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Can a Short Film Impact HIV-Related Risk and Stigma Perceptions? Results from an Experiment in Abuja, Nigeria

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HIV/AIDS-related stigma is believed to result in negative social consequences for people with the disease and to be a deterrent to HIV serostatus testing. The ability of communicators to change people’s stigma perceptions and subsequently impact decisions to test, however, is not well understood. Based on the entertainment–education approach, this article presents the results of a field experiment conducted in Abuja, Nigeria, testing a mediated intervention designed to reduce HIV-related stigma and risk perceptions. The results indicate that the intervention was effective relative to a control in impacting perceptions of the severity of HIV and some stigma-related attitudes, particularly for male participants; and that for this sample, risk and stigma perceptions significantly impact intentions to test for HIV. It also showed that severity perceptions mediated the relationship between viewing the film and testing intent.

Many people suffering from AIDS and not killed by the disease itself are killed by the stigma surrounding everybody who has HIV/AIDS.


From the inception of the HIV/AIDS pandemic, people living with HIV/AIDS (PLWH/As) worldwide, and the social groups believed to be associated with HIV/AIDS have been stigmatized (Herek, Capitanio, & Widaman, 2002). Notwithstanding continued efforts to combat the existence of HIV/AIDS stigma, it is seen as a challenge that prevents action at individual, community, national, and global levels (Piot, 2000; Piot & Seck, 2001). There are few well-documented and carefully evaluated studies of interventions designed to change stigma perceptions (Aggleton & Parker, 2002; Parker & Aggleton, 2002). Despite the best intentions, health communicators’ continued reliance on fear and negative emotion as a motivator of HIV risk-reduction behavior (e.g., Witte, Meyer, & Martell, 2001) may be inadvertently contributing to the continued stigmatization of the disease. That is, by designing campaigns to increase peoples’ fear of being infected with HIV/AIDS, communicators may be inadvertently increasing peoples’ fear of those who are living with HIV/AIDS.

By embedding prosocial messages in entertainment programs, communicators may better target audiences’ HIV-related attitudes and behaviors (Singhal & Rogers, 1999) without the potential for denial (Janis & Feshbach, 1953; Lapinski & Boster, 2001), reactance, or negative emotion and subsequent limited processing associated with fear-related messaging (e.g., Nabi, 2002). Moreover, tailoring messages to target stigma-related attitudes, and measuring stigma perceptions as a primary, rather than distal, outcome of interventions may overcome the limitations of previous attempts to change HIV-related stigma (Brown, Macintyre, & Trujillo, 2003). Thus, based on the principles of the entertainment-education approach (E–E; Singhal & Rogers, 1999), this study was designed to test the outcomes of a mediated...
HIV/AIDS AND SOCIAL STIGMA IN NIGERIA

Nigeria, sub-Saharan African’s most populous nation, has national HIV prevalence rates estimated at 5.4% and prevalence in subpopulations ranging from 8% to upward of 25%. Although the country has a lower prevalence rate than several other sub-Saharan African nations, the absolute number of people infected is believed to be much larger; it is estimated that about 5.5 million Nigerians live with the HIV virus (UNAIDS, 2002). Several factors have contributed to the rapid spread of AIDS in Nigeria. These include the high prevalence of other sexually transmitted diseases, infrequent use of condoms, poverty, lack of health care, and the silence and denial of HIV/AIDS due to the stigmatized nature of the disease (Gates Foundation, 2000; UNAIDS, 2002).

HIV/AIDS-related stigma refers to prejudice, discounting, discrediting, and discrimination directed at people perceived to have HIV or AIDS, along with the individuals, groups, and communities with which they are associated (Herek, 1999). It is believed to be hindering prevention efforts worldwide (UNAIDS, 2002). Like other forms of stigma (Dovidio, Major, & Crocker, 2000; Stangor & Crandall, 2000), HIV/AIDS-related stigma is believed to be effectively universal (UNAIDS, 2002), but the ways in which stigma is expressed and the specific groups targeted for HIV/AIDS stigma vary considerably from country to country (UNAIDS, 2002). HIV/AIDS has been stigmatized, in part, because in some societies throughout the world transmission of the disease has been associated with groups believed to engage in behaviors inconsistent with social norms, including homosexual sex (Falk, 2001; Herek, 1990), injected drug use (Capitano & Herek, 1999), and commercial sex work (Osho & Olayinka, 1999). Social sanctions are attached to deviations from normative behavior (termed injunctive norms; Cialdini, Reno, & Kallgren, 1990); stigmatization is one form of social sanction.

There is limited empirical research on HIV/AIDS stigma and its outcomes in Nigeria. Much research on HIV in Nigeria has examined seroprevalence (see Ajuwon & Shokunbi, 1996, for a review) or risk behaviors for a particular population group (e.g., Dada, Olaseha, & Ajuwon, 1998), despite the fact that the spread of HIV is also occurring rapidly in the general population (UNAIDS, 2002). Few studies have looked at the role of social stigma in HIV prevention in Nigeria; studies that have specifically dealt with the issues of HIV-related stigma indicate that stigma plays a role in provision of health care services, resulting in negative attributions about and denial of care for PLWH/As (Center for the Right to Health, 2004; Fredricksson & Kanabus, 2003), and perhaps causing people to be less likely to test for HIV (Izugbara, 2001). Given the rapid spread of HIV among the general heterosexual population in Nigeria, innovative interventions should be developed and evaluated to understand whether it is possible to modify attitudes believed to impact risk reduction behaviors such as serostatus testing, a cornerstone in the fight to reduce HIV prevalence (Janssen et al., 2001). Serostatus testing has been a critical component of HIV prevention in the United States (Hays, Ekstrand, Kegeles, Stall, & Coates, 1997; Janssen et al., 2001) and is emerging as important for reducing the spread of HIV in developing countries such as Nigeria (UNAIDS, 2002).

INTERVENTIONS DESIGNED TO REDUCE STIGMA PERCEPTIONS

Communication interventions to reduce HIV/AIDS stigma perceptions as either a primary or secondary outcome have been tested among a variety of population groups in developing and developed countries, but the effects have been mixed (Brown et al., 2003). An intervention designed to impact HIV-related stigma as a primary outcome (e.g., Klepp, Ndeki, Leshabari, Hannan, & Lyimo, 1997) and that is based on theory should have a greater impact on stigma perceptions than one that does not (Brown et al., 2003). One particular approach to designing communication interventions, the E–E approach (see Singhal, Cody, Rogers, & Sabido, 2004; Singhal & Rogers, 1999; for reviews), is particularly well-suited for targeting stigma perceptions.

The E–E approach is based on several theoretical perspectives, including social learning theory (Bandura, 1977, 2001), and suggests that persons can engage in observational learning by viewing mediated content through vicarious contact (Bandura 2001; Herek, 1986). Prior research examining the efficacy of E–E campaigns suggests that they can be effective at changing knowledge, attitudes toward a behavior, and behaviors (Igartua, Cheng, & Lopes, 2003; Piotrow et al., 1990; Shefner-Rogers, Rogers, & Singhal, 1998; Singhal & Rogers, 1999, 2002; Valente, Kim, Lettermaier, Glass, & Dibba, 1994). Other possible outcomes of entertainment-based change messages are not as well understood, including the extent to which E–E messages may increase perceived risk (a known motivator of behavior; e.g., Rimal & Real, 2003) or have other effects, such as changes in stigma perceptions.

Thus, our initial hypotheses examine the extent to which exposure to a film can impact peoples’ perceptions of their risk
for HIV/AIDS. In this case we examined the impact of the E–E film on two risk perception variables central to several theories of health-related behavior change (i.e., the health belief model, Rosenstock, 1974; and the extended parallel processing model, Witte, 1992) that impact behaviors: people’s perceptions of the severity of and their susceptibility to HIV/AIDS. Perceived severity is an individual’s beliefs regarding the seriousness of a health threat (in this case HIV/AIDS), and perceived susceptibility is an individual’s beliefs regarding his or her chances of experiencing the health threat (Rosenstock, 1974; Witte, 1992). Based on social learning theory, the E–E perspective suggests that vicarious learning processes occur when people view modeled behaviors, and that these effects are enhanced when the actors are demographically similar to the viewer (Bandura, 2001; Singhal & Rogers, 1999). The main character in the intervention being tested in this study is a man who is diagnosed as HIV positive; thus we expect that the film will impact male viewers’ risk perceptions more than female viewers. Further, pilot tests of the film content, the nature of which will be discussed in the Method section, revealed that males reported strong identification with the male main character and women did not. For men we expect a main effect for conditions such that exposure to the film will result in greater perceived severity of (H1a) and susceptibility to (H1b) HIV than exposure to a control. For both dependent variables, we do not expect a main effect for the film on women’s perceptions because there are no primary female characters in the film shown to have HIV or AIDS.

In the second set of hypotheses, we examine the impact of the intervention on four of the manifestations of stigma as discussed by Herek and his colleagues (Capitanio & Herek, 1999; Herek et al., 2002): endorsement of two types of stigmatizing policies (those to separate PWH/As from the public and to allow doctors and employers to disclose test results to persons other than the person tested, without his or her permission), attributions of blame to PLWH/As for becoming infected with HIV (e.g., “People who get HIV through unprotected sex have gotten what they deserve.”), and comfort with PLWH/As in a variety of social situations. It is predicted that persons exposed to a film containing messages regarding HIV/AIDS stigma embedded in an entertainment program will exhibit less endorsement of policies to separate PLWH/As from the public (H2a), less endorsement of policies allowing disclosure of test results without the tested person’s permission (H2b), less attribution of blame to PLWH/As for their infection with HIV (H2c), and greater reported comfort with PLWH/As in a variety of social situations (H2d) than will participants in a control condition.

We predict these effects because the film tested here deals specifically with these issues, each of which are issues in Nigerian society related to the social treatment of PLWH/As (Center for the Right to Health, 2004). For example, in the film, the main character’s employer discloses his test results to his parents before telling him, and the negative personal consequences are shown. Likewise, attribution of blame is addressed in several interactions between the main character and his family and friends. The implications of policies infringing on the rights of PLWH/As are highlighted in several places in the film. The specific content of the film is addressed in the Method section.

We also predicted differences between men and women in their response to the film, based on previous research. Brown et al.’s (2003) meta-analysis indicated a sex difference for stigma-related interventions such that women were more susceptible to these interventions than were men. Thus, we would expect that the effects of the film on stigma perceptions will be stronger for women than for men (Brown et al., 2003).

Finally, it was of interest here to determine the predictors of intentions to test for HIV, in particular, whether the intervention impacted testing intent. There is some evidence that one of the results of HIV/AIDS-related stigma is avoidance of HIV testing (Boyd, Simpson, Hart, Johnstone, & Goldberg, 1999; Simpson, Johnstone, Goldberg, Gormley, & Hart, 1999; Woods et al., 1999), undermining one of the key methods for slowing the spread of HIV (Hays et al., 1997; Janssen et al., 2001). Other research has suggested that both risk perceptions (e.g., Rimal & Real, 2003) and stigma perceptions (Fortenberry et al., 2002) can guide behavioral responses. Thus, RQ1 asks, Which is a stronger predictor of intentions to test for HIV: exposure to the film, stigma perceptions, or risk perceptions?

**METHOD**

**Site of Experiment and Participants**

Participants were recruited via a nonprobability, network sample with assistance from staff from local nongovernmental organizations (NGOs) in Abuja, Nigeria. Abuja is the capital city and administrative center of the country of Nigeria. Abuja is located in the geographic center of Nigeria; the city and surrounding area have a population of about 2 million. Abuja was chosen as the site for the study because the film being tested was filmed and produced in this city and because future distribution of the film would occur in Abuja. Power analyses using previous effect size estimates for the risk and stigma perceptions variables indicated a sample of 23 per cell as sufficient to detect effects at 90% power.

The participants in the study (N = 100) were primarily male (63%), and single (83%). Sixty-two percent of respondents reported some tertiary school courses. The average age of participants was 27.62 (SD = 5.71). Most participants indicated that they had engaged in sexual intercourse at some time during their lives (85%), and of those, 63% reported that they wore a condom during their last sexual encounter. Most participants had never tested
for HIV (73%) and none reported as HIV positive. This population was chosen for this study because HIV prevalence estimates among the general population in Nigeria are fairly high (UNAIDS, 2002), and the film was designed for distribution through the national media to the general population, as opposed to a particular group.

Procedure

To test the hypotheses and research question, a posttest-only full experiment was designed in which participants were randomly assigned to either a film or to a control condition. Participants were randomly assigned to conditions to create initially equivalent groups and to minimize the need for a pretest (Babbie, 1992). This design was chosen because it maximizes the internal validity of the research in several ways. Random assignment to experimental conditions facilitates initial equivalence of groups and negates the need for pretests likely to sensitize participants.

On entering the site of the study (a community recreation building centrally located in Abuja), participants were given a card that directed them to one of two rooms for the showing of the film. After entering the room, participants completed consent procedures. In the control condition \((n = 40)\), participants completed a questionnaire containing measures of the study variables without having viewed the film. In the intervention condition \((n = 60)\), participants viewed the film and then completed the questionnaire containing measures of the variables.

The questionnaire, which was exactly the same in both conditions, contained items designed to measure HIV risk perceptions and intentions to test for HIV. These questions were followed by items regarding endorsement of stigmatizing policies, comfort with people with HIV, and attitudes toward people with HIV. The final items on the questionnaire asked participants about several demographic factors, including age, sex, HIV testing and sexual history, and education. To ensure that all study participants received any potential benefits of the film, the control participants viewed the film after completing all study materials. Following completion of the study, all participants were debriefed as to the purpose of the study and given contact information for a local NGO that provides HIV information, counseling, and testing. Participants were not monetarily compensated for their participation.

Intervention

The film that was tested in this experiment is entitled Starting Over. Produced in 2002 in Abuja, Nigeria, the film was designed to examine social stigma regarding people with HIV/AIDS. Starting Over is the fictional story of Andrew, a young man in his early 20s. He is well loved by his parents, active in his father’s church, engaged to be married, and has been promised a job in his uncle’s bank after his graduation from a local university. Andrew contracts HIV due to a one-night casual sexual encounter spurred by alcohol consumption. After a pre-employment medical test confirms his HIV status, Andrew is rejected by his family and friends, loses his job at the bank, is ostracized by his church, and faces a future of uncertainty. In the end of the story, Andrew is helped by the compassion of his fiancée, who forgives him and helps care for him as well as reconcile him with his family and with local community members.

The film was written by a group of Nigerian writers and designed explicitly to entertain viewers while addressing the issue of HIV/AIDS-related stigma in Nigeria, as well as addressing the primary routes of HIV transmission in Nigeria in order to target perceived severity and susceptibility to HIV/AIDS. The film deals with stigma-related issues by portraying both enacted stigma and the outcomes of stigma, and challenging the appropriateness of these behaviors. Consulting on the design of the film were staff from a local NGO, the Center for the Right to Health, whose organizational mission includes combating stigma related to HIV/AIDS. The film also directly addresses risk for HIV by talking about modes of transmission in the film and by portraying Andrew as a person who contracts HIV through a one-time event embedded in an otherwise risk-free lifestyle. The main characters in the film were played by well-known Nigerian film stars, and the film was set in Abuja, Nigeria. The experiment was conducted prior to release of the film; thus, none of the participants could have been exposed to the content of the film prior to the study. The film is available on DVD from the second author.

Pilot

Before conducting the experimental study, a pilot test was conducted to compare men’s and women’s perceptions of the credibility of the film, the extent to which they enjoyed the film, and their identification with the main characters. Participants were sampled in the same way as they were for the final experiment, with help from local NGOs; all participants were recruited from Abuja, Nigeria. The pilot test was conducted with 29 participants, 52% of whom were male. The participants’ average age was 29.2 \((SD = 4.22)\), 86% reported taking some college courses, and 69% were single. Most (56%) indicated that they had not been tested; of those who had tested in the past, all reported being HIV negative.

The pilot participants completed a short survey as well as a series of focus group questions. On the survey, film enjoyment was assessed with 2 items, each on a 5-point semantic differential scale anchored with “enjoyable/not enjoyable” and “entertaining/boring” \((\alpha = .74)\). A \(t\) test with biological sex as the independent variable and enjoyment as the dependent variable indicated that generally enjoyment of the film was high and that men \((M = 4.64, SD = .49)\) and women
(M = 4.34, SD = 1.01) did not differ in their enjoyment of the film, t(25) = .91; p = .37, r = .17. Pilot participants also completed a 5-item assessment of the extent to which the film presented credible information (α = .82). This measure included semantic differential items anchored on a 5-point scale with adjectives such as “realistic/not realistic” and “accurate/inaccurate.” Independent sample t tests indicated that men (M = 4.11; SD = .65) and women (M = 4.27; SD = .90) did not differ in the extent to which they perceived the messages in the film as credible, t(21) = .49; p = .63; r = .11. Further, focus group data from the pilot participants revealed that males, in particular, identified with the male main character (Andrew), and female participants reported stronger levels of identification with Julie, the fiancée of Andrew.

Measurement

Although the scales used to measure the variables in this study were derived from existing measures, given that this study was conducted in a country other than the country in which the psychometric properties of the scales were established (the United States), all scales were subject to confirmatory factor analysis (CFA) tests of internal consistency and parallelism to establish the measurement models. Moreover, for each of the scales, the content of the items was modified from the original item content to be appropriate for the Nigerian sample, potentially altering the psychometric properties of the scales. All items were modified by the study authors, one of whom is Nigerian, and then reviewed by a group of Nigerian collaborators. Descriptions of the measures, the results of the CFA analyses, and the standardized item alphas for each scale are reported following. The means, standard deviations, and standardized item alphas for each scale across conditions are reported in Table 1.

Risk perceptions. Risk perception was assessed with three items designed to measure perceived severity of HIV (e.g., “HIV/AIDS is something I worry about.”) and four items measuring perceived susceptibility to HIV (e.g., “It is likely I could get HIV given my behaviors.”) adopted from the Risk Behavior Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996). Responses were assessed on 5-point Likert-type scales with “strongly disagree” and “strongly agree” as the anchors, with higher scores indicating greater perceived risk. Witte et al. provide evidence for the reliability and validity of the scale. Following CFA procedures, all items were retained for both scales.

Stigma perceptions. Stigma perceptions were assessed with items adopted from Herek and Capitano (1997). In Herek and Capitano these items were administered verbally with a 4-point Likert-type response format. For this study, items measuring the first three stigma factors described following were 5-point Likert-type items anchored with “strongly disagree” and “strongly agree.” The fourth stigma factor, comfort with PLWH/As, was assessed with a 5-point scale anchored with “very uncomfortable” and “very comfortable.”

Endorsement of stigmatizing policies was assessed with items measuring two factors: the endorsement of policies allowing doctors and employers to disclose HIV test results without the permission of the person tested (termed disclosure policy; e.g., “Doctors can discuss the results of a client’s HIV test with his/her family without the permission of the person who was tested.”) and of policies to quarantine and publicly identify PLWH/As (termed separation policy; e.g., “People with HIV/AIDS should be separated from others to protect the public health.”). For the disclosure policy factor, four items were summed to form a unidimensional scale in which higher numbers indicate greater endorsement of disclosure policies. The separation factor was assessed with 2 items that were summed to form a scale in which higher numbers indicated greater endorsement of separation of PLWH/As.

The third stigma factor, attributions of blame to PLWH/As for being infected with HIV, was assessed with four items in which higher numbers indicate greater attribution of blame to PLWH/As (e.g., “People who got HIV/AIDS through unprotected sex have gotten what they deserve.”). Following CFA procedures, one item was dropped from the analysis and the remaining three items were summed to form a unidimensional scale.

Comfort with PLWH/As in a variety of social situations was assessed with seven items. Following CFA procedures all items were retained, resulting in a unidimensional scale that was summed, with higher numbers indicating greater comfort with PLWH/As (e.g., “Suppose you find out the owner of the market where you go to shop has HIV/AIDS, how would you feel about that?”).

Intention to be tested for HIV. Intentions to test for HIV was measured with six Likert-type items (e.g., “I might be tested for HIV/AIDS sometime soon.”), with “strongly agree” and “strongly disagree” as the response scale anchors. Following CFA, five items were retained and summed to form a unidimensional scale in which higher numbers indicated greater testing intentions.

### Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>3.53</td>
<td>1.14</td>
<td>.70</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>2.00</td>
<td>.98</td>
<td>.73</td>
</tr>
<tr>
<td>Comfort with PLWH/As</td>
<td>2.60</td>
<td>1.08</td>
<td>.91</td>
</tr>
<tr>
<td>Attribution of blame</td>
<td>2.93</td>
<td>1.11</td>
<td>.80</td>
</tr>
<tr>
<td>Endorsement of separation policy</td>
<td>2.14</td>
<td>1.08</td>
<td>.70</td>
</tr>
<tr>
<td>Endorsement of disclosure policy</td>
<td>2.45</td>
<td>.93</td>
<td>.71</td>
</tr>
<tr>
<td>Intentions to test for HIV</td>
<td>3.34</td>
<td>1.10</td>
<td>.87</td>
</tr>
</tbody>
</table>

Note. PLWH/As = Persons living with HIV/AIDS.
Table 2
Test of H2 for the Effect of Film vs. Control on Stigma Perceptions for Both Men and Women

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Film M (SD)</td>
<td>Control M (SD)</td>
</tr>
<tr>
<td>Comfort with PLWH/As</td>
<td>2.61 (1.17)</td>
<td>2.81 (1.06)</td>
</tr>
<tr>
<td>Attribution of blame</td>
<td>2.78 (1.18)</td>
<td>3.37 (.85)</td>
</tr>
<tr>
<td>Endorsement of separation policy</td>
<td>1.91 (.96)</td>
<td>2.15 (1.13)</td>
</tr>
<tr>
<td>Endorsement of disclosure policy</td>
<td>2.37 (1.04)</td>
<td>2.57 (.99)</td>
</tr>
<tr>
<td>t (df)</td>
<td>.64 (56)</td>
<td>.52 (−.09)</td>
</tr>
<tr>
<td>p (r)</td>
<td>.05 (−.25)</td>
<td>.05 (−.25)</td>
</tr>
<tr>
<td>r (f)</td>
<td>.05 (−.25)</td>
<td>.05 (−.25)</td>
</tr>
</tbody>
</table>

Note. PLWH/As = Persons living with HIV/AIDS.

RESULTS

Tests of Hypotheses

The first several hypotheses were tested via a series of independent sample t tests conducted separately for male and female participants. Tests of H1a indicated that for male participants there was a main effect for film condition on perceived severity of HIV, \( t(56) = 2.03, p = .05, r = .25 \), such that men who viewed the film indicated greater perceived severity of HIV, \( M = 3.60, SD = 1.14 \), than those in the control condition, \( M = 2.95, SD = 1.16 \). Thus the data were consistent with our predictions for H1a. Consistent with our predictions for men, there was no significant main effect for the film condition on perceived severity of HIV/AIDS, \( t(25) = .61, p = .55, r = .12 \). Women in the control condition, \( M = 3.96, SD = 1.02 \), did not differ significantly from women in the experimental condition, \( M = 3.70, SD = 1.11 \).

Tests of H1b indicated that the data were not consistent with the predicted main effect such that men in the control condition, \( M = 2.25, SD = .89 \), did not differ significantly from men in the film condition, \( M = 2.21, SD = 1.09 \), on their perceived susceptibility to HIV, \( t(56) = .12, p = .91, r = .02 \). As predicted, there was no main effect for exposure to the film for women. Women in the film condition, \( M = 1.73, SD = 1.03 \), did not differ from those in the control condition, \( M = 1.72, SD = .75 \), on their perceptions of their susceptibility to HIV following the film, \( t(25) = .03, p = .97, r = .00 \).

Examination of the means for men and women across conditions revealed that men, \( M = 2.22, SD = 1.01 \), perceived themselves as more susceptible to HIV than did women, \( M = 1.65, SD = .85 \), and that this difference was significant \( t(83) = 2.16, p = .03, r = .23 \).

Test for the effects of the film on stigma perceptions (H2a–d) indicated that the effect sizes were small and typically not statistically significant, with two exceptions. The data indicated a significant main effect of film condition for men such that men who viewed the film attributed less blame to PLWH/As for their disease than those exposed to the control (H2c). For women, there was an effect for film condition on endorsement of disclosure policies (H2b) such that women who viewed the film were more likely to endorse these policies than those in the control condition. That is, women who were exposed to the film endorsed policies to disclose testing results without permission of the person being tested. This unintended consequence of the intervention will be addressed at length in the discussion section. The results of these analyses are reported in Table 2.

The Relative Impact of the Experimental Conditions, Risk, and Stigma Variables (RQ1)

After assessing the extent to which the data met the assumptions of multiple regression, hierarchical regression was used to test the relative weight of the experimental condition, stigma, and risk perception variables on intentions to test for HIV. Given the correlations among the stigma variables and the risk perception variables, these variables were each entered as separate blocks in the analyses. The risk perception variables were entered individually first, followed by the stigma variables, experimental condition, biological sex of participant, and whether or not the participant had previously tested for HIV.3

The results of these analyses indicated that step 1, perceived severity of HIV, contributed significantly to intentions to test

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1As a check on random assignment in the final experiment, we conducted analyses to determine whether or not age of participants and sex of participants was evenly distributed across the film and control conditions. We found that for those participants who reported age, age of participants did not differ across conditions, \( t(85) = 1.56, p = .12, r = .05 \). There were more men than women in the sample, but cross-tabulation of the data indicated that these groups were not unevenly distributed across conditions, \( \chi^2(1) = .011, p = .98 \). Further, people who self-reported testing for HIV in the past did not differ across conditions, \( \chi^2(1) = 3.15, p = .09 \). Given these findings, tests of hypotheses and research questions were conducted.

2Given the differences in cell size for male and female participants by film condition (see Table 2), and the sensitivity of analysis of variance to violations of assumptions of unequal cell size, t tests were conducted for these analyses for males and females separately rather than using analysis of variance to test the predictions.

3The order of the entry of the blocks was chosen based on Tabachnick and Fidel’s (2001) recommendation that variables be entered into the regression equation based on theoretical importance, beginning with the most important. Entering the stigma variables prior to entry of the risk perception variables did not substantially alter the results. Inclusion of education as an independent variable in the regression did not substantially alter the results.


for HIV, $R = .29, R^2 = .09, F(1, 57) = 5.26, p = .03$. Following step 2, the inclusion of susceptibility had little impact on testing intent, $R = .29, R^2 = .08, F(2, 58) = 2.53, p = .09$, and did not improve prediction of variance in intentions, $R^2 \Delta = .00; F(1,58) = .00; p = .99$. Addition of the stigma variables indicated that endorsement of policies to separate PLWH/As from the public in step 3, $R = .40, R^2 = .16, F(3, 58) = 3.57, p = .02$, improved prediction of intentions to test, $R^2 \Delta = .08, F(1, 57) = 5.27, p = .025$. The inclusion of comfort level with PLWH/As, $R = .46, R^2 = .21, F(4, 56) = 3.29, p = .01$, in step 4 contributed to the variance in intentions to test, $R^2 \Delta = .06, F(1, 56) = 4.00, p = .05$. The inclusion of the other 5 variables in separate steps did not add substantially to the variance in intentions to test ($R^2$ change range = .001–.007). The unstandardized and standardized regression coefficients, $t$ values, and semipartial correlations for each variable are reported in Table 3.

Post hoc examination of a mediated model for male participants in which experimental condition impacted perceptions of severity, $\beta = .26, SE = .11, p < .05$, and severity impacted intentions to test for HIV, $\beta = .36, SE = .12, p < .05$, indicated the data were consistent with this model (see Figure 1). The errors between the predicted and observed relationship for the experimental conditions and behavioral intention were not significant, residual = .06, $z = .37, p = .71$, further indicating consistency between the data and the model.

**DISCUSSION**

This article presents data testing the efficacy of an intervention designed to change a Nigerian sample’s risk and stigma-related perceptions and examines the relative effects of experimental conditions, risk, and stigma perceptions on testing behaviors. The results indicate that, consistent with our predictions, the intervention was successful in changing male participants’ perceptions of the severity of HIV. However, inconsistent with our predictions, the intervention did not impact the extent to which they perceived they were susceptible to HIV. For women, consistent with our predictions, there were no main effects for film viewing on risk perceptions. These findings provide some insight into the potential utility of E–E interventions for changing risk perceptions, particularly if the respondents identify with characters in the film.

The results further indicate that this intervention had a limited impact on stigma perceptions, with two exceptions. First, consistent with our predictions, men who viewed this film were less likely to attribute blame for having HIV to PLWH/As than were men in the control condition, a difference that did not occur for women. Some have suggested that stigmatization occurs whether the deviation from social norms is perceived by the members of the social system as largely volitional (e.g., obesity, Falk, 2001; engaging in illicit drug use, Capitanio & Herek, 1999) or nonvolitional (e.g., mental illness or ethnicity; Falk, 2001). This study gives some hope that so-called “victim blaming” can be reduced, perhaps decreasing stigma. This finding is likely due to the fact that the main character in the film was a male who contracted HIV after one incident of unprotected sex, likely arousing the sympathy of male but not female viewers. Indeed, focus group data collected during the pilot phase of the film and discussions of the film with participants during the debriefing sessions revealed strong identification with the main male character on the part of male study participants; suggesting a possible mediating role for identification. Of importance, when controlling for sex and other study variables, however, attributions of blame did not significantly impact testing decisions. Thus, it may be the case that this form of expressed stigma may have an impact on behavioral outcomes other than testing, such as the way one interacts with persons who are HIV positive. The relationship of the stigma variables to other behavioral outcomes (e.g., information seeking, disclosure of HIV status) provides an interesting avenue for additional research and theoretical development in this area.

Another finding for the effect of the intervention on stigma perceptions that merits some discussion was that female viewers were more likely to endorse policies allowing for the disclosure of test results without permission of

**TABLE 3**

Unstandardized (b) and Standardized ($\beta$) Regression Coefficients, $t$ Values, and Semipartial Correlations ($r$) for the Regression of Intentions to Test for HIV on the Predictor Variables

<table>
<thead>
<tr>
<th>Predictor</th>
<th>b</th>
<th>$\beta$</th>
<th>t</th>
<th>Semipartial $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>.26</td>
<td>.28</td>
<td>2.07*</td>
<td>.28</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>-.001</td>
<td>-.002</td>
<td>-.012</td>
<td>-.02</td>
</tr>
<tr>
<td>Separation</td>
<td>-.28</td>
<td>-.28</td>
<td>-2.30*</td>
<td>-.28</td>
</tr>
<tr>
<td>Comfort</td>
<td>-.24</td>
<td>-.26</td>
<td>-2.00*</td>
<td>-.24</td>
</tr>
<tr>
<td>Disclosure</td>
<td>-.007</td>
<td>-.08</td>
<td>-.46</td>
<td>-.05</td>
</tr>
<tr>
<td>Attributions</td>
<td>-.007</td>
<td>-.08</td>
<td>-.69</td>
<td>.08</td>
</tr>
<tr>
<td>Experimental condition</td>
<td>.17</td>
<td>.08</td>
<td>.64</td>
<td>.07</td>
</tr>
<tr>
<td>Sex</td>
<td>-.008</td>
<td>-.04</td>
<td>-.24</td>
<td>-.03</td>
</tr>
<tr>
<td>Previously tested for HIV</td>
<td>.007</td>
<td>.03</td>
<td>.24</td>
<td>.03</td>
</tr>
</tbody>
</table>

* $p < .05$.
the person being tested. This was an unintended consequence of the intervention and is likely due to the fact that the fiancée of the character who contracted HIV (Andrew) was a woman; therefore women viewing the film may have believed that such disclosure is necessary to protect females from the actions of male partners.

Health communicators often do not have complete control over the content of E–E interventions, making the possibility of unintended consequences more likely than in interventions where communicators have more control over messaging (i.e., traditional public service campaigns). This provides an ethical dilemma for those who design and implement interventions. That is, health communicators generally test for the intended consequences of interventions, but any intervention may have both positive and negative unintended consequences. If there are known negative consequences to interventions, practitioners can take steps to mitigate these effects. Thus, researchers should carefully consider and report on unintended effects of interventions (see Guttman, 2003, for additional discussion of this issue). In the case of this film, to address the findings of this study, a discussion guide was created and distributed with the film. This guide addresses the issues raised in this article and will be used to appropriately reinforce the central messages of the film; the extent to which the effects of mediated interventions can be tempered by discussion of the issues raised in the intervention is a point that merits further investigation by researchers of applied communication.

The findings for the regression analyses indicated that both perceived risk and several of the stigma perception variables impacted intentions to test for HIV, but that the experimental manipulation had little direct impact on testing. Specifically, these findings indicate that perceived severity of HIV, endorsement of policies to separate PLWH/As from society, and self-reported comfort with PLWH/As all substantially impact intentions to test for HIV, but that other variables, including previous testing history, have a more limited impact. Of importance, these data show that not only can one’s perceived risk for HIV impact decisions to test, but that beliefs about policy issues and attitudes toward interacting with PLWH/As can negatively influence decisions to test. The post hoc test of the mediated model indicated that the effects of the E–E film on testing intentions were mediated by perceptions of severity; indicating that exposure to the E–E film enhanced perceptions of the severity of HIV, which in turn enhanced intentions to test.

It is important to note that this study is limited in that we did not assess the impact of the film on perceptions of a number of the factors believed to be causes of stigma. It has been pointed out elsewhere (e.g., Alonzo & Reynolds, 1995) that stigma is a complex social force that serves as a tool to marginalize groups of people perceived to act outside of social norms (e.g., injection drug users, commercial sex workers, and homosexuals; Herek, 1999) or who are afflicted with some condition (Pryor, Reeder, Vinacco, & Knott, 1989), and that HIV/AIDS is associated with both of these criteria. Alonzo and Reynolds (1995) address the fact that the perception of HIV/AIDS as threatening causes increased stigma. Indeed, in this case, because perceptions of the severity of HIV/AIDS were enhanced by the film, it may be the case that this will act to augment stigma perceptions. Alonzo and Reynolds (1995) point out that because HIV/AIDS is not well understood, it is stigmatized. Because we did not measure knowledge in this study, it is difficult to speculate whether this film impacted understanding of HIV.

Additional Implications for Health Communicators

This study has a number of implications for those who wish to apply these findings to intervention design or to additional research. First, this study provides evidence that health promotion messages embedded within the content of entertainment films can impact some forms of risk perception, at least for the short term, giving credence to the idea that naturalistic forms of health messaging can be effective in promoting change in variables (i.e., perceived risk and stigma) other than the variables targeted in most previous E–E interventions. Moreover, this finding is interesting when viewed in conjunction with the mediated model that showed perceived severity had a strong impact on intentions to test, whereas the effect of perceived susceptibility was minimal. That is, this study provides some evidence that the inability to change perceived susceptibility may not be essential for interventions designed to change testing behavior, but that changing severity perceptions appears to be sufficient to impact intentions to test for HIV.

The findings related to stigma perceptions indicate that changing these perceptions is challenging but can be met with some success when the messaging or intervention is crafted specifically to modify them. Further, the relative influence of the stigma variables on intentions to test is something that has long been suspected, but for which there is scant empirical evidence. Convincing people to learn their serostatus has been a focus of HIV prevention in the United States (Hays et al., 1997; Janssen et al., 2001) and in developing countries such as Nigeria (UNAIDS, 2002). This study provides evidence of the factors that drive testing decisions and may lend insight to future behavior change campaigns and interventions. Although this study has important limitations, particularly the small sample size (although the power analysis indicated it was sufficient to detect effects), these data indicate that particular stigma perceptions can influence testing behaviors. Existing models of behavior change and the interventions derived from those models have typically focused on risk perceptions and do not account for stigma-related perceptions; likewise, the literature on stigma has been largely descriptive to date. Communication interventions and models designed to predict behaviors should bridge these two areas of research to enhance their predictive validity.
This study provides evidence of the role of stigma for one behavioral domain (i.e., HIV testing); however, other behaviors are likely to be influenced by stigma perceptions. For example, for other stigmatized conditions, such as eating disorders and depression, fear of social stigma may cause people to avoid seeking help for and additional information about the disorder (Fairburn & Beglin, 1993; Jones et al., 1984). Thus, stigma should be given careful consideration as health communicators design interventions related to issues around which stigma exists.

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REFERENCES


