	*SE*	*LLCI*	*ULCI*
Dialectical Thinking				
Direct Effect	*-1.17*	*2.73*	*-6.57*	*4.47*
Indirect Effect	*.26*	*.47*	*-.24*	*2.03*
Contradiction				
Direct Effect	*-.64*	*2.7*	*-5.97*	*4.7*
Indirect Effect	*-.27*	*.44*	*-1.29*	*.44*
Cognitive Change				
Direct Effect	*-1.4*	*2.76*	*-6.84*	*4.05*
Indirect Effect	*.49*	*.62*	*-.27*	*2.47*
Behavioral Change				
Direct Effect	*-.69*	*2.74*	*-6.09*	*4..72*
Indirect Effect	*-.22*	*.35*	*-1.39*	*.17*

Figure 3. *Mediated model with smoking intention as outcome.*

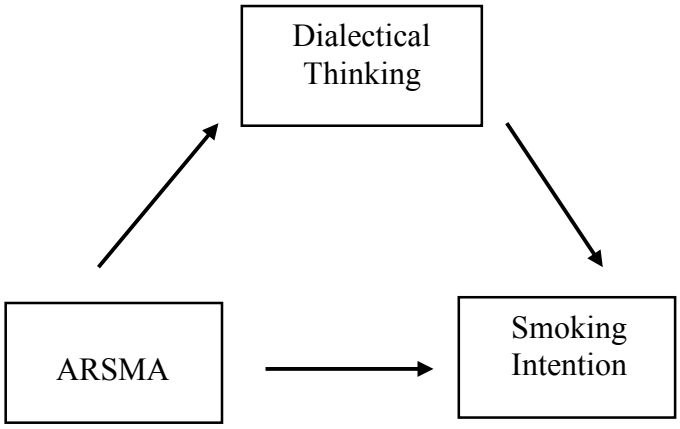


Figure 4. *Multiple mediated model with smoking intention as outcome.*

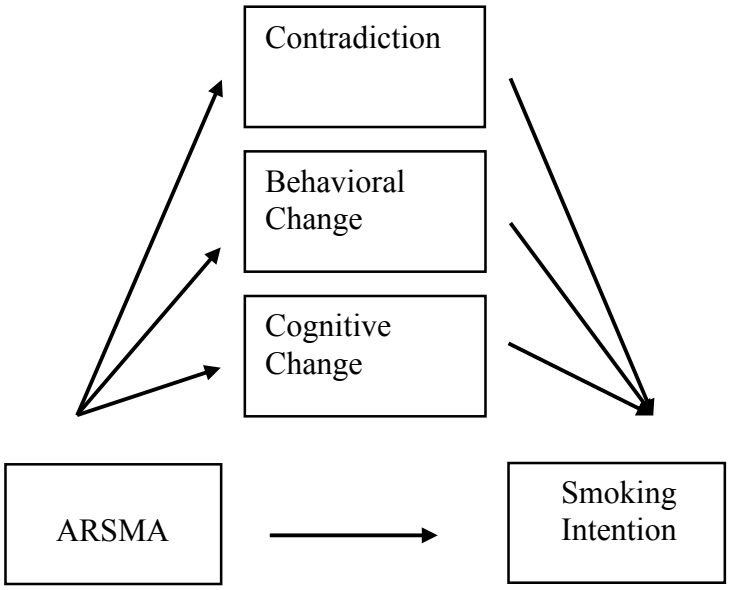


Table 5

Direct and Indirect Effects for Smoking Intention

	Effect	*SE*	*LLCI*	*ULCI*
Dialectical Thinking				
Direct Effect	*-.31*	*.21*	*-.74*	*.11*
Indirect Effect	*-.06*	*.04*	*-.17*	*-.00*
Contradiction				
Direct Effect	*-.38*	*.22*	*-.81*	*.06*
Indirect Effect	*.00*	*.03*	*-.05*	*.06*
Cognitive Change				
Direct Effect	*-.25*	*.22*	*-.7*	*.2*
Indirect Effect	*-.12*	*07*	*-3*	*-.02*
Behavioral Change				
Direct Effect	*-.29*	*.21*	*-.71*	*.12*
Indirect Effect	*-.08*	*.07*	*-.26*	*.02*

Table 6

Study 2 – Demographics

	Control (n = 63)		*Experimental (n = 59)*	
Source	*M*	*SD*	*M*	*SD*
Age	*26.78*	*5.15*	*27.93*	*4.72*
Age started smoking	*19.08*	*4.61*	*18.15*	*4.53*
Years in US	*23.44*	*7.48*	*23.17*	*8.76*
Generation		*%*		
1st		*10.5*		
1.5		*19.8*		
2nd		*56.2*		
3rd		*11.7*		
Other		*1.9*		
Sexual Orientation		*%*		
Heterosexual		*82.7*		
Gay/Lesbian		*6.2*		
Bisexual		*9.9*		

Table 7

Study 2 – Smoking Demographics

Smoked 100 cigarettes in lifetime?	
Yes	*59.8%*
No	*40.2%*
Social smoker?	
Yes	*47.5%*
No	*52.5%*
Smokes with…	
Alone	*28.7%*
With others	*13.1%*
Equally alone and with others	*18.9%*
Quit intentions	
Already quit	*9%*
Plan to quit in the next 30 days	*13.1%*
Thinking about quitting in next 6 months	*18%*
May quit in the future	*14.8%*
Do not intend to quit	*3.3%*

Table 8

Study 2 - Intercorrelations among Variables (n = 122)

Variable	*1*	*2*	*3*	*4*	*5*	*6*
1. Negative Consequences	--					
2. Negative Reinforcement	*.04*	--				
3. Positive Reinforcement	*-.1*	*.83***	--			
4. Smoking intentions	*-.43***	*.41***	*.51***	--		
5. Uneasy	*-.2**	*.07*	*.03*	*.04*	--	
6. Uncomfortable	*-.24***	*.07*	*.29**	*.29**	*.66***	--

Note. * denotes significance at $p < 0.05$ level, ** denotes significance at $p < 0.01$ level.

Table 9

Study 2 -Results from Multivariate ANOVA – SCQSF subscales

Source	*df*	*F*	η^2	*p*
Experiment vs Control				
Negative consequences	*(1, 120)*	*.94*	*.02*	*.42*
Negative reinforcement	*(1, 120)*	*.94*	*.02*	*.42*
Positive reinforcement	*(1, 120)*	*.94*	*.02*	*.42*
Smokers vs Nonsmokers				
Negative consequences	*(1, 120)*	*61.62*	*.62*	*.00*
Negative reinforcement	*(1, 120)*	*61.62*	*.62*	*.00*
Positive reinforcement	*(1, 120)*	*61.62*	*.62*	*.00*

Note. * denotes significance at $p < 0.05$ level.

Table 10

Study 2 -Results from Univariate ANOVA – SCQSF subscales

Source	*df*	*F*	η^2	*p*
Negative consequences	*1*	*2.25*	*.02*	*.14*
Negative reinforcement	*1*	*.46*	*.00*	*.5*
Positive reinforcement	*1*	*.38*	*.00*	*.54*

Note. * denotes significance at $p < 0.05$ level.

Table 11

Study 2 - Descriptive Statistics – Dependent Variables

	Control (n = 63)		*Experimental (n = 59)*	
Source	*M*	*SD*	*M*	*SD*
Negative consequences	*24.33*	*10.4*	*26.8*	*7.39*
Negative reinforcement	*29.78*	*19.91*	*32.25*	*20.64*
Positive reinforcement	*22.83*	*15.7*	*24.63*	*16.52*
Smoking intentions	*2.19*	*1.84*	*1.8*	*1.3*
Uneasy	*2.78*	*1.61*	*3.39*	*1.77*
Uncomfortable	*2.70*	*1.49*	*2.97*	*1.59*
	Smokers (n = 75)		*Nonsmokers (n = 47)*	
Negative consequences	*24.45*	*8.6*	*27.23*	*9.74*
Negative reinforcement	*42.99*	*13.27*	*11.81*	*13.48*
Positive reinforcement	*32.69*	*11.4*	*9.34*	*11.28*
Smoking intentions	*--*	*--*	*2.02*	*1.63*
Uneasy	*3.32*	*1.63*	*2.68*	*1.35*
Uncomfortable	*3*	*1.8*	*2.55*	*1.49*

Table 12

Study 2 - Results from Multivariate ANOVAs – Psychological Discomfort

Source	*df*	*F*	η^2	*p*
Experiment vs. Control				
Uneasy	*(1, 120)*	*2.09*	*.03*	*.13*
Uncomfortable	*(1, 120)*	*2.09*	*.03*	*.13*
Smokers vs. Nonsmokers				
Uneasy	*(1, 120)*	*1.85*	*.03*	*.16*
Uncomfortable	*(1, 120)*	*1.85*	*.03*	*.16*

Note. * denotes significance at $p < 0.05$ level.

Table 13

Study 2 - Results from Univariate ANOVA – Psychological Discomfort

Source	*df*	*F*	η^2	*p*
Uneasy	*1*	*4*	*.03*	*.05*
Uncomfortable	*1*	*.93*	*.01*	*.34*

Note. * denotes significance at $p < 0.05$ level.

Table 14

Study 2 - Results from Univariate ANOVA – Smoking Intentions

Source	*df*	*F*	η^2	*p*
Smoking intentions total score	*1*	*.64*	*.12*	*.43*

Note. * denotes significance at $p < 0.05$ level.