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## **The Importance of Interpersonal Discussion and Self-Efficacy in Knowledge, Attitude, and Practice Models**

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This study contributes to the theoretical discussions about the influence of education-entertainment programming on consumers of the genre. Data from the end-line evaluation of an EE program produced by the BBC World Service Trust in India, *Jasoos (Detective) Vijay*, is used. The analysis focused on 834 sexually active young men, the key demographic target audience for the program. Using structural equation modeling techniques, an initial knowledge, attitudes, and practices model is examined. Adding self-efficacy and interpersonal discussion improve this model. Not only is interpersonal discussion important, but the target others with whom that discussion occurs are also important for predicting behavioral change. Implications for EE theory and programs are explored.

Recent studies estimate that between 2 and 3.1 million adults in India are infected with HIV (International Institute for Population Sciences & Macro International, 2007).<sup>6</sup> The National Family Health

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Survey (NFHS-3), which tested more than 100,000 people, found the prevalence to be higher in urban areas (0.35%) than in rural areas (0.25%) (ibid.). The survey also found that more men are HIV positive than women, and that the majority of cases were in younger as opposed to older individuals. Taken together, these three parameters describe the demographic at highest risk for contracting HIV in India, namely young, urban males (ibid.).

In response to the growing numbers of HIV cases in India, the BBC World Service Trust developed an entertainment education program — *Jasoos Vijay*, a fast-paced, high production value detective show — as part of a larger HIV and AIDS- awareness multi-media campaign. The main character, Jasoos Vijay, was created to appeal to the primary target audience of sexually active men between 18 and 34 years of age. This study examines the relationship between exposure to an entertainment education (EE) program and the processes by which it produces knowledge, attitude, and behavioral effects. This triad of measures is often referred to as the KAP model and is frequently employed to assess the impact of health care interventions. In addition to these traditional measures, the current study explores the possible roles that both self-efficacy and interpersonal discussion might play in changing HIV/AIDS-related behavior among sexually active young men in India.

#### ***Cultural Context of HIV/AIDS in India***

One of the key communication challenges of HIV/AIDS-related campaigns in India is the taboo nature of the issue, especially given the associated sexual, social, and moral underpinnings. Traditionally, social and religious beliefs have played a strong role in keeping public discourse on issues of sexuality at a minimum. Even today in many Indian communities, particularly in the semi-urban and rural areas, there is a “culture of silence” surrounding open or direct discussions of sexual matters and sexual health (Bhattacharya, 2004; Roth, Krishnan, & Bunch, 2001; Singhal & Vasanti, 2005). As Bhattacharya (2004) points out,

To change the environment surrounding HIV/AIDS issues, it is critical to break the silence. Discussion on topics such as sex, sexuality, and sexual behavior issues . . . are still taboo in India. The norm of not discussing personal sexual behavior and the inability to connect personal risk to HIV are considered two barriers to initiating open and honest discussions. (p. 112)

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Research on the sexual and reproductive behavior of adolescents and young adults in India indicates that unprotected, premarital sexual activity begins relatively early (Joshi, Dhapola, & Pelto, 2004). At the same time, discussion with family members of sexuality-related topics is uncommon, a problem further compounded by a lack of formal sex education infrastructure in schools and colleges (Verma, Pelto, Schensul, & Joshi, 2004). Older relatives and extended family members are highly respected, and they routinely play gatekeeper roles on varying aspects of family and community life. They "often provide both informational and instructional support concerning social norms and family relationships to the younger family members . . . who happen to be in the age group most vulnerable to HIV/AIDS" (Bhattacharya, 2004, p. 112). Thus, it is plausible that, given the right impetus, existing interpersonal social networks could prove to be an invaluable asset in outreach to young, at-risk populations (Bhattacharya, 2004).

Nor is this "culture of silence" on discussion of sex and/or sexual health the only communication barrier. Prevalent gender norms are skewed such that (among heterosexual couples) men, and not women, are the ones with the power to initiate discussions and implement decisions regarding sexual matters (Ramakrishna, Pelto, Verma, Schensul & Joshi, 2004; Roth, Krishnan, & Bunch, 2001; Sivaram et al., 2004). These studies point to the need to target health campaigns for men, highlighting their role as decision makers not only for their own health, but also for that of their sexual partners. Thus, as Roth, Krishnan, and Bunch (2001) note, to prevent HIV/AIDS in India, "men's participation appears to be a promising strategy that needs to complement those [campaigns] that focus on helping women and raising their status and income in Indian society" (p. 74).

### ***Entertainment Education***

Entertainment education (EE) is the process of purposely designing and implementing a media message that both entertains and educates, in order to increase audience members' knowledge about a particular issue, create favorable attitudes, shift social norms, and change overt behavior. The purpose of EE is to contribute to the process of directed social change, whether at the level of the individual, community, or society (Singhal & Rogers, 1999, 2002).

In general, exposure to EE programs has been shown to effect changes in audience members' knowledge, attitude, and behavior on the issue being promoted (Papa et al., 2000; Rogers et al., 1999; Valente et al., 2007; Valente, Kim, Lettenmaier, Glass, & Dibba, 1994; Wilkin et al., 2007). However, it is worth noting that the degree, intensity, and scope of EE effects have varied dramatically. For instance, Yoder, Hornik, and Chirwa (1996) found that controlling for other variables, simple exposure to an EE program had little impact on knowledge and behavioral change in the target population. In contrast, Valente and Saba (2001) found that while exposure to and interpersonal communication encouraged by a campaign significantly impacted knowledge and behavior, they did not impact attitudes. Our first set of hypotheses tests the effect of exposure to *Jasoos Vijay* on the HIV/AIDS-related knowledge, attitudes, and behavior of the target population.<sup>1</sup>

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<sup>1</sup> Knowledge, attitudes, and behaviors were self-reported in the survey data.

H1a: Exposure to *JV* predicts increased HIV/AIDS-related knowledge.

H1b: Exposure to *JV* predicts more positive HIV/AIDS-related attitudes.

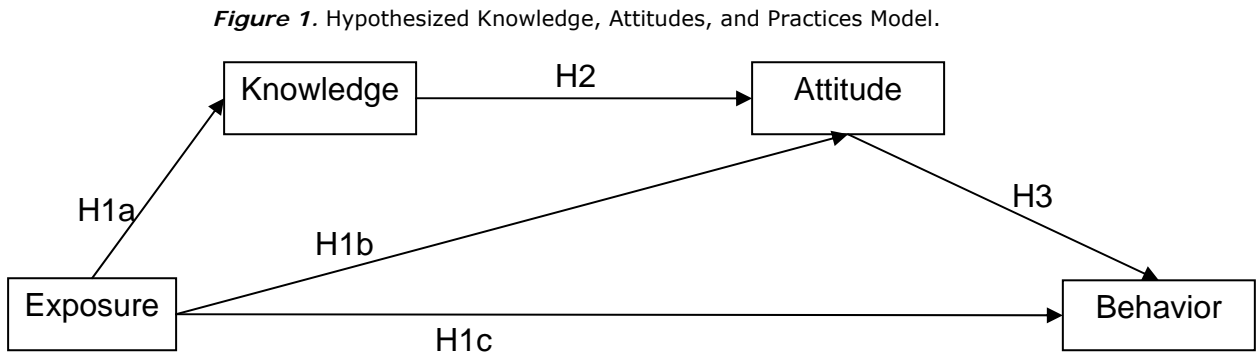
H1c: Exposure to *JV* predicts increased HIV/AIDS-prevention behavior (practices).

### ***The Knowledge, Attitude, and Practice Model***

Evaluations of EE interventions have traditionally focused on the KAP model — the link between an individual's knowledge, attitudes, & practices — to understand the process of behavioral and social change (Singhal, Rao, & Pant, 2006; Singhal & Rogers, 1999). Although various researchers have proposed different existing theoretical models of the knowledge-attitude-practice relationship, the most frequently applied ordering of the KAP variables is the cognitive model (Valente, Parades, & Poppe, 1998). This theoretical model "argues that individuals first learn about a practice, then develop a positive attitude toward it, and after passing through these stages, engage in the behavior" (p. 368). The present research tests the traditional KAP model (see Figure 1 for a depiction of hypothesized paths) on young, sexually active male viewers<sup>2</sup> of *Jasoos Vijay*. Specifically, we predict:

H2: HIV/AIDS-related knowledge predicts more positive attitudes toward HIV/AIDS.

H3: HIV/AIDS-related attitudes predict increased HIV/AIDS prevention behavior.



### ***Self-Efficacy***

Other recent models of behavioral change have incorporated additional key constructs. The most common addition is Bandura's (1977) concept of self-efficacy that has been integrated into Ajzen's (1985) Theory of Planned Behavior; Rosenstock, Strecher, and Becker's (1988) Health Belief Model; and Fishbein and Cappella's (2006) Integrated Model of Behavioral Prediction. Self-efficacy refers to an individual's assessment of his or her own ability to perform a particular behavior (Bandura, 1977). Bandura argues that self-efficacy is one of the most important prerequisites of behavior. Prior research indicates that

<sup>2</sup> Young, sexually active male viewers were between 18 and 34 years old and reported having engaged in sexual intercourse.

individuals with low self-efficacy who are not confident in their ability to perform a particular behavior tend to either not try to perform the behavior in question, or to give up easily when facing adversity (Bandura & Schunk, 1981).

The concept of self-efficacy has been explored in EE contexts previously. In Tanzania, exposure to a dramatic EE program increased viewers' beliefs that they could reduce their risk of contracting HIV/AIDS (Bandura, 2004). Self-efficacy may play a pivotal role in translating HIV/AIDS-relevant knowledge and attitudes into actual prevention behavior, such as using condoms, limiting one's sex partners, getting tested for HIV/AIDS, avoiding shared needles, etc. Therefore, we add the following research question:

RQ1. Does perceived self-efficacy with respect to HIV/AIDS prevention measures influence the relationship between exposure and knowledge, attitudes, and behavior?

### ***Role of Interpersonal Discussion***

Research from the past two decades on EE has repeatedly found that programs that spark interpersonal discussion are more likely to promote behavioral change (Papa & Singhal, 2008; Singhal & Rogers, 2002). This relationship has been especially relevant when considering discussion of sensitive or taboo topics. Studies across various cultures have found EE programming to be effective in provoking discussion and dialogue within the family — especially when related to sexual behavior (Rogers et al., 1999), domestic violence (Usdin, Singhal, Shongwe, Goldstein, & Shabalala, 2004), and family planning (Valente et al., 1994). For example, a study conducted by Valente et al. (1994) in Gambia found that a radio drama encouraged couples and families to talk about family planning.

When interpersonal discussion occurs, it can substantially influence subsequent behavior. An investigation into the role of interpersonal communication in promoting behavioral change was done by the team investigating the impact of the radio drama "*Twende na Wakati*" in Tanzania in the 1990s (Rogers et al., 1999). Their analysis found that "one of the main processes through which the soap opera changed Tanzanian listeners' family planning behavior was by stimulating interpersonal communication about the subject" (p. 208). Interpersonal village networks proved to be extremely important in circulating crucial information about contraceptives. Similar findings on the impact of interpersonal communication have also been reported from studies on family planning campaigns in Nepal (Sharan & Valente, 2002; Storey, Boulay, Karki, Heckert, & Karmacharya, 1999). Additionally, investigations from two mass media campaigns on reproductive health in Bolivia (Valente & Saba, 2001) found that exposure and interpersonal communication were associated with changes in knowledge and contraceptive use.

A detailed case study of the impact of a radio drama *Tinka Tinka Sukh* on a village in India (Lutsaan) by Papa et al. (2000) also emphasized the impact that discussion can have on collective efficacy. "Conversations about the educational content of a media program can create a socially constructed learning environment in which people evaluate previously held ideas, consider options, and identify steps to initiate social change" (p. 50). Interpersonal communication was found to increase the villagers' sense of collective efficacy and to lead to community action, as individuals came to believe that

unified efforts can solve a problem (Papa et al., 2000). In light of the evidence that interpersonal discussion can accelerate behavior change, we examine its role in impacting the behavior of sexually active, young male viewers of *Jasoos Vijay*:

RQ2: Does interpersonal discussion with respect to HIV/AIDS-prevention measures influence the relationship between exposure and knowledge, attitudes, and behavior?

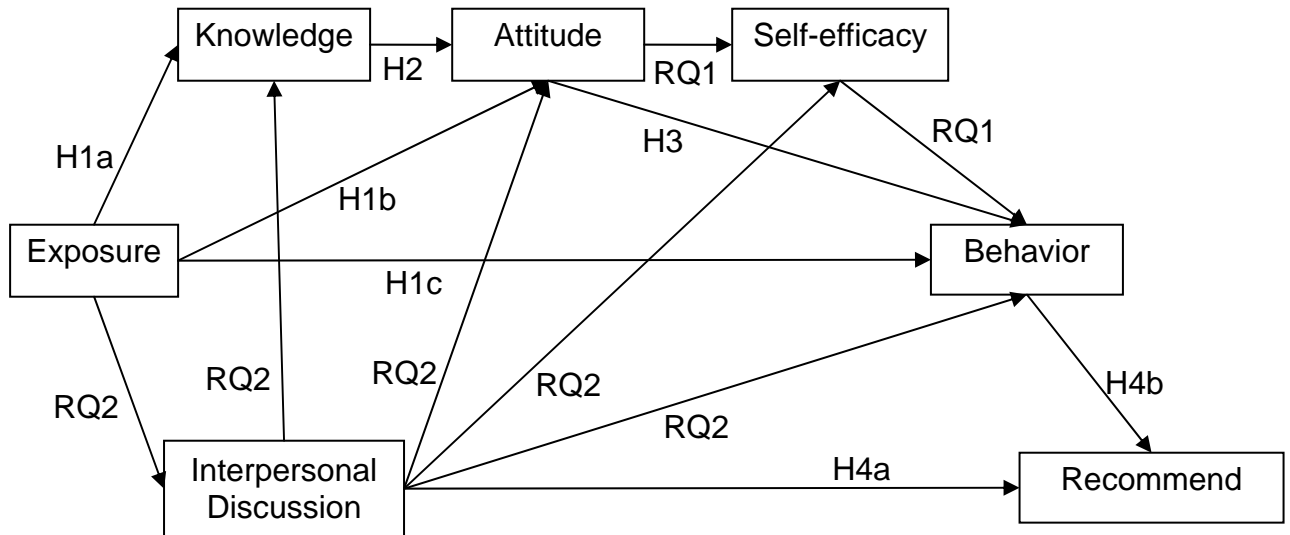
It is important to note that not everyone in the *Jasoos Vijay* audience or in India more generally is personally at elevated risk of contracting HIV/AIDS (e.g., those in long term monogamous relationships). Consequently, focusing exclusively on whether or not viewers personally engage in safer sex behaviors may underestimate the true impact of the program. To address this issue, we also examined the addition of one final construct — the extent to which viewers recommend HIV/AIDS-prevention behaviors to their friends and relatives. A previous investigation into the role of interpersonal communication in health behavior change examined the relationship between mass-media-generated interpersonal communication networks and an individual's behavior-change stage (Valente, Poppe, & Merritt, 1996). In their study, Valente et al. found that interpersonal communication varies according to an individual's behavior change stage. Based on Valente, Poppe, and Merritt's (1996) stages of change model, it was hypothesized that viewers who adopted HIV-prevention behavior would then be likely to recommend those behaviors to others in their social circle. Thus, the next set of hypotheses predicted that:

H4a: Engaging in interpersonal discussion with respect to HIV/AIDS-prevention measures predicts making HIV/AIDS-prevention recommendations to others.

H4b: Engaging in HIV/AIDS-prevention behavior predicts making HIV/AIDS-prevention recommendations to others.

Taken together, the four hypotheses and two research questions yield a conceptual model of the ways in which exposure, knowledge, attitudes, self-efficacy, and interpersonal discussion may produce effects on behavior and recommendations of behavior to others. (See Figure 2).

Figure 2. Complete Conceptual Model.



Given the taboo and personal nature of HIV/AIDS-related discussions, it is unclear to whom, if to anyone, viewers spoke about this topic. In light of the findings of Valente et al. (1996) on the differences in interpersonal networks for gaining information, this study investigates not only if young sexually active male viewers discussed these sensitive topics, but with whom and to what effect. Did talking to one's spouse have the most significant impact in adopting preventative measures and seeking treatment? Did cultural norms regarding taboos on discussions of sex with family members act as a barrier in bringing up these topics? In short:

RQ3: Does it matter with whom the viewers discuss HIV/AIDS prevention methods?

### **Method**

To address these hypotheses and research questions, a large-scale survey evaluating the impacts of *Jasoos Vijay* on the target population was conducted.

### **Jasoos Vijay Program**

The BBC World Service Trust, the international non-profit charity of the British Broadcasting Corporation, uses the creative power of media to reduce poverty and promote human rights by inspiring



people to build better lives<sup>3</sup>. From 2002 to 2007, the BBC World Service Trust produced and broadcast the entertainment education program, *Jasoos Vijay*, as the centerpiece of a larger, multi-format, multi-platform campaign. The purpose of the campaign was to raise awareness about HIV/AIDS and promote behavioral change in India. Funded by the British government's Department for International Development (DFID), the campaign was implemented in partnership with India's national broadcaster *Doordarshan* and the National AIDS Control Organization.

*Jasoos (Detective) Vijay* was a weekly crime drama telecast on the national TV channel on Sunday nights at primetime with a repeat telecast during the week (see video for example clips from the program). The show aired 130 episodes over the course of five years. By the end of the campaign, *Jasoos Vijay* was among the top 10 most watched programs on television in India. Television Audience Monitoring (TAM) People Meter data from Nielsen's audience panel estimated that, during its final year, *Jasoos Vijay* reached a weekly audience of up to 15 million, and over the course of the year, it reached 70 million viewers.<sup>4</sup>

#### ***Evaluation of the Impact of the Program***

*Jasoos Vijay* was telecast in three phases. During the first phase of the program, a panel study was conducted by Sood, Shefner-Rogers, and Sengupta (2006) to evaluate the impact of the *Jasoos Vijay* program and other campaign components on the general population. It was conducted in three northern Indian states, and it surveyed married and unmarried men and women aged between 15 and 60 years. Data from this study demonstrated that, among the general audience, people exposed to the campaign had significantly higher awareness and knowledge of HIV/AIDS-related issues. Exposure to the campaign also led to discussion about condoms, STIs, and AIDS, but did not impact condom use directly (Sood et al., 2006).

In a separate, cross-sectional study, and to further understand the impact of this long running campaign, the BBC World Service Trust conducted a survey at the beginning of the final phase of the project as a baseline of the public's HIV/AIDS-related knowledge, attitudes, and practices (KAP). After the campaign concluded, an end-line survey was conducted using the same research methodology. This evaluation showed that a higher percentage of those exposed to *Jasoos Vijay* knew the different routes of HIV transmission and the methods of preventing HIV transmission. Exposure to the program was also related to having more positive attitudes toward people living with HIV/AIDS and, among men, consistent condom use with commercial sex workers. (For further information on the program and a discussion on the percentage shifts in knowledge, attitudes and practices among viewers and non-viewers, see Deshpande, Balakrishnan, Bhanot, & Dham, in press). These studies have shown a relationship between

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<sup>3</sup> See <http://www.bbcworldservicetrust.org> for details on the BBC World Service Trust's current and past projects.

<sup>4</sup> Nielsen's TV audience panel does not cover towns with populations of less than 100,000, where the majority of the national broadcaster *Doordarshan's* audiences live. Media agencies believe that TAM data under reports *Doordarshan* viewers, implying that the actual reach of *Jasoos Vijay* might have been significantly higher than the figures reported by TAM data.

exposure and HIV/AIDS-related knowledge, attitudes, and/or behaviors. In contrast, the present paper focuses on whether the KAP model is adequate to capture the behavior change process, or whether its explanatory power is improved by the addition of HIV/AIDS-related self efficacy measures and discussion.

### ***Procedure***

A multi-stage, stratified random sampling procedure was used to select respondents from 168 towns (population below 500,000) and 535 villages (population around 5,000). The study was carried out in 17 Indian states, with each state being divided into socio-cultural regions and then further sub-divided into districts. The survey was administered in 10 languages. Respondents were matched based on gender, age, education, and location (specific town or village) from the baseline to the follow-up study. At each location, a random starting point was selected, and the households for interview were selected following the right-hand rule with a skip of three households from the first one. Each respondent who met the survey criteria was interviewed face-to-face. The data collection was carried out by an independent research agency, and quality control was ensured through an audit by a different agency. The end-line sample contained 12,050 men and women between the ages of 18 and 49 who were *Doordarshan* viewers (watched DD for at least two hours a week).

### ***Sample***

Our study focuses on the key target population of the campaign, namely sexually active males between the ages of 18 and 34 (N = 834). Our sample was distributed evenly between urban and rural men, with 49.5% and 50.5%, respectively. Within the sample, 5% had no formal schooling, 36.5% had less than a high school education, 42% had a high school degree, and 16% of the sample had a higher education degree.

### ***Measures***

Each of the key constructs of interest in the present analysis is described in detail below (see Appendix A for wording of survey items).

### ***Exposure***

Exposure to *Jasoos Vijay* was measured by two items — unaided spontaneous recall of characters in the show and of messages from the show. First, respondents were asked to name all the characters they recalled from the program. Respondents were given one point for each character they identified, up to a total of four characters for a total of four possible points. The second item asked respondents what HIV/AIDS-related messages they recalled, with respondents given one point for each of the following: testing of HIV/AIDS, treatment of STIs, treatment of HIV/AIDS, use of tested blood, use of sterilized needles, use of condoms, being faithful to a partner, abstaining from sex, not visiting sex workers, routes of HIV transmission, and support of people living with HIV/AIDS. Higher numbers indicated greater exposure, and exposure could range from 0 to 15. This type of exposure measurement benefits from the ability to tap both awareness and comprehension of the show (Valente, 2002).

### ***Knowledge of HIV Transmission Routes and Methods of Prevention***

Knowledge was also measured by two items. Respondents were first asked, "How is HIV/AIDS transmitted from one person to another?" They were given one point for mentioning each of the following routes: unprotected sex; sex with multiple partners; sex with commercial sex workers; using infected blood; using infected needles/syringes; and from an infected pregnant mother to her baby. Next, respondents were asked "How can a person reduce the risk of being infected by HIV/AIDS?" Again, they were given one point for mentioning each of the following methods of preventing HIV transmission: condom use; HIV testing; using sterilized needles/syringes; tested blood; faithfulness; and abstinence. Higher numbers indicated greater HIV/AIDS-related knowledge.

### ***Attitudes***

Survey respondents were asked a series of questions regarding whether a male or female member of their community who was infected with HIV/AIDS should be allowed to 1) stay, 2) whether a man infected with HIV/AIDS should be allowed to continue to work as long as he could, 3) whether a child infected with HIV/AIDS should be allowed to go to school, 4) whether all pregnant women should be tested for HIV/AIDS, 5) whether it is all right to pay for sex (reverse coded), and 5) whether a responsible partner would use a condom with non-regular sex partners. These items were summed such that higher scores implied more positive HIV/AIDS-related attitudes. The Cronbach's alpha for this scale was 0.63.

### ***Self-efficacy with Respect to HIV/AIDS-related Behaviors***

Self-efficacy was measured by agreement with the following statements on a 5-point Likert scale (ranging from strongly disagree to strongly agree):

- "I can communicate freely with my spouse on matters concerning sex";
- "I am confident that I can protect myself from HIV/ AIDS";
- "If I think necessary, I would insist on using a condom with my partner";
- "I would always use a condom to protect myself from HIV/AIDS";
- "If I perceive any risk, I am confident I can myself go for HIV testing";
- "If I need any treatment, I will only consult a qualified medical professional for treatment of STI's";
- "I will insist on using tested blood, whenever I need a blood transfusion for myself or my family members"; and
- "I will insist on using sterilized/boiled needles whenever I need to take an injection."

Items were re-scaled so that higher numbers indicated higher degrees of self-efficacy and then summed. The Cronbach's alpha for this scale was 0.74.

### ***Practices or HIV/AIDS-related Behaviors***

Behavior was also a self-reported summed score based on respondents agreeing that they had engaged in each of the following eight HIV/AIDS-related behaviors: testing for HIV/AIDS, treatment of STIs by qualified personnel, treatment of HIV/AIDS by qualified personnel; use of tested blood; use of sterilized needles; consistent use of condoms; being faithful to one partner; and not visiting sex workers.

### ***Recommending HIV/AIDS-related Behaviors to Others***

In addition to asking respondents whether or not they had engaged in any of the above behaviors, the survey also asked whether they had recommended any of these same eight HIV/AIDS-related behaviors to others. One point was allotted for each recommendation of each behavior.

### ***Interpersonal Discussion***

Respondents were also asked if they had ever discussed any of the eight HIV/AIDS-related behaviors with anyone and, if so, with whom (spouse, family, friend, other)? One point was allotted for each separate topic discussed with each individual.

### ***Analysis***

All of the hypotheses and the first two research questions were addressed through structural equation models. Within these models, individual hypotheses were tested with local *t* tests to determine whether they were statistically significant. Additionally, the global fit of the entire model was examined. The final research question was tested using multiple regression analysis. The alpha levels for all tests were set at .05 a priori.

### ***The Results***

#### ***Preliminary Analysis***

Prior to the structural equation modeling analysis, the data were prepared using SPSS 14 and PRELIS. Specifically, variable scales were created using SPSS as described above. PRELIS was used to compute the covariance matrix for input into the LISREL software. The covariance matrix for all of the variables is shown in Table 1 (see Appendix B for a table with the correlation matrix). The LISREL analysis was conducted using a covariance matrix and maximum likelihood estimation.

#### ***Primary Analysis***

##### ***Knowledge, attitudes, and practices***

The basic model parameter estimates are shown in Figure 3. The three EE pathways from exposure to knowledge, attitudes, and practices were all significant at the 0.05 level. Thus, all

components of the first hypothesis were supported. Likewise, the second hypothesis was supported. Knowledge of HIV transmission routes and methods of prevention significantly predicted HIV/AIDS-related attitudes. Finally, the third hypothesis was also supported. Attitudes about HIV predicted HIV/AIDS-related behaviors. Thus, in this hypothesized knowledge, attitudes, and practices model, all of the hypotheses were supported as predicted. Indicators of the goodness-of-fit of this model and subsequent iterations are included in Table 2. With a global  $\chi^2$  of 7.85 and 1 degree of freedom, the  $p$  value is less than 0.01, indicating that the model is not a very good fit to the data. Additionally, the root mean square error of estimation is over 0.05, also indicating that the model fit is not good. Thus, despite the strong support for the basic EE and KAP hypotheses, the model may benefit from modifications.

**Table 1.** Covariance Matrix (N = 754).

	Exposure	Discussion	Knowledge	Attitude	Self- efficacy	Behave	Rec
Exposure	7.27						
Discussion	1.08	5.69					
Knowledge	1.13	1.30	4.35				
Attitude	1.32	2.75	1.59	17.89			
Self-efficacy	0.75	3.01	1.29	8.06	15.86		
Behavior	0.68	0.97	0.46	0.90	1.31	2.10	
Recommend	1.73	5.44	1.61	1.96	1.84	2.58	27.34

### **Self-efficacy**

Figure 4 addresses RQ1 with the addition of self-efficacy to the basic KAP model. In this revised model (Model 2), attitudes significantly predict self-efficacy. In turn, self-efficacy has a significant effect on behavior. None of the other parameter estimates in the model change more than 0.03 with the addition of self-efficacy. Exposure continues to significantly predict knowledge, attitudes, and behavior, and knowledge affects attitudes. Overall, this model is a better fit with a global  $\chi^2$  of 10.88 (3),  $p = 0.01$ . The  $\chi^2$  to degrees of freedom ratio (3.62) is well below the acceptable guideline of 5.

Figure 3. Model 1 - Parameter Estimates for Knowledge, Attitudes, and Practices Model.

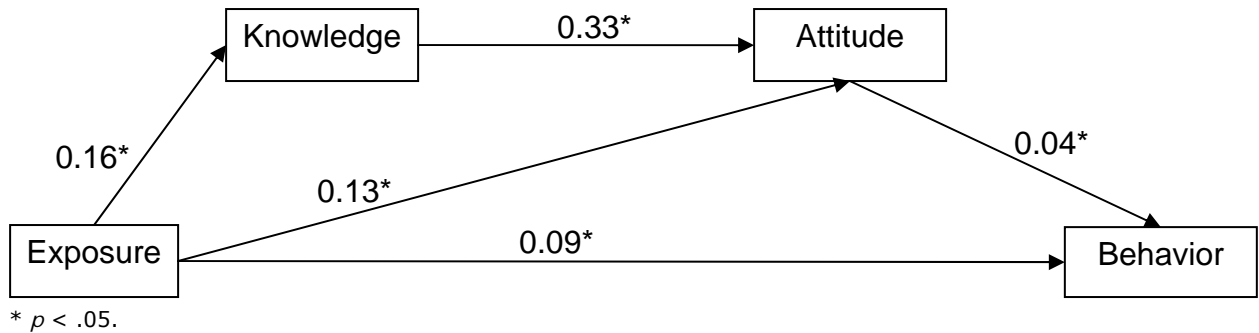
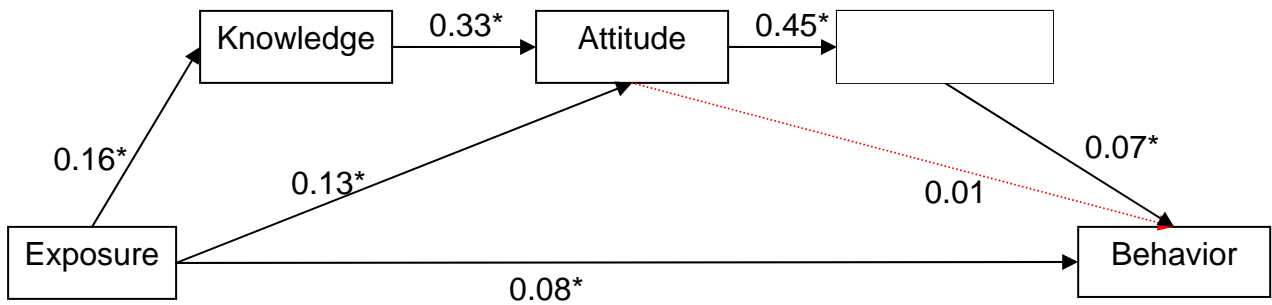


Table 2. Model Iterations.

	$\chi^2$ (df)	$\chi^2 / df$	RMSEA	$\chi^2_d$ (df)
	$p$	Ratio		$p$ -value
Model 1. KAP	7.85 (1)	7.85	0.10	
	< 0.01			
Model 2. Self-efficacy Added	10.88 (3)	3.62	0.06	
	0.01			
Model 3. Path from Attitude to Behavior Deleted	11.53 (4)	2.89	0.05	0.65 (1)
	0.02			$p > .05$
Model 4. Interpersonal Discussion Added	3.20 (4)	0.80	0.00	
	0.53			
Model 5. Path from Exposure to Attitude Deleted	5.50 (5)	1.10	0.01	2.30 (1)
	0.36			$p > .05$
Model 6. Recommend Added	14.30 (9)	1.59	0.03	
	0.11			

Note: The  $\chi^2_d$  test compares nested models. A  $p$ -value greater than .05 shows that the less constrained model is not significantly worse than the more constrained model.

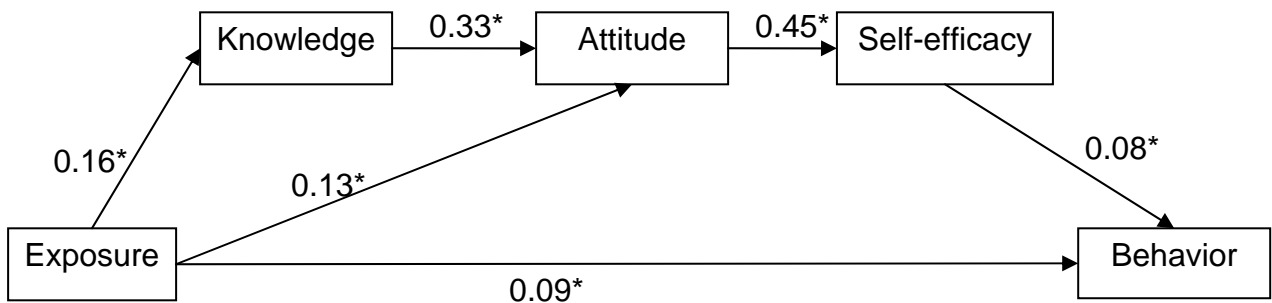
**Figure 4.** Model 2 - Parameter Estimates for Model with Self-efficacy Added.



\*  $p < .05$ .

However, Model 2 includes a non-significant pathway from attitude to behavior. The model was re-run with this pathway deleted (Model 3, see Figure 5). The individual parameter estimates remained stable. All of the paths included in this model were statistically significant at the 0.05 level. Because this model includes one fewer pathway, the previous model (Model 2) is nested within it. A  $\chi^2$  difference test ( $\chi^2_d$ ) comparing the two nested models was not statistically significant, showing that removing the pathway did not decrease model fit. In fact, the  $p$  value for the  $\chi^2$ , the  $\chi^2$  ratio, and the RMSEA were all improved for Model 3 compared to Model 2, indicating a better overall model fit. Overall, the addition of self-efficacy to the model increases the ability to predict behavior and does not affect the relationships among exposure, knowledge, attitudes, and behavior.

**Figure 5.** Model 3 - Parameter Estimates for Model with Self-efficacy Added and No Path from Attitude to Behavior.

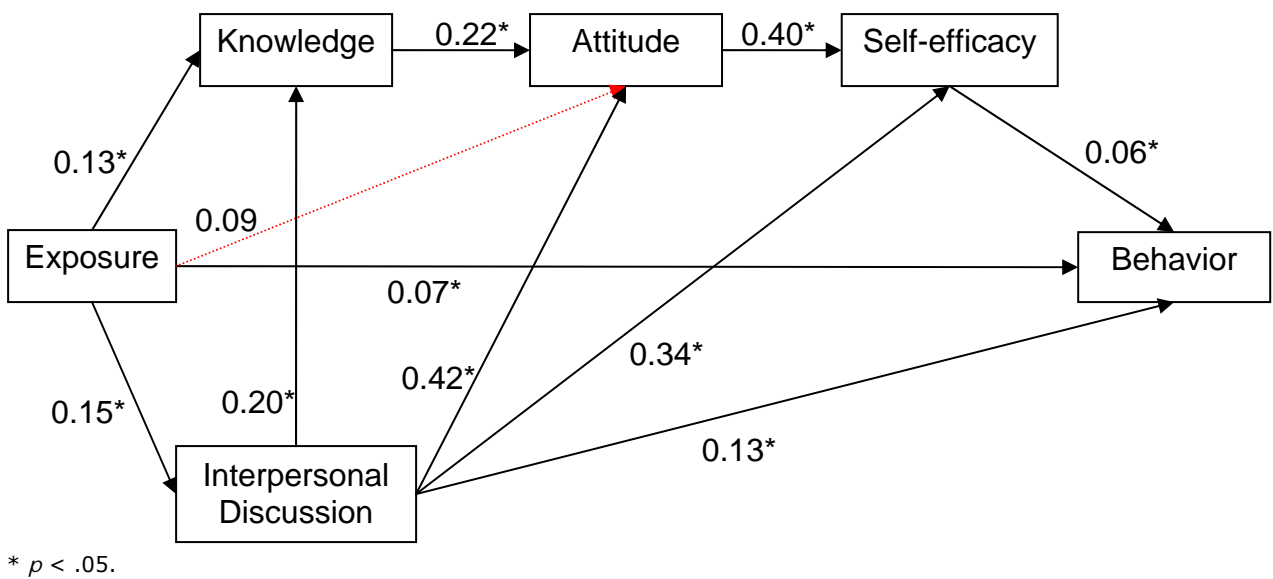


\*  $p < .05$ .

**Interpersonal Discussion**

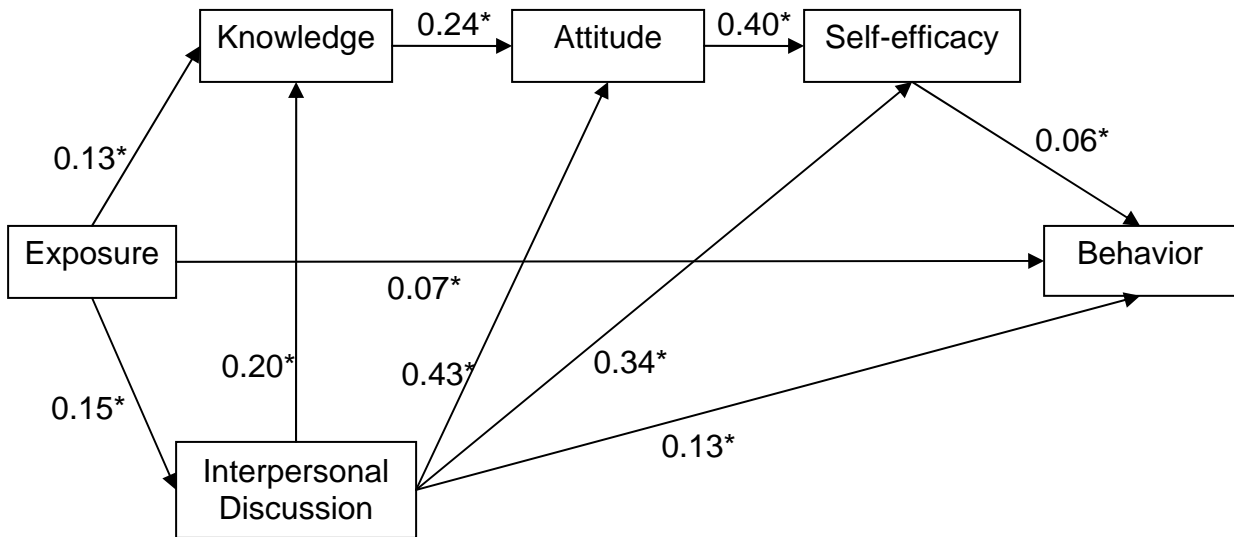
To address the second research question, interpersonal discussion about HIV was also added to Model 4 (see Figure 6). A path from exposure predicting interpersonal discussion and paths from interpersonal discussion to knowledge, attitude, self-efficacy, and behavior were included. Individual *t* tests of the parameter estimates were all significant and positive. While the majority of the previously modeled relationships between exposure, knowledge, attitude, self-efficacy, and behavior did not qualitatively change with the addition of interpersonal discussion, the path from exposure directly to attitude was no longer significant in this revised model. This model is a very good fit to the data, with  $\chi^2$  of 3.20 (4),  $p = 0.53$ . The non-significant path from exposure to attitude was deleted in the next model iteration (Model 5, see Figure 7). The overall model fit remained quite good, and the  $\chi^2_d$  test was not significant, showing that the model was no worse without inclusion of the pathway.

**Figure 6.** Model 4 - Parameter Estimates for Model with Self-efficacy and Discussion Added.





**Figure 7.** Model 5 - Parameter Estimates for Model with Self-efficacy and Discussion Added and Path from Exposure to Attitude Deleted.



\*  $p < .05$ .

Overall, the addition of interpersonal discussion to the model does not modify the majority of the relationships among exposure, knowledge, attitude, self-efficacy, and behavior. Instead, inclusion of interpersonal discussion increases the ability to predict knowledge, attitudes, and behavior.

### **Recommendations**

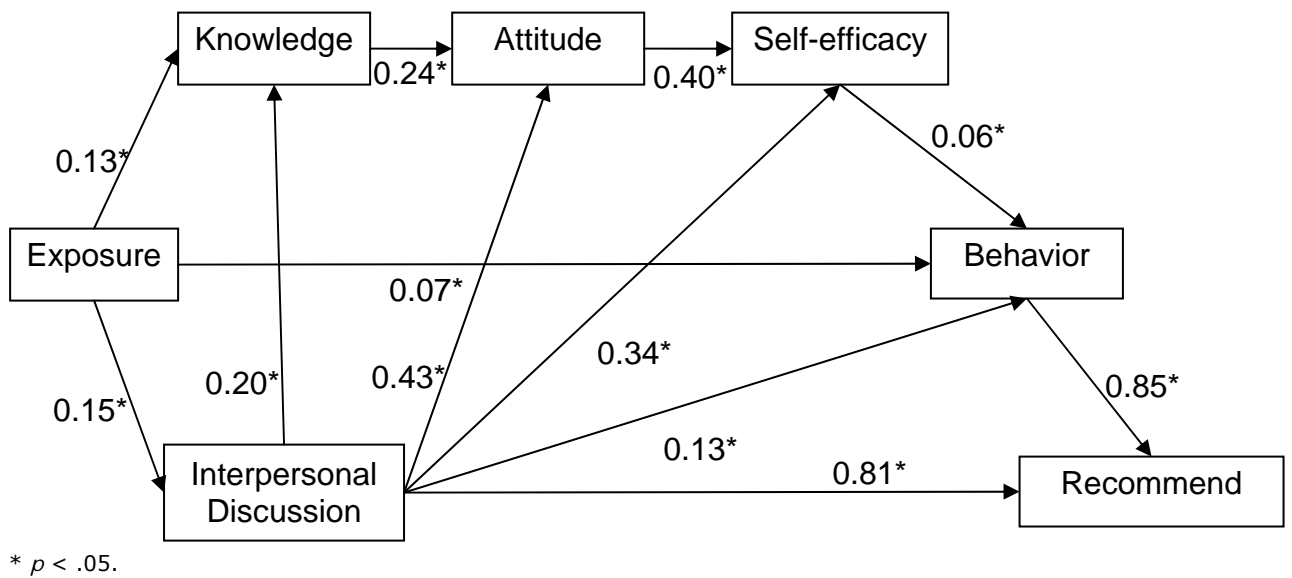
The final model, Model 6 (see Figure 8), includes the addition of one more construct, the extent to which people recommend HIV/AIDS-prevention behaviors to others. Both interpersonal discussion and behavior were predicted to lead to recommendations. As predicted by H4a and H4b, the parameter estimates for both of these paths were statistically significant and positive. Interpersonal discussion increases the likelihood that young men will recommend HIV/AIDS-related behaviors to others, and engaging in the behaviors themselves also increases the likelihood that they will recommend the behaviors. Thus, both parts of the fourth hypothesis are supported.

This final model is a good fit for the data with the global goodness of fit test not significant ( $p = 0.11$ ), a  $\chi^2$  to degrees of freedom ratio of only 1.6, and a low RMSEA of 0.03. Table 3 shows the total, direct, and indirect effects of exposure to *Jasoos Vijay* on each of the other variables in the model. Either directly or indirectly, exposure significantly predicts knowledge, attitudes, self-efficacy, behaviors, and recommendations.

**Interpersonal Discussion with Whom**

The third research question was addressed using linear regression analysis, controlling for exposure to the show. Interpersonal discussion with each of the target others was entered separately. Analysis of the correlation matrix and variance inflation factors showed that the interpersonal discussion variables with different targets were not multi-collinear. In fact, interpersonal discussion about HIV/AIDS-related topics with friends was significantly negatively correlated with discussion of those issues with all categories of family members (*r* of -0.28, -0.12, -0.16 for spouse, immediate family, and other relatives, respectively). Thus, all of the interpersonal discussion variables were also entered into a single model. Table 4 shows the beta coefficients for each regression model. Individually, discussion with one’s spouse, immediate family, and other relatives all predict HIV/AIDS-prevention behaviors. When entered into a single model, discussion with friends is also significantly predictive over and above the effects of talking with family. Overall, the person to whom one talks makes a difference in the effect of exposure to *Jasoos Vijay* and interpersonal discussion on behavior. In the present study, discussion of HIV/AIDS-related issues with family members was particularly effective in creating behavioral change.

**Figure 8.** Model 6 — Final Model.



**Table 3.** Total, Direct, and Indirect Effects.

	Effects of Exposure to <i>Jasoos Vijay</i>		
	Direct	Indirect	Total
Discussion	0.15*	-	0.15*
Knowledge	0.13*	0.03*	0.16*
Attitude	-	0.10*	0.10*
Self-efficacy	-	0.09*	0.09*
Behavior	0.07*	0.02*	0.09*
Recommend	-	0.20*	0.20*

\* $p < .05$ .**Table 4.** Interpersonal Discussion Predicting HIV/AIDS-Related Behaviors.

	Linear Regression Beta Coefficients					
	1	2	3	4	5	6
Exposure to <i>Jasoos Vijay</i>	0.13**	0.13**	0.13**	0.13**	0.13**	0.13**
Discussion with spouse	0.08*	-	-	-	-	0.09**
Discussion with family	-	0.09**	-	-	-	0.08*
Discussion with other relatives	-	-	0.09**	-	-	0.09**
Discussion with friends	-	-	-	0.04	-	0.09**
Discussion with others	-	-	-	-	0.02	0.03
$R^2$	0.023	0.026	0.026	0.018	0.018	0.042
Adjusted $R^2$	0.021	0.024	0.024	0.016	0.016	0.036

\* $p < .05$ . \*\* $p < .01$ .

### Discussion

The focus of the present paper was to test whether the KAP model is adequate to capture behavior change processes, or whether its explanatory power is improved by the addition of measures of HIV/AIDS-related self efficacy and interpersonal communication. Data from the end-line survey of a long-running EE program in India were used to evaluate the impact on the target audience of 18 to 34-year-old sexually active men. Our analysis first tested components of the basic KAP model in which exposure to *Jasoos Vijay* predicted increased HIV/AIDS-related knowledge, more enlightened attitudes toward HIV and engaging in HIV prevention practices or behaviors.

In short, exposure to *Jasoos Vijay* predicted increased HIV/AIDS-related knowledge, attitudes, and practices, supporting all components of Hypothesis 1. Moreover, knowledge of HIV transmission routes and methods of prevention significantly predicted more positive attitudes, supporting Hypothesis 2.

Likewise, having more enlightened attitudes about HIV directly predicted engaging in HIV/AIDS-prevention behaviors, supporting Hypothesis 3.

Further iterations of the model that incorporated self-efficacy help to illuminate the relationship between HIV/AIDS-related attitudes and behaviors. More specifically, in Model 2, which added self-efficacy to the basic KAP model, attitudes significantly predicted viewers' self-efficacy with respect to performing the eight HIV-prevention methods incorporated into the *Jasoos Vijay* narrative. Elevated self-efficacy was, in turn, related to actually engaging in these behaviors. In fact, the inclusion of self-efficacy within the model made the direct relationship between attitudes and behavior insignificant. Thus, self-efficacy fully mediates the relationship between attitudes and behaviors. This suggests that more enlightened HIV attitudes may serve to make individuals more confident that they can successfully perform these various HIV/AIDS-related behaviors, and this self confidence, in turn, increases the likelihood that they actually do engage in these safer sex practices. The improvement of the model with the addition of self-efficacy reinforces the claim by Bandura (2004) and other theorists that self-efficacy is one of the most important prerequisites of behavior and, consequently, should be incorporated in models of behavioral change.

Similarly, the addition of interpersonal discussion strongly improved the fit of the model. As shown in Model 5, the addition of interpersonal discussion to the model does not modify the majority of the relationships among exposure, knowledge, attitude, self efficacy, and behavior, but it does increase our ability to predict relevant knowledge, attitudes, and behavior. Interpersonal communication fully mediated the relationship between exposure and attitudes, and it partially mediated the relationships between exposure and both knowledge and behavior. In other words, the relationship between exposure and attitudes is better explained by their relationships with interpersonal communication. Given the mixed results of previous campaigns in impacting attitudes, it is particularly important to note that the effects of exposure on attitudes in this campaign all occurred through interpersonal communication. The importance of interpersonal discussion is consistent with Bandura's assertion that, in addition to direct effects, the media can also influence audiences indirectly, through a "socially mediated pathway" (2004, p. 141) in which interpersonal discussion can promote knowledge, change attitudes, and guide behavior. Interpersonal discussion can serve to reinforce the original EE message.

As noted previously, not everyone in our sample was personally at elevated risk of contracting HIV/AIDS. Many of the sexually active male viewers in our sample — such as those in long-term monogamous relationships — may have accurately concluded that they did not need to personally engage in the eight prevention behaviors promoted in *Jasoos Vijay*. Consequently, focusing exclusively on whether or not these viewers personally engaged in these safer sex behaviors may inadvertently underestimate the true impact of the program. To address this issue, we also examined the addition of one final variable — the extent to which viewers recommended these HIV/AIDS-prevention behaviors to others. As predicted in Hypothesis 4, both interpersonal discussion and engaging in safer sex behavior themselves increased the likelihood that the young sexually active men in our sample recommended HIV/AIDS-prevention behaviors to others.

The finding that interpersonal discussion was a pivotal component of encouraging viewers to adopt safer sex practices and to encourage others to do so was supported by viewer comments:

"Family perception about HIV/ AIDS has changed . . . after we started watching *Jasoos Vijay* . . . people are not embarrassed of talking about HIV/ AIDS. This is especially so between married couples."

Moreover, many viewers reported impact at the community level:

". . . inspired by your serial we have set up a group in our village which disseminates information on HIV, AIDS, STIs among the villagers . . . please send me booklets on HIV/AIDS . . ."

Our final research question asked whether the interlocutor with whom one discussed the safer sex practices depicted in the *Jasoos Vijay* series mattered. Linear regression analyses revealed a fascinating pattern of results. Speaking with one's spouse about the eight HIV prevention behaviors was significantly related to actually performing those behaviors. To a lesser extent, talking to one's immediate and extended family also predicted behavior. When all interpersonal discussion variables were entered into a single model, discussion with friends was also significantly predictive of engaging in safer sex practices over and above discussion with all family members. Interestingly, this suggests that viewers in our sample who tended to discuss the HIV/AIDS-prevention topics covered in *Jasoos Vijay* with family members did not tend to discuss these same topics with friends and vice versa. In short, it appears that viewers were more likely to talk *either* to their family *or* to their friends about HIV prevention; and those who talked to their family were more likely to follow through in terms of their own safer sex behavior. Our findings appear to be along the lines of recent work by various scholars on the role of conversations on campaign effects (see for example, Hoeken, Swanepole, Saal, & Jansen, 2009; Morgan, 2009; Southwell & Yzer, 2009). For example, Southwell and Yzer (2009) suggest that "conversation and campaign effects are most likely to intersect when campaign timing and context facilitates individuals' recognition of the relevance of campaign efforts to everyday survival and maintenance of self-image" (p. 4). In this study, the results indicate that discussion with family members and friends may play differential roles in activating the relevance of the campaign, and hence, who one talks to may, in part, account for the variance in behavioral outcomes. For EE campaign producers and researchers, this indicates the need to pay more nuanced attention not only to integrating elements that spark discussion in the audience, but also to whom the individuals talk to better account for effects on different topics and in different contexts.

In the past decade, research on EE programs has repeatedly highlighted the importance of interpersonal discussion as a key mediating variable in effecting behavior change. Theoretically, this model can be traced back to the two-step flow formulation of Katz & Lazarsfeld (1955) as well as Rogers' (1995) work on diffusion of innovation. Rogers suggested, "mass media channels are more effective in creating knowledge..., whereas interpersonal channels are more effective in forming and changing attitudes toward a new idea, and thus in influencing the decision to adopt or reject a new idea" (p. 36). However, within the realm of EE research, the role of interpersonal discussion of the key messages has yet to be adequately explored. As a step in this direction, our study clearly demonstrates that more attention needs to be focused on the complex way in which interpersonal communication works, impacting not only behavior, but also related aspects of knowledge, attitude, and self-efficacy. Focusing on interpersonal communication as a mediating variable may also enable us to theoretically explore the

complex interaction between individual-level (micro) behavioral change and community-level (meso/macro) social change. EE programming, even when focused on individual behavior adoption and change, typically deals with social issues and behaviors which are complex and often embedded in a web of social relations. Clearly, this also calls for future analysis and theorizing of effects to demonstrate equal sophistication and complexity (Dutta-Bergman, 2005; Singhal, in press without losing applicability). Our study suggests that focusing on interpersonal discussion could provide a crucial window into understanding the process of change and provide a clearer view of how EE programs interact with the individual, community, and environment to produce social change. As Southwell and Yzer (2009) note, "the more we understand why people verbally engage one another, the greater our ability to account for variance in campaign outcomes and in relationships between exposures and outcomes by assessing talk that occurs because of (and despite) campaign efforts" (p. 5). Further, our analysis suggests the potential for EE programs to role model a variety of interpersonal communication scenarios in order to optimize the behavior change outcomes.

### **Limitations**

Although previous research on *Jasoos Vijay* has used both baseline and end-line data to show a relationship between exposure to the program and change in knowledge, attitudes, and practices (Sood et al., 2006; Deshpande et al., in press), this study focused only on the end-line data. The decision to focus on post-only data enabled more accurate modeling of the actual relationships among knowledge, attitudes, and practices, as well as the roles of self-efficacy and interpersonal discussion. However, it does not test the impact of *Jasoos Vijay* as well as a pre/post design would. As a result, this study is more of a conceptual exploration of the relationships between EE programs and the processes by which they produce effects than a strict evaluative work.

In addition, the data for this study were originally collected for the pre/post evaluation without plans for a theoretical structural equation model. Thus, the questions asked in the survey to assess knowledge, attitudes, and beliefs do not all target the same behaviors. While all three constructs include methods of prevention, attitudes also include tolerance toward people living with HIV/AIDS, and behaviors also include getting tested for HIV/AIDS. The lack of a strong relationship between attitudes and behaviors in this study may have been based, in part, on this operationalization. Future studies should assess all relevant constructs with respect to the same target behaviors. That is, given the strong arguments of the need for behavioral specificity in assessing determinants of behavior (Fishbein, 1980) and the longstanding evidence that the most effective interventions are those that are directed at changing specific behaviors (Fishbein & Yzer, 2003), operationalization and measurement of HIV/AIDS-prevention behaviors and related determinants must be explored with greater specificity. A long-running EE intervention, with multiple behaviors being promoted, should ideally have constructs that are matched throughout to tap into different domains of behavior (e.g., condom use with spouse, condom use with casual partner, use of clean needles), thus enabling further investigation of the effect of exposure on various target behaviors.

**Conclusion**

EE programming has a history of demonstrated effects, and this study of the impact of *Jasoos Vijay* adds to that growing body of literature. However, future research needs to address and systematically unpack the “black box” of a blanket EE label. There now exists a wide array of EE projects that differ in terms of message, medium, audience, length, complexity, and innumerable other dimensions. What is lacking is a serious attempt to step back and make sense of this burgeoning field by contextualizing and extricating the differences in EE programs and their associated effects. For example, the results that we found arose from a long-running program on national television with explicit messaging on its core theme of HIV/AIDS-related issues. Other program formats — with differing media, genre, or message complexity — may not create the same pattern of effects. As Singhal and Rogers (2002) point out, “whereas EE interventions come in all shapes and sizes, current theoretical debates do not acknowledge the substantial variability among EE interventions, which undoubtedly influence the answers to the what, how, and why questions of EE effects” (p. 121). This study sheds light on EE interventions that use a serial drama format on television. Further research is likewise necessary to verify the value of the inclusion of self-efficacy and interpersonal discussion as key components in models of behavioral change and to begin to parse out how and when these variables are most effective with other EE formats.

**Appendix A**

## Survey Items

*Exposure Measures*

Can you name any characters from Jasoos Vijay?

Please tell me what all messages you have got from Jasoos Vijay.

*Knowledge of HIV transmission routes and methods of prevention*

How is HIV/AIDS transmitted from one person to another?

How can a person reduce the risk of being infected by HIV/AIDS?

*Attitude Measures*

If a male member in your community is infected with HIV/AIDS, do you think it is all right for him to stay in the town/village?

If a female member in your community is infected with HIV/AIDS, do you think it is all right for her to stay in the town/ village?

If a man is infected with HIV/AIDS, should he be allowed to work as long as he can?

If a child is infected with HIV/AIDS, should it be allowed to go to school?

All pregnant women should be tested for HIV/AIDS.

I think it is all right to pay for sex. [reverse coded]

I believe that a responsible (non-regular sex) partner would always use condoms.

*Self-efficacy with respect to HIV/AIDS-related behaviors*

I can communicate freely with my spouse on matters concerning sex.

I am confident that I can protect myself from HIV / AIDS.

If I think necessary, I would insist on using a condom with my partner.

I would always use a condom to protect myself from HIV/AIDS.

If I perceive any risk, I am confident I can, myself, go for HIV testing.

If I need any treatment, I will only consult qualified medical professionals for treatment of STIs.

I will insist on using tested blood whenever I need a blood transfusion for myself or my family members.

I will insist on using sterilized/boiled needles whenever I need to take an injection.

*Practices or HIV/AIDS-related behaviors*

Please state whether you have ever done any of the following?

Testing of HIV/AIDS

Treatment of STIs from qualified personnel

Treatment of HIV/AIDS from qualified personnel

Use of tested blood

Use of sterilized/boiled needles (safe handling of needles)

Consistent use of condoms to prevent HIV/AIDS and STIs

Being faithful to one partner

Not visiting sex workers



*Interpersonal discussion*

Which of the following topics have you discussed?

- Testing of HIV/AIDS
- Treatment of STIs from qualified personnel
- Treatment of HIV/AIDS from qualified personnel
- Use of tested blood
- Use of sterilized/boiled needles (safe handling of needles)
- Consistent use of condoms to prevent HIV/AIDS and STIs
- Being faithful to one partner
- Not visiting sex workers

Please mention with whom you have discussed these matters.

*Recommending HIV/AIDS-related behaviors to others*

Please state whether you have ever recommended any of the following.

- Testing of HIV/AIDS
- Treatment of STIs from qualified personnel
- Treatment of HIV/AIDS from qualified personnel
- Use of tested blood
- Use of sterilized/boiled needles (safe handling of needles)
- Consistent use of condoms to prevent HIV/AIDS and STIs
- Being faithful to one partner
- Not visiting sex workers

**Appendix B***Correlation Matrix (N = 754)*

	Exposure	Discuss	Knowledge	Attitude	Self- efficacy	Behave	Rec
Exposure	1.00						
Discussion	0.17**	1.00					
Knowledge	0.20**	0.26**	1.00				
Attitude	0.12**	0.27**	0.18**	1.00			
Self-efficacy	0.07	0.32**	0.16**	0.48**	1.00		
Behavior	0.17**	0.28**	0.15**	0.15**	0.23**	1.00	
Recommend	0.12**	0.44**	0.15**	0.09*	0.09*	0.34**	1.00

\*  $p < .05$ . \*\*  $p < .01$ .

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