2004

Assessing HIV risk behaviors among individuals in Taiwan: Application of the transtheoretical model and social cognitive theory.

Lee Wang
University of Alabama at Birmingham

ASSESSING HIV RISK BEHAVIORS AMONG INDIVIDUALS IN TAIWAN: APPLICATION OF THE TRANSTHEORETICAL MODEL AND SOCIAL COGNITIVE THEORY

by

LEE WANG

A DISSERTATION

Submitted to the graduate faculty of The University of Alabama and The University of Alabama at Birmingham, in partial fulfillment for the degree of Doctor of Philosophy

BIRMINGHAM, ALABAMA

2004

ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM

Degree Ph.D Program Health Education and Health Promotion

Name of Candidate Lee Wang

Committee Chair Diane M. Grimley

Title Assessing HIV Risk Behaviors Among Individuals in Taiwan: Application of the Transtheoretical Model and Social Cognitive Theory

Condoms are by far the safest approach and a practical measure to prevent HIV. According to literature, many adolescents and young adults are reluctant to use condoms consistently, and this kind of behavior results in young people being at higher risk for contracting HIV than older adults. The current study surveyed bicycle factory workers in Taiwan to assess condom use attitude, communication, self-efficacy, and social norm for condom use based on some constructs from the transtheoretical model of change and social cognitive theory. Three hundred fifty-seven individuals completed a self administrated survey. The samples were split into main and other partners based on the participants' reports. There were 308 main partners and 100 other partners. The main and other partners were separately conducted by factor analysis, reliability test, MANOVA, ANOVA and discriminant analysis. Factor analysis was used in data reduction based on theoretical factors. With MANOVA, the dependent variables were the linear combinations of the theoretical factors, based on the extractions from factor analysis, and the independent variables were the 5 stages of change for condom use, which were precontemplation, contemplation, preparation, action, and maintenance stages. After a significant F test in MANOVA, ANOVA and discriminant analysis were separately conducted by these factors. ANOVA tests were to specify the relationship between the stages for each

factor. In the discriminate analysis, the dependent variables were the 5 stages of change for condom use, and the independent variables were the linear combinations of the reducing theoretical factors. The results showed the self-efficacy and pro condom use attitudes as the predictors in both main and other partners. These results suggest the need of the transtheoretical model of change as the theory based in developing educational programs and materials on condom use for the prevention of HIV/AIDS in Taiwan.

DEDICATION

I dedicate this dissertation to my father, Tao Wang, who passed away 6 years ago. My father always had the greatest expectations of his children, and he is the most honest and dignified person who I have ever known. He is truly missed. I also dedicate this dissertation to my wife, Li-Yun Feng, for without her love and support, I would not have been able to accomplish this work.

ACKNOWLEDGEMENTS

I express my sincere appreciation to my professors for all their guidance through my graduate program. Because of their detailed instructions through all these years, I am well prepared for the challenges in my future teaching career.

I extend a special thank you to my committee. My advisor, Dr. Diane Grimely, always gave me her guidance and support during my learning. No matter how busy she was in her role as chair of the department, she always took care of me. Dr. Connie Kohler was always there to teach and inspire me since I attended her class in my second quarter. She is truly like my sister. Dr. Scott Snyder is the most excellent statistics professor whom I have ever met. He opened the door to advanced statistics for me, and he always patiently instructed me and answered my most complex questions. Dr. Patricia Lee's scrutiny of my dissertation helped me to greatly improve it. Dr. Perng-Ru Liu gave me many good suggestions based on his Taiwanese background and his knowledge in the medical field. Also, I appreciate Chun-Yin Hsiao's help, who is the superintendent of Taichung County Health Department, and the cooperation of workers in the Giant bicycle factory in Taiwan. Because of their contribution, I could finish this study.

I am very appreciative to some people who helped me in my studying and I will never forget their goodness to me. First, I thank the Chou family, especially Dr. Ming-Yung Chou who is the dean of the dental school at Chung Shan Medical University where I served. He always encouraged and supported me like a big brother. I also particularly want to thank my school and the department that supported my study in

University of Alabama at Birmingham. Grateful appreciation is extended to my brother and friends, Kei Wang and Drs. Max Yeh and Tammy Yeh, for their listening ears and unending tolerance and love. Dr. Benjamin Blagogee, my classmate, has always been there to inspire and support me. I feel really fortunate to have such wonderful friends.

With the greatest love and gratitude, I thank my wife, Li-Yun Feng, who was always there to support me. Without her willingness to take care of my mother and household responsibilities in Taiwan I could not have completed my goal.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF ABBREVATIONS

AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of variance (univariate)
CDC	Centers for Disease Control and Prevention
df	Degree of freedom
HIV	Human Immunodeficiency Virus
F	Fisher's F ratio
FP	Family Planning
KMO	Kaiser-Meyer-Olkin measure
MANOVA	Multivariate analysis of variance
N	Total number in a sample
n	Number in a subsample
p	Probability
SCT	Social Cognitive Theory
STI	Sexually Transmitted Infections
TTM	Transtheoretical Model of change
χ^2	Computed value of a chi-square test

INTRODUCTION

In December 1984, the first AIDS case was identified in Taiwan. By February 2003, a total of 4,501 individuals had been identified as being HIV infected (Taiwan Center for Disease Control, 2003). According to Taiwan's CDC, the actual number of cases was at least 5 to 10 times as many as the official number. Possible reasons for this discrepancy are that there was no compulsion for Taiwanese to have an HIV blood test because, if they are identified as HIV positive, individuals would not be accepted by the society, and there is no effective medicine to cure this disease (Taiwan AIDS Prevention Programs, 2001).

In Taiwan, the major transmission pathway of HIV is through sexual activity. By February 2003, 41.0% of HIV cases were documented as being heterosexually transmitted, 36.1% were transmitted through homosexual encounters, 12.8% were through bisexual activities, and only 2.0% of the cases were drug related (Taiwan CDC, 2003). The low rate of drug-related HIV infection may be due to the fact that the penalty for drug production, drug sale, or drug use is very serious in Taiwan, ranging from at least half of a year sentence to the death penalty (The Regulation fourth of the regulation of drug abuse prevention of the Republic of China, 1998). Also, in Taiwan, one can buy needles inexpensively at any pharmacy without a prescription so that HIV being transmitted from injection of drug use is rare. Therefore, HIV prevention in Taiwan may be effective through the reduction of risky sexual activities.

Statement of the Problem

The Taiwan government has spent a great deal of resources on the treatment and prevention of HIV/AIDS. For example, free medical care, which is covered by national health insurance at designated medical care institutions, is provided to diagnose HIV/AIDS positive patients, including combination anti retroviral therapy to delay disease progression. Active surveillance with HIV blood tests has been implemented with the military, prison inmates, and alien laborers since 1998 (Taiwan Health Department, 2003). The government also has had an HIV prevention educational planning program since 1994 (Taiwan AIDS Prevention Programs, 2001). Despite treatment and prevention programs, the number of HIV/AIDS cases in Taiwan has increased rapidly. The increase of new HIV positive individuals in 2000 was two times higher as compared to that of 1996 (Taiwan AIDS Prevention Programs, 2001). The increasing rate of HIV positives may be a result of the fact that Taiwanese had no correct concept of how to adopt safer sex practices to protect themselves from the threat of HIV/AIDS. Recently, a survey on sexual attitudes among internet users was conducted by the Taiwan Health Department. About 35% of the interviewees reported engaging in one-night stands. Of those respondents under age 18, only 46% reported that they used condoms during their one-night stand; for those over 30, approximately 61% reported they used condoms during these sexual encounters ("Survey Finds," 2002).

Although health promotion programs on condom use for protecting HIV/AIDS have been provided in Taiwan, they seemed to have little impact on the problem. For example, the latest 5-year national HIV/AIDS prevention project included a condom use promotion program, which was delivered through the media with several target popula-

tions such as students. This 5-year condom use promotion strategy was to hold lectures and to offer condom use materials to target populations (Taiwan AIDS Prevention Programs, 2001). However, such health promotion programs ignored the specific attitudes, intentions, and behaviors of the populations and may result in having little or no effect on condom use practices.

Goals of the Study

The first purpose of this study was to develop a quantitative survey designed to assess condom use intentions, attitude, communication, self-efficacy, and social norm in condom use among Taiwanese based on constructs from the transtheoretical model of change (TTM; Prochaska & DiClemente, 1983, 1984) and social cognitive theory (SCT; Bandura, 1986).

The second purpose was to evaluate the applicability of the TTM and SCT to the measurement of condom use behaviors among the Taiwan population by replicating findings found with American samples (Boyer, Shafer, & Techann, 1997; Brason, Peterman, Cannon, Ransom, & Zaidi, 1998; Fishbein, Bandura, & Triandis, 1992; Galavotti et al., 1995; Grimley, DiClemente, Prochaska, & Prochaska, 1995; Grimley, Prochaska, Velicer, & Prochaska, 1995; Jessor, Turbin, & Costa, 1998; Kalichman, Cherry, & Browne-Sperling, 1999; Kamb, Fishbein, & Douglas, 1998; Lauby et al., 1998; Noar, Morokoff, & Redding, 2001; Prochaska et al., 1990; Redding et al. 1996).

Research Questions

The present study addressed the following research questions:

1. Can a sample of Taiwanese be classified into one of the five stages for consistent condom use?

2. What are predictors for condom use behavioral intention among a sample of Taiwanese?

Hypotheses

Based on these research questions, the following null hypotheses were developed and tested at $p < 0.05$ level.

1. There are no statistically significant differences in the positive and negative aspects of using condoms across the five stages of change for condom use in this Taiwanese population.

2. There are no statistically significant differences between partner communications regarding condom use across the five stages of change for condom use in this Taiwanese population.

3. There are no statistically significant differences in perceived self-efficacy for using condoms across the five stages of change for condom use in this Taiwanese population.

4. There are no statistically significant differences in perceived positive social norm of condom use across the five stages of change for condom use in this Taiwanese population.

Significance of the Study

This study examined condom use intention, attitude, communication, self-efficacy, and social norm among a Taiwanese population. Using the constructs from the TTM and SCT, this study focused on individuals' stages of readiness for using condoms consistently and the interaction of the environment and individual behaviors that may influence condom use among this Taiwanese sample. Information gleaned from this study will help the development of HIV/AIDS health promotion programs and materials designed especially for this population.

LITERATURE REVIEW

From a Taiwanese prospective, there is a paucity of literature regarding factors associated with condom use for preventing HIV/AIDS. Thus, the following review consists of worldwide experiences, especially among Americans. Literature relating to condom use intentions, attitudes, communication, self-efficacy, and social norms on condom use and the application of the TTM and SCT to the measurement for condom use was also examined.

Safer Sex and HIV/AIDS

Safe sex. Safe sex can only be interpreted as safe if the partners are not exposed to HIV/AIDS through the exchange of blood, semen, or vaginal secretions. Due to the occasional failure of condoms as well as user failure during penetrative sex, even consistent condom use cannot be considered totally safe. Other than abstinence, only non-penetrative sexual contact such as hugging, holding, kissing or massaging qualifies today as safe sex practices (Kalichman, Nachimson, & Cherry, 1998). Once a person becomes sexually active it is difficult to persuade him or her to abstain from sexual intercourse; thus, many interventions aim to persuade individuals to engage in safer sex practices. Safer sex is defined as activities that substantially reduce, but do not totally eliminate, the risk of infection (Kalichman et al., 1998).

The practicalities of safer sex. Latex condoms are by far the safest approach and a practical measure to prevent HIV and some sexually transmitted infections (STIs; Kalichman et al., 1998). Studies have shown that many adolescents and young adults are reluctant to use condoms consistently (Grimley, DiClemente, et al., 1995; Hollar & Snizek, 1996; Lewis, Malow, & Ireland, 1997) and that this kind of behavior resulted in young people being at higher risk for contracting HIV and STIs than the older adults (Centers for Disease Control and Prevention [CDC], 2000). Even if one partner is HIV positive and the other is negative, condom use can protect the person who is HIV negative from contracting the infection. The risk of transmission of HIV is sill there, but limited. For instance, in one prospective research study, of the HIV-seronegative women who were in stable, monogamous relationships with a seropositive man, only 2% of the spouses of men who consistently used condoms during intercourse contracted AIDS, as compared with 15% of the partners of men who used condoms inconsistently (Saracco, Musicco, & Nicolisi, 1993). Likewise, homosexual men using condoms inconsistently were six times more likely to acquire HIV than consistent users (Detels, English, & Visscher, 1989).

Predisposing Factors of Condom Use in Taiwanese

In 1969, Taiwan embarked on a massive project on family planning to limit population growth ("Taiwan's FP," 1988). Throughout the next three plus decades, advances in family planning services have been achieved, and a variety of contraceptive methods are well known by Taiwanese. The condom was reported as the second most prevalent contraceptive methods for women to prevent pregnancy (Lethbridge & Wang, 1991). In

fact, the general Taiwanese used condoms mostly for the purpose of contraception and not for HIV/AIDS prevention. According to a recent survey in Taiwan, 75.4% of Taiwanese agreed and 9.3% of Taiwanese partially agreed that condom use could prevent HIV infection and STIs. However, when the same people were asked why they actually used condoms, 71.2% reported that they used condoms for contraception, 20.2% used them for contraception and HIV/STI protection, and only 6.3% reported using condoms exclusively to prevent HIV/ STI infections (Lew-Ting & Chen, 2000).

Condom Use Behavioral Complications

Condom use attitudes. Positive and negative aspects of condom use have been identified. Some positive condom use attitudes include avoiding HIV/ STD (Corby, Wolitski, Thronton-Johson, & Tanner, 1991), people's recognition of increasing HIV rates (Potter & Anderson, 1993), partner's positive attitudes associated with condom use (Fleisher, Senie, Minkoff, & Jaccard, 1994; Plichta, Weisman, Nathanson, Ensminger, & Robinson, 1992), and carrying condoms (Marin, Gomez, & Tschann, 1993); whereas, negative condom use attitudes include personal dislike (Corby et al., 1991), reducing sexual pleasure (Helweg-Larsen & Collins, 1994; Rosenthal, Biro, Succop, Baker, & Stanberry, 1994; Winstock, Lindan, Bolan, Kegeles, & Hearst, 1993; Wulfert & Wan, 1993), partner's dislike or resistance (Corby et al., 1991; Rosenthal et al., 1994), lack of availability (Corby et al., 1991), and embarrassment in purchasing condoms (Helweg-Larsen & Collins, 1994). Condom use was also often regarded as a barrier to intimacy. Individuals who provide sex for money, for example, were universally known to use condoms less often with regular sex partners than with their clients (Kane, 1990). Yet, despite the

prevalence of HIV/AIDS cases today, many sexually active people do not perceive themselves as being susceptible to contracting HIV/AIDS and do not consistently use condoms to protect themselves. The reason could be that most people believe that they are not at the risk of contracting HIV through sexual contact (Sheeran, Abraham, & Orbell, 1999).

Taiwanese specifically are not inclined to use condoms for reasons such as physical discomfort (42.4%), the perception that condoms were unsafe (4.1%), and other reasons (15.3%) such as personal dislike, inconvenience, unnatural, not necessary, and the perceived poor quality of condoms (Lew-Ting & Chen, 2000).

Communication between partners. Another reason why some people do not use condoms involves the discomfort associated with negotiating condom use with a partner (Helweg-Larsen & Collins, 1994). Implementing HIV/AIDS prevention for individuals required strategic interpersonal communication. Studies in the United States have shown that discussing condom use with a sexual partner was positively associated with safer-sex practices (Freimuth, Hammond, Edgar, McDonald, & Fink, 1992). However, because maintaining a relationship often takes precedence over health concerns, many people avoid discussing safer sex altogether or talk about HIV/AIDS generally rather than in the context of their personal sex histories for fear of threatening their relationships particularly with main partners (Sibthorpe, 1992). Studies have shown that men have more power over sexual encounters and condom use than women (Amaro, 1995; Saracco et al., 1993). Some women, for example, are hesitant to negotiate safer-sex practices with their

male partners due to gender-power differentials, conflicting gender roles, and lack of economic resources (Wright, 1992). Although cultural differences exist across countries, traditionally many women often do not broach the subject of sex and have little decision-making power during the sexual encounter (Orubuloye, Caldwell & Caldwell, 1993).

Self-efficacy and condom use. High-perceived self-efficacy for condom use has been associated with consistent condom use (Marin et al., 1993; McConnaughy, Di-Clemente, Prochaska, & Velicer, 1989). Galavotti and others (1995) developed measures and models of condom use attitudes and behaviors using a sample of women at high risk for HIV infection or transmission. The study adapted measures of self-efficacy based on the TTM for condom use with main partner and other partners and demonstrated that women within the later stages of change reported higher levels of self-efficacy as compared with women in the lower stages of change. Similar findings of self-efficacy and condom use have been found with numerous populations such as high-risk community samples (Prochaska et al., 1990), women at risk for HIV infection or transmission (Grimley et al., 1992; Lauby et al., 1998; Stark et al., 1999), college students (Grimley, Prochaska, et al., 1995; Grimley, Riley, Bellis, & Prochaska, 1993; Redding & Rossi, 1999), and late adolescent heterosexual adults (Noar, Morokoff, & Redding 2001).

Social norms and condom use. Social norms are a social group's expectations concerning appropriate behaviors (Allen & Allen, 1986), and these norms can influence people's condom use behavior. Social norms have been shown to be important influences on condom use at both the family and community levels. In a family, parental attitudes

and modeling of positive health behaviors may be protective against HIV and promote condom use (Jessor et al., 1998). Parental monitoring has been associated with adolescent girls' safer sex behaviors (Romer, Stanton, & Galbraith, 1999). In communities, community level prevention efforts could reach a large number of persons at risk. By creating positive social norms, community level programs may help to facilitate and maintain behavior change better than approaches that focus on the individual in isolation. For example, the AIDS Community Demonstration Project was carried out in five U.S. cities (CDC AIDS Community Demonstration Projects Research Group, 1999). The intervention was based on the use of small media and role model stories to mobilize community members. The small media materials featured theory-based HIV/STI prevention messages and were distributed along with condoms and bleach kits. The small media, which were community newsletters, pamphlets, and baseball cards, contained authentic stories about people who changed their HIV risk behaviors and were based on the TTM model. Data derived from the project indicated that exposure to the intervention increased from 5% from the 2nd month to the 27th month. There were statistically significant increases in carrying condoms and stages of change scores for condom use with both main partner and other partners in the targeted communities. The proportion of individuals reporting consistent condom use with main partner increased from 8.5% to 17%, and other partner increased from 25% to 33% (CDC AIDS Community Demonstration Projects Research Group, 1999). Based on the findings from the AIDS Community Demonstration Project, widespread HIV educational campaigns appeared to have changed the behavior of a vast spectrum of the population. This project resulted in condom use becoming more of a so-

cial norm for individuals within the community, thereby accomplishing the stated goal of the prevention program.

Underlying Theoretical Framework

The current cross-sectional, measurement study integrates theoretical principles from two of the most commonly used theories of behavior change, the TTM (Prochaska & DiClemente, 1983, 1984) and SCT (Bandura, 1986), to the measurement of condom use intentions, attitudes, and behaviors. The constructs from the two theories are described in detail below.

The Transtheoretical Model of Change

The TTM has been suggested for use in the design of HIV prevention interventions (Grimley, Prochaska, & Prochaska, 1997; Prochaska et al., 1994). The model includes four major constructs, which are (a) the stages of change (McConnaughy et al., 1989; McConnaughy, Prochaska, & Velicer, 1983), (b) the processes of change (Prochaska, Velicer, DiClemente, & Fava 1988), (c) decisional balance (Prochaska et al., 1994; Velicer, DiClemente, Prochaska, & Brandenbung, 1985), and (d) self-efficacy (Velicer, DiClemente, Rossi, & Prochaska, 1990). Because the TTM is a "template" of sorts that is translated or redefined across different health-related behavior, the general constructs of the model have been adapted to the measurement of condom use by making their content specific to condom use in order to operationalize the constructs (Grimley et al., 1997). In this study, the constructs of the stages of change, decisional balance, and self-efficacy were applied to condom use behaviors among a Taiwanese sample.

Stages of change. The TTM, which originated from smoking cessation and psychotherapy research, posits that behavior change is a gradual, continuous, dynamic process in which individuals progress through a sequence of stages (Prochaska & DiClemente, 1983, 1984). The following classification scheme is the assessment of condom use for individuals engaging in vaginal intercourse with main partners (Grimley et al., 1997):

1. Precontemplation includes individuals who are not currently using condoms every time for vaginal sex with their main partner and have no intention to start doing so in the foreseeable future (i.e., in the next 6 months).

2. Contemplation includes persons who are not currently using condoms every time for vaginal sex with their main partners, but intend to start doing so sometime in the next 6 months.

3. Preparation consists of individuals who intend to start using condoms every time within the next month and are currently using condoms almost always with their main partners. The preparation stage, therefore, consists of both intention plus some behavioral steps toward consistent use.

4. Action includes individuals who are using condoms every time for vaginal sex but have been doing so for less than 6 months.

5. Maintenance includes individuals who are using condoms with their partner every time for vaginal sex for more than 6 months.

The stage construct is important, in part, because it represents the temporal dimension in which behavior change unfolds. In the stage of change framework, individuals are thought to move from having no motivation to change to internalization of the

new behavior. The earlier stages are defined by the intention to change a problem behavior, whereas the later stages are defined by engaging in new behavior.

Decisional balance. The construct of decisional balance represents the cognitive and motivational aspects individuals consider about changing their behaviors. Simply stated, individuals tend to weigh the subjective benefits (pros) against the costs (cons) involved with modifying an unhealthy behavior and adopting a new behavior (Prochaska et al., 1994; Velicer et al., 1985).

The balance between the pros and cons varies depending on where a person is on the continuum of change. For example, the cons of changing always outweigh the pros for individuals in the precontemplation stage; the opposite is true for those in the action and maintenance stages. The crossover in the relative importance of the pros and cons always takes place before an individual takes action (Prochaska et al., 1994). These findings with the pros and cons point out that the construct of decisional balance is relevant for understanding and predicting transition between the earlier stages of precomtemplation, contemplation, and preparation. During the later stages of action and maintenance, however, decisional balance is less important as a predictor of progress (Prochaska et al., 1994). Decision balance has been identified to be related to condom use behavior in a number of previous studies (Galavotti et al., 1995; Grimley et al., 1992; Grimley et al., 1993, Grimley et al., 1995; Lauby et al., 1998; Noar et al., 2001; Prochaska et al., 1990; Redding et al., 1996).

Self-efficacy. In the TTM framework, the construct of self-efficacy represents an integration of the model of self-efficacy (Bandura, 1982) and the coping models of relapse and maintenance (Shiffman, 1986). Within the context of the TTM, self-efficacy is conceptualized as two constructs: (a) confidence or the situation-specific confidence people have that they can copy with high-risk situations, and (b) temptation or the urge to engage in a specific habit when presented with a tempting or difficult situation (Prochaska, Redding, & Evers, 1997).

SCT

Most HIV/AIDS prevention programs based on SCT have targeted the improvement in the knowledge of HIV, changing attitudes and social norms regarding HIV prevention, and increasing communication skills for negotiating safer sex (Boyer et al., 1997; Brason et al., 1998; Kamb et al., 1998; Kalichman et al., 1999; National Institute Of Mental Health Prevention Trial Group, 1998; Rotheram-Borus, Cantwell, & Newman, 2000). The intervention strategies of SCT address the following variables: behavioral intentions to act in a safe manner, self-efficacy, beliefs and attitudes regarding HIV, perceptions of peer and partner norms, outcome expectancies, affective self-regulation, problem-solving and negotiation skills, and knowledge of HIV (Fishbein et al., 1992).

The major constructs from the SCT include reciprocal determinism, behavioral capability, expectation, self-efficacy, observational learning, and reinforcement (Bandura, 1977, 1986). The concepts of reciprocal determinism and self-efficacy were applied to the measurement of condom use in this study. The concept of reciprocal determinism is that behavior and environment are reciprocal systems and the influence is in both direc-

tions. It explains human behavior in terms of a model of reciprocal determinism in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other (Bandura, 1986). Self-efficacy is defined as the conviction that one can successfully execute the behavior required to produce desired outcomes, and it is regarded as the most important construct in SCT (Bandura, 1982, 1986). Self-efficacy has been shown to affect whether individuals consider changing their behavior, the degree of effort they invest in changing, and long-term maintenance of behavioral change (Bandura, 1982, 1986; O'Leary, 1985; Velicer, et al., 1990).

Summary

The TTM and SCT have successfully explained condom use behavior in the United States. The TTM has afforded researchers with a framework to develop and distribute educational messages that may be more appropriate for individuals in terms of their stages of change for condom use. If the environment could encourage target populations to change behaviors through communication, social values, and norms, behavior change may be more likely to occur and be sustained. The reciprocal determinism of personal factors and environmental events could help to facilitate change. For example, Marcus and Crane (1998) reviewed 28 studies of media-based interventions and found that recall of mass-media messages generally was high, but mass-media campaigns had very little impact on physical activity behavior in the short term. Therefore, the study findings suggest that researchers should have more contacts and interventions tailored to the target audience.

In summary, although there are few studies of condom use for preventing HIV/AIDS among the Taiwanese specifically, the available literature from other demographic studies on a worldwide basis has contributed to this study.

METHODS

The overall purpose of this study was to identify salient predictors of condom use behaviors in a sample of male and female Taiwanese. The study was based on data gathered from workers in a traditional industry factory because factory workers are fairly representative of the average Taiwanese. By the instruments designed based on constructs from the TTM and SCT and the Taiwanese special socio cultural environment and statistics including factor analysis, MANOVA, and discrimanat analysis, the purpose of the study has been accomplished.

Sample

Data from this cross-sectional study were gathered from Taiwanese traditional factory workers. This particular population was targeted because the educational backgrounds of factory workers more accurately reflect that of the majority of the Taiwanese. A bicycle company, Giant, was selected from the town of Dajia, which is located in the central part of Taiwan. The town map is presented in Figure 1. The bicycle business is a traditional industry in Taiwan. Workers in this bicycle factory are almost always from Dajia and its neighborhoods. The town was regarded as a typical country city of Taiwan during the processing of the continually growing modernization and urbanization.

Sample Size

A sample size of 221 participants allowed for an odds ratio of 2.5 for no condom use versus condom use with main partner with a 0.05 confidence interval and 80% power. However, considering the five cells representing the stages of change, 357 valid samples were collected from approximately 700 native workers in order to avoid a lack of representation in each stage of change for condom use.

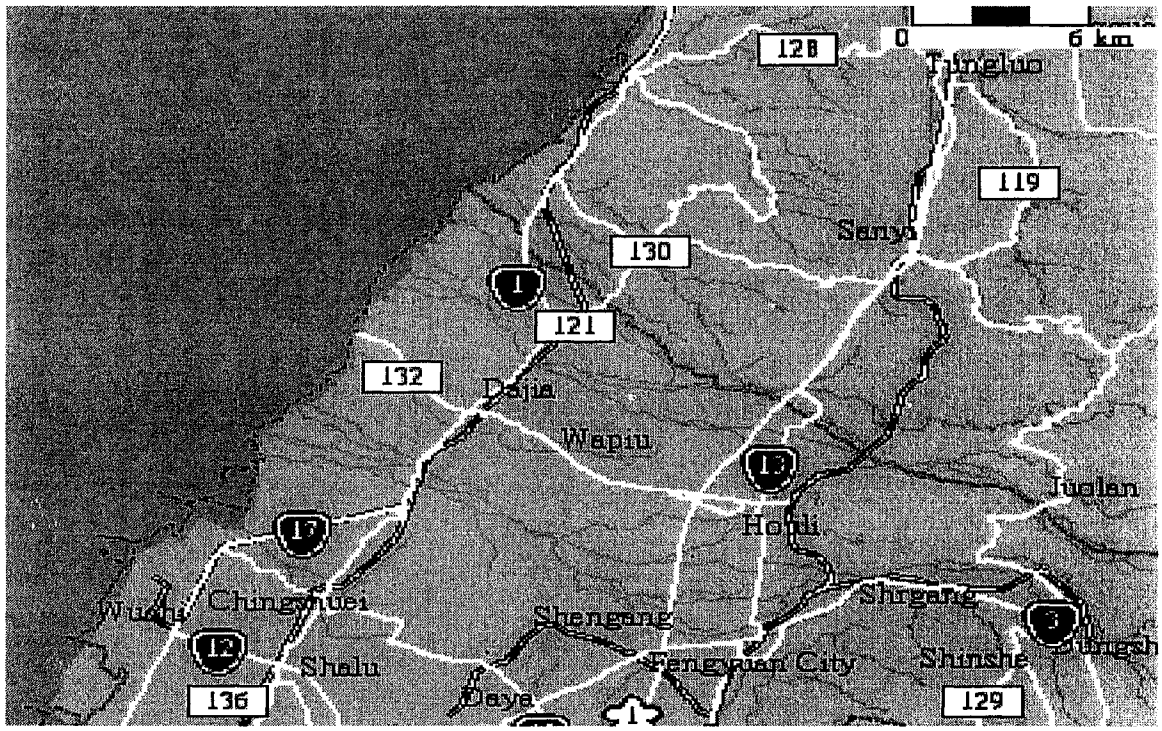

Figure 1. The location of Dajia in the center of Taiwan.

Procedure

The institutional review board for human use of the University of Alabama at Birmingham approved the study design and protocol. Through the assistance of the Taichung County Health Department and the agreement of the administration and labor

units of the factory, the data collection work got started. The researcher and the official of the Taichung County Health Department had a meeting with the coordinators to talk about the details of the survey. The coordinators of this work were two senior staff members, who were in charge of the factory sanitary and safety needs. Two weeks before the survey, four posters were exhibited on bulletin boards, restaurants, and access areas of the factory. Also, the announcements for the survey were released at the Wednesday morning assembly meeting. The research team along with the coordinators distributed the questionnaires to workers in the morning on the first day of the survey. It was a self-administered survey. Workers had 2 days to fill out the surveys during their break times such as teatime, lunchtime, or mid afternoon rest time. An elaborate compact disc container was offered as compensation for anyone who returned the survey. Four big posters were exhibited on the bulletin boards and in access areas to remind workers to fill out this survey. The research team received the completed surveys and gave out the presents at three times during off-office hours, namely 5:30 p.m., 8:00 p.m., and 9:00 p.m. in the first and second days of the survey at the location of the factory time clock.

Instrumentation

A survey was designed comprised of three parts, which included basic demographic information and the dependent and independent variables. The dependent variables were the stages of change for condom use. Independent variables were factors associated with stages of change for condom use, which consisted of condom use attitudes (pros and cons), communication, self-efficacy, and social norms. The instrument design was based on the TTM and SCT that have been used in many studies in the United States,

so that the validity of using this measure is out of the question. The reliability test was done by a pretest. Fifty Taiwanese other than these bicycle factory workers were recruited to complete this pretest. Although the items of the instrument have been verified or tested in the United States, the translation to Chinese was interpreted accurately to minimize the issue of reliability. The items of instrument were modified from responses of participants in the pretest for this reliability issue. Table 1 presents the measures, theoretical constructs, and corresponding survey items.

Table 1

Measures, Theoretical Constructs and Corresponding Survey Items

Measures	Theoretical constructs	Items in survey
Dependent variables		
Stages of change	TTM--Stages of change	B4. B5. B6. B7. C4. C5. C6. C7.
Independent variables		
Condom use attitude	TTM--Pros and Cons	B1. C1.
Communication	SCT--Reciprocal determinism	B2. C2.
Self-efficacy	TTM/SCT--Self-efficacy	B3. C3.
Social norm	SCT--Reciprocal determinism	D.

Note. TTM = transtheoretical model of change; SCT = social cognitive theory.

Stages of change for condom use assessment. Two separate staging assessments of condom use were utilized based on partner type. The separate staging algorithms were used to assess condom use by partner type because prior studies have shown that main and other partner relationships were qualitatively different, and individuals were at different stages of readiness to use condoms based on main and other partners. (Collins, Kohler, DiClemente, & Wang, 1999; Grimley et al., 1995; Grimley, Edward, DiClemente, & Lee, 2004; Grimley et al., 1997; Grimley et al., 1995). A six-question algorithm was

used to ascertain stage of change, which was adapted from Grimley and others (1997). The target populations were categorized into one of the five stages based on the questions of the frequency and duration of their condom use and their future intention to use condoms every time they have vaginal intercourse.

Pros and cons condom use. The condom use attitude construct was based on the TTM decisional balance construct. Condom use attitudes were measured separately based on partner type. The questions were adapted and revised from Galavotti and others (1995) and Grimley and others (Grimley et al., 2004; Grimley, Prochaska, et al., 1995). Participants indicated the level of agreement by using a 5-point Likert-type scale: 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), 5 (Strongly agree). The questions of pro and cons of condom use were mixed together in 10 items. Items 3, 4, 7, 9, and 10 were pros, and Items of 1, 2, 5, 6, and 8 were cons.

Condom use communication. The measure of condom use communication was based on the construct of reciprocal determinism from SCT. Condom use communication with main partner and other partners were assessed separately. Participants circled the answers according to the Likert-type scale: 1 (Never, 0%), 2 (Almost never, 25%), 3 (Sometimes, 50%), 4 (Almost always, 75%), 5 (Always, 100%).

Perceived self-efficacy. The measure of perceived self-efficacy was based on both the TTM and SCT. This perceived self-efficacy was assessed separately for main partner and other partners. The measure was adopted and revised from the study by Grimly et al.

(1996). Participants circled the level of confidence according to the following Likert-type scale: 1 (Not at all confidence, 0%), 2 (Slight confidence, 25%), 3 (Somewhat confidence, 50%), 4 (Confidence, 75%), and 5 (Very confidence, 100%).

Social norm for condom use. The measure assessing social norm for condom use was based on the construct of reciprocal determinism from the SCT. Participants indicated the level of agreement by using a Liker-type scale: 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly agree).

Data Analysis

Descriptive analysis. Descriptive analysis were conducted to characterize the study sample. Frequency and percentage were used to explain the distribution of the sample for categorical demographic characteristics such as gender, education, and martial status. Means were used as univariate descriptive analyses for continuous variables such as age.

Multivariate analysis and reliability test. The analysis procedures were factor analysis, reliability tests, MANOVA, ANOVA, and discriminant analysis based on partner type.

Factor analysis was used in data reduction to identify a small number of factors that explained most of the variance observed in a much larger number of variables. All of the theory-based items were included in the factor analysis, which included 10 items of condom use attitude, 5 items of communication, 5 items of self-efficacy, and 5 items of

social norms. Factor analysis yielded factors that represented the different dimensions of condom uses, which explained the variation and covariation among measures.

Reliability tests were then conducted on the results from the factor analysis. Cronbach's alpha coefficients of internal consistency were calculated for each factor to determine if high internal consistency exists.

With MANOVA, the dependent variables were the above theoretical factors, based on the extractions from the factor analysis. The independent variables were the five stages of change for condom use by partner type. Fisher's F ratio tests were performed on the differences for the linear combination of these reducing theoretical factors across the stages of change.

If the main effect and interactions were significant, they were followed up by ANOVA with Scheffe's tests to specify the relationship between the stages for each factor.

After obtaining a significant Fisher's F ratio test of MANOVA, discriminant analysis was conducted to distinguish stages based on linear combinations of measures. In other words, the dependent variables were now the five stages. The independent variables, which were linear combinations of measures, were made up of the above theoretical factors. Through discriminant analysis, several discriminant functions were observed. Wilks' lamda test indicated that there were differences in the discriminant functions. In the significant discriminant functions, through standardized coefficients and coefficients in the structure matrix among predictors, the predictors were known. Also, discriminant analysis offered classification procedures to evaluate how well individual cases were

classified into their appropriate stages on the basis of their scores on the independent variables.

Statistical Package for Social Science (version11.0) statistical software program was used for all analyses.

RESULTS

Descriptive Analysis

General description. The focus of this study was to investigate a sample of Taiwanese regarding their condom use with main partners and other partners. A total of 357 individuals composed of 46.5% (n = 166) females and 53.5% (n = 191) males were surveyed in a Taiwanese bicycle factory. The mean age of the sample was 34.5 years with nearly 98% of the population between 19 to 49 years. The majority were married 70.1% (n = 242). Taiwan fundamental education was very universal; only 3.3% (n = 11) had an elementary education, 25.2% (n = 83) had finished 9 years of education, 59.9% (n = 197) individuals had a 12-year high school education and 11.6% (n = 38) individuals had a college diploma. In sexual orientation, Taiwanese were very traditional with 98.2% (n = 322) self-identifying as being heterosexual. Table 2 presents demographic characteristics of the survey respondents in detail.

Partner types. Of the 357 participants, 86.2% (n = 308) reported having a main partner, and 28.0% (n = 100) reported having other partners such as girl friends, one-night stands, and prostitutes. Of the 357 survey respondents, 25.5% (n = 91) reported that they had both main and other partners; 11.2% (n = 40) said they had no main partner but only other partners.

Of the 308 participants reporting a main partner, 53.9% (n = 166) were men and 46.1% (n = 142) were women. However, of 100 individuals with other partners, 68% (n = 68) were the men and 32% (n = 32) were women; obviously the numbers of men were two more times greater than women.

Table 2

Demographic Characteristics of the Survey Respondents

Characteristics	n	%
Age group		
20-29 years old	106	30.2
30-39 years old	150	42.7
40-49 years old	88	25.1
50-59 years old	7	2.0
Sex		
Female	166	46.5
Male	191	53.5
Martial status		
Single	87	25.2
Married	242	70.1
Living as married	5	1.4
Divorced/Separated	11	3.2
Education		
Elementary school (Grade 6)	11	3.3
Junior high school (Grade 9)	83	25.2
Senior high school (Grade 12)	197	59.9
College degree	38	11.6
Sex orientation		
Opposite sex	322	98.2
Same sex	2	0.6
Opposite sex & same sex	4	1.2

Note. For some variables there were fewer than 357 responses, due to missing data, including those who neglected the questions or those who chose not to answer it.

Data Analyses With Main Partner

Samples across the stages of change with main partner. The distribution of samples across the stages of change for condom use with main partner is summarized in Table 3. Of the 308 individuals reporting a main partner, the majority of participants reported being in the precontemplation stage, with the second largest group being in the preparation stage, the third largest group being in the maintenance stage, and the smallest groups were the contemplation and action stages. By examining the frequencies in the five stages, there was a significant difference, $\chi^2 = 130.31$, $p < 0.001$.

Table 3

Distribution of Samples Across the Stages of Change With Main Partner (N = 308)

Stages	n	%
Precontemplation	138	45
Contemplation	29	9
Preparation	57	19
Action	29	9
Maintenance	55	18

Factor analysis of the theoretical measures with main partner. The first step was to use factor analysis to determine the number of factors to retain. From a theoretical perspective, five factors representing the pros, cons, communication, self-efficacy, and social norms were expected. The Kaiser-Meyer-Olkin Measure and Bartlett's test of factor analysis with main partner shows in Table 4. The KMO value was 0.83, $p < 0.001$, which meant that the variables were related to each other, and the factor analysis could be conducted.

Table 5 shows the total variance explained in the factor analysis with main partner, and Figure 2 presents the scree plot of the eigen values. Deciding the number of factors to be retained was based on an eigen value greater than 1. Factors were in the sharp descent of part of the plot before the fourth factor. Therefore, three factors were retained.

Table 4

Kaiser-Meyer-Olkin Measure and Bartlett's Tests in Factor Analysis With Main Partner

Kaiser-Meyer-Olkin measure of sample adequacy	Bartlett's test of sphericity approximate chi-square	df	p value
0.83	2499.72	300	< 0.001

Table 5

Total Variance Explained in Factor Analysis With Main Partner

	Extraction sums of squared loadings			Rotation sums of squared loadings		
Factor	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.49	21.96	21.96	4.14	16.55	16.55
2	2.36	9.42	31.38	3.18	12.73	29.27
3	1.23	4.93	36.31	1.76	7.03	36.31

The rotation method was varimax. The first result of the factor rotation matrix with main partner shows in Table 6. This matrix shows factor loadings, which are the correlations between each item. The cut-off point of 0.45 dropped 10 items, which were Attitude 1, Attitude 2, Attitude 4, Attitude 5, Attitude 6, Attitude 8, Communication 2, Communication 3, Communication 4 and Communication 5, in the next rotation.

In the first factor analysis, variables reduced from 25 to 15. The second result of the factor rotation is shown in Table 7. In Factor 1, Attitude 6 needed to be dropped be-

cause it was less than 0.45. The items of Self-efficacy 1, Self-efficacy 2, Self-efficacy 3, Self-efficacy 4, and Self-efficacy 5 were associated with the first factor. The items of Social Norm 1, Social Norm 2, Social Norm 3, Social Norm 4, and Social Norm 5 were associated with the second factor. The items of Attitude 3, Attitude 7, Attitude 9, and Attitude 10 were associated with the third factor.

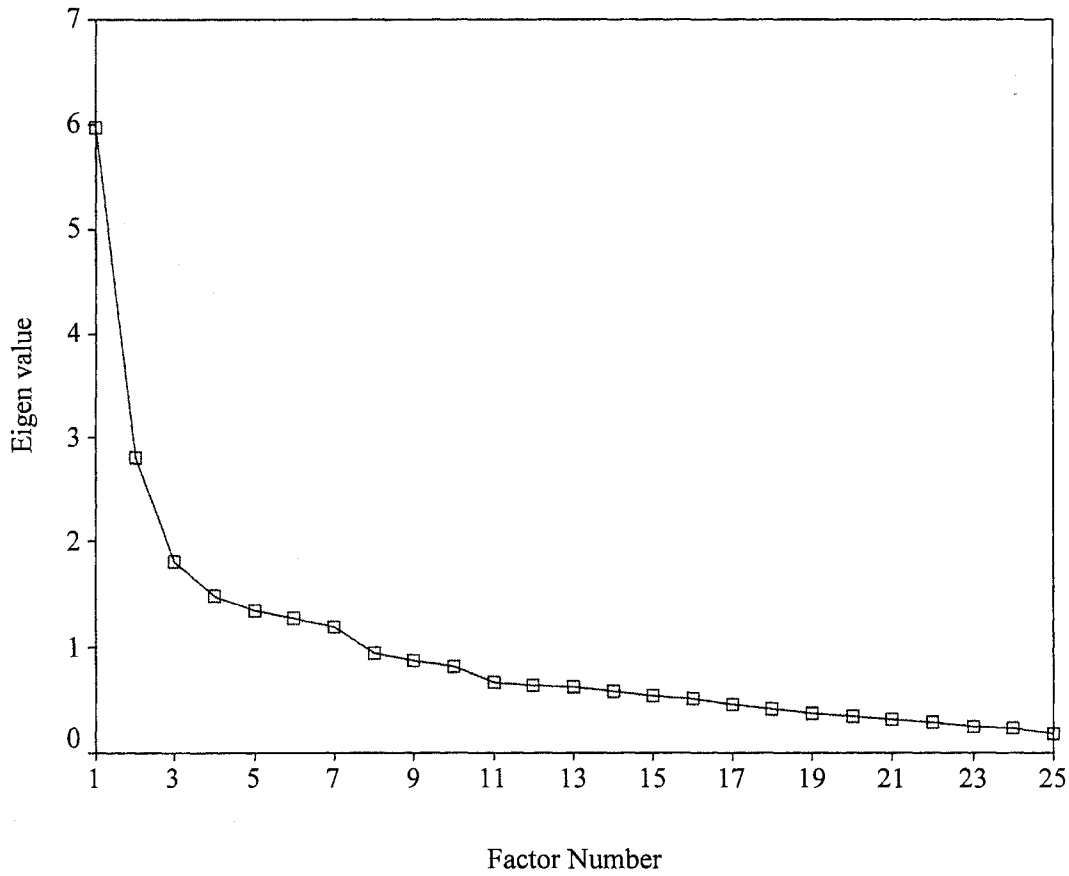

Figure 2. Scree plot in factor analysis with main partner.

Thus, three factors were chosen from the second factor analysis. The first factor was self-efficacy based on the original self-efficacy scales. The second factor was social norm that remained from the original social norm scales. The third factor was pro con-

dom use attitude, which originated from pro condom use attitude scales except for the fourth question.

Table 6

Rotated Factor Matrix in Factor Analysis With Main Partner (First)

	Factors		
Variables	1	2	3
Attitude 1			
Attitude 2	-0.40		
Attitude 3			0.59
Attitude 4			
Attitude 5			
Attitude 6	-0.68		
Attitude 7			0.64
Attitude 8			
Attitude 9			0.64
Attitude 10			0.56
Communication 1	0.37		
Communication 2			
Communication 3	0.35		
Communication 4			
Communication 5			
Self-Efficacy 1	0.76		
Self-Efficacy 2	0.75		
Self-Efficacy 3	0.79		
Self-Efficacy 4	0.79		
Self-Efficacy 5	0.78		
Social Norm 1		0.75	
Social Norm 2		0.73	
Social Norm 3		0.74	
Social Norm 4		0.85	
Social Norm 5		0.50	

Note. Suppress absolute value less than 0.35.

Reliability test for the factors of main partner. The Cronbach's alpha coefficient of self-efficacy was 0.90. The Cronbach's alpha coefficient of social norm was 0.85, and

the Cronbach's alpha coefficient of pros condom use attitude was 0.79. These Cronbach's alpha coefficients show that these three factors had moderate to high internal consistency.

MANOVAs. MANOVA was used to examine the association among these three factors across the five stages. The dependent variables were the three factors representing self-efficacy, social norms, and pro condom use attitudes; whereas, the independent variable was the stages of change construct. Wilks' lambda was 0.63, F (12, 733) = 11.52, $p < 0.001$, which meant significant differences were found for the linear combination of these three factors across the stages of change.

Table 7

Rotated Factor Matrix in Factor Analysis With Main Partner (Second)

	Factors		
Variables	1	2	3
Attitude 3			0.61
Attitude 6	0.37		
Attitude 7			0.66
Attitude 9			0.75
Attitude 10			0.59
Self-Efficacy 1	0.76		
Self-Efficacy 2	0.76		
Self-Efficacy 3	0.81		
Self-Efficacy 4	0.84		
Self-Efficacy 5	0.76		
Social Norm 1		0.76	
Social Norm 2		0.74	
Social Norm 3		0.74	
Social Norm 4		0.84	
Social Norm 5		0.51	

Note. Suppress absolute value less than 0.35.

ANOVAs. By the follow-up univariate ANOVA analysis with the Sheffe test, some stages were found significantly different between each other in the factors of self-efficacy and pro condom use attitude. Tables 8, 9, and 10 present ANOVAs between stages for self-efficacy, social norm, and pro condom use attitude. The level of significance (α= 0.05) was divided by 20 due to a Type 1 error. In the self-efficacy factor, there were the following situations with ANOVA: Individuals in the stage of precontemplation showed significantly less sensitivity than individuals in the stages of preparation, action and maintenance ($p < 0.05$). Individuals in the stage of maintenance had significantly more self-efficacy than in the stages of precontemplation and contemplation ($p < 0.05$). In the social norm factor, there was no significant difference between each stage with ANOVA. In the pro condom use attitude factor, individuals in the stage of precontemplation significantly showed less condom use inclination than in the stages of action and maintenance ($p < 0.05$).

Discriminant analysis. Discriminant analysis was conducted as a follow-up procedure to the significant MANOVA. The dependent variables were the five stages of change for condom use with a main partner. Linear combinations of the independent variables were formed, which were self-efficacy, social norms, and pro condom use attitude with main partner. The linear combination of the independent variables served as the basis for assigning individuals into the five stages. Table 11 presents Wilks' lambda in the test of the dicriminant functions with main partner. Of the three possible discriminant functions, only the first function was statistically significant. In the first function Wilk's lambda was 0.63, χ^2=127.54, $p < 0.001$. The eigen value was 0.53 and had a canonical-

correlation of 0.59 in the first discriminant function. By squaring the canonical correlation, the value was 0.35, meaning that 35% of the variability of the individuals for the first discriminant function was accounted for by differences among the five stages.

Table 8

ANOVAs Between Stages for Self-Efficacy With Main Partner

Stages	Stages	Mean difference	Standard error	p value
PC	C	-0.08	0.17	0.995
PC	P	-0.65	0.14	< 0.001*
PC	A	-0.78	0.17	< 0.001*
PC	M	-1.19	0.14	< 0.001*
C	PC	0.08	0.17	0.995
C	P	-0.58	0.19	0.066
C	A	-0.71	0.22	0.038
C	M	-1.11	0.20	< 0.001*
P	PC	0.65	0.14	< 0.001*
P	C	0.58	0.19	0.066
P	A	-0.13	0.19	0.977
P	M	-0.53	0.16	0.034
A	PC	0.79	0.17	< 0.001*
A	C	0.71	0.22	0.038
A	P	0.13	0.19	0.977
A	M	-0.40	0.19	0.368
M	PC	1.19	0.14	< 0.001*
M	C	1.11	0.20	< 0.001*
M	P	0.53	0.16	0.034
M	A	0.40	0.19	0.368

Note. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance. *$p < 0.05$.

Table 12 shows the standardized coefficient and coefficient in the structure matrix among predictors in the first discriminant function with main partner. By examining the

magnitudes of the standardized canonical coefficient and coefficients in the structure matrix of the three factors in the first discriminant function, self-efficacy had the largest and most positive coefficients meaning this factor was the most strongly related to it; therefore, the model of the discriminant function was loaded as the model of self-efficacy and pro condom use attitude.

Table 9

ANOVAs Between Stages for Social Norm With Main Partner

Stages	Stages	Mean difference	Standard error	p value
PC	C	0.10	0.19	0.992
PC	P	-0.09	0.15	0.982
PC	A	-0.44	0.19	0.225
PC	M	-0.18	0.16	0.839
C	PC	-0.10	0.19	0.992
C	P	-0.19	0.21	0.935
C	A	-0.54	0.24	0.302
C	M	-0.28	0.22	0.789
P	PC	0.09	0.15	0.982
P	C	0.19	0.25	0.935
P	A	-0.35	0.21	0.620
P	M	-0.09	0.18	0.993
A	PC	0.44	0.19	0.255
A	C	0.54	0.24	0.302
A	P	0.35	0.21	0.620
A	M	0.26	0.22	0.846
M	PC	0.18	0.16	0.839
M	C	0.28	0.22	0.789
M	P	0.09	0.18	0.993
M	A	-0.28	0.22	0.864

Note. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.

Table 13 presents the group centroid values of the five stages in the self-efficacy and pro condom use attitude model with main partner. The group centroid values were the mean values of the five stages. The stage of precontemplation was lower than the stages of action and maintenance in the self-efficacy and pro condom use attitude model. The group centroid values in this model appeared consistent with the former significance of MANOVA and the interpretation of the ANOVA.

Table 10

ANOVAs Between Stages for Pros Condom Use Attitude With Main Partner

Stages	Stages	Mean difference	Standard error	p value
PC	C	-0.48	0.17	0.085
PC	P	-0.47	0.13	0.022
PC	A	-0.81	0.17	< 0.001*
PC	M	-0.73	0.14	< 0.001*
C	PC	0.48	0.17	0.085
C	P	0.00	0.19	1.000
C	A	-0.34	0.22	0.669
C	M	-0.26	0.20	0.852
P	PC	0.47	0.13	0.022
P	C	0.00	0.19	1.000
P	A	-0.34	0.19	0.422
P	M	-0.26	0.16	0.615
A	PC	0.81	0.17	< 0.001*
A	C	0.34	0.22	0.669
A	P	0.34	0.19	0.422
A	M	0.08	0.19	0.989
M	PC	0.73	0.14	< 0.000*
M	C	0.26	0.20	0.852
M	P	0.26	0.16	0.615
M	A	-0.08	0.19	0.989

Note. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance. *$p < 0.05$.

Table 11

Wilks' Lambda in the Test of the Discriminant Functions With Main Partner

Test of functions	Wilks' Lambda	Chi-square	df	p value
1 through 3	0.63	127.54	12	< 0.001
2 through 3	0.97	9.49	6	0.148
3	0.99	2.65	2	0.227

Table 12

Standardized Coefficient and Coefficient in Structure Matrix Among Predictors in the Discriminant Function With Main Partner

Predictors	Standardized coefficient	Coefficient in structure matrix
Self-efficacy	0.85	0.76
Social norm	0.18	0.17
Pro condom use attitude	0.63	0.52

Table 13

Group Centroid Values of the Five Stages in the Self-Efficacy and Pro Condom Use Attitude Model With Main Partner

	PC	C	P	A	M
Group Centroid Values	-0.71	-0.28	0.34	0.80	1.10

Note. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenanc.

The overall percent of individuals correctly classified was 44% in the self-efficacy and pro condom use attitude model. The measure of agreement in Kappa was 0.42 ($p < 0.001$), which indicated a moderately accurate prediction. Table 14 shows percentages and frequencies of individuals classified in the self-efficacy model with main partners. This table indicated how well the classification function was predicted in the

sample. In the stage of precontemplation, 52 % (n = 65) of 124 cases were classified correctly. In the stage of contemplation, 39% (n = 11) of 28 cases were classified correctly. In the stage of preparation, 13% (n = 7) of 54 cases were classified correctly. In the stage of action, 52% (n = 15) of 29 cases were classified correctly, and, in the stage of maintenance, 55% (n = 27) of 49 cases were classified correctly. Obviously, the stages of precontemplation and preparation were underestimated, and the stages of contemplation, action, and maintenance were overestimated.

Table 14

Percentages and Frequencies of Individuals Classified in the Self-Efficacy and Pro Condom Use Attitude Model With Main Partner

		Predicted category									
		PC		C		P		A		M	
Actual category	Total	n	%	n	%	n	%	n	%	n	%
PC	124	65	52	36	29	8	10	5	6	7	6
C	28	7	25	11	39	4	14	5	18	1	4
P	54	12	22	13	24	7	13	8	15	26	14
A	29	1	3	5	17	1	3	15	52	7	24
M	49	5	10	6	12	3	6	8	16	27	55

Note. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance. Percentages and frequencies did not include those who chose not to answer some questions.

Summary of Analysis With Main Partner

Self-efficacy. Self-efficacy was the dominant factor in the self-efficacy and pro condom use attitude model of the discrimiant function. Figure 3 presents standardized mean scores for self-efficacy across the stages of change of condom use with a main partner. Confidence scores were the lowest in the precontemplation stage and gradually

increased linearly across the stages of contemplation, preparation, action and maintenance. This increasing confidence score in the later stages for condom use has been found by other studies in the Untied States (Galavotti et al., 1995; Grimley, Prochaska, et al., 1995; Lauby et al., 1998; Noar et al., 2001; Prochaska et al., 1990).

Table 15 presents means among the measures of self-efficacy in individual's confidence to use condoms. Item 2 shows the highest mean. It indicated if the individual was prepared, use of condoms was most likely to occur. Item 4 shows the lowest mean. It indicated that one was less likely to use a condom if one had to stop what he or she was doing and go out to get condoms.

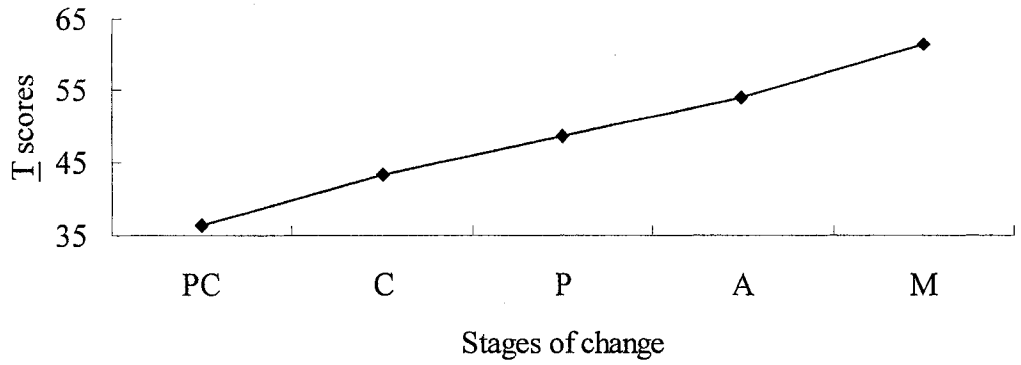

Figure 3. Standardized means for self-efficacy across the stages change with main partner. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.

Condom use attitude. Pro condom use attitude is in the self-efficacy and pro condom use attitude model of the discriminant function. Cons condom use attitude is not a factor in the self-efficacy and pro condom use attitude model of the discriminant function

but it gradually declined with later stages. Figure 4 presents standardized means of pros and cons of condom use across the stages of change with main partner. In Figure 4, the line of the pro condom use attitude gradually raises with later stages; oppositely, the line of the cons condom use attitude gradually declines with later stages. The cons were higher than the pros for those in the precontemplation stage, and the cross-over between the pros and cons occurred in the preparation stage. This relationship between the pros and cons of condom use and the stages for condom use corroborates the studies conducted in the United States (Galavotti et al., 1995; Grimley et al., 1992, Grimley et al., 1993; Grimley, Prochaska, et al., 1995; Lauby et al., 1998, Noar et al., 2001; Prochaska et al., 1990; Redding et al., 1996).

Table 15

Means Among the Measures of Self-Efficacy With Main Partner

How confident are you that you could use condoms every time	Mean
1. You have been drinking alcohol or taking drugs with your main partner.	3.32
2. You are sexually aroused with your main partner.	3.40
3. You think your main partner might get upset about using condoms.	3.35
4. You have to stop with your main partner and go out to get condoms.	3.11
5. Your main partner doesn't want to use one.	3.22

Table 16 shows means among the measures of condom use attitude with main partner. Items 3, 4, 7, 9 and 10 are pro attitude, and Items 1, 2, 5, 6, and 8 are cons attitude for condom use. Obviously, the average of pro attitude (3.73) is greater than the cons attitude (3.07). The prevention of pregnancy and disease are the first and secondary priorities for condom use in these Taiwanese samples.

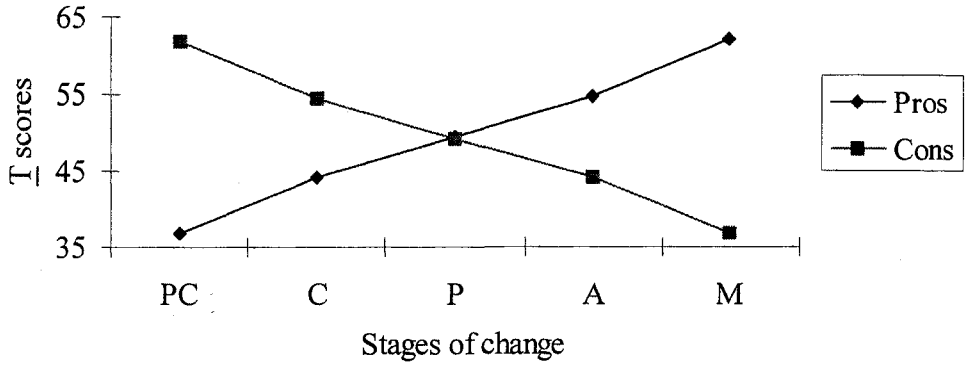

Figure 4. Standardized means for decisional balance across the stages change with main partner. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.

Table 16

Means Among the Measures of Condom Use Attitude With Main Partner

Condom use attitudes	Mean
1. Your main partner would feel angry if you suggested condom use.	3.16
2. You feel closer to your main partner without a condom.	3.16
3. You think condom use helps protect your main partner and you from disease.	3.94
4. You think condom use will make sex last longer with your main partner.	3.12
5. You need your partner's cooperation with condom use.	3.44
6. Condom use makes sex feel unnatural.	2.99
7. Condom use makes you feel safer from pregnancy with your main partner.	4.01
8. Condom use causes you much trouble with your main partner.	2.58
9. Condom use helps you and your main partner to stay clean.	3.83
10. Condom use makes you feel more responsible.	3.73

Social norm and communication. Although the factor of social norm was in the self-efficacy and pro condom use attitude model of the discriminant function, it only had relatively small coefficient. Therefore, social norm would not be regarded as a measurement for predicting condom use behavioral intention with main partner in Taiwanese.

Communication was not a factor in the discriminant function; therefore, it would not be considered as a measurement for predicting condom use behavioral intention with main partner in Taiwanese either.

Data Analysis With Other Partners

Samples across the stages of change with other partners. Of the total sample of 357 individuals, 100 (28%) reported having other partners (68 females and 32 males). The distribution of the sample across the stages of change with other partners is presented in Table 17. The majority was in the maintenance stage, the second largest group was the preparation stage, the third largest group was in the precontemplation stage, the fourth was the action stage, and the last group was the contemplation stage. There was a significant difference in the percentages of individuals across the five stages, $\chi^2 = 19.3$, $p < 0.001$.

Table 17

Distribution of Samples Across the Stages of Change With Other Partners (N = 100)

Stages	n	%
Precontemplation	19	19
Contemplation	8	8
Preparation	26	26
Action	14	14
Maintenance	33	33

Combined stages with other partners. In the other partner analysis, the five stages of change were combined into three stages primarily due to the small number of individuals in the contemplation stage. The collapsing of stages has been seen in other studies

in the United States (Bowen & Trotter, 1995; Ross, Kohler, Grimley, & Bellis, 2003), resulting in three theoretically consistent stages. The three stages were labeled not thinking, thinking, and doing. The stage of not thinking was the precontemplation stage. The stage of thinking was the stage of contemplation and preparation, and these two stages were combined owing to the fact that individuals were thinking about using condoms sometime in the future. The stage of doing included the stages of action and maintenance, and these two stages combined because these individuals had been using condoms consistently but for different lengths of time.

Factor analysis of theoretical measures with other partners. The KMO and Bartlett's test of factor analysis is presented in Table 18. The KMO value was 0.81, $p < 0.001$. Due to the significant difference, the factor analysis was conducted.

Table 18

Kaiser-Meyer-Olkin Measure and Bartlett's Test in Factor Analysis With Other Partners

Kaiser-Meyer-Olkin measure of sample adequacy	Bartlett's test of sphericity approximate chi-square	df	p value
0.81	1126.26	300	< 0.001

The total variance explained in factor analysis is shown in Table 19, and the scree plot presents in Figure 5. The fourth factor values started to level off, and the eigen value of the third factor was greater than 1, so that three factors were chosen to rotate in the factor analysis.

Table 19

Total Variance Explained in Factor Analysis With Other Partners

Factor	Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.42	25.66	25.66	5.15	20.61	20.61
2	2.58	10.30	35.96	3.25	13.01	33.61
3	0.90	3.60	39.56	1.49	5.95	39.56

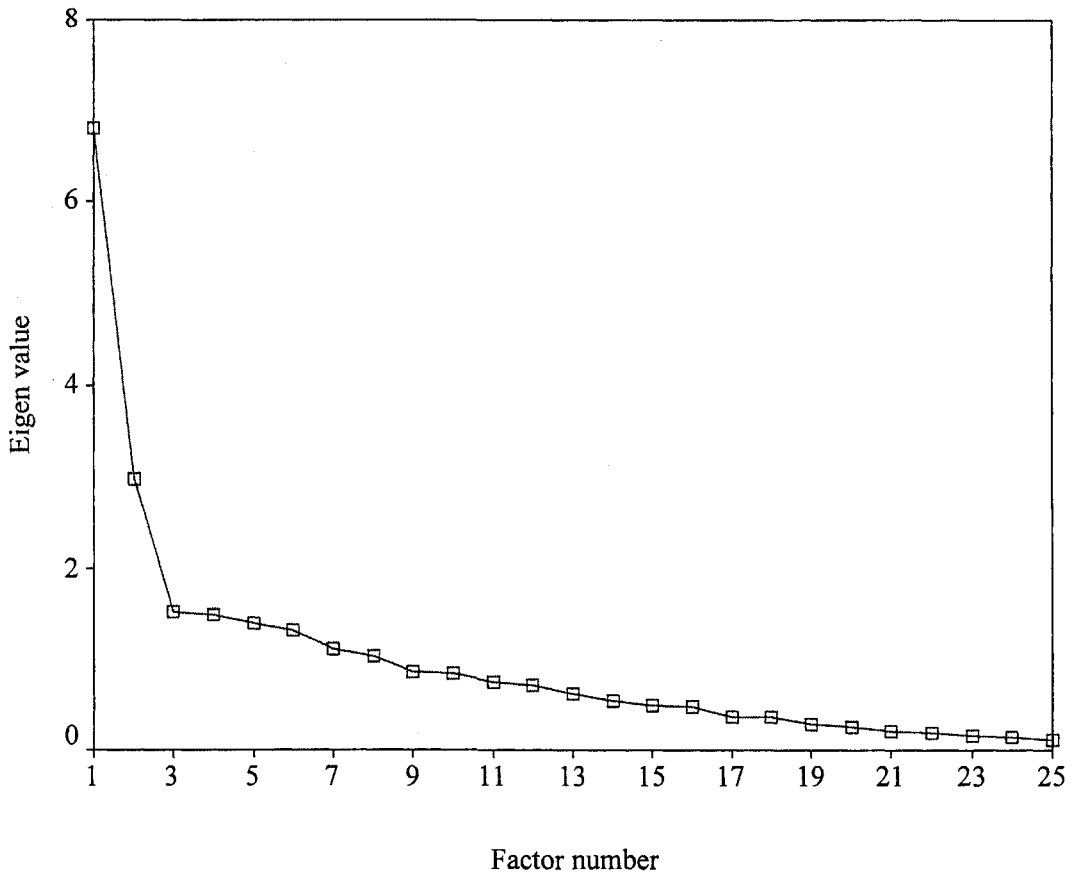

Figure 5. Scree plot in factor analysis with other partners.

The rotation method was varimax. The first result of the factor rotation matrix presents in Table 20. In each factor loading, there were the correlations between each variable. The cut-off point was 0.45. In this first rotated factor matrix, Attitude 10 was

overlapping in the Factors 1 and 3; therefore it was eliminated for the next rotation. The items, which were Attitude 1, Attitude 2, Attitude 4, Attitude 5, Attitude 6, Attitude 8, Communication 1, Communication 2, Communication 3, Communication 4, and Communication 5 less than 0.4, were dropped out for the next rotation as well.

Table 20

Rotated Factor Matrix in Factor Analysis With Other Partners (First)

	Factors		
Variables	1	2	3
Attitude 1			
Attitude 2			
Attitude 3	0.85		
Attitude 4			
Attitude 5			
Attitude 6			
Attitude 7			0.63
Attitude 8			
Attitude 9			0.47
Attitude 10	0.47		0.45
Communication 1			
Communication 2			
Communication 3			
Communication 4			
Communication 5			
Self-Efficacy 1	0.84		
Self-Efficacy 2	0.87		
Self-Efficacy 3	0.87		
Self-Efficacy 4	0.86		
Self-Efficacy 5	0.68		
Social Norm 1		0.78	
Social Norm 2		0.79	
Social Norm 3		0.71	
Social Norm 4		0.83	
Social Norm 5		0.72	

Note. Suppress absolute value less than 0.35.

The first factor analysis reduced variables from 25 to 13. The second result of the factor rotation matrix shows in Table 21.

The factor 3 was eliminated for further examination because of only two items in this factor. Two factors were chosen after factor analysis. The first factor was self-efficacy and pro condom use attitude based on the original items of self-efficacy and Attitude 3 of pro condom use. The second factor kept the original social norm scales.

Table 21

Rotated Factor Matrix in Factor Analysis With Other Partners (Second)

	Factors		
Variables	1	2	3
Attitude 3	0.84		
Attitude 7			0.68
Attitude 9			0.56
Self-Efficacy 1	0.84		
Self-Efficacy 2	0.85		
Self-Efficacy 3	0.86		
Self-Efficacy 4	0.89		
Self-Efficacy 5	0.70		
Social Norm 1		0.78	
Social Norm 2		0.81	
Social Norm 3		0.70	
Social Norm 4		0.81	
Social Norm 5		0.72	

Note. Suppress absolute value less than 0.35.

Reliability test for the factors of other partners. The Cronbach's alpha coefficient of the first factor, self-efficacy and pro condom use attitude, was 0.93. The Cronbach's alpha coefficient of the second factor, social norm, was 0.88. These Cronbach's alpha coefficients show that the two factors had high internal consistency.

MANOVAs. In a MANOVA, the dependent variables were the factors of self-efficacy and pro condom use attitude and social norms. The independent variables were the three combined stages. Wilks' lambda was 0.37, F (4, 190) = 30.84, p < 0.001, which meant the significant difference was found for the linear combination of these two factors across the stages of change.

ANOVAs. By the follow-up univariate ANOVA analysis with the Sheffe test, in the factor of self-efficacy and pro condom use attitude, stages were significantly different between each other. The level of significance ($\alpha = 0.05$) was divided by 6 due to a Type 1 error. Individuals in the earlier stage showed significantly less self-efficacy and condom use inclination than in the later stage. In the factor of social norm, there was no difference between each stage. Tables 22 and 23 present ANOVAs between stages for the factors of self-efficacy and pro condom use attitude and social norm.

Table 22

ANOVAs Between Stages for Self-Efficacy and Pros Condom Use Attitude With Other Partners

Stages	Stages	Mean difference	Standard error	p value
NT	T	-1.12	0.17	< 0.001
NT	D	-2.03	0.16	< 0.001
T	NT	1.12	0.17	< 0.001
T	D	-0.91	1.34	< 0.001
D	NT	2.03	0.16	< 0.001
D	T	0.91	1.34	< 0.001

Note. NT = not thinking; T = thinking; D = doing.

Discriminant analysis. In discriminant analysis, the dependent variables were the three combined stages with other partners, and the independent variables were linear combinations of the measures of self-efficacy and pros condom attitude use and social norms with other partners. Table 24 presents Wilks' lambda in the test of the dicriminant functions with other partners. Of the two possible discriminant functions, only the first function was statistically significant. Wilks' lambda was 0.37, $\chi^2 = 95.55$, $p < 0.001$. The eigen value was 1.72 with a canonical correlation of 0.80 in the first discriminant function. By squaring the canonical square correlation, the value was 0.64. That meant 64% of the variability of the individuals for the first discriminant function was accounted for by differences among the three stages.

Table 23

ANOVAs Between Stages for Social Norm With Other Partners

Stages	Stages	Mean difference	Standard error	p value
NT	T	0.52	0.27	0.982
NT	D	-0.26	0.26	0.995
T	NT	-0.52	0.27	0.982
T	D	-0.78	0.21	0.936
D	NT	0.26	0.26	0.995
D	T	0.78	0.21	0.936

Note. NT = not thinking; T = thinking; D = doing.

Table 25 presents the standardized coefficient and coefficient in the structure matrix among predictors in the first discriminant function with other partners. By examining the magnitudes of the standard coefficients and coefficients in the structure matrix of two

factors in the first discriminant function, self-efficacy and pro condom use attitude had large positive coefficients; therefore, this model was loaded as self-efficacy and pro condom use attitude in the first discriminant function.

The group centroid values were the mean values of the three combined stages. In the model of self-efficacy and pro condom use attitude, the group centroid values in the stage of doing (1.19) was greater than other stage, followed by the stages of thinking (-0.35) and not thinking (-2.25). The result was consistent with the former significance of MANOVA and the interpretation of ANOVA analysis.

Table 24

Wilks' Lambda in the Test of the Discriminant Functions With Other Partners

Test of functions	Wilks' lambda	chi-square	df	p value
1 through 2	0.37	95.55	4	< 0.001
2	1.00	0.11	1	0.746

Table 25

Standardized Coefficient and Coefficient in Structure Matrix Among Predictors in the Discriminant Function With Other Partners

Predictors	Standardized coefficient	Coefficient in structure matrix
Self-efficacy and Pros condom use attitude	1.00	1.00
Social norm	-0.02	0.13

The overall percent of cases correctly classified was 73%. The measure of agreement in Kappa was 0.62, $p < 0.001$, which indicated accurate prediction. Table 26 presents percentages and frequencies of individuals classified in the discriminant function

analysis, which indicated how well the classification function predicted in the sample. In the stage of not thinking 79 %, (n = 15) of 19 individuals were classified correctly. In the stage of thinking, 65% (n = 22) of 34 individuals were classified correctly, and, in the stage of doing, 76% (n = 35) of 46 individuals were classified correctly.

Summary of Analysis With Other Partners

Self-efficacy. From the model of the self-efficacy and pro condom use attitude in the discriminant function, the factors of self-efficacy and pro condom use attitude predominated condom use behavioral intention with other partners among Taiwanese. Figure 6 presents the standardized mean scores of self-efficacy across the stages of change with other partners. Confidence scores increased almost linearly from the stage of not thinking to the stage of doing. Although the stages were combined for the sample sizes, the trend of the increasing confidence score with later stages was similar with the studies in the United States (Galavotti et al., 1995; Grimley, Prochaska, et al., 1995; Lauby et al., 1998; Noar et al., 2001; Prochaska et al., 1990).

Table 26

Percentages and Frequencies of Individuals Classified in the Self-efficacy and Pros Condom Use Attitude Model With Other Partners

Actual category	Total	Predicted category					
		Not thinking		Thinking		Doing	
		n	%	n	%	n	%
Not thinking	19	15	79	4	21	0	0
Thinking	34	6	18	22	65	6	18
Doing	46	1	2	10	22	35	76

Note. Percentages and frequencies did not include those who chose not to answer some questions.

Table 27 presents means among the measures of self-efficacy in individual's confidence that one could use condoms with other partners. Item 2 shows the highest confidence; it meant that if an individual was fully prepared, condom use was at the highest level. Item 4 shows the lowest confidence, which meant one was less likely to use condoms if an interruption had to take place for purchase of condoms.

Condom use attitude. Pro condom use attitude was in the model of self-efficacy and the pros of condom use in the discrimiant analysis. The cons of condom use was not in the model; however, it gradually declined from the not thinking stage to the doing stage. Figure 7 presents standardized mean scores for the pros and cons condom use across the stages of change with other partners. The scores for the pros gradually increased within the later stages; conversely, the scores of the cons gradually declined in the later stages. The cross-over between two scores occurred at the thinking stage. Even though the stages were combined due to cell size, the trends in scores of the pro and cons of condom use were similar to those found in previous studies in the United States (Galavotti et al., 1995; Grimley et al., 1992; Grimley et al., 1993; Grimley, Prochaska, et al., 1995; Lauby et al., 1998, Noar et al., 2001; Prochaska et al., 1990; Redding et al., 1996).

Table 28 presents means among the measures of condom use attitude with other partners. Items 3, 4, 7, 9, and 10 are pro attitude, and Items 1, 2, 5, 6, and 8 are cons attitude for condom use. The average of the pro attitude (3.22) is greater than the cons attitude (2.81). With other partners, the prevention of pregnancy is the major consideration for condom use, and the prevention of disease is the second thought for condom use.

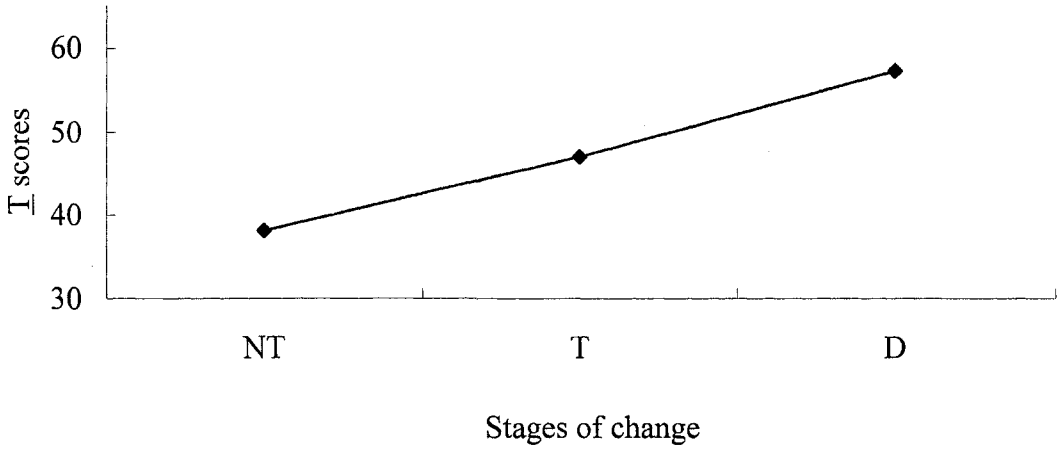

Figure 6. Standardized means for self-efficacy across the stages of change with other partners. NT = not thinking; T = thinking; D = doing.

Table 27

Means Among the Measures of Self-Efficacy With Other Partners

How confident are you that you could use condoms every time	Mean
1. You have been drinking alcohol or taking drugs with your other partner.	2.97
2. You are sexually aroused with your other partner.	3.20
3. You think your other partner might get upset about using condoms.	3.04
4. You have to stop with your other partner and go out to get condoms.	2.70
5. Your other partner doesn't want to use condoms.	3.08

Social norm and communication. Social norm had a small coefficient in the model of self-efficacy and pro condom use attitude of the discrimiant function. Communication was not a factor in the discriminant function. Therefore, the factors of social norm and communication were not regarded as measurements for predicting condom use behavioral intention in Taiwanese.

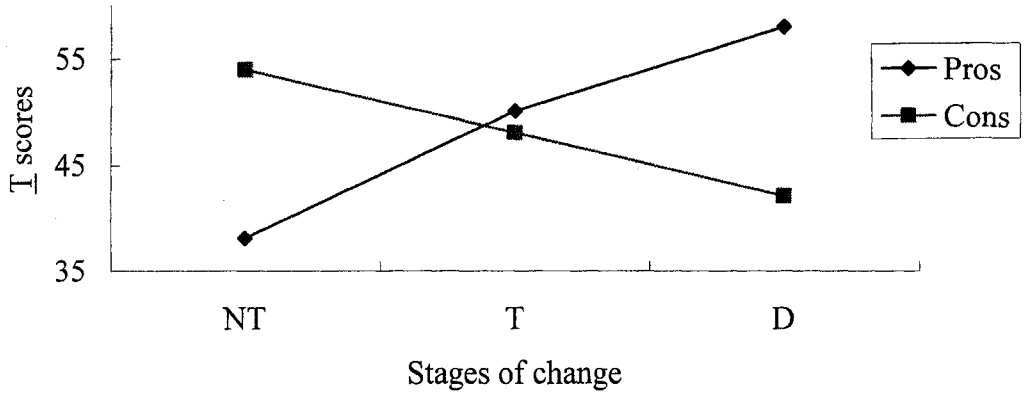

Figure 7. Standardized mean scores for decisional balance across the stages of change with other partners. NT = not thinking; T = thinking; D = doing.

Table 28

Means Among the Measures of Condom Use Attitude With Other Partners

Condom Use Attitudes	Mean
1. Your other partners would feel angry if you suggested condom use.	2.73
2. You feel closer to your other partners without a condom.	2.84
3. You think condom use helps protect your other partners and you from disease.	3.23
4. You think condom use will make sex last longer with your other partners.	2.87
5. You need your partners' cooperation with condom use.	2.89
6. Condom use makes sex feel unnatural.	2.86
7. Condom use makes you feel safer from pregnancy with your other partners.	3.81
8. Condom use causes you much trouble with your other partners.	2.77
9. Condom use helps you and your other partners to stay clean.	3.01
10. Condom use makes you feel more responsible.	3.17

DISCUSSION

This study addressed the research questions: Can a sample of Taiwanese be classified into one of the five stages of condom use? What are predictors for condom use behavioral intention among a sample of Taiwanese? This study also examined the research hypotheses: There are statistically significant relationships between individuals in the later stages of change and those in the earlier stages of change for condom use reported by those with positive aspects, better communication, higher perceived self-efficacy, and perceived higher social norms associated with condom use.

This chapter is a detailed discussion to link study findings with the research questions and hypotheses. Recommendations for the future research and developing educational programs and materials are also made.

Samples Classified Into the Stages of Change for Condom Use

The staging algorithms used in the current study have been widely used to estimate the number of subjects who fall into one of the stages in TTM on their condom use intentions and behaviors in the United State. (Galavotti et al., 1995; Grimley et al., 1992, Grimley et al., 1993; Grimley, Prochaska, et al., 1995; Lauby et al., 1998, Noar et al., 2001; O'Reilly & Haggins, 1991; Prochaska et al., 1990; Redding et al., 1996; Schenell, Galavotti, Fishbein, & Chan, 1996; Stark et al., 1999). However, this was the first example of the staging algorithm being used for condom use behavior as a factor in developing HIV/AIDS programs and materials in Taiwan. In this study, individuals were classified

into five stages of change for condom use. Because the educational programs and materials that will be developed in Taiwan will be tailored to the specific population in each stage, it is desirable to know the distribution of individuals across the stages.

From the population distribution of each stage, it was found that there were differences between behavioral intentions regarding main partner and other partners across the stages of change. More than half of the individuals (54%) were in the stage of precontemplation and contemplation for condom use with their main partner; conversely, most of the individuals (73%) have tried to use or consistently used condoms with their other partners (stages of preparation, action, and maintenance). Interestingly, the distributions across the stages of change with main partners and other partners in the current sample were similar to findings in studies conducted in the United States (Collins et al., 1999; Lauby et al., 1998); only the magnitude in each stage was different. Taiwan successfully implemented family planning during the 1960s and 1970s (Lethbridge, & Wang 1991), thereby creating the acceptance of condom use for that purpose, which could explain this situation.

Predictors, Findings, and Testing Results With Main Partner

The results of the current study found the predicting factor, self-efficacy, associated with condom use attitudes explained Taiwanese condom use behavioral intentions with main partner. These findings were the same as the studies in the United States (Galavotti et al., 1995; Grimley et al., 1992; Grimley et al., 1993; Grimley et al., 1997; Grimley, Prochaska, et al., 1995; Lauby et al., 1998; Noar et al., 2001; Prochaska et al., 1990; Redding et al., 1996). It also identified that the measurement for condom use be-

havioral intention with main partner among Taiwanese based on the constructs of TTM is applicable with this population.

The study was based on the Taiwanese socio cultural environment, and the measures of self-efficacy and condom use attitude appeared to be feasible in Taiwan. Undoubtedly, self-efficacy will be the key focus. As condom use attitude, the pros showed a factor in the self-efficacy and pro condom use attitude model, but the cons were not included in this model. It indicated that the perceived advantages of condom use were more important than the perceived disadvantages of condom use in deciding to use condoms. This study finding, as other previous studies, suggests that increasing positive condom use attitudes is more important than decreasing the negative condom use attitudes in developing educational strategies (Galavotti et al., 1995; Grimley, Prochaska, et al., 1995; Noar et al., 2001; Prochaska et al., 1994; Redding et al., 1996). To develop appropriate programs and materials to move individuals from the earlier stages to the later stages along the behavior change continuum on condom use with main partner would be the task for health educators.

Not surprisingly, the prevention of pregnancy was the highest mean among 10 condom use attitude items with main partner. This finding demonstrates the influence of family planning on condom use rooted in the Taiwanese people.

When using discriminant analysis with main partner, the model of self-efficacy and pro condom use attitude underestimated the precontemplation stage. Some individuals in the precontemplation stage were misclassified into the contemplation stage (52% correct classification, but an additional 29% were classified as the stage of contemplation). This situation caused the contemplation stage to be overestimated. Conversely,

some individuals in the contemplation stage were misclassified into the precontemplation stage. Also, 24% of individuals in the preparation stage were predicted by the contemplation stage. In these two earlier stages, the educational strategies should increase information about condom use and awareness regarding one's risk for HIV in the precontemplation stage; the educational strategies should increase self-efficacy and emphasize the pro condom use attitude in the contemplation stage for those who were vacillating in using condoms. The later stage of action and maintenance separately got 52% and 55% prediction, respectively. Also 16% of individuals in the maintenance stage were predicted by the action stage, and 24% of individuals in the action stage were predicted by the maintenance stage. The model of self-efficacy and pro condom use attitude indicates the individuals believe in these two higher stages more strongly than other stages.

Individuals in the stage of preparation were randomly assigned into the different predicted stages. That meant this self-efficacy and pro condom use model could not accurately predict individuals in the preparation stage. It indicated individuals did not hold their belief strongly and did not make their decisions either. Educational strategies should help those people commit to act for or believe in condom use in the preparation stage.

Predictors, Findings, and Testing Results With Other Partners

The study finding that the predictor of individuals with other partners was self-efficacy and pro condom use attitudes, which associated with cons condom use attitude, explained Taiwanese condom use behavioral intentions with other partners. This result was consistent with the other studies done in the United States. (Galavotti et al., 1995; Grimley et al., 1992; Grimley et al., 1993; Grimley et al., 1997; Grimley, Prochaska, et

al., 1995; Noar et al., 2001; Prochaska et al., 1990; Redding et al., 1996). Similar to the analyses with main partners, this also verified the constructs of TTM being applicable for predicting condom use behavioral intentions with other partners of Taiwanese.

The study findings suggest that the low level of self-efficacy and the pros of condom use for individuals in the earlier stages should be a priority for developing educational programs and materials with other partners. Like main partners, increasing the positive aspects of condom use is more important than decreasing the negative aspects when developing educational messages and intervention strategies (Galavotti et al., 1995; Grimley, Prochaska, et al., 1995; Noar et al., 2001; Prochaska et al., 1994; Redding et al., 1996). With educational programs and materials, it would be expected the numbers of pros for behavior change and self-efficacy among Taiwanese would increase.

Noticeably, there were 26% individuals in the preparation stage for other partners meaning they were more seriously thinking about change within the near future and had already tried to use condoms. Educational programs and materials will reinforce the pros of condom use and increase self-efficacy for these individuals who are ready to change.

Like main partners, pregnancy prevention was the highest mean followed by disease prevention for the pros of condom use. With the dangers of HIV being widely spread today, individuals who still engage in sexual behavior with other partners should know the means of protection from the disease. However, 27% of individuals with other partners who were in the stages of precontemplation and contemplation are at greater risk of contracting or transmitting the disease. When asked the question "Would you tell your other partner if you had HIV?" only 43% of people said they would almost always or al

ways tell their other partners. Alarmingly, 26% of individuals with main partners admitted they had other partners, and it would be easy to bring disease to their main partners.

When we looked at the individuals with other partners in the model of self-efficacy and the pros of condom use, 73% of these individuals were classified into the three stages (not thinking, thinking, and doing) by virtue of where they belonged in the classification category. That meant the model of self-efficacy and pros of condom use was a strong predictor of current condom use with other partners. Therefore, educational programs and materials should be developed to move individuals from the earlier stages to the later stages along the behavior change continuum.

Implications for Unremarkable Variables

In this study, social norms did not show differences between the earlier stages and the later stages of condom use either with main partners or with other partners. One reason for this may be that the concept of using condoms has been popular among Taiwanese since the implementation of family planning during the 1960s, and it might cause the ceiling effect in Taiwan.

Communication with main partners or other partners was not a remarkable construct for condom use in Taiwanese. There exists a distinct separation between the views of sexual behavior in American and Taiwanese societies, which involves the deeper issues of education, culture, and society. In Taiwanese society, sex is a very private topic, which is suppressed and sometimes regarded as a "dirty thing." People do not get adequate sexual education at school. Parents also do not talk about sex to their children. The topic of sex is forbidden in public speaking. As a result, people avoid talking about sex

and its related behaviors and products. Ironically, sexual businesses are on the corner of the people's neighborhood. The shortage of communication between individuals and their partners reflects the sexual repression of Taiwanese society and that people do not have correct sexual information. It also explains why communication did not influence condom use behavioral intention among a sample of Taiwanese.

Recommendations for Future Research

This study provided some insights into the area of condom use and HIV/AIDS prevention among Taiwanese. The educational programs and materials would reflect the behavioral techniques employed by individuals to modify the deficits in the stages based on TTM. Eleven change processes have been developed for condom use in TTM (Prochaska et al., 1992; Prochaska et al., 1988; Grimley et al., 1997; Noar et al., 2001; Redding & Rossi, 1999). Incorporating the strategies of change process into HIV/AIDS education programs and materials is likely to lead to a successful behavior change. The 11 strategies of change process can be divided into two broad categories, experiential processes, and behavioral processes. Experiential processes include activities related to thinking and experiencing emotion about changing. That includes consciousness raising, self-reevaluation, dramatic relief, environment reevaluation and social liberation. Behavioral processes include the categories of behavior, which are assumed to be helpful for changing this behavior. That includes self-liberation, counter conditioning, stimulus control, reinforcement management, helping relationships, and assertiveness. Providing individuals in the stages of change with tailor made educational programs and materials that guide them through the stages to successful action and maintenance is crucial. During and after

educational programs, conducting evaluation research to assess the change processes of TTM and further test the applicability of TTM to the Taiwanese population is necessary.

Conclusion

This study evaluated a quantitative survey designed to assess condom use attitudes, communication, self-efficacy, and social norms for condom use among a sample of Taiwanese based on constructs from the TTM and SCT. The findings of self-efficacy associated with condom use attitude were strong predictors for condom use with main partner and other partners among a sample of Taiwanese.

Educational programs and materials should be offered based on the findings of this study, especially this study designed for the Taiwanese culture. If these programs and materials can be implemented, the researcher believes that a profound improvement in the HIV/AIDS situation in Taiwan would be achieved.

REFERENCES

Allen, J., & Allen, R. F. (1986). Achieve health promotion objectives through cultural change systems. American Journal of Health Promotion, 1, 42-49.

Amaro, H. (1995). Love, sex, and power: Considering women's realities in HIV prevention. American Psychologist, 50, 437-447.

Bandura, A. (1977). Self-efficacy: Toward an unifying theory of behavior change. Psychological Review, 84, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

Bandura, A. (1986). Social foundation of thought and action. A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.

Bowen, A. M., & Trotter, R. (1995). HIV risk in intravenous drug users and crack cocaine smokers: Predicting stage of change for condom use. Journal of Consulting and Clinical Psychology, 63, 238-248.

Boyer, C. B., Shafer, M., & Techann, J., M. (1997). Evaluation of a knowledge and cognitive behavioral skill-building intervention to prevent STD and HIV infection. Adolescence, 32, 25-42.

Brason, B. M., Peterman, T. A., Cannon, R. O., Ransom, R., & Zaidi, A. A. (1998). Group counseling to prevent STD and HIV: A randomized control trial. Atlanta, GA: Centers for Disease Control and Prevention, National Center for HIV, STD and TB Center.

Centers for Disease Control and Prevention. (2000). Sexually transmitted disease surveillance, 1999. Atlanta, GA: Division of STD Prevention.

Centers for Disease Control and Prevention AIDS Community Demonstration Projects Research Group. (1999). Community level HIV intervention in 5 cities: Final outcome data from the CDC AIDS community demonstration project. American Journal of Public Health, 89, 336-345.

Collins, C., Kohler, C., DiClemente, R., & Wang, M. Q. (1999). Evaluation of the exposure effects of a theory-based street outreach HIV intervention on African-American drug users. Evaluation and Program Planning, 22, 279-293.

Corby, N. H., Wolitski, R. J., Thronton-Johson, S., & Tanner, W. M. (1991). AIDS knowledge, perception of risk, and behaviors among female sex partners of injection drug users. AIDS Education & Prevention, 3, 353-366

Detels, R., English, P., & Visscher, B. R. (1989). Seroconversion, sexual activity and condom use among 2915 HIV seronegative men followed for up to three years. Journal of Acquired Immune Deficiency Syndromes, 2, 77-83.

Fishbein, M. Bandura A., & Triandis, H. C. (1992). Factor influencing behavior and behavior change: Final report—theorist's workshop. Rockville, MD: National Institute of Mental Health.

Fleisher, J. M., Senie, R. J., Minkoff, H., & Jaccard, J. (1994). Condom use relative to knowledge of sexually transmitted disease prevention. Journal of Community Health, 19, 395-407.

Freimuth, V. S., Hammond, S. L., Edgar, T., McDonald, D. A., & Fink, E. L. (1992). Factor explaining intent, discussion and use of condoms in first time encounters. Health Education Research, 7, 203-215.

Galavotti, C. Carbral, R, Lansky, A. Grimley, D. M. Riley, G. E., & Prochaska, J. O. (1995). Validation of measures of condom and other contraceptive use among women at high risk for HIV infection and unintended pregnancy. Health Psychology, 14, 570-578.

Grimley, D. M., DiClemente, R. J., Prochaska, J. O., & Prochaska, G. E. (1995). Preventing adolescent pregnancy, STDs, and HIV: A promising new approach. Family Life Educator, 13, 7-15.

Grimley, D. M., Edward, W. E., DiClemente, R. J., & Lee, P. (2004). Condom use among low-income African American males attending an STD clinic. American Journal of Health Behavior, 28, 33-42.

Grimley, D. M., Prochaska, G. E., & Prochaska, J. O. (1997). Condom use adoption and continuation: A transtheoretical approach. Health Education Research, 12, 61-75.

Grimley, D. M., Prochaska, G. E., Prochaska, J. O., Velicer, W. F., Galavotti, C., Rebecca J., et al. (1996). Cross-Validation of measures assessing decisional balance and self-efficacy for condom use. American Journal of Health behavior, 20, 406-416.

Grimley, D. M., Prochaska, J. O., Velicer, W. F. & Prochaska, G. E. (1995). Contraceptive and condom use adoption and maintenance: A stage paradigm approach. Health Education Quarterly, 22, 20-35.

Grimley, D. M., Riley, G. E., Bellis, J. & Prochaska, J. O. (1993). Assessing the stages of change and decision-making for contraceptive use for the prevention of pregnancies, STDs and AIDS. Health Education Quarterly, 20, 445-470.

Grimley, D. M., Riley, G. E., Prochaska, J. O., Redding, C. A., Ruggiero, L. Velicer, W. F., et al. (1992). The application of the transtheoretical model to contraceptive and condom use in high-risk women. (Contract Rep. No. 92-109). Atlanta, GA: Centers for Disease Control and Prevention.

Helweg-Larsen, M., & Collins, B. E. (1994). The UCLA multidimensional condom attitudes scale: Documenting the complex determinants of condom use in college students. Health Psychology, 13, 224-237.

Hollar, D. S., & Snizek, W. E. (1996). The influences of knowledge of HIV/AIDS and self-esteem on the sexual practices of college students. Social Behavior and Personality, 24, 75-85.

Jessor, R., Turbin, M. S., & Costa, F. M. (1998). Protective factors in adolescent health behavior. Journal of Personality amd Social of Psychology, 75, 788-800.

Kalichman, S. C., Cherry, C., & Browne-Sperling, F. (1999). Effectiveness of a video based motivational skills building HIV risk reduction intervention for inner city Africa American men. Journal of Consult Clinic Psychology, 67, 959-966.

Kalichman, S. C., Nachimson, D., & Cherry, C. (1998). AIDS treatment advances and behavioral prevention setbacks: Preliminary assessment of reduced perceived threat of HIV-ADS. Health Psychology, 17, 546-550.

Kamb, M. L. Fishbein, M., & Douglas, J. M. (1998). Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: A randomized controlled trial. Project respect study group. Journal of American Medical Association, 280, 1161-1167.

Kane, S. (1990). AIDS, addiction and condom use: Sources of sexual risk for heterosexual women. Journal of Sex Research, 27, 427-444.

Lauby, J.L., Semaan, S., Cohen, A., Levaiton, L., Gielen, A., Pulley, L.V., et al. (1998). Self-efficacy, decisional balance and stages of change for condom use among women at risk of HIV infection. Health Education Research, 13, 343-356.

Lethbridge, D. J., & Wang, R. (1991). Pattern of contraceptive use among urban women in Taiwan. Health Care for Women International, 12, 431-441.

Lew-Ting, C. Y., & Chen, S. S. (2000). Prevention is the best policy—the public's belief of AIDS and STDs control and attitude towards condom use in Taiwan. Chinese Journal of Public Health, 19, 180-191.

Lewis, J. E., Malow, R. M., & Ireland, S. J. (1997). HIV/AIDS risk in heterosexual col lege students: A review of a decade of literature. Journal of American College Health, 45, 147-157.

Marcus, A. C., & Crane, L. A. (1998). A review of cervical cancer screening intervention research: Implication for public health programs and future research. Preventive Medicine, 27, 13-31.

Marin, B. V., Gomez, C. A., & Tschann, J. M. (1993). Condom use among Hispanic men with secondary female sexual partners. Public Health Reports, 108, 42-750.

McConnaughy, E. A., DiClemente, C. C., Prochaska, J. O.. & Velicer, W. F. (1989). Stages of change in psychotherapy: A follow-up report. Psychotherapy: Theory, Research, and Practice, 4, 494-503.

McConnaughy, E. A., Prochaska, J. O., & Velicer, W. F. (1983). Stages of change in psychotherapy: Measurement and sample profiles. Psychotherapy: Theory, Research, and Practice, 20, 368-375.

National Institute Of Mental Health Prevention Trial Group. (1998). A randomized clinical trial of small group counseling to reduce risk for HIV. Science, 280, 1889-1894.

Noar, S. M., Morokoff, J. M., & Redding, C. A. (2001). An examination of transtheoretical predictors of condom use in the late-adolescent heterosexual men. Journal of Applied Biobehavioral Research, 6, 1-26.

O'Leary, A. (1985). Self-efficacy and health. Behavioral Research and Therapy, 23, 437-451.

O'Reilly, K. R., & Haggins, D. L. (1991). AIDS community demonstration projects for HIV prevention among hard-to-reach groups. Public Health Reports, 45, 714-720.

Orubuloye, I. O., Caldwell, J. C., & Caldwell, P. (1993). African women's control over their sexuality in an era of AIDS: A study of the Yuruba of Nigeria. Society Science Medicine, 17, 455-485.

Plichta, S. B., Weisman, C. S., Nathanson, C. A., Ensminger, M. E., & Robinson, J. C. (1992). Partner-specific condom use among adolescent women clients of a family planning clinic. Journal of Adolescent Health, 13, 506-511.

Potter, L. B., &Anderson, J. E. (1993). Pattern of condom use and sexual behavior among never-married women. Sexual Transmitted Diseases, 20, 201-208.

Prochaska, J. O. (1979). Systems of psychotherapy: A transtheoretical analysis. Pacific Grove, CA: Brooks-Cole.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. Journal of Consulting and Clinical Psychology, 5, 390-395.

Prochaska, J. O., & DiClemente, C. C. (1984). The transtheoretical approach: Crossing the traditional boundaries of therapy. Homewood, IL: Dow Jones/ Irwin.

Prochaska, J. O., & DiClemente, C. C. (1984). In search of how people change: Applications to addictive behavior. American Psychologist, 47, 102-114.

Prochaska, J. O., Harlow, L. L., Velicer, W. F., Redding, C. A., Snow, M. G., Rossi, S. R., et al. (1990). Stage of change, self-efficacy, and decisional balance for condom use with a high-risk sample. (Contract Rep. No. 0-415-002). Atlanta, GA: Centers for Disease Control and Prevention.

Prochaska, J. O., Redding, C. A., & Evers, K. (1997). The transtheoretical model and stages of change. In K. Glantz, F. M. Lewis, & B. K. Rimder (Eds.), Health behavior and health education: Theory, research, and practice (pp. 60-84) San Francisco: Jossey-Bass.

Prochaska, J. O., Velicer, W. F., DiClemente, C. C., & Fava, J. (1988). Measuring processes of change: Applications to the cessation of smoking. Journal of Consulting and Clinical Psychology, 56, 520-528.

Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcu, B. H., Rakoski, W., et al. (1994). Stages of change and decisional balance for 12 problem behaviors. Health Psychology, 13, 39-46.

Redding, C. A., & Rossi, J. S. (1999). Testing a model of situational self-efficacy for safer sex among college students: Stage of change and gender-based differences. Psychology and Health, 14, 467-486.

Redding, C. A., Rossi, J. S., Armstrong, K. A., Coviello, D., Barron, D., Evers, K., et al. (1996). Stages, pros, cons, and efficacy for condom use in at-risk adolescent females (abstract). Annals of Behavior Medicine: Processing of the Fourth International Congress of Behavioral Medicine, 18, (SupplCO15) S 194.

Romer, D., Stanton, B., & Galbraith, J. (1999). Parental influence on adolescent sexual behavior in high-poverty setting. Archives of Pediatrics and Adolescent Medicine, 153, 1055-1062.

Rosenthal, S. L., Biro, E. M., Succop, P. A., Baker, J. G., & Stanberry, L. R. (1994). Reasons for condom utilization among high-risk adolescent girls. Clinical Pediatrics, 33, 706-711.

Ross, L., Kohler, C. L., Grimley, D. M., & Bellis, J. (2003). Intention to use condoms among three low-income, urban African-American sub-groups: Cocaine users, non-cocaine drug users, and non-drug users. Journal of Urban Health, 80, 147-160.

Rotheram-Borus, M. J., Cantwell, S., & Newman, P. A. (2000). HIV prevention programs with heterosexuals. AIDS, 14, S59-S67.

Saracco, A., Musicco, N., & Nicolisi, A. (1993). Man-to-woman sexual transmission of HIV: Longitudinal study of 434 steady sexual partners of infected men. Journal of Acquired Immune Deficiency Syndrome, 6, 497-502.

Schenell, D. J., Galavotti, C., Fishbein, M., & Chan, D. K. (1996). Measuring the adoption of consistent use of condoms using the stages of change model. Public Health Report, 111, S59-S68.

Sheeran, P., Abraham, C., & Orbell, S. (1999). Psychosocial correlates of heterosexual condom use: A meta-analysis. Psychological Bulletin, 125, 90-132.

Shiffiman, S. (1986). A cluster analytic classification of smoking relapse episodes. Addictive Behaviors, 11, 295-307.

Sibthorpe, B. (1992). The social construction of sexual relationships as a determinant of HIV risk perception and condom use among injection drug users. Medical Anthropology Quarterly, 6, 255-270.

Stark, M. J., Tesselaar, H. M., O'Connell, A. A., Person B., Galavotti C., Cohen A., et al. (1999). Psychosocial factors associated with the stages of change for condom use among women at risk for HIV and STDs: Implication for intervention development. Journal of Consulting and Clinical Psychology, 6, 967-968.

Survey finds alarming number of youths engage in unsafe sex. (2002, Sep. 26). Taiwan News, Taipei, p.12.

Taiwan AIDS Prevention Programs. (2001). Taiwan AIDS prevention programs--the third five-year planning. Taipei, Taiwan: The Center for Disease Control of the Republic of China.

Taiwan Center for Disease Control. (2003). AIDS statistics. Retrieved March 19, 2003, from http://www.cdc.gov.tw/ch/

Taiwan's FP program rated best in third world; UK ranks first among large developed nations. (1988). Family Planning Perspectives, 20, 46-47.

Taiwan Health Department. (2003). Taiwan public health report: Control of communicable disease. Taipei, Taiwan: Health Department of the Republic of China.

The Regulation fourth of the regulation of drug abuse prevention of the Republic of China. (1998). The regulation of drug abuse prevention of Republic of China. Taipei, Taiwan: Juridical Department of the Republic of China.

Velicer, W. F., DiClemente, C. C., Prochaska, J. O., & Brandenbung, N. (1985). Decisional balance measure for assessing and predicting smoking status. Journal of Personality and Social Psychology, 48, 1279-1289.

Velicer, W. F., DiClemente, C. C., Rossi, J. S., & Prochaska, J. O. (1990). Relapse situations and self-efficacy: An integrated model. Addictive Behavior, 15, 271-283.

Winstock, H. S., Lindan, C., Bolan, G., Kegeles, S. M., & Hearst, N. (1993). Factors associated with condom use in a high-risk heterosexual population. Sexually Transmitted Disease, 20, 14-20.

Wright, D. (1992). Impediments to safer heterosexual sex: A review of research with young people. AIDS Care, 4, 11-23.

Wulfert, E., & Wan, C. K. (1993). Condom use: A self-efficacy model. Health Psychology, 12, 346-353.

APPENDIX A

UNIVERSITY OF ALABAMA AT BIRMIGHAM INSTUTUTIONAL REVIEW BOARD APPROVAL FORM

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Institutional Review Board for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

The Institutional Review Board for Human Use (IRB) has an approved Multiple Project Assurance with the Department of Health and Human Services and is in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines. The Assurance became effective on January 1, 1999 and the approval period is for five years. The Assurance number is M-1149.

Principal Investigator:	WANG, LEE
Co-Investigator(s):	
Protocol Number:	**X030530027**
Protocol Title:	*Developing HIV Educational Materials in Taiwan Based on the Transtheoritical Model of Change and Social Cognitive Theory*

The IRB reviewed and approved the above named project on 07/03/03. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 7-3-03

Date IRB Approval Issued: 07/03/03

Marilyn Doss

Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104

7/21/'03

Project Revision/Amendment Form (revised 7-15-02)

Federal regulations require IRB approval before implementing proposed changes.
Please complete this form and attach the changed research documents. Change means any change, in content or form, to the protocol, consent form, or any supportive materials (such as the Investigator's Brochure, questionnaires, surveys, advertisements, etc.)

Principal Investigator: Lee Wang Date: 7/18/03
Contact: 1617 Treecrossings PKWY Hoover, AL35244 Phone #:(205)9825979
Campus Address: Ryals Public Health Building, 1665 University Blvd.
Study/Protocol Title: Assessing HIV Risk Behaviors among Individuals in Taiwan Based on The Transtheoritical Model of Change and Social Cognitive Theory
IRB Protocol #: X030530027

RECEIVED JUL 18 2003 OFFICE OF INSTITUTIONAL REVIEW BOARD

Current Status of Project: (check only one)

- ☐ Currently in Progress (# participants entered: ____)
- ☑ Study has not yet begun (no participants entered)
- ☐ Closed to participant enrollment (remains active); # participants on therapy/intervention____; # participants in long-term follow-up only

This submission changes the status of this study in the following manner: (check all that apply)

- ☐ Protocol Revision
- ☐ Protocol Amendment
- ☐ Study Closed to participant entry
- ☐ Study Terminated
- ☐ Revised Consent Form
- ☐ Addendum (new) consent form
- ☐ Enrollment temporarily suspended by sponsor
- ☑ Other, (specify) Only Changing Title

1. Briefly describe, and explain the reason for, the revision or amendment. Include a copy of supportive documents with changes highlighted. Please highlight changes/revisions/additions to the consent form, protocol, research questionnaire, etc.
   Developing HIV educational materials will be the next stage of this study, so Dr. Diane, Grimley, the researcher advisor, suggested that this study change title from Developing HIV Educational Materials in Taiwan base on The Transtheoritical Model of Change and Social Cognitive Theory to Assessing HIV Risk Behaviors among Individuals in Taiwan Based on The Transtheoritical Model of Change and Social Cognitive Theory.

1. Does this revision/amendment revise or add a genetic or storage of samples component?
   ☐ Yes ☑ No If yes, please see the Guidebook to assist you in revising or preparing your submission documents or call the IRB office at 4-3789.

2. Does the change affect subject participation (e.g. procedures, risks, costs, etc.)?
   ☐ Yes ☑ No

4. Does the change affect the consent document? ☑ Yes ☐ No If yes, briefly discuss the changes.
   Yes; the study is changed by the title
   Include the revised consent form with the changes highlighted.
   Will any participants need to be reconsented as a result of the changes? ☐ Yes ☑ No
   If yes, when will participants be reconsented?

Signature of Principal Investigator Lee Wang Date July 18,03

FOR IRB USE ONLY

DOLA - 7/3/03

APPROVED Marilyn Doss 7/18/03
MARILYN DOSS, M.A.
Vice Chair - IRB

Revised 7-15-02

APPENDIX B

THE SURVEY FOR DEVELOPING HIV/AIDS EDUCATIONAL MATERIALS IN TAIWAN

The Survey for Developing HIV/ AIDS Educational Materials in Taiwan

This survey is on behalf of Department of Health Behavior in University of Alabama at Birmingham, AL, U. S. and Department of Public Health of Chung Shang Medical University in Taiwan. This information will help us to develop HIV educational program in Taiwan. Your questionnaire is completely anonymous and all answers you give will be confidential. When the result of this survey is completed, your answers will be grouped with others so no one will know how you answered the questions. It will take about 20 minutes; we sincerely wish your cooperation. Thank you very much.

A. Demographic

1. How old are you? _____

2. Are you male or female?
(1) Male
(2) Female

3. What is your marital status?
(1) Never married
(2) Married
(3) Living as married
(4) Divorced/Separated
(5) Widowed

4. What is the highest year of school you completed?
(1) Elementary school
(2) Junior high school
(3) Senior high school
(4) College or University
(5) Graduate school or more

A-1. Sex Orientation

1. When you have sex, are you partner of
(1) Opposite sex
(2) Same sex
(3) Both sex

The following questions relate to condom use. The questions for the main partner are the same as for the other partner. These questions do not judge you or your partner, and we sincerely wish to get your honest answers in order to prevent HIV.

B. Main Partner

1. Do you have a main or steady sex partner?
(1) Yes
(2) No--Skip to section C of page 5

2. How long have you been with your main partner?
(1) 1-6 month
(2) 1 year
(3) 2 year
(4) 3 years
(5) 4 years or more

3. When you have sex with your main partner, how often do you use a condom in the past 2 months?
(1) Every time
(2) Almost every time—Skip to question 5 below
(3) Sometimes—Skip to question 5 below
(4) Almost never—Skip to question 5 below
(5) Never—Skip to question 5 below

4. How long have you been using a condom every time you have sex with your main partner? For.....

(1) Less than 6 months—Skip to section B1

(2) More than 6 months—Skip to section B1

5. Are you thinking about starting to use condom every time you have sex with your main partner in the next 6 months?

(1) Yes—Go to next question

(2) No—Skip to section B1

6. Are you planning to start to start using condoms every time you have sex with your main partner in the next 30 days?

(1) Yes—Go to next question

(2) No—Skip to section B1

7. Have you used condoms with your main partner almost every time in the past 2 months?

(1) Yes—Go to next section B1

(2) No—Go to next section B1

B1. Condom Use Attitude—Main Partner

Please circle one of the answers that you are satisfied.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Your main partner would feel angry if you suggested condom use.					
2. You feel closer to your main partner without a condom.					
3. You think condom use help protect your main partner and you from disease.					
4. You think condom use will make sex last longer with your main partner.					
5. You need your partner's cooperation with condom use.					
6. Condom use makes sex feel unnatural.					
7. Condom use makes you feel safer from pregnancy with your main partner.					
8. Condom use causes you much trouble with your main partner.					
9. Condom use helps you and your main partner stay clean.					
10. Condom use makes you feel more responsible.					

B2. Communication—Main Partner

Please circle one of the answers that you are satisfied.

	Never (0%)	Almost never (25%)	Some-times (50%)	Almost always (75%)	Always (100%)
1. You talk with your main partner about the need for condom use before sex.					
2. You are shy or afraid of talking with your main partner about condom use.					
3. Your main partner would not like to talk with you about condom use.					
4. You ask your main partner's sexual history before having sex.					
5. If you had a HIV, you would tell your main partner.					

B3. Self-Efficacy—Main Partner

Please circle one of the answers that you are satisfied.

	Not at all confident (0%)	Slight confident (25%)	Some confident (50%)	Confident (75%)	Very confident (100%)
1. How confident are you that you could use condoms every time you have been drinking alcohol or taking drugs with your main partner.					
2. How confident are you that you could use a condom every time you are sexually aroused with your main partner.					
3. How confident are you that you could use a condom every time you think your main partner might get upset about using condoms.					
4. How confident are you that you could use a condom every time, especially when you have to stop what you're doing with your main partner and go out and get one.					
5. How confident are you that you could use condom every time when your main partner doesn't want to use one.					

C. Other Partners

1. In the last 6 months, have you had you sex with someone other than a main partner?
(1) Yes
(2) No—Skip to section D of page 8

2. When you have sex with your other partners, how often do you use a condom in the past 2 months?
(1) Every time
(2) Almost every time—Skip to question 5 below
(3) Sometimes—Skip to question 5 below
(4) Almost never—Skip to question 5 below
(5) Never—Skip to question 5 below

3. How long have you been using a condom every time you have sex with your other partners? For…..
(1) Less than 6 months—Skip to section C1
(2) More than 6 months—Skip to section C1

4. Are you thinking about starting to use condom every time you have sex with your other partners in the next 6 months?
(1) Yes—Go to next question
(2) No—Skip to section C1

5. Are you planning to start to start using condoms every time you have sex with your other partners in the next 30 days?
(1) Yes—Go to next question
(2) No—Skip to section C1

6. Have you used condoms with your other partners almost every time in the past 2 months?
(1) Yes—Go to next section C1
(2) No—Go to next section C1

C1. Condom Use Attitude—Other Partners

Please circle one of the answers that you are satisfied.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Your other partners would feel angry if you suggested condom use.					
2. You feel closer to your other partners without a condom.					
3. You think condom use help protect your other partners and you from disease.					
4. You think condom use will make sex last longer with your other partners.					
5. You need your other partners' cooperation with condom use.					
6. Condom use makes sex feel unnatural..					
7. Condom use makes you feel safer from pregnancy with your other partners.					
8. Condom use causes you much trouble with your other partners.					
9. Condom use help you and your other partners stay clean.					
10. Condom use makes you feel more responsible.					

C2. Communication Skill—Other Partners

Please circle one of the answers that you are satisfied.

	Never (0%)	Almost never (25%)	Some-times (50%)	Almost always (75%)	Always (100%)
1. You talk with your other partners about the need for condom use before sex.					
2. You are shy or afraid of talking with your other partners about condom use.					
3. Your other partners would not like to talk with you about condom use.					
4. You ask your other partners' sexual history before having sex.					
5. If you had a HIV, you would tell your other partners.					

C3. Self-Efficacy—Other Partners

Please circle one of the answers that you are satisfied.

	Not at all confident (0%)	Slight confident (25%)	Some confident (50%)	Confident (75%)	Very confident (100%)
1. How confident are you that you could use condoms every time you have been drinking alcohol or taking drugs with your other partners.					
2. How confident are you that you could use a condom every time you are sexually aroused with your other partners.					
3. How confident are you that you could use a condom every time you think your other partners might get upset about using condoms.					
4. How confident are you that you could use a condom every time, especially when you have to stop what you're doing with your other partners and go out and get one.					
5. How confident are you that you could use condom every time when your other partners doesn't want to use one.					

D. Social Norms

Please circle one of the answers that you are satisfied.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. As far as you know condom is acceptable in your society.					
2. As far as you know condoms in your society are easily available.					
3. As far as you know most people think it is important to talk about condom use with their partners.					
4. As far as you know most people think it is smart to use condoms.					
5. As far as you know most people use condoms every time they have sex.					

APPENDIX C

THE SURVEY FOR DEVELOPING HIV/AIDS EDUCATIONAL MATERIALS IN TAIWAN (CHINESE)

發展台灣防範愛滋病教材問卷調查

本問卷由美國阿拉巴馬大學伯明翰校區**(University of Alabama at Birmingham)**健康行爲學系及台灣中山醫學大學公共衛生學系聯合提供。這份資料將對台灣防範愛滋病教材的發展有很大的幫助。本問卷不具名，在您作答後，所有問卷將隨機混合，所以您的答案和資料將完全保密。您約需花費 **20** 分鐘完成本問卷。我們誠摯地盼望您的合作。謝謝您。

一. 基本資料

1. 年齡 _____
2. 性別 __1)男性 __2)女性
3. 婚姻狀況 __1)未婚 __2)已婚 __3)同居 __4)離婚、分居 __5)喪偶
4. 最高學歷 __1)小學 __2)國中 __3)高中 __4)大專、大學 __5)研究所

一～一. 您的性傾向 __1)異性戀者 __2)同性戀者 __3)雙性戀者

以下的問題是有關您和性伴侶之間使用保險套的相關問題，主要性伴侶與其他性伴侶的題目是一樣的。這個問卷是用來發展台灣防範愛滋病教材，而不是來評斷您與您的伴侶。我們誠摯的希望您能誠實回答。

二. 主要性伴侶

下列問題與您的性伴侶及保險套使用狀況有關，請勾選您的答案：

1. 您是否有主要或固定的性伴侶？
___1)有
___2)沒有（若勾此答案，請直接翻到第 5 頁「三. 其他性伴侶」）

2. 您與您的性伴侶成爲固定性伴侶模式，已經持續多久時間？
___1)1 至 6 個月
___2)1 年
___3)2 年
___4)3 年
___5)4 年或 4 年以上

3. 當您與您的主要性伴侶做愛時，您過去 2 個月使用保險套的狀況：
__1)每次都使用
__2)幾乎每次都使用（若勾此答案，請跳答下面第 5 題）
__3)有時候使用（若勾此答案，請跳答下面第 5 題）
__4)幾乎沒使用（若勾此答案，請跳答下面第 5 題）
__5)未使用（若勾此答案，請跳答下面第 5 題）

4. 您與您的主要性伴侶，持續每次都使用保險套的習慣有多久了？
__1)少於 6 個月
__2) 6 個月或 6 個月以上
（若勾此答案，請直接翻到第 3 頁，並完成第 3 頁和第 4 頁的問題。）

5. 您是否考慮未來 6 個月內，每次與您的主要性伴侶做愛時，都使用保險套？
__1)是
__2)不是（若勾此答案，請直接翻到第 3 頁，並完成第 3 頁和第 4 頁的問題。）

6. 您是否計劃未來 1 個月內，每次與您的主要性伴侶做愛時，都使用保險套？
__1)是
__2)不是 （若勾此答案，請直接翻到第 3 頁，並完成第 3 頁和第 4 頁的問題。）

7. 在過去 2 個月內，與您的主要性伴侶做愛時，您是否幾乎每次都使用保險套？
__1)是
__2)不是

二～一. 保險套態度：主要性伴侶

請在下列問題勾選您的答案 ：

1. 如果您要求使用保險套，您的主要性伴侶會生氣。	非常不同意	不同意	沒意見	同意	非常同意
2. 如果不使用保險套，您覺得與您的主要性伴侶會更親近。	非常不同意	不同意	沒意見	同意	非常同意
3. 您覺得使用保險套後，可避免您及您的主要性伴侶得到性病及愛滋病。	非常不同意	不同意	沒意見	同意	非常同意
4. 您覺得使用保險套時，會讓您與您主要性伴侶的做愛時間更長久。	非常不同意	不同意	沒意見	同意	非常同意
5. 當您使用保險套時，您需要您主要性伴侶的合作。	非常不同意	不同意	沒意見	同意	非常同意
6. 當您使用保險套時，會讓您覺得做愛不自然。	非常不同意	不同意	沒意見	同意	非常同意
7. 使用保險套，可以讓您與您主要性伴侶避孕。	非常不同意	不同意	沒意見	同意	非常同意
8. 使用保險套，會爲您與您主要性伴侶帶來很多麻煩。	非常不同意	不同意	沒意見	同意	非常同意
9. 您覺得使用保險套，可協助保持您與您主要性伴侶性生活的乾淨。	非常不同意	不同意	沒意見	同意	非常同意
10. 使用保險套，會讓您覺得您對您主要性伴侶更負責任。	非常不同意	不同意	沒意見	同意	非常同意

二～二. 溝通: 主要性伴侶

下列問題，與您及您主要性伴侶的溝通情況有關，請勾選您的答案 ：

1. 做愛前您會向您的主要性伴侶提出使用保險套要求。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
2. 您會羞於或害怕向您的主要性伴侶提起使用保險套。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
3. 您的主要性伴侶願意和您談使用保險套。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
4. 在您與您的主要性伴侶發生性關係前，您瞭解對方過去的性經驗。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
5. 如果您呈現愛滋陽性反應，您會告訴您的主要性伴侶。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)

二～三. 實踐: 主要性伴侶

下列問題，與您使用保險套的確定態度有關，請勾選您的答案：

1. 即使飲酒或瞌磕藥後，您確定與您的主要性伴侶做愛時每次都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
2. 您確定每次與您的主要性伴侶做愛時，都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
3. 在您認爲您的主要性伴侶對您要使用保險套生氣的前提下，您確定每次做愛都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
4. 您確定能每次與您的主要性伴侶做愛都能使用保險套，就算必須暫停您們的親密行爲，外出購買保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
5. 您認爲在您的主要性伴侶不願意使用保險套的前提下，您確定每次做愛都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)

三. 其他性伴侶

1. 您是否有其他的性伴侶
___1)有
___2)沒有（若勾此答案，請直接翻到第 8 頁，並完成第 8 頁的問題。）

2. 當您與您的其他性伴侶做愛時，您過去 2 個月使用保險套的狀況：
__1)每次都使用
__2)幾乎每次都使用（若勾此答案，請跳答下面第 4 題）
__3)有時候使用（若勾此答案，請跳答下面第 4 題）
__4)幾乎沒使用（若勾此答案，請跳答下面第 4 題）
__5)未使用（若勾此答案，請跳答下面第 4 題）

3. 您與您的其他性伴侶持續每次都使用保險套的習慣有多久了？
__1)少於 6 個月
__2) 6 個月或 6 個月以上
（若勾此答案，請直接翻到第 6 頁，並完成第 6 頁和第 7 頁的問題。）

4. 您是否考慮未來 6 個月內，每次與您的其他性伴侶做愛時，都使用保險套？
__1)是
__2)不是（若勾此答案，請直接翻到第 6 頁，並完成第 6 頁和第 7 頁的問題。）

5. 您是否計劃未來 1 個月內，每次與您的其他性伴侶做愛時，都使用保險套？
__1)是
__2)不是 （若勾此答案，請直接翻到第 6 頁，並完成第 6 頁和第 7 頁的問題。）

6. 在過去 2 個月內，與您的其他性伴侶做愛時，您是否幾乎每次都使用保險套？
__1)是
__2)不是

三～一. 保險套態度: 其他性伴侶

請在下列問題勾選您的答案：

1. 如果您要求使用保險套，您的其他性伴侶會生氣。	非常不同意	不同意	沒意見	同意	非常同意
2. 如果不使用保險套，您覺得與您的其他性伴侶會更親近。	非常不同意	不同意	沒意見	同意	非常同意
3. 您覺得使用保險套後，可避免您及您的其他性伴侶得到性病及愛滋病。	非常不同意	不同意	沒意見	同意	非常同意
4. 您覺得使用保險套時，會讓您與您其他性伴侶的做愛時間更長久。	非常不同意	不同意	沒意見	同意	非常同意
5. 當您使用保險套時，您需要您其他性伴侶的合作。	非常不同意	不同意	沒意見	同意	非常同意
6. 當您使用保險套時，會讓您覺得做愛不自然。	非常不同意	不同意	沒意見	同意	非常同意
7. 使用保險套，可以讓您與您其他性伴侶避孕。	非常不同意	不同意	沒意見	同意	非常同意
8. 使用保險套，會爲您與您其他性伴侶帶來很多麻煩。	非常不同意	不同意	沒意見	同意	非常同意
9. 您覺得使用保險套，可協助保持您與您其他性伴侶性生活的乾淨。	非常不同意	不同意	沒意見	同意	非常同意
10. 使用保險套，會讓您覺得您對您其他性伴侶更負責任。	非常不同意	不同意	沒意見	同意	非常同意

三～二. 溝通: 其他性伴侶

下列問題與您及您其他性伴侶的溝通情況相關，請勾選您的答案：

1. 做愛前您會向您的其他性伴侶提出使用保險套要求。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
2. 您會羞於或害怕向您的其他性伴侶提起使用保險套。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
3. 您的其他性伴侶願意和您談使用保險套。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
4. 在您與您的其他性伴侶發生性關係前，您瞭解對方過去的性經驗。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)
5. 如果您呈現愛滋陽性反應，您會告訴您的其他性伴侶。	不會 (0%)	幾乎不會 (25%)	有時候會 (50%)	時常如此 (75%)	一直如此 (100%)

三～三. 實踐: 其他性伴侶

下列問題與您使用保險套的確定態度相關，請勾選您的答案：

1. 即使飲酒或瞌磕藥後，您確定與您的其他性伴侶做愛時每次都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
2. 您確定每次與您的其他性伴侶做愛時，都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
3. 在您認爲您的其他性伴侶對您要使用保險套生氣的前提下，您確定每次做愛都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
4. 您確定能每次與您的其他性伴侶做愛都能使用保險套，就算必須暫停您們的親密行爲，外出購買保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)
5. 您認爲在您的其他性伴侶不願意使用保險套的前提下，您確定每次做愛都能使用保險套。	沒信心 (0%)	信心低落 (25%)	不一定 (50%)	有信心 (75%)	十足信心 (100%)

四. 社會風氣

請在下列問題勾選您的答案：

1. 保險套是被我們社會所接受的。	非常不同意	不同意	沒意見	同意	非常同意
2. 保險套在我們社會中是很容易取得的物品。	非常不同意	不同意	沒意見	同意	非常同意
3. 在我們社會中的大多數人，認爲伴侶之間談起保險套是非常重要的。	非常不同意	不同意	沒意見	同意	非常同意
4. 在我們社會中的大多數人，認爲使用保險套是非常聰明的。	非常不同意	不同意	沒意見	同意	非常同意
5. 在我們社會中的大多數人，做愛時會用保險套。	非常不同意	不同意	沒意見	同意	非常同意

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM
DOCTOR OF PHILOSOPHY

Name of Candidate Lee Wang

Graduate Program Health Education and Health Promotion

Title of Dissertation Assessing HIV Risk Behaviors Among Individuals in Taiwan: Application of the Transtheoretical Model and Social Cognitive Theory

I certify that I have read this document and examined the student regarding its content. In my opinion, this dissertation conforms to acceptable standards of scholarly presentation and is adequate in scope and quality, and the attainments of this student are such that _he may be recommended for the degree of Doctor of Philosophy.

Dissertation Committee:

Name		Signature
Diane M. Grimley	**, Chair**	
Connie L. Kohler		
Patricia A. Lee		
Perng-Ru Liu		
Scott W. Snyder		

Director of Graduate Program

Dean, UAB Graduate School

Date