

## EFFECTIVENESS OF A THEORY-BASED RISK REDUCTION HIV PREVENTION PROGRAM FOR RURAL VIETNAMESE ADOLESCENTS

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As of April 2003, 64,801 HIV cases have been documented in Vietnam (Policy Project 2003), 53.9 % of which are among individuals 20-29 years of age. Although HIV education efforts have increased, there remains a need for proven effective programs. We present findings from a randomized-controlled effectiveness trial of an HIV prevention program for adolescents 15-20 years. Four hundred eighty adolescents were randomized into control and intervention groups. Evaluation data were collected using the Vietnamese Youth Health Risk Behavior Instrument, including scales based on the protection motivation theory (PMT). Findings presented show significant differences in knowledge of severity and vulnerability of HIV/AIDS ( $p < .05$ ), perceptions of self-efficacy ( $p < .001$ ), and response efficacy for condom use ( $p < .05$ ) between control and intervention youth at immediate and 6-month postintervention. A significant difference was also found for response cost of condom use ( $p < .05$ ) at immediate postintervention. No significant difference was found for the construct of response cost at 6 months, and there were no significant differences for the constructs external and internal rewards. Reported engagement in vaginal sex (1.7%), or anal and/or oral sex (3.1%) was extremely low, and therefore changes in actual behaviors could not be accurately measured. However, intention to use condoms in possible future sexual encounters increased significantly ( $p < .05$ ) for the intervention youth compared to control youth between baseline

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The authors thank the directors and staff at Khanh Hoa Provincial Health Service, Nha Trang City Health Service, and Dien Khanh District Health Service. They also like to thank the residents, commune leaders, and health care providers of Dien Lac, Dien Thanh, Dien Phu, Dien An, Vinh Trung, Vinh Phuong, Vinh Thai, and Vinh Hiep communes. They particularly thank the intervention facilitators for their time and ongoing support for the program. They also thank Elinor Robinson-Mitchell and George Mitchell for assisting with the facilitator training. The project was funded by Fogarty International AIDS/FIRCA Grant 1 R03 TW05699-01.

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(74/240, 30.8%) and both immediate postintervention (132/230, 57.4%), and six month follow-up (123/228: 53.9%). These data suggest the potential applicability of the PMT for HIV program development with non-Western adolescents but also point to the need for further studies on how constructs within behavioral theories might need to be modified in different sociocultural settings.

Over the past 2 decades, significant work has been done regarding maximizing the effectiveness of HIV/AIDS prevention programs for adolescents (Jemmott & Jemmott 2000; Robin et al., 2004). This work has contributed significantly to knowledge regarding adolescent health and behavior across cultures. However, particularly in nonindustrialized countries there remains a need for more health education programs and evaluation of these programs (Merson, Dayton, & O'Reilly, 2000). In this article, we present findings from the evaluation of a theory-based HIV risk reduction program delivered in south-central Vietnam. Specifically, we present data on perceptions of sexual risk and efficacy of condom use as measured through the constructs of the protection motivation theory (PMT; Rogers, 1983). The original HIV risk reduction program, Focus on Kids, was developed in the United States for use among African American urban adolescents (Stanton et al., 1993). In Vietnam, the program was modified to be culturally appropriate both in terms of content and instructional methods for use with Vietnamese adolescents in eight rural communes surrounding Nha Trang City in Khanh Hoa Province. The program was evaluated using a modified version of the Youth Health Risk Behavior Instrument (YHRBI), which was developed in conjunction with the Focus on Kids curriculum. Both the original curriculum and the Youth Health Risk Behavior Instrument were based on the PMT (Stanton, Black, Kaljee, Ricardo, 1993).

The PMT is framed on the cognitive processes, which people may use to assess threats in the environment (threat appraisal process) and select among available coping options (coping appraisal process). In terms of HIV/STI risk and/or unwanted pregnancy, we utilized the PMT to assess the degree to which individuals perceive one or any of these as a threat in relation to their sexual decision making, and their perception of possible options to decrease that threat (e.g., abstinence, condom use).

## BACKGROUND AND SIGNIFICANCE

The first case of HIV was diagnosed in Vietnam in 1990 (Ivker 1996). Since that time, cases of HIV have been identified in all 61 provinces of the country. By the end of 2003, according to the Ministry of Health there were 76,180 documented cases of HIV in Vietnam, of which 11,659 developed AIDS and 6,550 died (Xinhua News Agency 2004). However, other estimates suggest the number of HIV infections at the end of 2003 to be 220,000 (ranging between 110,000 and 360,000), with a rate of 0.4% among the general adult population (UNAIDS, World Health Organization [WHO], 2004). Among those documented cases, 53.6 % are in young adults between the ages of 15 and 24 (Policy Project 2003). A significant proportion of the cases are among IV drug users and commercial sex workers. However, with more diligent and consistent surveillance in recent years (e.g., military recruits and prenatal clinics), there are indications of increases in HIV infection in the general population (Policy Project, 2003; UNAIDS, WHO 2002). In Nha Trang, the provincial capital of Khanh Hoa Province, the cumulative number of known HIV positive cases increased from 93

in 1993 to 743 in December 2003, with a cumulative number of 348 individuals with AIDS (Nha Trang City Health Services, 2004). Approximately 40% of the reported HIV cases are among individuals under the age of 29 years. At the provincial level, as of mid-2003, there were 1,168 HIV-positive cases in Khanh Hoa. In addition to prevention of HIV infection, condoms are a means of preventing the spread of other STIs and decreasing risk of unwanted pregnancies. In Vietnam in 2000, it was estimated that there were about 1 million new cases of STIs every year, including 150,000 syphilis cases, 150,000 gonorrhea cases, and 500,000 cases of chlamydial infection (WHO, 2000). Research suggests that many women engage in self-treatment or no treatment for STIs (Nguyen, Vo, Mai, Truong, & Ha, 1997). In addition, because there are no reporting or data collection requirements for private facilities, official figures are significantly lower than actual cases due to high utilization of private health care services for STI treatment (WHO, 2000). In 2003, in Nha Trang, a total of 498 cases of STIs were reported through public hospitals and the city clinics though again the actual number is estimated to be much higher (Nha Trang City Health Services, 2004).

Vietnam has one of the highest abortion rates in the world, with rates as high as 83.3 per 1,000 women aged 15–44 (Alan Guttmacher Institute, 1999). Estimates suggest that 44 % of pregnancies are terminated and approximately 300,000 abortions are performed annually for young women under 19 years (EC/UNFPA 1999). In 2003, in Nha Trang a total of 82 abortions were reported in young women under 24 years old. However, a majority of young, unmarried women seek abortions through private facilities through which there are no mechanisms for data collection and reporting (Nha Trang City Health Services, 2004).

Condoms are one of the least used form of contraception in Vietnam, especially among low-income individuals and youth (Ross & Phan 1997). In a 1997 survey, 92 % of ever-married women knew of condoms, an increase from 44.5 % in 1988. However, only 12.3 % of “ever-married” women report ever using a condom, and only 2.5 and 7.0 % respectively, among “ever-married” women in the 15-19- and 20-24-year age range report ever using a condom (National Committee for Population and Family Planning, 1999). Among university students who were sexually active, 44.2 % did not use any form of contraceptive (Huynh, Tuan, Nhuon, & Minh, 1997). In a study of male clients at a sexually transmitted disease (STD) clinic, 73 % had visited a commercial sex worker in the last 3 years, and 70 % surveyed had never used a condom (Thuy et al., Phon 1999). In a survey in the Western Highland region of Vietnam, among married individuals 36.9 % interviewed indicated they used a condom during extramarital sexual relations and 46.1 % with their spouse. Among single men and women, 28.9 % use condoms with their regular partner (Thai & Nguyen 1999). In a CARE International in Vietnam and Vietnam Ministry of Health (1997) survey of knowledge, attitudes and practices of contraceptive methods in Vietnam, only 3.6% of single respondents said that they were using contraceptives, whereas the majority claimed not to be sexually active. Furthermore, unmarried youth in Vietnam who are having sex rarely use a condom or other means of protection from unwanted pregnancy or STIs (Gammeltoft, 2002). These studies suggest very low condom use rates even when individuals are engaged in high-risk behaviors. Unmarried youth, particularly young women, are reluctant to obtain or carry condoms, and to ask their partners to use condoms (Kaljee, Minh, Thoa, & Tho 2003).

In Vietnam, efforts to provide HIV education to adolescents and young adults have increased in recent years. Prevention work with this population is one of the key elements of the new National Strategy on HIV/AIDS Prevention and Control (2004).

However, general sexual and reproductive health education is currently insufficient even among youth attending school. Although sex education curriculae are available, poor teacher training and inadequate educational materials mean little information is provided to the students, and in some instances none of the sex education material is taught (InterPress News Agency, 2002). The situation merits the implementation of educational programs evaluated and proven to be effective with this population to minimize the spread of HIV/AIDS, other STIs, and prevent unwanted pregnancies.

## METHODS

Quantitative and qualitative evaluation data were collected as a part of a randomized-controlled effectiveness trial of the Vietnamese Focus on Kids program conducted from September 2001 to July 2003. There were five data collection points for the quantitative data (baseline, immediate postintervention, and 6-, 12- and 18-month postintervention). The qualitative data were collected at baseline and at 6 months. Randomization was at the commune level. A total 240 youth in four communes received the intervention immediately after baseline, whereas the 240 control youth received the intervention after collection of the 18-month follow-up data. In this article, we report on the quantitative evaluation data from baseline, immediate postintervention, and 6-month follow-up. Because a booster session was included after the 6-month follow-up in one commune, we are not including the 12- and 18-month data in the current analysis, which aims to address the effectiveness of the basic program.

## THEORETICAL ORIENTATION

The PMT is organized along two cognitive mediating processes. The first of these processes, the “threat appraisal process” envisions environmental and personal factors combining to pose a potential threat. The threat appraisal includes four factors: intrinsic rewards, extrinsic rewards, perceived severity, and perceived vulnerability. Intrinsic rewards include self-gratification or other internal positive feelings an individual may experience when engaging in a particular activity or behavior. Extrinsic rewards are perceived reinforcing social responses from peers, family, or other social groups. Perceived severity is the degree to which an individual feels that an action will deleteriously effect his or her physical, emotional, or social well-being, and perceived vulnerability measures how likely a person feels that he or she will experience a particular negative outcome.

The second of these processes, the “coping appraisal process” evaluates those personal and social factors that contribute to an individual’s ability to avert the “threat.” The coping appraisal process includes three factors. These coping factors are self-efficacy, or the individual’s perception of his or her ability to carry out a protective behavior, response efficacy, or the individuals perception that the behavior will “work”; and response costs or the social and/or economic costs of carrying out a protective behavior. Thus, in terms of condom use, self-efficacy is whether the individual feels that he or she can successfully obtain condoms, use them correctively, and persuade his or her partner to cooperate in their use. Response efficacy is the individual’s belief that using condoms will actually reduce risk of HIV, STIs, and unwanted pregnancy. Response costs are concerns about social stigma or rejection or other negative effects (e.g., making sex less pleasurable, because of the individual’s decision to use condoms). The PMT model has been used as the theoretical framework in a large range of health promotion and educational efforts including prevention of HIV/AIDS

(Floyd, Prentice–Dunn, & Rogers 2000). In a study conducted in Germany and Spain of heterosexual men between the ages of 20 to 45, the PMT model was used to measure responses to the AIDS epidemic. Self–efficacy expectancies in regards to assertiveness and use of protective measures were significantly predictive of promoting risk reduction (Bengel, Belz–merk, & Farin 1996). In a more recent study of injecting drug users in Canada, the PMT was found to be effective in predicting condom users and nonusers (Houlding & Davidson, 2003). A majority of these studies are conducted with Western participants, though one study looked at the PMT and stigmatization of people with AIDS (PWA) in Chiang Mai, Thailand. This study reports that inaccurate beliefs about HIV transmission led to greater stigmatization, lower feelings of vulnerability, and lower sense of self–efficacy in regards to protective behaviors (Boer & Emons, 2004).

In the Vietnamese Focus on Kids program, the PMT was used within a sociocultural framework. Both the threat and coping appraisal processes for any individual are dynamic, and affect and are affected by the sociocultural environment. Thus, in the development of the program and the evaluation, as well as in our data analysis, we have included and remained cognizant of the potential impact of social, economic, and political factors on youths’ decision–making and their ability to engage in protective behaviors.

#### RESEARCH SITE

In 2003 approximately 75 % of the population in Vietnam lived in rural areas (UNDP, 2004). Vietnam is ruled through a one–party Communist system. Since reunification in 1975, the country has gone through multiple social and economic changes. In the mid–1980s, Doi Moi (Innovative Policies) was implemented by the Vietnamese government allowing for greater flexibility in economic practices and precipitating a move toward market economics. These policies loosened restrictions on engagement in private enterprise (Anh, 1995). In the past few years, the increasing influx of tourism and greater access to nonstate regulated media through television and the internet has brought about rapid changes. With these economic and social changes, youth have more access to recreational activities and social meeting places such as cafes, small restaurants, karaoke, and bars (Kaljee et al., 2004).

Khanh Hoa Province (population 1,031,000) is located in south-central coastal Vietnam and is bordered on the east by the South China Sea and on the west by a rural mountainous region. In 1999 there were 132 communes in the province including 26 in the provincial capital of Nha Trang City (population 327,500). In Khanh Hoa Province, approximately 80 % of the population lives in communes designated as rural. Communes are geopolitical units governed by commune leaders but are also under the auspices of the government at the provincial and national level. The population size within a commune varies considerably from under 2,000 in more remote rural areas to almost 25,000 in urban Nha Trang. The research site included four rural communes within the Nha Trang City limits, and four communes in Dien Khanh District, approximately 10 kilometers from Nha Trang. The mean population size for the study communes was 7,879 (6,888–10,576).

#### ETHICAL ASSURANCES

The University of Maryland Baltimore, School of Medicine Institutional Review Board, and the Khanh Hoa Provincial Health Service Ethical Review Board (Nha Trang City) approved the protocol for this project. Participants 18 years and older signed a consent form. Participants younger than 18 years signed an assent form, and

their parent/guardian signed a consent form. All interviewers and staff were trained in ethical research and obtaining consent.

#### RESEARCH POPULATION AND SELECTION

The research population included adolescents between the ages of 15 and 20 years. A convenience sample of 60 youth was selected from each of the eight study communes, for a total of 480 participants. Community recruiters were hired to recruit participants and out of those recruited, 100% participated in the baseline survey.

Community recruiters were asked to consider gender, age (15-20 years), family economic status, and educational status (in school and out of school) for participant selection. Nonetheless, there is the possible limitation to the generalizability of these data given potential biases both on the part of the community recruiters in their selection process and in terms of participants willingness to be engaged in the project.

#### PROGRAM CONTENT AND FACILITATOR TRAINING

The Vietnamese Focus on Kids program includes eight sessions and two sessions for community project development and delivery. The program is designed to teach youth new skills for decision making and communication, as well as factual information about HIV/AIDS and other STIs, birth control, and condom use. The program contextualizes issues within the community and family, with a fictional youth, matched by gender for the participant group, and his or her family. Changes in the curriculum included (a) contextualizing the stories, scenarios, and role-plays in a Vietnamese context; (b) modification of the condom demonstration and inclusion of information about only those birth control methods readily available in the research site; (c) modification of the section on communication to incorporate differences in verbal and nonverbal styles; (d) a greater emphasis on basic knowledge about HIV/AIDS and other STIs, as well as puberty and adolescent development; and (e) addition of a section on the effects of alcohol use on relationships and engagement in sexual behaviors. In addition, some activities, which were initially designed for a younger audience, were omitted, and the facilitators incorporated some familiar games used in schools and with other youth groups.

Six facilitators per intervention commune were trained for the Focus on Kids curriculum. The facilitators included teachers, youth leaders, and commune center health care providers. The training took place over a 3-day period. All materials were translated into Vietnamese, and experienced translators worked with the Focus on Kids trainers during the training. The control commune facilitators received the same level of training after collection of the 18-month follow-up data.

#### PROGRAM DELIVERY AND PARTICIPATION

The program was delivered once a week for 10 consecutive weeks, including the community project and graduation. Each session was approximately 2 hours in length. In each commune there were six groups of 10 same-gender youth, with one facilitator per group. The program delivery sites were the local schools, and the program was offered on Saturdays and Sundays. Prior to the beginning of the program, parents of the youth were invited to an informational session. Attendance rates during the program averaged at 85 %.

#### INSTRUMENT DEVELOPMENT

As previously noted, the quantitative evaluation tool was based on the Youth Health Risk Behavior Survey developed in conjunction with the Focus on Kids curric-

ulum. The modified Vietnamese Youth Health Risk Behavior Instrument included all of the sections from the original tool plus an additional section on communication within a male–female relationship. The sections included (a) demographics (gender, age, religion, in–school/out–of–school, employment status) [6 items]; (b) engagement in fighting/weapon carrying [8 items]; (c) engagement in substance use including tobacco and alcohol (6 items); (d) past and current relationships, and engagement in sexual behaviors including vaginal, oral, anal sex, as well as use of condoms and other contraceptives (28 items); (e) male–female partner communication (20 items); (f) a condom access and use efficacy scale (8 items); (g) attitudes and beliefs regarding sexuality, HIV/AIDS, contraceptives, condom use, and alcohol consumption (41 items); (h) perceptions of friends engagement in risk activities including alcohol use (7 items); (i) intentions to engage in various behaviors including alcohol consumption (8 items); and (j) an HIV/AIDS knowledge questionnaire (24 items). In addition, there was a question on whether the respondent had ever talked to an adult about HIV/AIDS and a question whether he or she knew anyone who had HIV/AIDS. The instrument contained a total of 158 items.

For the Vietnamese YHRBI, items were modified to reflect differences between Vietnamese and American adolescent cultures, as well as research interests. In Vietnam, drug questions were deleted because of ethical concerns about youth revealing illegal information. Other modifications were primarily in the section on perceptions and attitudes. Modifications in this section included items on benefits of education for future employment, filial responsibility, alcohol use, pregnancy and abortion, government responsibility for preventing HIV/AIDS, commercial sex workers, and media influences on adolescent behavior.

### PROTECTION MOTIVATION THEORY SCALES

Utilizing an independent *t* test and comparing mean difference scores for the control and intervention groups, both threat appraisal and coping appraisal constructs were measured. In the Vietnamese YHRBI for threat appraisal in relation to sexual behaviors, there were 6 items for intrinsic rewards ( $\alpha = .77$ ), 3 items for extrinsic rewards ( $\alpha = .79$ ), and a 24 item knowledge scale for severity and vulnerability. The coping appraisal constructs included an eight–item condom self–efficacy scale ( $\alpha = .86$ ), a three–item response efficacy scale ( $\alpha = .70$ ), and a five–item response cost scale ( $\alpha = .48$ ) (Table 1).

### DATA COLLECTION

Data collection was self–administered. In 2002 the adult literacy rate in Vietnam was over 90 % (UNDP, 2004), and there were no significant problems related to respondents' ability to read the instrument. If perceived as necessary by an interviewer, the instrument was read aloud to the youth separately. This was necessary for fewer than 10 youth. Data were collected in the community, most often in the local school during after school hours. Youth were divided into same–gender groups of 10, and an interviewer reviewed procedures and was available for questions. The youth completed the instrument in approximately 30 minutes. Participant retention rates remained high throughout the study with 466/480 (97.1%) of youth completing the postintervention and 454/480 (94.6%) completing the 6–month follow–up evaluation. Youth were given a small stipend (approximately U.S.\$3) after completion of each evaluation.

TABLE 1. List of Items for Each Construct by Process (Threat/Coping)

**Threat Appraisal***Extrinsic rewards (3 items)*

1. I want others my age to think I am having sex.<sup>a</sup>
2. Even if all my friends were having sex, I would not feel I had to.
3. I want others my age to think I am a virgin.

*Intrinsic rewards (6 items)*

1. Someone my age would want to have sex to see how it feels
2. Girls think it is important to have sex to feel like a woman.
3. Boys think it is important to have sex to feel like a man.
4. Sex feels good for girls.
5. Sex feels good for boys.
6. Sex feels better when you drink alcohol.

*Severity/Vulnerability (24 items)*

1. If you touch someone with AIDS you can get AIDS.
2. Anybody can get AIDS.
3. You can get AIDS from sharing needles with someone who is infected with the AIDS virus.
4. Using a condom during sex is a way to protect yourself from getting AIDS.
5. AIDS can be cured if treated early.
6. Taking birth control pills is one way to protect yourself from becoming infected with the AIDS virus.
7. Using an IUD can protect you from the AIDS virus.
8. You can get AIDS the first time you have sex.
9. If a condom breaks while you're having sex, you can get the HIV virus.
10. When used correctly, condoms almost never break.
11. Anal (rectal) intercourse is risky because it transmits the AIDS virus.
12. You can get the AIDS virus during oral sex.
13. A person can get the AIDS virus in one sexual contact.
14. Keeping in good physical shape is the best way to keep from getting AIDS.
15. Condoms make intercourse completely safe.
16. A shower after sex reduces the risk of getting AIDS.
17. By having just one sex partner at a time you can protect yourself from AIDS.
18. The AIDS virus doesn't go through unbroken skin.
19. A person must have a lot of different sex partners to be at risk for AIDS.
20. If the man pulls out (withdraws) before orgasm, then intercourse is safe.
21. A negative result on the HIV test can happen even if somebody has the AIDS virus.
22. It's more important for people to protect themselves against AIDS in big cities than in small cities.
23. Most people who have the AIDS virus know they have it.
24. All sexually transmitted diseases can be cured.

*Coping Appraisal**Self-efficacy (8 items)*

1. I could get condoms if I wanted to.
2. I could put a condom on correctly.
3. I could convince the person I am having sex with that we should use a condom, even if he doesn't want to.
4. I could ask for condoms in a pharmacy.
5. I could ask for condoms at the Commune Health Center.
6. I could carry a condom and keep a condom with me.
7. I could ask the person I am having sex with about sexual relationships that he/she has had in the past.
8. I could refuse to have sex if the other person will not use a condom.

*Response efficacy (3 items)*

1. If you are going to have sex, condoms are an important way to prevent pregnancy.
2. If you are going to have sex, condoms are the best way to prevent you from getting an STD.
3. If you are going to have sex, condoms are an important way to prevent getting AIDS.

*Response cost (5 items)*

1. If a girl carries condoms, people think she is having sex.
2. Condoms make sex hurt for a girl.
3. Condoms take away the feeling a boy has during sex.
4. If a young person carries condoms, his or her friends will laugh or make jokes about him/her.
5. When a girl and a boy are in a serious relationship, they don't use condoms.

<sup>a</sup>Indicates items that were reverse-scored for the construct.

### DATA ANALYSIS

Data was entered into the SpSS, version 11.5, program and independently reviewed by a second individual for accuracy. Demographic data were described via Pearson's chi-square. Prior to inferential statistical analysis, variables were created for respondents' total scores on each of the coping and threat appraisal subscales. Under threat appraisal, an HIV/AIDS knowledge scale was utilized to measure both vulnerability and severity. For scale validity, Cronbach's alphas were calculated on each of the scales at baseline, and with the exception of the response cost scale all alphas were at or above .70. To adjust for the strategy of cluster (rather than individual) randomization, the intraclass correlation coefficient (ICC) was determined for each construct and items included in the analysis (Smeeth & Siu-Woon Ng, 2002; Wears, 2002). ICC values ranged from 0 to .09. To assess differences between control and intervention groups, analysis of covariance (ANCOVA) analyses, with religion as a covariate and *F* values adjusted for ICC were performed on the mean differences between baseline and postintervention scores, and baseline and 6-month follow-up scores.

## RESULTS

### BASELINE DEMOGRAPHICS

At baseline the mean age was 17.1 years ( $SD = 1.7$  years). Buddhism was the most commonly reported religion of the participants (66.3 %), followed by no reported religion (25.4 %) and Catholicism (7.3 %). Approximately 68 % of the respondents ( $n = 326/480$ ) reported that they were currently in school at the time of the survey, with around 75 % of those in school ( $n = 250/326$ ) in Grades 10–12. Among youth respondents not currently in school ( $n = 154/480$ ), 24.2 % had finished up to 12th grade ( $n = 37/154$ ) and a similar number ( $n = 42/154$ ) reported finishing up to 6th grade or less. Thirty-five % of male respondents ( $n = 84/154$ ) were out of school compared to 29 % of female respondents ( $n = 70/154$ ). Sixteen % of the sample was employed at the time of the survey ( $n = 77/480$ ), with the majority of those working also not in school (88.3%;  $n = 68/77$ ). Construction work (36.5 %), labor (33.8 %) and service (13.5 %) were the occupations most commonly reported by the respondents. Significantly more males (20 %;  $n = 48/240$ ) were employed than females (12.1 %;  $n = 29/240$ ) ( $\chi^2 = 5.6$ ,  $p = .018$ ). There were no significant differences between control and intervention groups for gender ( $\chi^2 = .00$ ,  $p = 1.000$ ), in school ( $\chi^2 = .96$ ,  $p = .328$ ), and employment ( $\chi^2 = .14$ ,  $p = .709$ ). There was a difference, however, in religion, with more Catholics ( $n = 33/240$ , 13.8%) in the control compared with those in the intervention group ( $n = 2/240$ , 0.8%) ( $\chi^2 = 32.1$ ,  $p = .000$ ), and the control youth were slightly older than the intervention youth ( $t = -2.025$ ;  $p = .043$ ) (Table 2).

Of the 480 youth, 164 (34.2%) report ever having a girlfriend or boyfriend, with this nearly evenly split between males ( $n = 81/240$ ) and females ( $n = 83/240$ ). A total of 133/480 (27.7%) of respondents report a current boyfriend or girlfriend. Self-reported rates of engaging in sexual behaviors were very low. Only 8/480 youth (1.7%) reported ever engaging in vaginal intercourse, including four females and four males. Although the numbers are too small to draw conclusions, condom use among this group was very low. Five of those reporting sexual activity stated that they "never" use condoms, two reported "rarely," and 1 reported "always." Youth were also asked if they ever engaged in anal and/or oral sex. A total of 15/480 youth (3.1%) report engaging in "other" sex, with 11/15 of those respondents female. There was no signifi-

TABLE 2. Demographics by Intervention Status

	Intervention (N = 240)	Control (N = 240)
Female	120 (50%)	120 (50%)
Mean age <sup>a</sup>	16.9 years	17.2 years
In school	168 (70.0%)	158 (65.8%)
Employed	37 (15.4%)	40 (16.7%)
Religion <sup>b</sup>		
Buddhist	173 (72.1%)	145 (60.4%)
Catholic	2 (0.8%)	33 (13.8%)
Other	2 (0.8%)	3 (1.3%)
No religion	63 (26.3%)	59 (24.6%)

<sup>a</sup>*p* value of *t* stat < .05. <sup>b</sup>*p* value of  $\chi^2$  < .001.

cant difference between control and intervention at baseline for either vaginal sex ( $\chi^2 = 2.0$ , *p* = .154) or anal and/or oral sex ( $\chi^2 = .07$ , *p* = .799).

#### PREVENTION MOTIVATION THEORY SCALES

*Threat Appraisal.* The intrinsic and extrinsic rewards scales were 5-point scales from “strongly agree” to “strongly disagree,” with high scores equivalent to strong perceptions of importance of rewards. Therefore, the desired effect of the intervention was to lower both the intrinsic and extrinsic rewards scores. As shown in the top half of Table 3, mean scores decreased for extrinsic rewards at postintervention and, at 6 months, decreased for both extrinsic and intrinsic rewards. These data suggest a decline in the endorsement of the rewarding value of sexual behaviors. However, the ICC-adjusted ANCOVA with religion as a covariate found the difference in scores between groups was not significant.

Vulnerability and severity were measured by a true/false knowledge scale, which was rescored as “correct” and “incorrect” for analyses. Desired change is an increase in the vulnerability/severity score. As shown in Table 3, the mean intervention youth score increased from 15.44 at baseline to 18.67 at postintervention and to 17.94 at 6-months. For this scale, there was a significant difference between control and intervention youth both at postintervention ( $F_{1, 458} = 16.60$ , *p* = .001) and at 6-month follow up ( $F_{1, 443} = 5.91$ , *p* = .015).

*Coping Appraisal.* On the self-efficacy scale the responses included “yes,” “no,” and “don’t know.” For purposes of this analysis, both “no” and “don’t know” were scored as 0 and “yes” as 1. Desired change was an increase in score (greater self-efficacy for condom access and use). Intervention youth mean scores increased from 2.35 at baseline to 5.46 at postintervention and 4.69 at 6-months (Table 3). At both postintervention ( $F_{1, 462} = 24.65$ , *p* = .001) and at 6 months ( $F_{1, 460} = 8.09$ , *p* = .005), there was a strong significant difference between control and intervention groups.

The response efficacy and response cost scales were scored on a five-point scale from “strongly agree” to “strongly disagree.” For response efficacy, the desired change was an increase in score (increase in perception of the efficacy of condom use). Scores for intervention youth increased from 11.85 at baseline to 13.32 at postintervention and 13.06 at 6-months (Table 3). At both postintervention ( $F_{1, 461} =$

TABLE 3. Means and Mean Differences for PMT Constructs

Threat Appraisal	Extrinsic Rewards		Intrinsic Rewards		Severity/Vulnerability	
	Control	Intervention	Control	Intervention	Control	Intervention
Baseline <sup>a</sup>	7.83 (1.69)	8.07 (1.90)	13.90 (4.08)	14.24 (3.74)	16.02 (3.13)	15.44 (3.51)
Post Intervention <sup>a</sup>	7.55 (1.74)	7.50 (1.87)	14.83 (4.14)	14.47 (3.67)	16.40 (3.13)	18.67 (3.18)
6 Months <sup>a</sup>	7.64 (1.74)	7.44 (1.69)	13.26 (3.26)	12.83 (3.18)	16.85 (3.14)	17.94 (3.44)
Post – Baseline <sup>b</sup>	–.28	–.57	.93	.24	.38**	3.23**
6 Months – Baseline <sup>b</sup>	–.18	–.63	–.64	–1.41	.83*	2.50*

  

Coping Appraisal	Self-Efficacy		Response Efficacy		Response Cost	
	Control	Intervention	Control	Intervention	Control	Intervention
Baseline <sup>1</sup>	2.87 (2.56)	2.35 (2.43)	12.80 (2.16)	11.85 (2.69)	14.86 (2.91)	14.65 (2.81)
Postintervention <sup>a</sup>	3.12 (2.44)	5.46 (2.19)	12.34 (2.56)	13.32 (2.08)	14.43 (2.84)	13.55 (3.27)
6 Months <sup>a</sup>	3.39 (2.43)	4.69 (2.61)	12.44 (2.55)	13.06 (2.04)	14.26 (2.84)	13.91 (2.94)
Postbaseline <sup>b</sup>	.25***	3.11***	–.46**	1.47**	–.43*	–1.10*
6 Months – Baseline <sup>b</sup>	.52***	2.34***	–.36*	1.21*	–.60	–.74

<sup>a</sup>Mean (SD) baseline, immediate post intervention, or 6 months post intervention. <sup>b</sup>Between-group analysis of mean difference between immediate postintervention and baseline, or 6 months postintervention and baseline tested via analysis of covariance (ANCOVA) with religion entered as covariate. The ANCOVA *F* value was adjusted for intraclass correlation coefficient (ICC) according to the following formula: Adjusted *F* = original *F*/VIF where VIF = 1 + (m0–1)ICC. ICC = (MSb–MSw)/(MSb+(m0–1)MSw). m0 = (1/(k–1))(n–(Emj2/n)). \**p* value of adjusted *F* < .05. \*\**p* value of adjust *F* < .01. \*\*\**p* value of adjusted *F* < .001.

10.19, *p* = .002) and 6 months ( $F_{1,460} = 6.54$ , *p* = .011) there was a significant difference between the control and intervention groups.

The desired change for the response cost scale was a decrease in score (less negative “costs” to condom use). From baseline to postintervention, there was a decrease in score for the intervention group from 14.65 to 13.55, and this was a significant difference in comparison with the control group ( $F_{1,461} = 5.36$ , *p* = .021). However, this significance was no longer evident at 6 months ( $F_{1,460} = 1.50$ , *p* = .221) (Table 3).

*Intentions to Engage in Sexual Intercourse and Condom Use.* As previously mentioned, reported sexual behaviors were very low, and insufficient for statistical analysis. However, we also asked youth about their intention to engage in behaviors in the “next 6 months” along a 5–point scale from very likely to very unlikely. For analytical purposes, the “very likely” and “likely” and the “very unlikely and ”unlikely” responses were combined to create a 3–point scale

In regards to intention to engage in sexual intercourse, there was no significant difference between control and intervention groups at either postintervention ( $F_{1,459} = .04$ , *p* = .836) or at 6 months ( $F_{1,460} = .29$ , *p* = .589). However, in regards to the item “if you have sex, would use a condom,” there was an increase in %age of intervention youth who stated that they would “likely” use a condom from baseline (74/240; 30.8%) to postintervention (132/230; 57.4%) and at 6–month follow-up (123/228; 53.9%). These increases were significant when compared to control youth at both the postintervention [ $F_{1,459} = 12.81$ , *p* < .001] and the six month follow-up [ $F_{1,459} = 7.82$ , *p* = .005] (Table 4).

TABLE 4. Intention to Use Condom—"If you have sex, would use a condom"

		Control		Intervention	
		No.	%	No.	%
Baseline	Likely	95	39.6	74	30.8
	Don't Know	68	28.3	97	40.4
	Unlikely	77	32.1	69	28.8
		<i>n</i> = 240		<i>n</i> = 240	
Postintervention*	Likely	86	37.1	132	57.4
	Don't Know	73	31.5	45	19.6
	Unlikely	73	31.5	53	23.0
		<i>n</i> = 232		<i>n</i> = 230	
6-month**	Likely	93	39.7	123	53.9
	Don't Know	72	30.8	57	25.0
	Unlikely	69	29.5	48	21.1
		<i>n</i> = 234		<i>n</i> = 228	

Note. Mean difference between control and intervention groups of immediate postintervention and baseline, or 6 months postintervention and baseline tested via analysis of covariance (ANCOVA) with religion entered as covariate. The ANCOVA *F* value was adjusted for intraclass correlation coefficient (ICC) according to the following formula: Adjusted  $F = \text{original } F / \text{VIF}$  where  $\text{VIF} = 1 + (m0 - 1) \text{ICC}$ .  $\text{ICC} = (\text{MSb} - \text{MSw}) / (\text{MSb} + (m0 - 1) \text{MSw})$ .  $m0 = (1 / (k - 1)) (n - (\sum j^2 / n))$ . \**p* value of adjusted  $F < .05$  \*\**p* value of adjust  $F < .01$ .

## DISCUSSION

Behavioral interventions have been shown to be effective for adolescents and young adults in terms of increases in knowledge, self-efficacy, decreases in risk behaviors, and increased protective behaviors (Jemmott & Jemmott 2000). The WHO Study Group on Adolescent Health and Development (1999) outlined six "planning principles" in relation to health programs for adolescents. These include the need to develop different programs to meet the needs of youth depending on their sexual experience and other characteristics, build on existing services and incorporate what the youth want to know, and engage local adults in creating a supportive environment for the youth. In addition, across studies it has been shown that the strongest interventions are theory based (Kim et al., 1997). The Vietnamese Focus on Kids curriculum based on the PMT was adapted after extensive preliminary piloting and qualitative research, and consideration was given to low reported rates for engagement in sexual behaviors among the target population. The U.S. staff worked closely with the Vietnamese staff, and local educators and health care providers in program development and implementation, and these same individuals were trained to deliver the curriculum in the research community sites.

The data analyzed suggest that the youth who participated in the Vietnamese Focus on Kids Program significantly increased their knowledge in relation to vulnerability and severity of HIV/AIDS and their self-efficacy and perceptions of response efficacy of condom use. There was a less sustained change for response cost in relation to condom use. Although the data were limited in terms of changes in actual reported behaviors, there was a sustained change over 6 months among intervention youth in relation to intention to use condoms in the future. Given evidence that there is insufficient knowledge available to many Vietnamese youth about HIV and reproductive health, and low reported rates of condom use among sexually active young

adults, these are important first steps in increasing protective behaviors in this population.

Although the PMT has been utilized with populations in both the United States and internationally, there remains limited documentation of the applicability of this and other health behavior change theories outside of the West. These data suggest that at least in terms of analysis of changes in knowledge about severity and vulnerability, and perceptions regarding condom access, use, and efficiency, the theory provides a framework for evaluating an HIV risk reduction program with Vietnamese adolescents.

However, these data also raise some issues that warrant further exploration in regards to the application of behavioral change theories across cultures. Both intrinsic and extrinsic rewards showed trends in the “right” direction (decreases in scores), but these changes were not significant. Response cost showed no significant change after 6 months. This may be due to an insufficient focus in the existing curriculum to adequately address these constructs or the inadequacy of the scales to measure change, particularly as the Cronbach’s alpha for response cost was very low. Alternatively, it may indicate these constructs are of lesser importance, and/or are more difficult to change in Vietnamese adolescent culture. Thus, it may be fairly easy to convince Vietnamese youth that they know how to use a condom (self-efficacy) and that condoms are effective in preventing disease and unwanted pregnancy (response efficacy). However, the social pressure in Vietnam against premarital sexual relations is very strong, and therefore it may be significantly more difficult, or even inappropriate to teach the youth that they will not be stigmatized for planning ahead (e.g., carrying condoms) (response cost). Also, in a culture that places a strong emphasis on filial and societal responsibilities, constructs such as intrinsic and extrinsic rewards may need to be reconceptualized and adapted to non-Western ideals and social structures. Further cross-cultural research needs to be done with adolescents in order to better understand which components of the PMT and other health behavior theories are more and/or less predictive of positive behavior changes, how sociocultural and political-economic factors affect these individual behavior changes, and to further refine valid and reliable evaluation tools.

Although social stigmatization in Vietnam against premarital sex may contribute to delay in sexual initiation as indicated in the low reported rates of sexual intercourse, these same pressures contribute to youth being “unprepared” to engage in protective behaviors such as condom use (Kaljee et al., 2004). With a still emerging HIV/AIDS epidemic throughout Vietnam, and rapid social and economic changes in the country affording greater freedoms to Vietnamese youth, there is an increased likelihood that these youth need to be prepared to make informed decisions regarding protective sexual behaviors. The current research suggests that the Vietnamese Focus on Kids program does increase youths’ intention to use condoms in the future, their perceptions of their ability to use condoms and the efficacy of condom use, and their sense of vulnerability and severity regarding HIV/AIDS. Future research should focus on understanding the links between these attitudinal changes and actual behaviors among adolescents in Vietnam and other nonindustrialized countries. A further challenge will be to develop programs that sustain increases in knowledge, positive perceptions of condom use, and intentions to use condoms over an extended period of time, so that if and when youth become sexually active, they will be prepared to engage in safe behaviors.

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