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## HIV/AIDS Prevention Among the Male Population: Results of a Peer Education Program for Taxicab and Tricycle Drivers in the Philippines

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### Abstract

This study assesses the results of a 2-year community-based peer education program aimed at increasing HIV/AIDS knowledge, attitudes toward condoms, and condom use behavior among taxicab and tricycle drivers in the Philippines. Pretest, posttest, and follow-up data were collected throughout the educational intervention program. The results of the repeated measures analysis of variance (ANOVA) indicate a significant change on knowledge about HIV/AIDS from baseline to posttest and from posttest to follow-up ( $F = 449.27$ ,  $df = 2$ ,  $p < .001$ ). There was also a significant change on attitudes about condom use from baseline to posttest and from posttest to follow-up ( $F = 425.19$ ,  $df = 2$ ,  $p = 0.001$ ), and a significant effect on condom use behavior with commercial sex workers from baseline to posttest and follow-up ( $F = 428.31$ ,  $df = 2$ ,  $p = .001$ ). The peer-mediated intervention was found to be an effective means of HIV/AIDS prevention among taxi and tricycle drivers in the Philippines.

### Keywords

HIV/AIDS prevention; taxi drivers; peer education; participatory action research; Philippines

HIV/AIDS prevention efforts in the Philippines have generally focused on the high-risk groups such as the commercial sex workers (CSWs), men who have sex with men (MSMs), and intravenous drug users (IDUs). Although these high-risk groups are critical to the spread of HIV/sexually transmitted infections (STIs), research on other target populations where data are sparse should also be conducted. One group where the impact on HIV/STI transmission is growing is the male population in the transportation industry. This type of population is often referred to as the “bridge” population. The spread of HIV/STI in the community is carried out mainly through the sexual interaction between the core group (i.e., high-risk CSWs) and the transportation drivers who act as a “bridge” for the spread of disease to the general population. As the HIV/STI epidemics spread across communities, transmission from transportation drivers to their wives and sex partners becomes an important route of infection among women. This pattern of transmission has occurred in many developing countries (Gawande, Vasudeo, Zodpey, & Khandait, 2000; Rao, Pilli, Rao,

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& Chalam, 1999). Thus, there is an urgent need to examine the critical role the male population in the transportation industry in the Philippines plays in the spread of HIV/STI due to their mobility, casual contact with multiple sexual partners, and their interaction with CSWs. The evaluation of the prevention program on taxi and tricycle drivers is important for stemming the spread of the HIV/STI epidemic in the Philippines.

The role of transportation drivers, particularly long-haul truckers and CSWs in the spread of HIV/STI has been studied in many settings. However, most of these studies focus on risk behaviors and the epidemiology of HIV/STI among truck drivers (Bwayo et al., 1994; Lacerda et al., 1997). For example, research of long-haul truckers in Florida found that high-risk sexual behavior is common and that truckers are at risk for HIV infection primarily because of unprotected sexual intercourse with multiple sex partners (Stratford, Ellerbrock, Akins, & Hall, 2000). Truckers from Pakistan and India have been studied and are found to be at risk due to their sexual practices and high mobility (Agha, 2000; Rao et al., 1999). Very few data are available on HIV/STI prevention programs among transportation drivers (Laukamm-Josten et al., 2000; Leonard et al., 2000; Walden, Mwangulube, Makhumula-Nkhoma, 1999) and, specifically, the effect of peer education intervention programs on the sexual practices of taxi and tricycle drivers in the transportation industry in the Philippines.

Studies specific to taxi and tricycle drivers have not been published in well-circulated academic journals. Most of these studies focus on health and problems of HIV infections among taxi drivers. For example, research on taxi drivers in Japan describes the working conditions and daily life of taxi drivers and how their occupation affects their health status (Ueda et al., 1989, 1992). A few studies on taxi drivers as they relate to HIV/STI have been published, such as the Beijing study looking at the knowledge, attitudes, and beliefs (KAB) of AIDS among taxi drivers that indicated that HIV/STI education is important in reducing the number of sexual partners and promoting the use of safe sex practices like condom use (Zhang, Luo, & Zhang, 1994). A study in Nigeria found that commercial taxi and bus drivers are at high risk for HIV infection and transmission and concluded that interventions are urgently needed to prevent the spread of HIV among drivers and their partners (Akintola, 2001). A study in the Philippines investigated the characteristics, working and social environment, and KAB of drivers and owners of vehicles in the transportation industry, in relation to HIV/AIDS/STI and found them to be at high risk for HIV/STI infections. The study recommended intensive and continuous education (Gust, Dumayag, Santos, & Baco, 2001). The Lesotho Assessments for the USAID Southern Africa Regional Program on HIV/AIDS from 1999 to late 2000 conducted interviews with taxi drivers among others in risk environments of border crossings and trade towns and found them to be an important bridge population in the sexual networks, linking transient and residential communities (Family Health International, 2001). None of these studies, however, focused their research on the effect of intervention programs on HIV/STI prevention for transportation drivers.

## BACKGROUND

The University of California at Los Angeles (UCLA)/University of the Philippines HIV/AIDS Prevention Program builds and expands the successful results of targeted educational interventions among CSWs and their managers/supervisors in the Philippines (Morisky et al., 1998). In this study, drivers (bus, taxi, jeepney, and pedicab drivers) were identified as primary clients by CSWs, in addition to other high-risk male client groups in the Philippines, such as the military, police, and factory workers. Taxicab and tricycle drivers are a high-risk group who engage in sexual practices that place them at greater risk for contracting HIV/STI. The nature of their profession brings them in close contact to the nightlife and the CSWs whom they frequent and often places them in the position of being contacts for these workers. Nevertheless, they may become an ideal medium to deliver safe

sex and other HIV prevention messages to the community. These findings highlight the need to develop client-centered interventions because the clients not only frequent CSWs but have the potential to influence their customers to use condoms.

The aim of this study is to identify and train members of the target groups to serve as gatekeepers of STI and HIV/AIDS information and to evaluate the effects of an educational and behavioral intervention on the targeted groups with respect to changes in knowledge, attitudes, and sexual practices. This study looks at male populations employed in the transportation industry and taxi and tricycle drivers associations, and the impact of a peer-mediated intervention in the Philippines. The intervention approach builds on the successful Peer Educator Model (Morisky & Ebin, 2000). Peer influence is considered a significant element of Bandura's social cognitive theory (Bandura, 1991) and Azjen's (1991) theory of planned behavior, from which we can infer the importance of peers in modeling and supporting desired behaviors to their target groups. In applying these theories to sexual behaviors, we can expect safer sexual practices to be influenced by norms and shared expectations within the community. Asamoah et al. (1994) and Lyttleton (1994) have effectively demonstrated the inclusion of peer educators in HIV behavioral interventions. The outcome of this intervention is to have the targeted groups view safer sex practices as normal behavior and integrate those views into the norms, values, and behaviors of the group. It is hypothesized that taxi and tricycle drivers in the intervention site will demonstrate significantly higher levels of HIV/STI knowledge, positive attitudes toward safe sexual practices, and higher levels of reported use of condoms compared to the control site. To monitor community participation, individuals were asked whether they had ever discussed HIV/STI prevention with their coworkers and whether they ever attended an AIDS prevention workshop or seminar. Participants were also asked whether they ever received educational materials on AIDS/STI prevention from their employers. Results from previously published research (Morisky, Ang, Coly, & Tiglaio, 2003) indicated that participants and peer leaders discussed more about HIV/STI prevention, and a higher percentage of participants attended AIDS prevention workshop after the intervention. A higher percentage of participants also reported having received educational materials on AIDS/STI prevention from their employers.

## METHOD

### Design

A community-based approach, using a crossover study design is used in the intervention site of Lapu-Lapu and Mandawe City, two large cities in the southern Philippines. These two cities are in close proximity to each other and are similar in terms of area, population, and socioeconomic demographic characteristics. There are only two taxi and tri-cycle drivers associations operating in these cities, and both associations participated in the study. Participation rates exceeded 98% in both study sites. There are four study groups in the design: (a) intervention group taxi drivers in Site 1, (b) control group taxi drivers in Site 2, (c) intervention group tricycle drivers in Site 1, and (d) control group tricycle drivers in Site 2.

Approximately 200 taxi drivers and 150 tricycle drivers from each of the four study groups (total of 700 men) were assessed with respect to HIV/AIDS knowledge, attitudes toward condoms, and condom use behavior in a 2-year longitudinal study. Baseline surveys were obtained from both taxi and tricycle driver association members from each of the respective groups. Intervention and control groups were compared with postintervention surveys (conducted 12 months following the training session) and follow-up surveys to evaluate the effect of the intervention on the taxi and tricycle drivers. The control group consists of taxi and tricycle drivers who did not receive any intervention during the evaluation period.

Information documented on these groups included KAB and pre-STD/AIDS prevention, number of sexual partners, communication with peers regarding STD/AIDS topics, and condom distribution to peers.

Table 1 displays the longitudinal crossover research design. The intervention group (Taxi1 and Tricycle1) and control group (Taxi2 and Tricycle2) were assessed at baseline (Months 1 to 3). The intervention was conducted in Months 4 to 15 (Phase 1 of the study). Posttest assessments for treatment and control group were administered in Months 16 to 18. Thereafter, Phase 2 interventions for treatment and control groups were conducted in Months 19 to 30. Finally, follow-up assessment for all study groups was made in Months 31 to 33. This design allows the assessment of both short- and longer-term impact of outcome indicators since we have conducted assessments at baseline (Months 1 to 3), posttest (Months 16 to 18), and follow-up (Months 31 to 33).

## Instrument

The questionnaire was designed to measure knowledge, attitudes, and practices related to STI-HIV/AIDS, using 27 items with a 5-point scale (1 = *never*, 5 = *always*). For this study, HIV/AIDS knowledge was assessed with questions asking how AIDS is transmitted (8 items, with alpha reliability = .81) and the risk of getting AIDS from certain activities (10 items, with alpha reliability = .88). Attitude toward condom use was measured by a 7-item, 5-point scale measure (1 = *disagree*, 5 = *agree*). The alpha reliability of the attitude items is .86. These items included questions like “condoms are easy to use,” “condoms do not cause pain or discomfort,” and so on. Condom use was assessed with two questions (1 = *never*, 5 = *always*): “How often do you use condoms?” and “Did you use a condom the last time you had sex?” The measures used in this study had been assessed and evaluated in terms of reliability and validity in other previous studies on CSWs (Morisky et al., 1998, 2003).

Components of the intervention were the following:

*Obtaining permission.* The owners/officers of the associations of taxicab and tricycle drivers in the two study communities were approached by the senior project staff and site coordinators to inform them of the nature and scope of the proposed intervention program and to get their approval. The study adhered to the informed consent procedures approved by the Institutional Review Board of each collaborating university. They were reimbursed for their lost earnings for the time of the interview. The drivers were interviewed at a private location near their terminals/car barns. Organization participation was predicated on conducting interviews during lunch breaks or between shifts.

Seminars for all taxicab/tricycle drivers in the intervention groups. The seminars dealt with the magnitude of STI/HIV/AIDS, human sexuality, types and modes of transmission, methods of prevention control with an emphasis on practicing safe sex (condom use), and the role of men in transmission. Slides and video presentations, as well as guided model demonstrations and self-reinforcements were used to equip individuals with this basic knowledge and skills.

*Recruitment and training of peer educators.* Prior to the conclusion of the seminar, 20 peer educators for each target group were recruited by group nomination, volunteer, and/or appointed by their officials. The peer educators underwent additional training (2-day workshop) to receive a more thorough discussion of the social and behavioral aspects of STI/HIV prevention in the community employing a “train-the-trainer” approach. They were taught methods and strategies and to engender communication skills so that these key informants can influence other drivers to educate their customers

who frequent commercial sex establishments on the importance of safe sexual practices as well as provide condoms to their customers.

*The work of peer educators.* The site coordinators were the intervention leaders, and the peer educators met weekly with the site coordinators and reviewed the aggregate data from their respective organization. Information, education, and communication (IEC) is one effective way of raising the levels of KAP that may prevent the acquisition and spread of HIV (Green & Kreuter, 1999). Frequency distributions and cross-tabulations of baseline/posttest data were provided for the development of educational materials in response to educational and behavioral diagnosis.

With this information, the peer educators developed these IEC materials, including the conceptualization and development of the *fotonovellas*, posters, and stickers, which allowed them to internalize the concept of HIV/AIDS/STI prevention (Morisky, 2004). Following the development of educational materials, the peer educators in each driver association taught their peers at different sites, such as the tricycle drivers at the terminals while waiting for passengers and the taxicab drivers at the car barns. The finished IEC products, which allowed them to educate and reinforce safe sexual practices to their peers, were distributed to their peers and posted in strategic places such as stickers inside taxis and tricycles. After educational materials were distributed to peers, the peer educators continued to meet monthly with the site coordinator to discuss problems encountered, successful approaches, and shared recommended strategies for educational counseling.

## Data Analysis

All variables were initially analyzed descriptively by univariate statistics, including examining frequencies, percentages, means, and standard deviations. This was followed by statistical analysis in which repeated measures analysis of variance (ANOVA) was carried out on the primary outcome measures, where three occasions—baseline, posttest and follow-up, and two groups—treatment and control group study design was used to detect the differences between the measures for the continuous outcome variables. These primary outcome measures were knowledge, attitude, and condom use behavior.

## RESULTS

### Sample

A total of 400 taxi and 300 tricycle drivers participated in the study. The mean age of the participants was 34.5 years. In general, we found that taxi drivers were slightly more educated than the tricycle drivers. In addition, they have worked longer in their profession and earned slightly more than their counterparts, the tricycle drivers. Table 2 describes the demographic characteristics of this sample. Table 3 assesses the difference in demographic characteristic of taxi and tricycle drivers between the intervention and the control sites. Table 3 shows that the age, income, education, and working experience are all similar between the two sites with all of these variables not significantly different at  $p = .05$ .

### Knowledge

A comparison between baseline, posttest, and follow-up results shows that knowledge about HIV/AIDS transmission increased from baseline to posttest and follow-up for the intervention group, as illustrated in Table 4. Baseline to posttest knowledge increased from 3.81 ( $SD = 0.82$ ) to 4.26 ( $SD = 0.85$ ). Knowledge about HIV/AIDS transmission also increased from posttest ( $M = 4.26$ ,  $SD = 0.65$ ) to follow-up ( $M = 4.61$ ,  $SD = 0.68$ ) for the intervention group. Repeated measures ANOVA from baseline to posttest and follow-up showed a significant change in knowledge for Time  $\times$  Condition, indicating differential

change across time between the intervention and control group ( $F = 449.27$ ,  $df = 2$ ,  $p < .001$ ).

## ATTITUDES

A comparison between baseline, posttest, and follow-up results shows that attitudes about condom use increased from baseline to follow-up for the intervention group, as illustrated in Tables 4 and 5. Baseline to posttest attitudes increased from 2.07 ( $SD = 0.48$ ) to 2.34 ( $SD = 0.51$ ) for the intervention group. Attitudes about condom use also increased from posttest to follow-up ( $M = 2.34$ ,  $SD = 0.51$  to  $M = 2.56$ ,  $SD = 0.49$ ) for the intervention group.

Repeated measures analysis from baseline to posttest and follow-up showed a significant change in attitudes for Time  $\times$  Condition, indicating differential change across time between intervention versus control group ( $F = 425.19$ ,  $df = 2$ ,  $p = .001$ ).

### Condom Use Behavior

In assessing condom use behavior outcome, only taxi and tricycle drivers who reported that they have had sex with a CSW in the previous 6 months were included in the study groups. The data collected revealed an increase in condom use behavior for the intervention group from baseline ( $M = 2.05$ ,  $SD = 2.54$ ) to posttest ( $M = 2.54$ ,  $SD = 0.81$ ). Condom use behavior also increased from posttest ( $M = 2.54$ ,  $SD = 0.81$ ) to follow-up ( $M = 2.68$ ,  $SD = 0.83$ ). Repeated measures ANOVA analysis from baseline to posttest and follow-up showed a significant change in condom use Time  $\times$  Condition, indicating differential change across time between the intervention and control group ( $F = 428.31$ ,  $df = 2$ ,  $p < .001$ ). These results are shown in Table 5.

## DISCUSSION

### Unique Characteristics of Transportation Drivers

The sexual behavior of taxi and tricycle drivers and the role they serve calls for the need to target appropriate educational programs to this heterosexual male population for the prevention of HIV/STI transmission. Their lifestyle often consists of frequent visits to establishments where CSWs are employed. Furthermore, low consistent condom use increases their vulnerability to HIV/STI infection. Easy access to CSWs and a feeling of anonymity created by working long night hours alone for some drivers might be a reason why they use the services of CSWs. In addition, the drivers serve a clientele who often request entertainment information from them, with taxi drivers generally serving the higher class clientele, and tricycle drivers, the lower class clientele. Thus, the drivers are in a position to have a unique impact on the rate of HIV/STI transmission. This intervention is directed at a high-risk population that has not been widely targeted despite their potential to transmit HIV/STI and thus has implications for future studies and interventions.

### Effects of Peer Education

The intervention was found to be relatively effective for taxi and tricycle drivers with respect to change in knowledge, attitudes, and condom use. There are several reasons that may explain these findings. One plausible explanation is that taxi and tricycle drivers form a tight association within their peers. Thus, a peer-led program would benefit the taxi and tricycle drivers since a strong element of trust and confidentiality is important with such a design. Another likely explanation is that the intervention program was structured to provide factual HIV/AIDS information aimed toward eliminating prior misconceptions, as well as building skills and confidence in the drivers, thereby resulting in a greater positive change in knowledge and attitudes, and condom use from baseline to posttest to follow-up.

The great potential of a peer-mediated education program in training peer educators in targeted study groups is well supported in this study, with the intervention found to be an effective means of HIV/AIDS prevention among taxi and tricycle drivers in the Philippines. Because peer educators are selected from within the group, they can continuously reinforce messages in culturally appropriate ways and in a comfortable setting. The critical role of such mediators, primarily the influence of individuals on their peers, is an important element of Bandura's social cognitive theory and Ajzen's theory of planned behavior that facilitated change through their interpersonal communication skills in this intervention. It is shown that the intervention provides their peers with the means, resources, and social supports to change their knowledge, attitudes, and condom use behavior, as well as their display of subjective norms that allow their peers to influence or change group behaviors. This intervention program includes all the components of the Peer Educator Model, including activities that allow the peer educators to develop the concept of ownership and involvement through planning, and decision-making activities such as the design of IEC materials. Thus, the study contributes to the literature of peer-mediated programs on male client groups that have had a positive impact on several important HIV/AIDS outcome measures, such as the studies in Senegal (Leonard et al., 2000), Malawi (Walden et al., 1999), and Tanzania (Laukamm-Josten et al., 2000).

This intervention distinguishes itself in that it is based on both an individual and group change behavior model, designed as a local community-based educational program with a high level of cooperation and involvement by the taxi and tricycle driver associations and the individuals themselves. It is a structured program that maximizes participatory research, including an evaluation design that allows all individuals to benefit from the educational intervention, and provides 12 and 24 months impact and outcome evaluation of cognitive determinants (knowledge and attitude changes) as well as condom use behavior, respectively (Green & Mercer, 2001). Results from this study will contribute to the limited published studies in this area of research that may have great implications on the role of male populations providing local transportation services in the transmission of HIV/AIDS.

## STUDY LIMITATIONS

Several limitations of this study should be considered when interpreting these findings. The data are collected from self-reports, which may be subject to error through a social desirability bias. However, the questionnaires were previously assessed for social desirability, and no significant social desirability bias was found (Morisky, Ang, & Sneed, 2002). This lends support to the viability of the KAB questionnaires used in the study. We do suggest that further research be conducted on assessment of KAB change to provide more reliable and valid measures. Another limitation is the inherent shortcoming of a crossover research design study. In Phase 1, we have a quasi-experimental design with an intervention and a control group; however, at the second follow-up assessment, we are left with a comparison group, which is no longer a true control group, because they also received the intervention. Thus, for the significant effects that we found during follow-up, we cannot rule out alternative explanations such as testing effects, history, maturation, and so on, so further research is needed in this area. Finally, follow-up assessments were conducted within 3 years, a relatively long period of time; however, in the future, perhaps an even longer period of assessment could be conducted to evaluate the longer term impact of the intervention.

## IMPLICATIONS FOR PRACTICE

Future HIV/AIDS prevention efforts should focus on the high-risk, male population in the transportation industry such as taxi and tricycle drivers, who play a major role in the

transmission of HIV/AIDS. Men generally still dominate and control women's sexual behavior in the Philippines. The previous study by Morisky, Pena, Tiglaio, & Liu, (2002) found that despite efforts to educate CSWs to practice safe sex and to have a greater impact, there was a great need to focus on their male clients such as taxi and tricycle drivers as well, in order to curb the escalating HIV/STI infection rates. This intervention confirms the effectiveness of similar interventions that targets clients of CSWs (Celentano et al., 2000; New Era, Family Health International, 1997; Wong, Lee, Lo, & Lo, 1994) and supports the Merson, Dayton, & O'Reilly, (2000) analysis mentioned above, which found that behavioral change interventions are effective when targeted to populations at high risk, particularly CSWs and their clients.

The findings present important implications for research and program planning in designing community-based peer education intervention programs. Taxi and tricycle drivers are in a unique position to help further the HIV/AIDS prevention efforts; they have the potential to change their sexual behaviors and lifestyle as well as to educate and counsel their clientele when they are given the proper health education, training, and motivation to do so.

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**Table 1**

Research Design

Study Group	Baseline Assessment (Months 1-3)	Phase 1 (Months 4-15)	Posttest Assessment (Months 16-18)	Phase 2 (Months 19-30)	Follow-Up Assessment (Months 31-33)
Taxi 1	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>		O <sub>3</sub>
Taxi 2	O <sub>1</sub>		O <sub>2</sub>	X <sub>2</sub>	O <sub>3</sub>
Tricycle 1	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>		O <sub>3</sub>
Tricycle 2	O <sub>1</sub>		O <sub>2</sub>	X <sub>2</sub>	O <sub>3</sub>

NOTE: O<sub>1</sub>, O<sub>2</sub>, and O<sub>3</sub> represent the baseline, posttest, and follow-up assessment; X<sub>1</sub> and X<sub>2</sub> represent the peer education intervention.

**Table 2**

## Sample Demographic Characteristics

Type of Driver	Age	Education (Years)	Length of Working (Months)	Income Per Year (Pesos) <sup>a</sup>
Taxi ( <i>n</i> = 400)	34.73	9.47	98.82	60,066.5
Tricycle ( <i>n</i> = 300)	34.36	8.17	84.98	54,681.0

<sup>a</sup>At time of study, 40 pesos = U.S.\$1.

**Table 3**

Comparison of Demographic Characteristics Between Sites at Baseline

	<u>Site 1 Intervention Group (n = 350)</u>		<u>Site 2 Control Group (n = 350)</u>		<i>p</i> Values
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age (years)	34.82	8.54	34.35	8.73	.53
Education (years)	9.02	2.53	8.82	2.61	.31
Length of work (months)	93.14	9.62	92.68	9.79	.59
Income per year (pesos)	57,691	14,218	57,749	14,892	.72

Table 4

Descriptive Statistics: Knowledge, Attitudes, and Condom Use Behavior

Taxi and Tricycle Drivers	Baseline		Posttest		Follow-Up	
	M	SD	M	SD	M	SD
Knowledge (range: 1.0-5.0)						
Intervention (n = 350)	3.81	0.82	4.26	0.85	4.61	0.86
Control (n = 350)	3.78	0.86	4.06	0.88	4.21	0.87
Attitudes (range: 1.0-5.0)						
Intervention (n = 350)	2.07	0.87	2.34	0.88	2.56	0.88
Control (n = 350)	2.09	0.90	2.06	0.87	2.36	0.89
Condom use behavior (range: 1.0-5.0)						
Intervention (n = 350)	2.05	0.78	2.54	0.81	2.68	0.83
Control (n = 350)	2.06	0.81	2.10	0.82	2.39	0.84

**Table 5**

Repeated Measures Analysis of Variance Results for Primary Outcome Measures: Knowledge, Attitude, and Condom Use

Source of Variance	Mean Square	df	F Value	Significance
Knowledge				
Intercept	105,210.93	2	449.27*	< .001
Error	234.18			
Attitudes				
Intercept	102,205.24	2	425.19*	< .001
Error	240.38			
Condom use behavior				
Intercept	105,211.43	2	428.31*	< .001
Error	245.64			

\* Significant at  $p < .001$ .