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Conceptualizing the Influence of Social Agents of Behavior Change: A Meta-Analysis of the Effectiveness of HIV-Prevention Interventionists for Different Groups

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A meta-analysis of 166 HIV-prevention interventions tested theoretical predictions about the effects of experts, lay community members, and similar and dissimilar others, as agents of change. In general, expert interventionists produced greater behavior change than lay community members, and the demographic and behavioral similarity between the interventionist and the recipients facilitated behavioral change. Equally importantly, there were differences across groups in the efficacy of various sources, especially among populations of low status and/or power. These findings support the hypothesis that unempowered populations are more sensitive to characteristics of the interventionists who can facilitate access to various resources. In addition, they suggest the need to ensure the availability of health professionals from diverse demographic and behavioral backgrounds.

Keywords: HIV prevention, source features effect, similarities, source–audience effect

Intervening to stimulate cognitive and behavioral changes in a societal group supposes a social relationship in which a communicator must gain the trust of and effectively promote the advocated changes in the audience. To this end, characteristics of the agent of change such as competence and similarity to the targets are likely to be critical. As the idea of social relationship suggests, however, the degree to which an audience develops trust and engages in consequent change is not only a function of the independent features of the interventionist. Instead, an intervention source may be effective for some audiences but ineffective for others, complicating empirical predictions as well as the selection of influential communicators.

Given the potential implications of the source–recipient interface, the present paper is concerned with identifying the most influential agents of change in terms of professional expertise in health education, lay membership in the target community, and demographic and behavioral similarities to the target group, based on hypotheses that have oriented behavior change efforts since the 1960s. These hypotheses are diametrically opposed; on one hand, they advocate that experts are more influential than nonexperts (Kelman & Hovland, 1953), and on the other hand, that lay community members are more influential than experts (Kelly, 2004).

Our analysis was also guided by a conceptualization of the likely mediating psychological influences of the expertise or laity of the interventionist as well as its demographic and behavioral similarity to the recipients (see Figure 1). For instance, professional experts in health education may be more apt to produce changes in important mediators of health behavior, such as attitudes and intentions, social norms, knowledge, and behavioral skills. Moreover, the demographic and behavioral similarity between agents of change and recipients may also produce changes in these mediational variables if similar others are more persuasive, are easier for recipients to identify with, communicate information more effectively, and provide adequate role models.

We were also interested in examining social moderators of the influence of the expertise of interventionists and their similarity to the recipients. In particular, we assumed that the sensitivity of a given social group to social factors that allow them access to cognitive, material, or emotional resources would determine the degree of influence of both the expertise of interventionists and their similarity to the target audience. Groups that traditionally lack power, like women, individuals from African ethnicities, and teens, may be more sensitive to characteristics of the interventionist, because other people can meet currently unmet needs in the cognitive, material, and emotional domains. As a result, lower-power intervention recipients may tune in to whoever is perceived as having greater amounts of useful knowledge, such as experts in the case of disenfranchised adults, or peers in the case of teens. At the same time, greater attention to the social agent of an interven-

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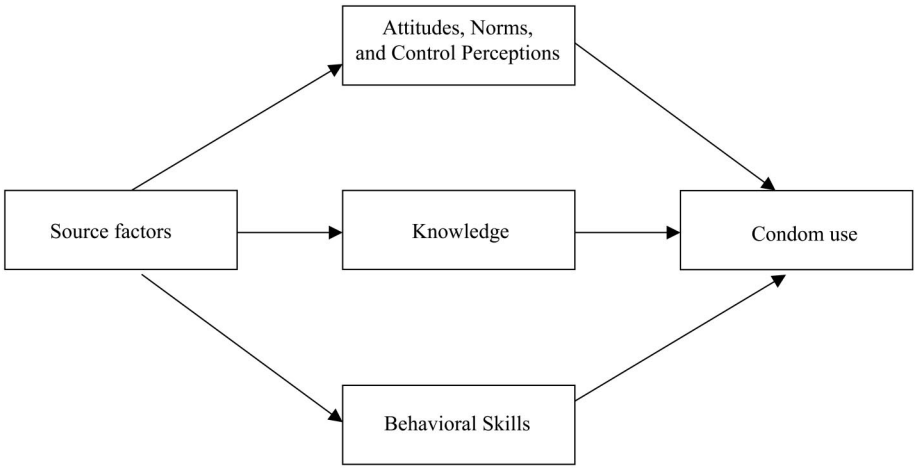

Figure 1. Mediating mechanisms of the influence of source characteristics.

tion by lower-power recipients may increase the beneficial impact of the demographic and behavioral similarity between the interventionists and those recipients.

In the present article, we report a meta-analysis of the effects of different sources of HIV-prevention interventions across different populations. We retrieved published and unpublished reports of the effects of interventions to increase condom use among recipients, and classified each intervention in terms of the characteristics of the source. The source could be an expert in health education (e.g., physician and nurse) or a lay community member (e.g., peer counselor and community representative), and could be more or less similar to the recipients of the communication. To capture this similarity, we categorized each intervention into those in which the ethnicity, gender, and age of the source and the recipient could be expected to match versus those in which these factors could be expected to not match. We also classified the target samples as belonging to groups of predominantly African or European ethnicity (analyzed in the United States, in African countries, and elsewhere), male or female, and over or under 21 years of age. Whenever possible, we also coded for the risk group of the sample (e.g., men who have sex with men and multiple-partner heterosexuals) and for the source–recipient similarity in membership in that group. In combination, this information allowed us to examine the effect of each intervention on behavior change as a function of the characteristics of the sources, the characteristics of the targets, and the interaction between the two.

There is an important comprehensive meta-analysis of the effects of the content of HIV-prevention interventions, in which various assumptions from behavior change models were analyzed (Albarracín et al., 2005). This preceding meta-analysis demonstrated that interventions designed to increase procondom attitudes, perceived behavioral control, HIV-relevant knowledge, and behavioral skills generally were successful. Surprisingly though, intervention arguments designed to instill procondom use norms were a failure in all cases with the exception of teen recipients. Although such a finding is consistent with a large developmental literature on the social characteristics of adolescents (Kerr, Stattin, Bisecker, & Ferrer-Wreder, 2002), an analysis of normative intervention aspects centered around the intervention content is extremely restrictive. As a result, more broadly conceptualizing interventions as a social relationship (see, e.g., Bronfenbrenner, 1977) in which the interventionist and the recipient exchange resources and power seems important for a complete understanding of behavioral change and an adequate implementation of potentially life-saving interventions.

Hypotheses About Differential Effectiveness of the Interventionist Expertise and Interventionist–Recipient Similarity

Researchers and practitioners often contrast *expert education*, defined as the transmission of the knowledge and skills communities need on the part of specialists, with, *peer education,* defined as the transmission of the knowledge and skills people need on the part of sources of equal standing (e.g., somebody who belongs to the same societal group based on age or status) (Merriam-Webster's Dictionary, 1985). Arguably, the use of lay community members as sources is currently presented as an ideal resource (if not the "gold standard") in HIV prevention. At a fairly general level, the National Institutes of Health (2003) instructed its grant applicants to consider the social and cultural lifestyle and cultural diversity of the audiences for which preventive interventions are designed. At a more specific level, a systematic review of HIV behavioral prevention research with Latinos (Darbes, Kennedy, Peersman, Zohrabyan, & Rutherford, 2002) commissioned by the Surgeon General's Leadership Campaign on AIDS concluded that effective interventions (a) are designed reflecting the specific needs and characteristics of the Latino community; (b) take into account gender and cultural differences; and (c) use peer educators when applied to adolescents and injection drug users.[1] Because of such findings, Jenkins and Kim (2004) made the provocative statement that researchers must engage with the culture of recipients to get beyond the limitations of experts.

Despite the widespread use and the recognized value of lay community members as effective health interventionists, the public

[1] As the authors recognized, however, peer educators were not directly tested against professional staff in these studies.

health system still relies on health professionals for the proper administration of various prevention programs. For example, just considering the professionals who work for health departments in the United States, physicians, nurses, physician assistants, social workers, psychologists, midwives, and educators together comprise an estimated 22,500 professionals (R. Davis, personal communication, September, 2004), many of whom have contact with the targets of health prevention programs. Because the training and use of these professionals demands considerable financial resources, synthesizing their effectiveness relative to lay community members seems essential. We presently summarize past findings about the effects of experts and lay peers as well as demographic and behavioral similarity between the recipient and the source, and then present a hypothetical model about the way in which the social power of the audience might moderate the influence of those source characteristics.

Effectiveness of Professional Experts, Lay Community Members, and Similar Others

The persuasion literature provides countless examples that credible communicators are more effective than noncredible ones. First, credible communicators appear to provide a readily available cue to validate the message recommendations (e.g., Chaiken, 1980; Hovland, Janis, & Kelley, 1953; Petty & Cacioppo, 1986). Second, credible communicators can also motivate individuals to attend to the message in ways that lead to internalizing the content that is being transmitted (e.g., Chaiken, 1980; Hovland et al., 1953; Kelman & Hovland, 1953). Consistent with these possibilities, there is cumulative evidence that credible sources are more influential than noncredible ones (see Kumkale & Albarracín, 2004).

Consistent with the social psychological findings about source credibility, some health-education researchers have emphasized the need for qualified experts in disease prevention. Prochaska et al. (2004), for example, have demonstrated that good expert training is essential for successful sources of interventions designed to reduce smoking, high-fat consumption, and sun exposure. Moreover, in the specific domain of HIV prevention, Schaalma, Abraham, Gillmore, and Kok (2004) maintained that sex education programs must necessarily involve experts because the social skills that young people need are not the sort of skills they can learn from observing their parents or peers. Instead, the sources of safer-sex programs in schools require special training to properly teach the skills relevant to sexual behavior. In support of this assertion, the most successful teachers in the domain of HIV prevention appear to be the most knowledgeable about health and AIDS prevention (Gyarmathy et al., 2002). Moreover, comparing programs facilitated by adults (parents, counselors, teachers, nursing school students, faculty members, community adults, administrators, and physicians) with programs facilitated by peers (adolescent mothers or people infected with HIV), trained adult facilitators are reportedly more effective than both untrained adults and peers.

Proponents of the peer-education approach, however, have solid arguments that come from political, educational, and psychosocial theorizing, all suggesting that the experience of participation in a prevention project empowers members of the target population, while allowing them to acquire health-related knowledge (Amaro, 1995, 2000; Freire, 1972; Putnam, 1911). As a result, peer educational approaches using lay members of the target community have become common practice, even when their success is variable (see Turner & Shepherd, 1999; examples of null results: Howard & McCabe, 1990; Jemmott, Jemmott, & Fong, 1998; Kerrigan, 1999; St. Lawrence, Brasfield, Jefferson, Alleyne, & O'Bannon, 1995; Walter & Vaughn, 1993) and the understanding of the processes underlying this variable success is even more limited. On the one hand, an investigation of peer- and nurse-managed HIV-prevention counseling for homeless women suggested similar effectiveness of the two methods (Nyamathi, Flaskerud, Leake, Dixon, & Lu, 2001). On the other hand, some studies have yielded significant differences in the impact of professional experts and peers. Quirk, Godkin, and Schwenzfeier (1993), for example, reported that physician counselors elicited greater learning about sexual risks, whereas peer educators elicited greater learning about intravenous-drug risks. Similarly, a study with young women suggested an advantage of peer educators for some variables (i.e., conveying information about bleaching needles), but equivalence between trained adult educators and peers for other variables (i.e., perceived difficulty of asking a partner about his past sexual experiences and decrease in frequency of self-reported vaginal sex, both for the most sexually active participants) (Siegel, Aten, Roghmann, & Enaharo, 1998). Furthermore, another study conducted in the Northeastern United States indicated that peers were more effective than teachers immediately after the intervention, but actually less effective after 12 months elapsed (J. D. Fisher, Fisher, Bryan, & Misovich, 2002).

Another instantiation of the idea of using sources from the recipients' community is to match interventionists and audiences demographically and/or behaviorally. For instance, Kalichman, Williams, and Nachimson (1999; see also Kalichman, Kelly, Hunter, Murphy, & Tyler, 1993) reported positive results from a brief behavioral-skills-building intervention in which African American females with expertise in public health education and prevention of STIs (Sexually Transmitted Infections) were selected to reach other African American females (see also Bichsel, 1998; Dalton, 2001; Dyche & Zayas, 1995; Frost-Pineda, Van Susteren, & Gold, 2004; Nikelly, 1997). However, in the opinion of a sample of Alaskan women at risk for HIV infection, to be effective, outreach workers need not be similar to targets with respect to race, gender, or age, but do need to be pleasant and have similar life experiences to the targets (Fenaughty & Namyniuk, 2004). In addition, in a study with teens by Jemmott et al. (1998), matching the ethnicity of leaders and the target youth was unrelated to the effectiveness of interventions for African American youth, even though matching age is reportedly important for teen audiences (Kalafat & Elias, 1994; Milburn, 1995; Myrick & Folk, 1991; Myrick, 1996; Ozer, Weinstein, Maslack, & Siegel, 1997; Philliber, 1999; Reeder, Pryor, & Harsh, 1997; Stuart, Waalen, & Haelstromm, 2003; Tindal & Salmon-White, 1990; Wolf, Bond, & Tawfik, 2000; but see Department for Education and Skills, U.K., 2000). Finally, Pealer et al. (2004) recently reported that an analysis of the data from a multisite trial (Project RESPECT) revealed no significant association of intervention completion or new STIs with either the demographic characteristics of the 32 counselors who participated in the project or demographic matching between the interventionists and clients.

Moderators of the Effects of Professional Experts, Lay Community Members, and Similar Others

Of course, professional expertise or laity, as well as social, developmental, and demographic similarity between sources and recipients of an intervention have different meanings depending on the characteristics of the targets of the intervention and their need for resources (see, e.g., Foa & Foa, 1974). As a result, an analysis of power (Albarracín, Kumkale, & Johnson, 2004; Cartwright, 1959; French & Raven, 1959; P. Johnson, 1976; Weber, 1994) seems indispensable to understand the effectiveness of certain intervention sources for certain target groups. Consider the model in Figure 2, which depicts social power as a moderator of the effectiveness of various types of interventionists. As shown, lower social power should increase sensitivity to social facilitators with access to resources of which powerless people are deprived, whereas higher social power should decrease sensitivity to social facilitators of access to cognitive, material, and emotional resources that powerful people already enjoy (for an analysis of how social support can provide these resources, see Bourdieu, 1986; Coleman, 1990; Kawachi, Kennedy, & Glass, 1999; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997). Consequently, features of the interventionist should all be more influential when the recipients have lower than higher power.[2]

In fact, the inconsistent findings we summarized before strongly imply that the expertise of interventionists and their similarity to the audience may be beneficial for some populations, but either irrelevant or detrimental for others. For example, the acquisition of expert knowledge may be particularly important for groups that are generally deprived of social resources, such as women (Berger, Fisek, Norman, & Zelditch, 1977; McKee & Sherriffs, 1957; but see Bradley, 1980; Lockheed, 1985, for situations in which women acquire power) and people from African ethnicities (hereafter referred to as *Blacks*, with U.S. Blacks designated *African Americans*; Katz, Goldston, & Benjamin, 1958; Lee & Ofshe, 1981; Tuzlak, 1989). At the same time, however, these groups may be the ones that need a communicator or intervention facilitator who is similar to them, appears trustworthy, and models the empowerment they themselves need. For example, there is strong consensus that reducing HIV/AIDS in Sub-Saharan Africa requires empowering women by facilitating their access to education, income-generating activities, and knowledge of their legal and human rights (Joint United Nations Programme on HIV/AIDS, 1999; South Africa Inter-Ministerial Committee on AIDS, 2000; United Nations Development Fund for Women, 2001). Similarly, less acculturated minority groups—who are often deprived of resources—show stronger preferences for counselors who are similar to them in ethnicity than do more acculturated minority groups (Hom, 1998; for a study of counselor preferences, see also Hennessy, Mercier, Williams, & Arno, 2002).

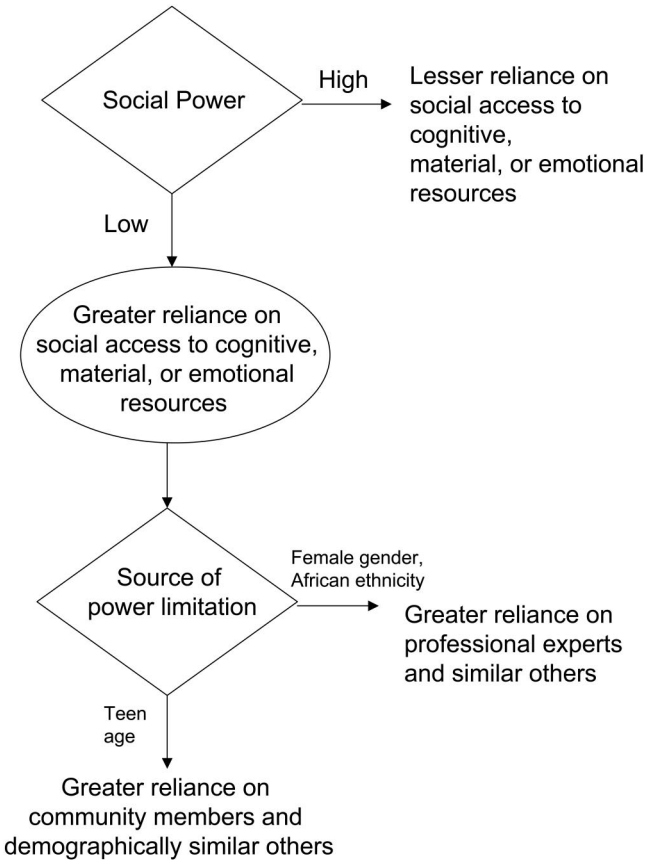

Figure 2. Social power as a moderator of the influence of source characteristics.

In short, a consideration of our meta-analysis is that neither the expertise of the source of the intervention nor their similarity to the audience of interest should uniformly matter for all groups. As another example, many decades of developmental research (Kerr et al., 2002) suggest that different age groups might be differentially sensitive to the influence of peers versus experts. For example, teens approach their peers and often manifest resistance to authorities such as teachers or parents. Consequently, they may react better to lay sources than to expert sources (Rickert, Jay, & Gottlieb, 1991). Furthermore, different age groups may also be disparately sensitive to variations in their demographic and behavioral similarity to the interventionists. For instance, teens, compared to adults, have a greater tendency to associate with and value similar others (Kerr et al., 2002), and thus may be easily swayed by teen than adult interventionists.

Hypotheses About the Psychological Mediators of the Influences of Expertise and Source–Recipient Similarity

If characteristics of the interventionist have an influence on behavior change, this influence should be mediated by psychological variables that normally influence behavior change. Of various models of behavior change (see Albarracín et al., 2003, 2005), a highly integrative one was proposed by J. D. Fisher and Fisher (1992, 2000). These researchers maintain that, to achieve behavioral change, people have to acquire relevant HIV-risk-reduction information, motivation, and behavioral skills, and that successful HIV-prevention interventions should facilitate at least some of these processes. Information involves knowledge about HIV transmission and prevention, which may originate from the medical

[2] It is important to note that our prior analyses of the impact of the intervention content indicated that not all factors have greater impact among low-power groups (see Albarracín et al., 2005).

establishment or from community myths. Motivation comprises primarily attitudes, social norms, and control perceptions, which are assumed to underlie behavioral decisions (see also Ajzen, 1991; Ajzen & Fishbein, 1980, 2005). Behavioral skills involve action repertoires and abilities that increase the likelihood of achieving a behavioral goal (Bandura, 1989; Kelly, St. Lawrence, Betts, Brasfield, & Hood, 1990). Both information and motivation may influence behavioral skills, and all three components may jointly influence actual condom use.

Given past support for the information-motivation-behavioral-skills model (J. D. Fisher, Fisher, Misovich, Kimble, & Malloy,1996; J. D. Fisher, Fisher, Williams & Malloy, 1994; W. A. Fisher, Williams, Fisher, & Malloy, 1999; for reviews, see Albarracín et al., 2003, 2005), it seems plausible that both the expertise versus community membership of an intervention source, as well as its demographic and behavioral similarity to the recipients, will influence actual behavior change by previously influencing motivation, knowledge, and/or behavioral skills (see Figure 1). For instance, compared to lays, professional experts may offer more convincing arguments and thus instill the formation of more favorable attitudes and intentions about condom use (see Kumkale & Albarracín, 2004). Compared to lays, experts may also provide information more effectively, be better informants, and provide more effective facilitation of behavioral skills (see, e.g., Prochaska et al., 2004).

The similarity between interventionists and intervention recipients may also impact motivation, information, and behavioral skills. Similar others may generate arguments that are particularly persuasive and also elicit positive affect in the recipient of an intervention (Clore & Byrne, 1974). As a result, greater demographic and behavioral similarity may lead to more positive attitudes and intentions about condom use than lesser demographic and behavioral similarity. In addition, similar others may be able to transmit information in a format that the similar recipients can understand, thus producing greater increases in knowledge than dissimilar others. Finally, people serve as models of human behavior to others, particularly when the model and the target share the same value and interpretation system (Bandura, 1989). Consequently, similarity may foster greater changes in behavioral skills than dissimilarity.

The availability of a model about the hypothetical mediators of the expertise of the interventionists and their similarity to the recipients also suggests that the lack of effects or the presence of reversed effects of source factors should be accompanied by a corresponding lack of effect or presence of a reverse effect on the theoretical mediators. Assume, for example, that gender and ethnic similarity influence behavior because they influence the formation of pro-condom-use norms. Assume also that gender- or ethnic-similarity are more important for women and girls and people from African ethnicities than for men and boys and people from European ethnicities. Given these assumptions, the effect of similarity on norms should also be greater among women and girls and people from African ethnicities than among men and boys and people from European ethnicities.

The Present Meta-Analysis: Public Health Significance and Methodology

As exemplified by the aforementioned studies, the relative effectiveness of professional experts and lay people as sources of HIV-prevention interventions is far from clear. Of the available reviews on these issues (Coyle, Needle, & Normand, 1998; Gibson, McCusker, & Chesney, 1998; Ickovics & Yoshikawa, 1998; Kegeles & Graham, 1998; Kirby et al., 1994; Merson, Dayton, & O'Reilly, 2000; Myhre & Flora, 2000; Oakley, Fullerton, & Holland, 1995; Prendergast, Urada, & Podus, 2001; Rotheram-Borus, Cantwell, & Newman, 2000), none has precisely estimated whether experts or lay people induce greater behavioral change, or whether sources and targets must be similar on the dimensions of ethnicity, gender, age, and behavioral choices. Fortunately, however, carefully executed reviews like the one we attempted can often provide comparative estimates of the effectiveness of various methodologies and help to resolve a controversy. We expected that knowledge of the relative effectiveness of expert and lay interventionists, or of similar and dissimilar others, would assist policymakers in making decisions about which sources to recruit and train in order to curb the HIV epidemic.

No systematic analysis of demographic or behavioral matching is currently available either, in part because of practical constraints and the very assumption that matching is desirable. For example, programs targeting females such as disadvantaged women, commercial sex workers, homeless women, and Black adolescent females consistently employ female sources (e.g., Gielen et al., 2001; Sterk, Theall, Elifson, & Kidder, 2003). Likewise, programs targeting male populations such as prisoners and gay men are delivered exclusively by male sources (e.g., Elford, Sherr, Bolding, Serle, & Maguire, 2002; Grinstead, Faigeles, & Zack, 1997; Harding, Dockrell, Dockrell, & Corrigan, 2001). Because concern about tailoring has obstructed comparative research regarding the best sources in the domain of HIV prevention (for a notable exception see null effects of gender and ethnic matching for teens in B. T. Johnson, Carey, Marsh, Levin, & Scott-Sheldon's, 2003, research synthesis) and in other domains of health promotion, our meta-analysis can help to fill a surprisingly large gap.

To contribute to reducing the limitations of past research on this critical health-promotion problem, in this meta-analysis, we recorded and analyzed the characteristics of the intervention sources and their level of matching with the target audiences. Among these characteristics, we classified sources as experts or lay community members, and examined source–recipient similarity in gender, ethnicity, and age. In addition, certain groups who engage in HIV-risky behaviors (intravenous drug users, men who have sex with men, multiple-partner heterosexuals, or partners of drug users) may benefit more from experts or from peers who share their life experiences. Consequently, we also analyzed the interactions between the inclusion of these groups in the target sample and the expertise and similarity of the sources delivering the intervention.

The translation of outcome findings into recommendations for the actual implementation and dissemination of preventive interventions is better justified when one has validated those outcomes with appropriate mediational data (see, e.g., J. D. Fisher & Fisher, 1992). Therefore, our meta-analysis also sought to understand the mechanisms underlying the impact of different interventionists. In particular, selecting an influential source can lead to internalization of new attitudes or to the formation of norms consistent with the source's advocacy (see Ajzen & Fishbein, 1980, 2005; Fishbein & Ajzen, 1975; see also Kelman, 1961). In addition, different sources may induce various levels of self-efficacy and knowledge by eliciting varying degrees of confidence in one's ability to perform

the behavior in question (Bandura, 1992) or attention to and corresponding learning of the material (Eagly, 1974; Hovland et al., 1953). These possibilities (see Figure 1) were investigated by means of path analyses of behavior change, with changes in attitudes and intentions, norms, knowledge, and behavioral skills being introduced as mediators of the influence of source's expertise and similarity.

Method

Review and Inclusion Criteria

We first conducted a thorough review of reports that were available by September 2003. It included a computerized search of Medline, PsycINFO, ERIC, Social Science Citation Index, and Dissertation Abstracts International using a number of keywords and their combination, including *HIV (AIDS) messages*, *HIV (AIDS) communications*, *HIV (AIDS) interventions*, *HIV (AIDS) prevention*, and *health education and HIV (AIDS)*. Second, we manually searched all available issues appearing during or after 1985 of the journals, *AIDS, AIDS Education and Prevention, AIDS Research, American Behavioral Scientist, American Journal of Community Psychology, American Journal of Nursing, American Journal of Public Health, Basic and Applied Social Psychology, Communication Research, Communications, Health Communication, Health Education Quarterly, Health Education Research, Health Psychology, Journal of the American Medical Association, Journal of Applied Communication Research, Journal of Applied Social Psychology, Journal of Consulting and Clinical Psychology, Journal of Personality and Social Psychology, Journal of Sex Research, Medical Anthropology, Morbidity and Mortality Weekly Report, Qualitative Health Research,* and *Social Science and Medicine*. We also checked cross-references in the obtained reports, sent requests for information to researchers funded by National Institutes of Health, and contacted selected experts and agencies who could provide relevant materials.

Once our search was complete, we selected studies that met the following eligibility criteria: [3]

1. Presence of a condom-use-promotion intervention. To be eligible, studies had to include at least one intervention designed to increase condom use among recipients. In addition, reports often included comparison and control conditions. Groups that researchers treated as "comparison" conditions but that participated in an intervention were considered treatment groups. We considered control groups only those not exposed to any kind of intervention at the time the study was conducted. These controls provide an estimate of the change that occurs in the absence of systematic exposure to an HIV-prevention intervention.

2. Presence of information about the interventionist. Studies were included only when they included information about the source that allowed us to classify the intervention sources as experts or peers or to describe them in terms of gender, age, ethnicity, or behavior-risk group. We thus excluded reports presenting no source information whatsoever.

3. Condom use behavior. We only included studies describing the outcomes of a standard intervention to promote condom use. Reports focusing on other safer sex behaviors (e.g., abstinence), or behaviors only tangentially related to condom use (e.g., "buying condoms" and "carrying condoms"), were excluded, except when they also measured condom use.

4. Presence of appropriate statistics. We synthesized studies that provided information to calculate the effect of the intervention over time, and excluded reports without a pretest. Most of the reports obtained pre and posttest measures from the same sample, but some obtained the pre and posttest measures from independent samples (for the benefits of conducting between-subjects longitudinal comparisons, see Cook & Campbell, 1979).

Of the 768 research reports considered for inclusion in this meta-analysis, 98 met our inclusion criteria, providing 224 statistically independent groups or units. Although these groups are a subset of those included in Albarracín et al.'s (2005) meta-analysis testing the effectiveness of different contents of interventions across different populations and contexts, the analyses of the effects of source characteristics have never been reported before.

Table 1
Characteristics of the Included Research Reports (Total = 98)

Variable	Statistic
Year of publication (r = 1)	
M	1996
SD	3.47
k	98
First author's institution (κ = .79)	
Major research university	76.5 (75)
Other	23.5 (23)
Country (κ = 1)	
United States	79.6 (78)
Other countries	20.4 (20)
Language of intervention (κ = 1)	
English	78 (80)
Other	20 (20)
Number of groups (κ = 1)	
M	2.20
SD	1.06
k	98
Research design (κ = .72)[a]	
Experimental (random assignment)	39.8 (39)
Quasi-experimental (No random assignment)	60.2 (59)
Measurement (κ = 1)	
Within-subject	87.1 (195)
Between-subjects	12.9 (29)
Inclusion of a control group (κ = 1)	
Yes	49 (48)
No	51 (50)

Note. Unless otherwise indicated, table entries are percentages, followed by frequencies between parentheses. k = maximum number of intervention and control groups. κ = intercoder reliability coefficient for categorical variables. r = intercoder reliability for continuous variables.
[a] Intercoder reliability was initially low, but satisfactory after both discussion of the coding criteria and recalculation of the reliability on a different set of studies. We report the second of these coefficients.

Dimensions Coded

Independent raters coded relevant characteristics of the reports and methods used in the study. After the initial training, intercoder agreement was 95%, and intercoder-reliability coefficients (kappas for categorical variables and simple correlations for continuous variables) are summarized in Tables 1 and 2. Occasional disagreements were resolved by discussion and further examination of the studies.

[3] A file containing 574 reports that we excluded following an examination of the actual report appears at http://www.psych.ufl.edu/~albarrac/meta.htm. Of the 574 excluded reports, 18.8% were theoretical or review papers, 16.8% were surveys, 8.7% were qualitative, 15.7% reported interventions that did not target condom use, 12.5% had data on condom use interventions without a pretest, 11.9% reported otherwise usable interventions but the statistics could not be used to derive the effect sizes we needed, 12.0% reported no standardized intervention, 1.4% were not HIV related at all, and 2.1% had no outcome variable that we were interested in synthesizing. In addition, 96 additional reports on condom use interventions were excluded because they excluded information on source characteristics.

Table 2
Source and Other Characteristics of Included Groups or Conditions

Variable	Treatment groups (k = 166)	Control groups (k = 58)
Characteristics of the source		
There is a professional expert source (κ = 1)		
Yes	69.9 (116)	—
No	21.7 (36)	—
There is a lay community member source (κ = .81)		
Yes	27.1 (45)	—
No	64.5 (107)	—
Gender similarity (κ = 1)		
Dissimilar	15.7 (26)	—
Sometimes	48.2 (80)	—
Ethnic similarity (κ = 1)		
Dissimilar	16.3 (27)	—
Sometimes	25.3 (42)	—
Age similarity (κ = 1)		
Dissimilar	29.5 (49)	—
Sometimes	8.4 (14)	—
Participant characteristics		
Sample size (r = .98)		
Total	57,553	25,245
M	257	267
Mdn	94	76
SD	667	937
k	166	58
% males (r = 1)		
M	44.38	45.85
Mdn	47	46.50
SD	40.58	39.79
k	164	58
% recipients whose sex was not identified (r = 1)		
M	1.20	0
Mdn	0	0
SD	10.94	0
k	166	58
Age in years		
M	28.18	26.28
SD	8.53	8.27
k	126	43
Ethnic descent		
% European (r = .89)		
M	25.70	33.90
Mdn	6	21.80
SD	33.06	34.58
k	148	51
% African (r = .77)		
M	53.71	43.68
Mdn	59	41.50
SD	39.08	36.67
k	155	48
% Latin American (r = 1)		
M	13.20	15.14
Mdn	2.80	3
SD	24.84	27.65
k	138	44
% Asian (r = .68)		
M	7.88	10.48
Mdn	0	0
SD	24.87	28.02
k	124	37
% Native North American (r = .76)		
M	0.25	0.37
Mdn	0	0
SD	0.96	1.22
k	124	35
Age in years (r = 1)		
M	28.88	26.28
Mdn	28.30	28
SD	88.53	8.27
k	126	43
% high school graduates (r = 1)		
M	42.49	45.36
Mdn	50	46.50
SD	36.82	41.98
k	70	28
Size of population of city or village (million)[a]		
M	1,836,067.75	1,243,714.82
Mdn	772,072	628,088
SD	2,387,299.89	1,804,237.80
k	151	55
Inclusion of specific groups (κ = .80)[b]		
Men who have sex with men		
Yes	26.5 (44)	27.6 (16)
No	73.5 (122)	72.4 (42)
Intravenous drug users		
Yes	16.9 (28)	15.5 (9)
No	83.1 (138)	84.5 (49)
Partners of intravenous drug users		
Yes	13.9 (23)	6.9 (4)
No	86.1 (143)	93.1 (54)
Sex workers		
Yes	9 (15)	6.9 (4)
No	91 (151)	93.1 (54)
Multiple-partner heterosexuals		
Yes	19.9 (33)	10.3 (6)
No	80.1 (133)	89.7 (52)
Participants with a history of STIs		
Yes	12 (20)	10.3 (6)
No	88 (146)	89.7 (52)
Participants with severe mental illness		
Yes	3 (5)	3.4 (2)
No	97 (161)	96.6 (56)
Drug users		
Yes	15.7 (26)	6.9 (4)
No	84.3 (140)	93.1 (54)
Level of baseline condom use (κ = 1)		
Low (Never/almost never or <40%)	44 (73)	44.8 (26)
Moderate (Sometimes or 40–80%)	27.1 (45)	20.7 (12)
High (Always/almost always or 80%+)	2.4 (4)	1.7 (1)
% of condom use at pretest (r = .91)		
M	31.40	28.70
Mdn	27	25
SD	20.27	20.65
K	101	38

Table 2 (*continued*)

Variable	Treatment groups (k = 166)	Control groups (k = 58)
% HIV+ participants at pretest (r = 1)		
M	14.01	30.54
Mdn	4	16.30
SD	22.01	35.02
k	39	10
Intervention strategies		
Threat-inducing arguments (κ = .92)		
Yes	51.2 (85)	—
No	48.8 (81)	—
Attitudinal arguments (κ = 1)		
Yes	56.6 (94)	—
No	43.4 (72)	—
Normative arguments (κ = 1)		
Yes	18.1 (30)	—
No	81.9 (136)	—
Factual information (κ = .83)		
Yes	95.8 (159)	—
No	4.2 (7)	—
Behavioral skills arguments (κ = 1)		
Yes	28.3 (47)	—
No	71.7 (119)	—
Condom distribution (κ = .90)[c]		
Yes	34.3 (57)	8.6 (5)
No	65.7 (109)	91.4 (53)
Condom use skills training (κ = 1)		
Yes	29.5 (49)	—
No	65.7 (109)	—
Interpersonal skills training (κ = 1)		
Yes	34.9 (58)	—
No	61.4 (102)	—
Self-management training (κ = 1)		
Yes	19.9 (33)	—
No	74.7 (124)	—
HIV counseling and testing (κ = 1)		
Yes	27.1 (45)	—
No	72.9 (121)	—
Intervention setup		
Setting of exposure (κ = 1)[b]		
School		
Yes	15.1 (25)	—
No	84.9 (141)	—
Community (street, community center, gay bar)		
Yes	28.9 (48)	—
No	71.1 (118)	—
Clinic		
Yes	41.6 (69)	—
No	58.4 (97)	—
Mass communication		
Yes	1.2 (2)	—
No	98.8 (164)	—
Media of delivery (κ = .93)[b]		
Face to face		
Yes	95.8 (159)	—
No	4.2 (7)	—
TV, videos, radio		
Yes	29.5 (49)	—
No	70.5 (117)	—
Brochures, posters or print		
Yes	10.1 (30)	—
No	81.9 (136)	—
Treatment applied to individuals or groups (κ = .92)		
Groups	57.8 (96)	—
Individuals	26.5 (44)	—
Both	12 (20)	—
Duration of HIV prevention intervention in hours (r = 1)		
M	9.29	—
Mdn	4.70	—
SD	14.79	—
k	103	
Other methodological features		
Payment received ($ U.S.) (r = 1)		
M	21.22	14.46
Mdn	0	0
SD	37.00	30.80
k	166	58
Days between treatment and posttest (r = 1)		
M	152	—
Mdn	90	—
SD	213.57	—
k	158	—
Basis for intervention (κ = 1)		
Formal theory acknowledged as basis	53.6 (89)	53.4 (31)
Informal conceptualization, no theory cited	33.7 (56)	31 (18)
Informal conceptualization, theory cited	12.7 (21)	15.5 (9)
Formative research was conducted (κ = 1)[c]		
Yes, mentioned	38 (63)	51.7 (30)
No, not mentioned	62 (103)	48.3 (28)
Is intervention culturally appropriate? (κ = .91)		
Yes	28.9 (48)	—
No	71.1 (118)	—
Specific population targeted (κ = 1)		
Yes	94.6 (157)	—
No	5.4 (9)	—
Sample targeted by ethnicity (κ = 1)		
Yes	22.9 (38)	—
No	77.1 (128)	—
Sample targeted by gender (κ = 1)		
Yes	44 (73)	—
No	56 (93)	—
Self-selected samples (κ = 1)		
Yes	85.5 (142)	70.7 (41)
No	14.5 (24)	29.3 (17)
Attrition rate between the pretest and the immediate posttest (r = 1)		
M %	16.28	17.49
Mdn	0	0
SD	21.91	27.16
k	83	28

Note. For categorical variables, entries are percentages followed by frequencies between parentheses. A dash indicates that the variable applied only to intervention groups. k = maximum number of intervention and control groups; κ = intercoder reliability coefficient for categorical variables; r = intercoder reliability for continuous variables; STIs = sexually transmitted infections.

[a] Information was retrieved from an independent source. [b] Reliability was obtained for a general category, which we later broke down into the mutually exclusive categories that follow. [c] Intercoder reliability was initially low, but satisfactory after both discussion of the coding criteria and recalculation of the reliability on a different set of studies. We report the second of these coefficients.

Description of report. We also coded the following information with regard to the reports and its authors: (a) publication year; (b) country of intervention (i.e., United States vs. other countries); (c) state of intervention for studies in the United States; and (d) language of intervention (English vs. other languages).

Source experts, peers, and demographic similarity. With regard to the source, we first coded whether the source/s of the intervention comprised a professional expert (i.e., yes vs. no), and whether the source/s comprised a lay community member (i.e., yes vs. no). Professional experts included doctors, public health educators, teachers, members of the research team, social workers, psychologists, counselors, and medical students. Lay community members included community leaders (e.g., gay leaders), teens, and religious ministers. As expected, the two dummy codes for expertise and lay community membership correlated highly ($r = -.86$, $p < .001$), but the correlation was not perfect because some interventions included both expert and lay sources. For the purpose of replication, both of these indexes were used in analyses.

We also coded for similarities between the source and the target population on the basis of information regarding age, ethnicity, gender, and behavior-risk group membership. According to our coding scheme, the source *always* matched the recipients when all recipients were from the same demographic group and the source or sources were also from that group. The source matched the recipients *sometimes* when the source was similar to some of the participants but not others. The source *never* matched the recipients when the group of the source was not at all represented in the audience of a particular intervention. Based on those criteria, sources were coded as sometimes, always or never of the same gender group as the recipients; sometimes, always or never of the same ethnic group as the recipients; sometimes, always or never of the same age as the recipient; and sometimes, always or never of the same risk group as the recipient. However, an examination of the distribution of these codes suggested that some of the cells had few groups, which led us to merge *sometimes* and *always similar* into a category of *likely similarity* and contrast it with *never similar*—dissimilar—in analyses.

Target population characteristics. We also recorded *characteristics of the participants*, including demographics of the target group as well as specific characteristics and behaviors of the target group that are associated with HIV-infection risk. To describe the target population, we retrieved the: (a) sample size, (b) percentage of male participants in each group; (c) mean or median age; (d) percentage of participants of European, African, Latin American, Asian, and Native-North American descent;[4] (e) percentage of participants who completed at least high school; and (f) population of the city or village at the time the intervention was conducted.

To further describe the sampling of participants in relation to characteristics or behaviors associated with HIV-infection risk, we registered the inclusion of behaviorally at-risk groups in each sample (i.e., men who have sex with men, intravenous-drug users, partners of intravenous-drug users, commercial sex workers, multiple-partner heterosexuals, participants with a history of STIs, participants with severe mental illness, and drug users). We also recorded the baseline level of condom use, which we classified as low (i.e., never or almost never, or 40% or less of the time), moderate (i.e., sometimes or 40% to 80% of the time), and high (i.e., always or almost always, or 80% or more of the time); percentage of condom use over intercourse occasions at pretest; and rate of HIV at pretest.

Methodological characteristics. Regarding the *intervention*, we recorded the presence or absence of threat arguments, such as discussions about the recipient's personal risk of contracting HIV or other STIs; attitudinal arguments, such as statements about the positive implications of using condoms for the health of the partners and for the romantic relationship; and normative arguments asserting support for condom use on the part of friends, family members, or partners. We also classified reports according to the presence of information about or descriptions of mechanisms of HIV, HIV transmission, and methods of HIV prevention. In addition, we established whether the message verbally instructed participants on behavioral skills for situations in which the partner does not want to use a condom, the recipients or their partners are sexually excited, or alcohol or drugs are involved; whether it entailed active training in condom use behavioral skills (e.g., opening wrapper without tearing it, unrolling condom in proper direction), interpersonal skills (e.g., role-playing condom use negotiation), and self-management skills (e.g., identifying contextual factors that could impede safer sex behavior); and whether HIV counseling and testing was performed.[5] The impact of these strategies has been established elsewhere (see also Albarracín et al., 2005) but must nevertheless be controlled when studying the effects of the intervention source.

We also coded for other methodological characteristics that are relevant to the *setup of the interventions*. We thus classified each treatment group according to whether the setting of the intervention comprised schools, community setting, clinics, or mass-communication media. We also recorded the mode of delivery of the intervention, including face-to-face interactions, videos, and brochures, posters, or print; whether exposure to the communication was individual or in groups; and the duration of the intervention in hours.

Finally, we coded issues related to *measurement precision and reactivity*, including whether the design was within-subjects or whether different samples were used at pre- and posttest; whether participants were randomly assigned to conditions; the mean payment in exchange for participation in U.S. dollars; the mean and median number of days between the treatment and the posttest; whether there was formative research to adapt the intervention to the target population and media; whether the intervention was intended to be culturally appropriate; and whether the intervention attempted to reach general population recipients or was targeted to a specific group. When there was a specific target, we further specified whether the program was designed for a specific (a) gender or (b) ethnic group. We also coded groups that partook in the study voluntarily as self selected, relative to captive groups that could easily not refuse to participate (i.e., volunteers vs. participants in classrooms or prison settings). Attrition rates for each group were also calculated and taken into account when the *N*s were reported for the pre- and the posttest measures.

Retrieval of Effect Sizes

Two raters calculated effect sizes independently. Disagreements were examined by a third researcher and resolved by discussion. Raters were instructed to calculate effect sizes representing change from the pretest to the most immediate posttest. When a report contained more than one measure of the constructs of interest, we first calculated effect sizes for each one and then obtained the average, which was used as the effect size for that particular variable (see B. T. Johnson, 1993).

To represent change from the pretest to the posttest measures, we used Becker's (1988) *g*, which is calculated by subtracting the mean at posttest from the mean at pretest and dividing the difference by the standard deviation of the pretest measure. We calculated effect sizes representing change in condom use (the outcome variable), as well as norms, attitudes,

[4] The ethnicity data were retrieved regardless of country, except for the case of Native Americans, which were only available for North American countries. When these data were not reported and countries were highly ethnically homogeneous (e.g., certain African countries, the Netherlands, Italy), we obtained the information from population reports from those countries. The imputation of these data did not alter the findings but allowed a few additional effects to be included in those analyses.

[5] We also coded for more specific arguments within each category as well as more specific behavioral techniques within each training strategy. These codes allowed us to construct frequency ratings for the intensity of each strategy, and analyses were conducted with these ratings as well. The results with the dichotomous and polichotomous indexes were almost identical.

control perceptions, knowledge, and behavioral skills (the potential mediators). In all cases, we considered the wording of the measures and not the authors' labels for constructs. We describe typical measures of each variable below.

Condom use. Condom use measures included assessments on subjective frequency scales as well as reports of the number of times participants used condoms over intercourse occasions. For example, the Community Demonstration Projects Research Group (Centers for Disease Control [CDC], 1993) asked participants, "When you have vaginal sex with your main partner, how often do you use a condom?" (p. 11), and participants provided their response on a scale from 1 (*every time*) to 5 (*never*). Similarly, to obtain a more precise report of condom use, Ploem and Byers (1997) asked participants to report the frequency of sexual intercourse over the previous 4 weeks as well as the number of occasions of sexual intercourse for which condoms were used. The researchers then derived a percentage of condom use for each participant. In addition, many researchers have analyzed change in the number of unprotected sex of occasions (Allen, Serufiliria, et al., 1992) or the percentage of times participants had unprotected sex during a given period of time (Collins, Kohler, DiClemente, & Wang, 1999). In these cases, change scores were reverse-scored to maintain a metric in which higher numbers indicate increases in protection from HIV.

Norms. According to Fishbein and Ajzen (1975), subjective norms are influenced by a set of salient beliefs about the normative prescriptions of specific (salient) referents, weighted by the motivation to comply with each of those referents. For example, a man may perceive social pressure to use condoms if he believes that his partner thinks that he should use condoms and he is motivated to comply with the partner. In this meta-analysis, we combined both global, subjective norm measures and belief-based measures of norms to assess the normative influence of the communications. Subjective norms were typically measured with probability scales in response to statements like "Would you say that most of the people who are important to you think that you should or should not use a condom for vaginal sex with your main partner?" (CDC, 1993, p. 12). Normative beliefs were generally assessed with bipolar probability statements about the opinion of a specific referent (e.g., "Do you feel that your main partner thinks you should or should not use a condom every time you have vaginal sex with her?"; CDC, 1993, p. 6), whereas motivations to comply were typically measured with unipolar scales in response to items like "When it comes to protecting yourself from AIDS, do you want to do what your main partner thinks you should do?" (CDC, 1993, p. 6).

Attitudes and intentions. Because of the high correlation between change in attitudes and intentions in this data set ($r = .64$, $p < .01$, $k = 12$) and the relative low number of these measures, we averaged change in attitudes and intentions. Attitudes toward the behavior were typically measured with semantic differential types of scales (e.g., "Do you think using a condom every time you have vaginal sex with your main partner would be pleasant or unpleasant? And would you say it would be *extremely*, *quite*, or *slightly* (*pleasant/unpleasant*)?", CDC, 1993, p. 12). Researchers sometimes obtained expectancy-value estimates of attitude by subjectively weighting the belief that a behavioral outcome will occur by the evaluative implications of that outcome (e.g., "show that you care" or "make you worry less," CDC, 1993, p. 3 and p. 5, respectively). Behavioral or outcome beliefs were typically measured with bipolar probability statements linking the behavior to a set of outcomes (e.g., "using a condom would take all the fun out of sex for me," O'Leary, Jemmott, Goodhart, & Gebelt, 1996), whereas outcome evaluations were measured by means of bipolar evaluative items (e.g., "becoming pregnant now would be *good* or *bad*," CDC, 1993, p. 5).[6] In turn, measures of intentions assessed the intent or willingness to use condoms in the future. Typical items were "In the future, do you plan to use condoms?" (Eldridge et al., 1997, p.67), or "In the next six months, how likely do you think it is that you will start using a condom every time you have vaginal sex with your main partner?" (CDC, 1993, p. 11).

Control perceptions. We used an average of change in perceived control over condom use and self-efficacy as a measure of control perceptions (see also Albarracín et al., 2003, 2005). Measures of perceived control included items like "Now it is just a 'what if' question, but if you wanted to use a condom every time you have anal sex with your main partner, how sure are you that you could?" (CDC, 1993, p. 17). Other researchers asked participants to rate statements like, "I can use a condom without fumbling around" (Kelly, McAuliffe, et al., 1997, p. 1285). Specific measures of self-efficacy comprised items that relate control to specific events. For example, the Community Demonstration Projects Research Group (CDC, 1993) included items like "How sure are you that you can use condoms every time for vaginal sex with your main partner when your partner doesn't feel like using them?" or "When there aren't any condoms around, how sure are you that you can wait until you get one every time before having vaginal sex with your main partner?" (p. 7). Similarly, O'Leary and her colleagues (1996) asked participants to report whether "It would be easy or hard to refuse to have sex with a person if s/he won't use a condom" (p. 520).

Knowledge. A large number of studies assessed the participant's knowledge about HIV or AIDS, and typically comprised a series of statements that the participant evaluated as true or false (e.g., "The AIDS virus can be caught through ordinary close social contact, such as sitting next to an infected person," Rigby, Brown, Anagnostou, Ross, & Rosser, 1989, p. 149). Knowledge scores in most cases were calculated by computing the percentage of questions a participant answered correctly. When researchers reported statistics for individual items, we calculated effect sizes for each question and then averaged those effects into a global measure of change in knowledge.

Behavioral skills. We also calculated change in measures of behavioral skills, which assess the participant's ability to use (acquire and apply) condoms, and to negotiate condom use (i.e., communication about sex or sexual assertiveness skills). For instance, negotiation skills were measured by presenting participants with coercive sexual situations leading to unsafe sex and asking them to respond as they would in that situation (Eldridge et al., 1997). Independent raters then evaluated participants' negotiation skills on a scale from 1 (*unlikely to prevent risk behavior*) to 10 (*likely to prevent risk behavior*).

Analytic Strategy

We calculated weighted mean effect sizes to examine change over time in treatment and control groups, and performed corrections for sample-size bias to estimate the effect size *d*. We used Hedges and Olkin's (1985) procedures to correct for sample-size bias,[7] to calculate weighted mean effect sizes, effect sizes (*d*), and to estimate homogeneity statistics (*Q*), which test the hypothesis that the observed variance in effect sizes is no greater than that expected by sampling error alone. When designs were between-subjects, calculations of the variance also followed procedures developed by Hedges and Olkin. When designs were within-subject, we calculated the variance of effect sizes using Morris's (2000) procedures. We performed calculations for within-subject effect sizes using correlations from Project RESPECT (see Kamb et al., 1998), which provide moderate values of this association (see also Albarracín et al., 2003, 2005).

Analyses of effect sizes were performed using fixed-effects procedures. In this case, one assumes a fixed population effect and estimates its sampling variance, which is an inverse function of the sample size of each group. The inverse of the effect size's variance is used to weight

[6] When the *N* at the pretest differed from the *N* at the posttest, the smaller *N* was used.

[7] When the *N* at the pretest differed from the *N* at the posttest, the smaller *N* was used.

effect sizes prior to obtaining average values. Thus, effect sizes from studies with larger sample sizes are considered more precise and carry more weight than effect sizes obtained from studies with smaller sample sizes. These procedures are powerful and produce narrow confidence intervals (CIs; Rosenthal, 1995; Wang & Bushman, 1999).[8]

The analyses of the effectiveness of specific types of intervention sources and populations were conducted using analysis of variance (ANOVA) procedures. In these procedures, the inverse of the variance of the effect size being predicted was introduced as a weight, and the significance of the effects of interest was determined by examining the significance of Q_B, which is a sum of squares analogous to an F ratio but distributed as a chi-square. Q_Bs were obtained for the main and simple effects of source and recipient characteristics, and also for the interaction between source and recipient characteristics.

Results

Preliminary Findings

Description of reports. A summary of the characteristics of the included reports appears in Table 1. As can be seen, most reports were gathered around 1996 in the United States by researchers who were affiliated with a major research university. The reports comprised an average of two groups or conditions, included interventions generally presented in English, utilized random assignment about one third of the time, generally measured change within-participant, and had a control group in about half of the cases. Only analyses from the immediate posttest were included because the number of available studies that included both analyzable information about the source of the intervention as well as data from two or more posttests was limited. Approximately one third of the studies reported in this meta-analysis included longitudinal data, thus restricting the scope and generalizability of the findings presented.

Description of units. The characteristics of the sample of the 224 units in our meta-analysis appear in Table 2, organized according to whether the units represented an intervention or a control group. Of the conditions summarized in our review, 70% had expert sources. Of these expert sources, 25% were public health educators; 25% were psychologists; counselors or masters level professionals; 13% were physicians; 11% were staff from clinics or from the research team; 9% were nurses; 16% were teachers, social workers, or outreach workers; and 1% were not specified but worked at health centers. Of the nonexpert sources, 88% were community leaders, peer opinion leaders, and community peers (including classmates and family members); 10% were artists (rap teams and actors); and 2% religious leaders.

Regardless of whether the interventionists were experts or lay community members, most of them were similar in gender and ethnicity to at least some of the participants. Age similarity, however, was less frequent. Overall, however, there was sufficient variability in the characteristics of the interventionists to allow us to perform the analyses of interest for this article.

Studies sampled a total of 82,600 participants, with similar representation of males and females. The participants were around 29 years old and diverse in ethnicity, behavior-risk group, and sexual orientation. Samples had considerable behavioral risk, including men who have sex with men, intravenous drug users, partners of intravenous drug users, female sex workers, multiple-partner heterosexuals, participants with a history of STIs, patients with severe mental illness, and general samples of drug users (e.g., people in drug rehabilitation). Most participants for whom a measure of condom use was obtained never used condoms, and only a minority was using condoms at a relatively high rate. The average rate of infection with HIV was about 23%, although most studies had no information on seropositivity.

As can be seen from the second section of Table 2, many methodological choices were represented in the conditions we summarized. The intervention strategies included threat-inducing arguments, attitudinal arguments, normative arguments, behavioral-skills arguments, information, behavioral skills training, condom provision, and HIV counseling and testing.

More communications were presented in clinics than in any other place, although many of the messages were delivered in community and school settings, and two via mass-communication media. The communications were generally presented face-to-face, and many included videotapes as well. The treatment was applied to groups in a majority of the cases, and lasted an average of 9 hours.

Further, there was considerable variability in research design and measurement across the studies. On average, participants were compensated less than $20 for their participation. The mean length of time between treatment and posttest was slightly over 5 months, although the median was 3 months. Half of the treatments in our sample were explicitly based on theory, at least 30% were designed from formative research with the target population, almost 30% were explicitly intended to be culturally sensitive, most of the studies targeted a specific population, samples were self-selected quite frequently, and attrition was over 17% for both treatment and control groups.[9]

Overall Effects of the Interventions Compared With the Control Groups

Although an analysis of the general effects of HIV interventions was not the objective of this article, it was important to demonstrate that the interventions sampled here produced greater behavior change than control groups. As reported elsewhere (Albarracín et al., 2005), interventions produced greater increases in condom

[8] Random-effects analyses were also performed. They yielded the same patterns although the significance of many of the findings was much lower.

[9] In sum, in terms of intervention strategies, setup and other methodological features, the units we summarized are largely comparable to the ones synthesized elsewhere. Because this is a subsample of the units that Albarracín and her colleagues (2005) meta-analyzed with other purposes, we refer the reader to that source for details. For the purpose of this meta-analysis, however, strategies, setup, and other characteristics were simply controlled for.

use than did control groups ($d = 0.27$ vs. 0.08, $k = 224$, $Q_B(1) = 264.43$, $p < .001$).[10]

Source and recipient effects. To examine the effects of the source's expertise, lay community membership, and similarity to recipients, we submitted change in behavior as an outcome variable in ANOVAs weighted by the corresponding variance of the effect size. The predictors in these analyses were the gender, ethnicity, age, and behavioral-risk group of the participants, each introduced independently and in interaction with the expertise and lay community membership of the source (see Table 3), as well as the source's similarity to the recipients in terms of gender, ethnicity, age, and behavioral-risk group (see Table 4).

The analyses with gender, ethnicity, and age were replicated using continuous variables in addition to the breakdowns presented here (gender was considered predominantly male when more than 50% of the sample was male, ethnicity was considered predominantly European when more than 50% of the sample had that background, age was under 21 years when the mean or median age was under 21, and so forth). The analyses using dichotomous and continuous predictors were very similar, which led to presenting the ones with dichotomous predictors for interpretational purposes. The analyses with past condom use required collapsing moderate and high condom use due to the low number of conditions with high condom use (see Table 1). (Other groups in Table 1 were not sufficiently represented to perform these analyses.)

Behavioral effects of source's expertise and similarity to recipients across different audiences. One question that guided this meta-analysis is whether expert education is more or less effective than peer education. Across the board, experts induced more behavioral change than did nonexperts, and noncommunity members induced more behavioral change than did community members. This conclusion was verified by significant main effects of the source expertise and lay community membership variables on behavior change.

Table 4 also shows that sources that are similar to the recipients had important effects on the behavior change elicited by the interventions in our analyses. Sources that were similar in gender, ethnicity, and behavior-risk group had overall more positive effects across all groups than sources that were dissimilar in those variables. Although age similarity had no overall significant effect in some of the analyses, its influence is best understood from the interactions that are presently described.

Potential interactions between the expertise of the source and characteristics of the participants[11] can be examined from the Q_Bs for the interactions between source and recipient variables in Table 3, complemented with the Q_Bs for the simple effects of the source variables for each group. These analyses indicate that even when experts produced greater behavior change in general, these differences were smaller for men and boys, either reversed or disappeared for Whites, and were absent for individuals under 21.

Further, there were important interactions between source–recipient similarity and recipient group. Compared with men and boys, women and girls frequently changed their behavior more in response to interventionists who were similar to them in gender, ethnicity, and behavior-risk group. Likewise, compared with individuals with predominantly European ethnicities, individuals with predominantly African ethnicities changed their behavior more when the interventionists were similar to them in gender (and ethnicity and risk group, although the interactions were nonsignificant) than when they were not.[12] Finally, people 21 years of age and younger changed more in response to others similar to them in age and risk group than people over 21. In contrast, people over 21 changed more in response to gender-similar sources than people under 21.

Finally, we also examined three-way interactions between recipient group, presence of experts or lay community members, and each of the four similarity variables introduced at a time. These analyses revealed four higher order interactions with the recipients' age. As shown in Figures 3 and 4, younger individuals changed in response to lay community members only when the lay community members were similar to them in gender and ethnicity, whereas older individuals changed more in response to experts when the experts were similar to them in gender and ethnicity. The three-way interactions involving recipient's age, type of source, and gender or ethnicity were significant in all cases ($Q_B > 4.77$, $p < .01$). No three-way interactions involving other recipient characteristics emerged, suggesting that the effects of expertise and similarity we previously described were additive.

Mediating processes underlying interventionists' effects. In an attempt to understand the mechanisms underlying the effects of source expertise and source–recipient similarity, we performed path analyses in which changes in norms, attitudes and intentions, control perceptions, knowledge, and behavioral skills, were examined as potential mediators of the influence of source characteristics on change in condom use. On an important note, because not

[10] Comparing all interventions with all control groups is insufficient to rule out two important rival hypotheses. First, considering interventions without controls allows for the possibility that spontaneous maturation might be responsible for the observed increases in condom use (see Cook & Campbell, 1979). Second, comparing interventions and controls that did not use random assignment cannot control for selection biases and particularly the possibility that the group assigned to the intervention was simply easier to change than the group assigned to the control. In light of these alternative hypotheses, we conducted an additional analysis in which we calculated scored representing controlled change. For this purpose, we selected only studies that used random assignment as well as a control group and subtracted the effect size d representing change in the control group from the effect size representing change in the treatment group. The variance of the resulting Δ (Becker, 1988) equals the inverse of the sum of the variances of the effect sizes that entered the calculation of Δ, and was used to derive a CI for the overall effectiveness of HIV prevention intervention when one selects only controlled randomized trials ($k = 33$). The result from the fixed-effects analysis was an average controlled change of 0.06 (95% CI = 0.03, 0.12), $Q(32) = 167.28$, $p < .001$, which was small but significantly different from zero. Although the convergence of this analysis and those in Table 2 is not surprising given that Δ correlated .82 with the d representing change in the treatment group, it provides further support for the use of d in our subsequent analyses. These analyses were previously reported by Albarracín et al. (2004).

[11] As reported previously (see Albarracín et al., 2005), characteristics of the recipients influenced behavior change (see main effects of recipient variables in Tables 3 and 4). Even when gender made no difference, predominantly Black and older recipients had greater increases in condom use in response to the intervention than did predominantly White and younger recipients.

[12] Analyses were also conducted using regression analyses with the continuous variables of gender, ethnicity, and age. The results replicated but are more clear when presented dichotomously.

Table 3
Effects of Experts and Lay Community Members on Behavior Change as a Function of Recipients' Characteristics

Variable	*d.*		Q_B				*k*
			Simple effects of source variable	Main effect of source variable	Main effect of recipient variable	Interaction	
Gender							
Expertise	Expert	Nonexpert					
Predominantly male	0.34	0.17	62.20***				
Predominantly female	0.35	0.12	206.75***	224.91***	1.11	6.07**	150
Lay community membership	Not a lay community member	Lay community member					
Predominantly male	0.34	0.17	66.94***				
Predominantly female	0.37	0.15	197.60***	224.73***	0.06	3.68	150
Ethnicity							
Expertise	Expert	Nonexpert					
Predominantly European	0.16	0.20	3.02				
Predominantly African	0.44	0.12	466.39***	100.05***	49.14***	167.60***	152
Lay community membership	Not a lay community member	Lay community member					
Predominantly European	0.16	0.20	4.33*				
Predominantly African	0.46	0.14	465.01***	100.83***	71.29***	182.97***	152
Age							
Expertise	Expert	Nonexpert					
Predominantly <21	0.07	0.05	0.09				
Predominantly >21	0.42	0.15	401.37***	38.69***	96.50***	32.01***	152
Lay community membership	Not a lay community member	Lay community member					
Predominantly <21	0.06	0.07	0.03				
Predominantly >21	0.43	0.16	413.87***	39.52***	121.40***	44.06***	152

Note. All factors were dummy coded (expert or noncommunity member = 1, nonexpert or lay community member = 0). Significant Q_Bs indicate significant effects of the involved factors. *d,* = fixed-effects weighted model means adjusted for all other effects. Q_B for simple and main effect = homogeneity coefficient for the difference across levels of a factor, distributed as a chi-square with number of factor levels −1 degree of freedom; Q_B for interaction = homogeneity coefficient for the interaction between factors, distributed as a chi-square with (number of levels of factor $A - 1$) × (number of levels of factor $B - 1$) degree of freedom; k = number of conditions in analysis. Control means were $d. = 0.12$ for males, $d. = 0.06$ for females, $d. = 0.12$ for White participants, $d. = 0.06$ for Black participants, $d. = 0.09$ for over 21, and $d. = 0.01$ for under 21.
*** $p < .001$.

all researchers measured these variables in addition to condom use and because some of the matrices produced impossible solutions (Shadish, 1996), detailed analyses for the different subgroups in Tables 3 and 4 could not be conducted. Yet, we were able to create a dummy-coded variable that separated samples with a predominance of women, girls, and Blacks—who are afforded less power—from samples with predominance of men and boys or Whites (predominantly White or Black men and boys, and predominantly White women and girls)—who are afforded more power.

Separate analyses for these two groups were conducted for the influence of source expertise on behavior change and the potential mediators (see Figure 5). In addition, we averaged the four dummy-coded variables representing similarity for gender, ethnicity, age, and behavior-risk group, and we used this measure in analyses of the mediating effects of overall similarity across these two groups (see Figure 6).

The path analyses in Figures 5 and 6, which were fit using EQS 6.1 (Bentler & Wu, 1995) and complemented with the use of Sobel (1982) tests, permit an examination of the mediating influences of norms, attitudes and intentions, control perceptions and skills, as well as knowledge. As the model in Figure 5 suggests, for all groups the positive influence of expert sources on behavior change was mediated by influences on norms, perceived control, and behavioral skills, as well HIV-related knowledge, for all groups. For higher power groups, expert sources also produced greater change in attitudes and intentions, and these changes in attitudes and intentions significantly mediated increases in condom use. However, as one might expect given the weaker effect of expertise among groups with greater power, source expertise did not exert a positive influence on attitudes and intentions, but instead had a negative influence on change in these variables ($p < .001$, for the difference between the path coefficients). This failure of expertise to positively influence attitudes and intentions among more powerful participants might be responsible for the failure of expertise to exert stronger behavioral-change effects in this group.

The mediational patterns for similarity were different from the patterns for expertise. First, as can be seen from Figure 6, the effect

Table 4
Effects of Source–Recipient Similarity on Behavior Change as a Function of Recipients' Factors

Variable	*d.*		Q_B				*k*
			Simple effects of source variable	Main effect of source variable	Main effect of recipient variable	Interaction	
			Gender				
Gender similarity	Likely similar	Dissimilar					
Predominantly male	0.28	0.26	0.18				
Predominantly female	0.40	0.04	368.99***	90.67***	7.26**	77.14***	106
Age similarity	Likely similar	Dissimilar					
Predominantly male	0.13	0.18	0.72				
Predominantly female	0.13	0.06	3.56	0.20	4.10*	3.28	63
Ethnic similarity	Likely similar	Dissimilar					
Predominantly male	0.15	0.27	13.08***				
Predominantly female	0.33	0.04	145.78***	14.80***	1.26	96.29***	67
Risk-group similarity	Likely similar	Dissimilar					
Predominantly male	0.12	0.20	6.05*				
Predominantly female	0.35	0.12	76.31***	17.40	14.71	60.29***	93
			Ethnicity				
Gender similarity	Likely similar	Dissimilar					
Predominantly European	0.19	0.05	26.36***				
Predominantly African	0.40	0.08	319.86***	203.20***	54.20***	32.96***	106
Age similarity	Likely similar	Dissimilar					
Predominantly European	0.20	0.07	6.96**				
Predominantly African	0.10	0.08	0.22	5.86**	2.07	3.53	63
Ethnic similarity	Likely similar	Dissimilar					
Predominantly European	0.15	0.06	2.17				
Predominantly African	0.24	0.08	66.08***	15.99***	2.58	1.47	69
Risk-group similarity	Likely similar	Dissimilar					
Predominantly European	0.18	0.14	2.86				
Predominantly African	0.25	0.13	21.74***	19.36***	2.46	3.63	94
			Age				
Gender similarity	Likely similar	Dissimilar					
Predominantly <21	0.12	−0.02	16.71***				
Predominantly >21	0.37	0.09	286.49***	123.09***	89.12***	14.04***	106
Age similarity	Likely similar	Dissimilar					
Predominantly <21	0.27	0.04	18.67***				
Predominantly >21	0.07	0.09	0.40	10.54***	5.09*	15.55***	63
Ethnic similarity	Likely similar	Dissimilar					
Predominantly <21	0.19	−0.02	23.94***				
Predominantly >21	0.24	0.10	52.10***	55.58***	11.33***	2.08	69
Risk-group similarity	Likely similar	Dissimilar					
Predominantly <21	0.25	0.04	13.52***				
Predominantly >21	0.21	0.17	4.38*	17.22***	1.90	8.00**	94

Note. All factors were dummy coded (likely similar = 1; dissimilar = 0). *d.* = fixed-effects weighted model means adjusted for all other effects; Q_B for simple and main effect = homogeneity coefficient for the difference across levels of a factor, distributed as a chi-square with number of factor levels −1 degree of freedom; Q_B for interaction = homogeneity coefficient for the interaction between factors, distributed as a chi-square with (number of levels of factor $A - 1$) × (number of levels of factor $B - 1$) degree of freedom; *k* = number of conditions in analysis.
Significant Q_Bs indicate significant effects of the involved factors. Control means were *d.* = 0.12 for males, *d.* = 0.06 for females, *d.* = 0.12 for White participants, *d.* = 0.06 for Black participants, *d.* = 0.09 for over 21, and *d.* = 0.01 for under 21.
* $p < .05$. ** $p < .01$. *** $p < .001$.

of the similarity score was only significant for women and girls and people from African ethnicities. In addition, only changes in norms significantly mediated changes in behavior, whereas changes in attitudes and intentions, perceptions of control, knowledge, or behavioral skills had no mediating effects in the models that included source–recipient similarity as the external variable. Perhaps more important, the lack of overall effect of demographic similarity among more powerful participants was accompanied by

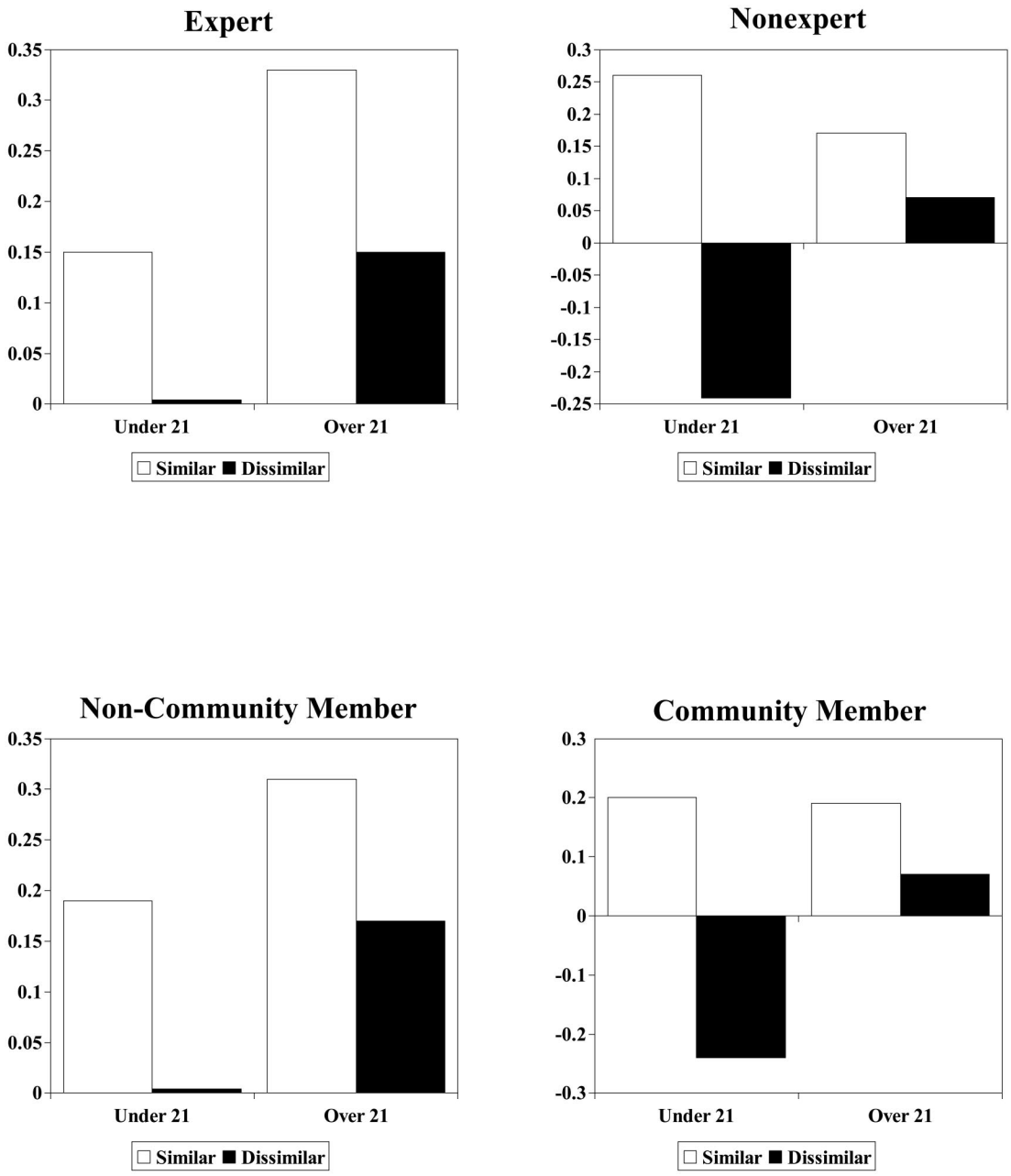

Figure 3. Effects of gender similarity and expertise/lay community membership for individuals 21 and under and over 21. The *y*-axis represents *d*.

a lack of influence of similarity on norms. This finding thus provides further support for the conclusion that normative change mediated the effects of similarity on behavior change.

Supplementary Analyses

Effects of the behavioral risk of recipients. We submitted behavior change as the outcome variable in ANOVAs as a function of inclusion of specific risk groups (i.e., men who have sex with men, intravenous drug users, partners of intravenous drug users, multiple-partner heterosexuals, commercial sex workers, and infrequent past condom users)[13] and the expertise of the source, the lay community membership of the source, or (when available) the risk group similarity between the source and the recipient. These analyses are summarized in Table 5.

Inclusion of certain risk groups often made a difference in how much recipients changed in response to the intervention (see Q_Bs for main effects of risk group in Table 5). Whereas conditions

[13] Because of incomplete cells, we could not analyze the effects of including participants with severe mental illnesses or general drug users.

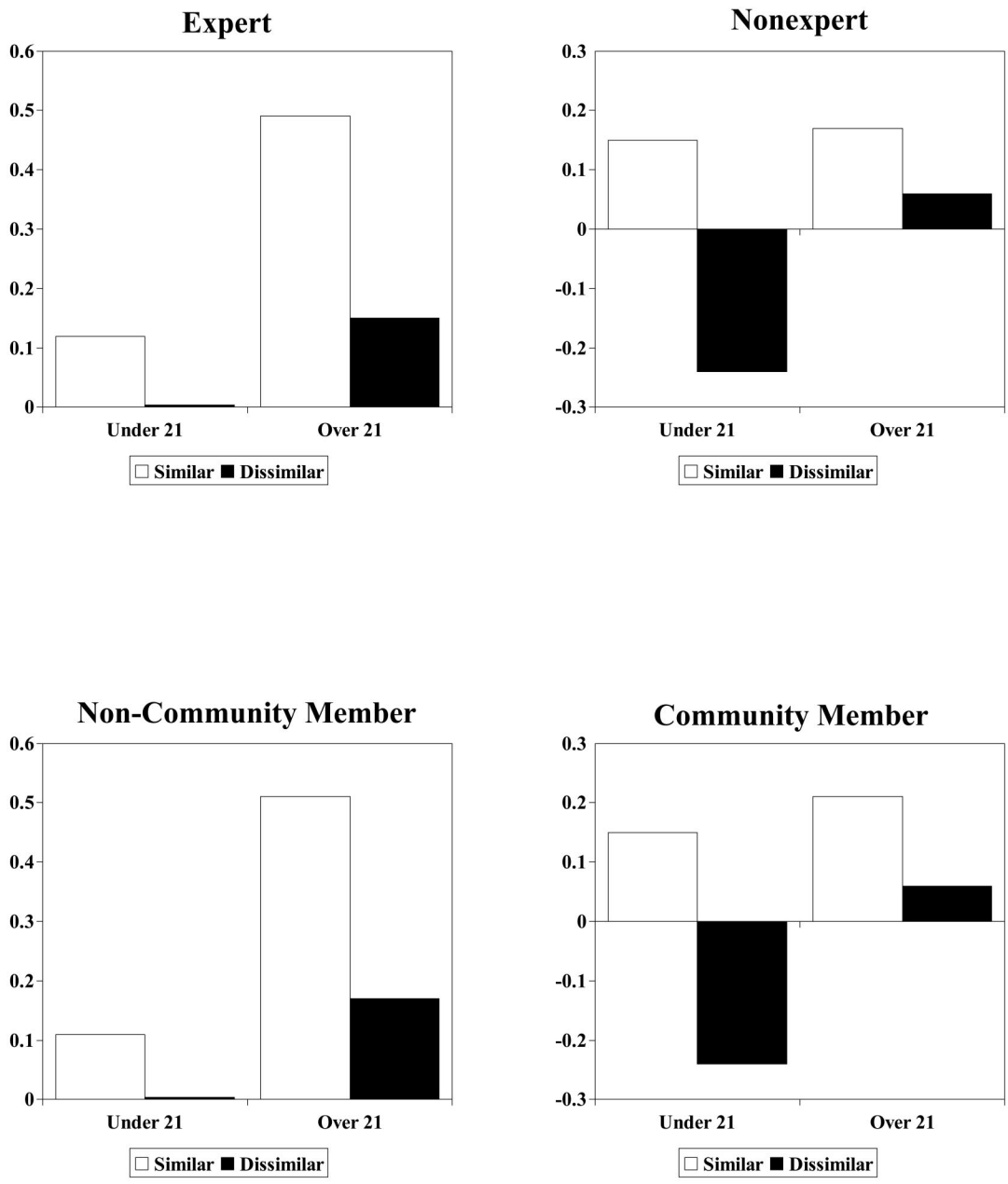

Figure 4. Effects of ethnic similarity and expertise/lay community membership for individuals 21 and under and over 21. The *y*-axis represents *d*.

including multiple-partner heterosexuals demonstrated more change than groups not including this multiple-partner heterosexuals, conditions including men who have sex with men, intravenous drug users, partners of intravenous drug users, commercial sex workers, and lower condom-use participants demonstrated less change than conditions without these groups. (Commercial sex workers also appeared to change more according to some of the analyses.)

Of importance, the inclusion of specific risk groups interacted with the presence of an expert source for all groups but intravenous drug users (see Q_Bs for interactions in Table 5). Specifically, groups including men who have sex with men, partners of intravenous drug users, commercial sex workers, and lower condom users all changed more when an expert delivered the intervention and less when a lay community member did so. By contrast, multiple-partner heterosexuals showed more behavior change when community members rather than experts were in charge.

The risk group similarity between interventionists and recipients also interacted with the recipients' risk group in some cases (see Q_Bs for interactions with risk group similarity in Table 5). Partners of intravenous drug users and sex workers changed more in response to partners of intravenous drug users and sex workers

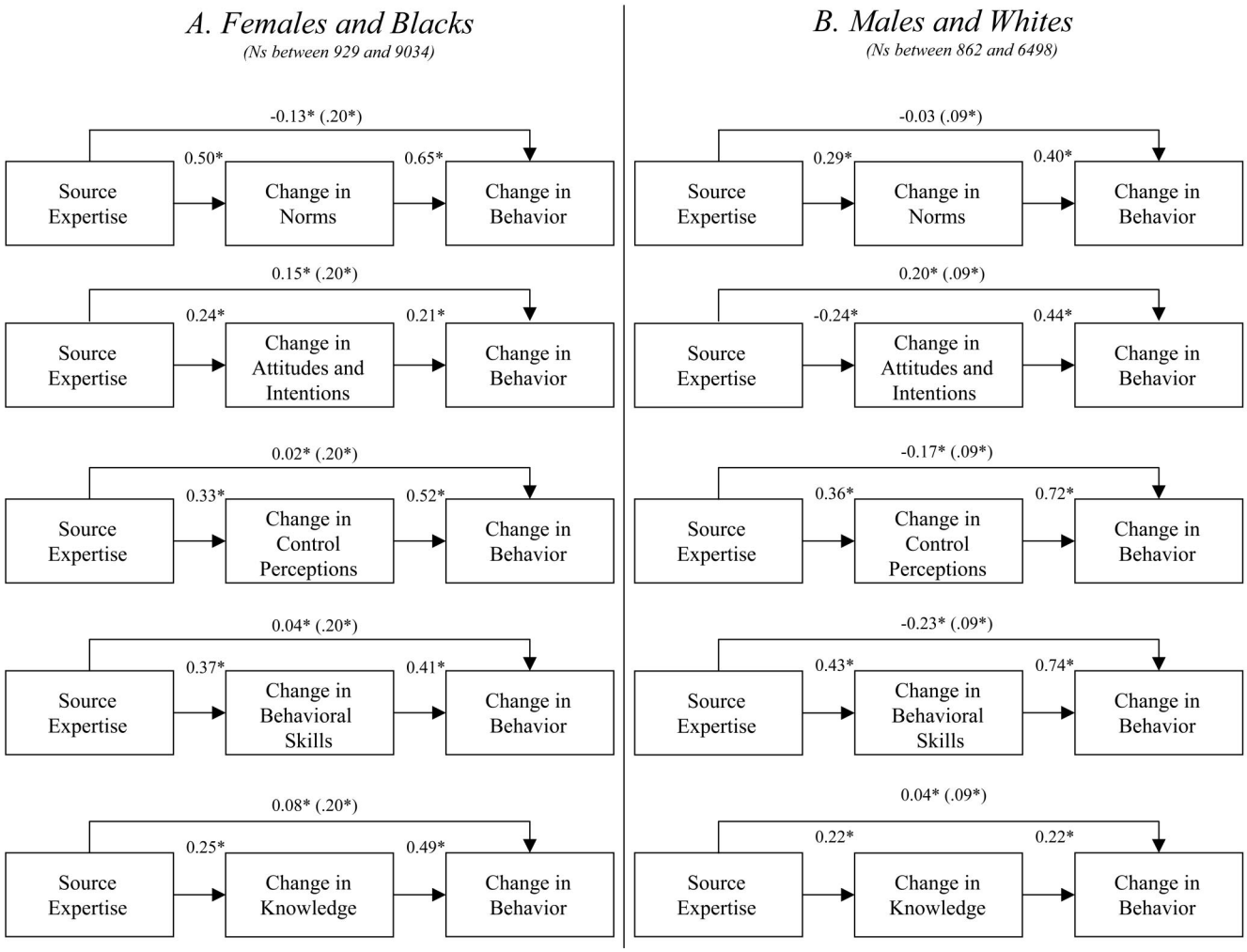

Figure 5. Path analyses for the effects of expertise. (The analysis for lay community membership is almost identical and was suppressed for simplicity.) Models were fit using pairwise deletion procedures to maintain the number of groups included in the main analyses reported in this article. The first number next to each path is a standardized path coefficient. The parenthetical numbers correspond to the univariate correlations between expertise and each potential mediator. Sobel tests were significant in all cases.

(respectively) than to other groups. The pattern, however, reversed for men who have sex with men, who changed more in response to sources who did not identify as members of the same group. Furthermore, risk group similarity did not interact with the presence of intravenous drug users or multiple partner heterosexuals, and could not be examined for level of condom use because reports did not inform the level of condom use of the interventionists (and interventionists are unlikely to disclose it).

Controlling for spurious methodological factors. We also analyzed whether the effects reported in Tables 4 and 5 generalized across different methodological decisions, including intervention characteristics. Table 6 summarizes the effects of a number of intervention and methodological variables on change in condom use in the sample of interventions we studied. Consistent with prior reports (see Albarracín et al., 2003, 2005), the use of threat-inducing and normative arguments decreased behavior change, whereas the use of information, behavioral skills arguments, behavioral skills training, and HIV counseling and testing increased it. With respect to settings, whereas school and community settings were associated with less behavior change, health clinics were associated with more behavior change. Finally, face-to-face interactions, the use of audiovisual media, group interventions, theory-based interventions, targeting samples by gender, and self-selection all increased behavior change, whereas the use of formative research had an unexpected negative effect on behavior change. As reported by Albarracín et al. (2005), however, this latter reversed effect disappeared when all variables were simultaneously entered into the analysis. Thus, we concluded that the reversal was due to associations with other characteristics of the intervention more than to a true negative effect of elicitation research.

In light of the significant findings in Table 6, it was important to determine that the effects in Tables 3–5 were not attributable to differences in intervention strategies and setup. For example, it

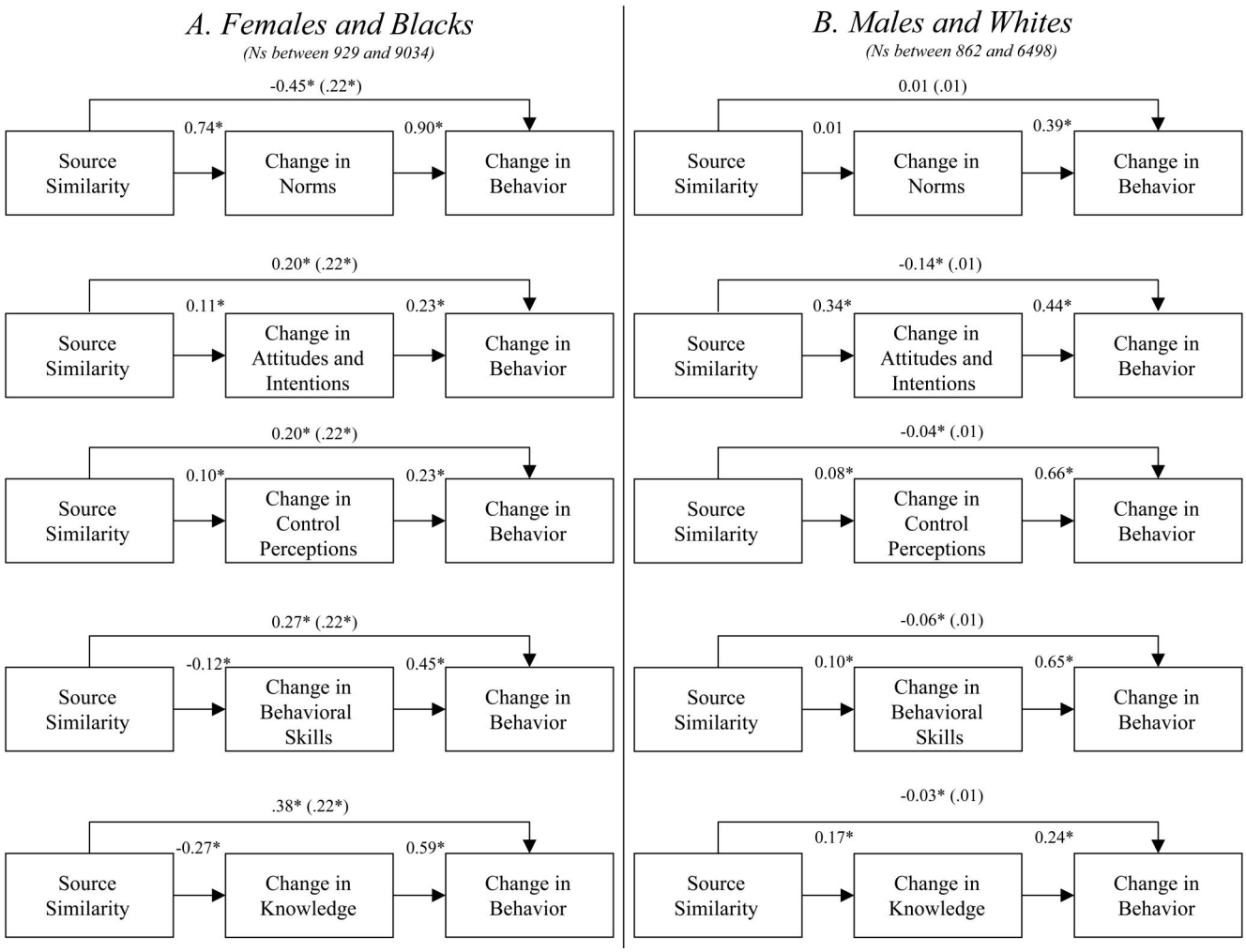

Figure 6. Path analyses for the effects of source–recipient similarity. Note that the dissimilar cell for females and people from African ethnicities is identical to the one in Figure 5 due to perfect overlap in the sampled cases. Models were fit using pairwise deletion procedures to maintain the number of groups included in the main analyses reported in this article. The first number next to each path is a standardized path coefficient. The parenthetical numbers correspond to the univariate correlations between similarity and each potential mediator. Sobel tests were obtained when the univariate correlation between similarity and behavior change was significant (= males and Whites). Of these tests, only the one with normative change as the mediator was significant.

could be that expert sources are more often in charge of complex behavioral skills interventions than nonexpert sources. Consequently, covarying out these strategies would allow one to determine whether the effects we described reflect expertise or merely factors that coincide with it. With this objective in mind, we reran the analyses in Tables 3–5 while covarying out the factors in Table 6. These analyses revealed that the significant effects highlighted before remained, even after controlling for potential confounds.

Effects of different types of experts. There is also considerable interest in identifying the most competent interventionists for use in HIV-prevention programs. For this purpose, we compared different types of experts and found that the effect size for behavior change was 0.51 for public health educators (in absence of this source, $d = 0.22$), $Q_B(1) = 332.08$; 0.41 for physicians (in absence of this source, $d = 0.25$), $Q_B(1) = 71.93$; 0.34 for nurses and physician assistants (in absence of this source, $d = 0.27$), $Q_B(1) = 11.52$; 0.25 for psychologists, counselors and professionals with a masters in a mental health discipline, (in absence of this source, $d = 0.28$), $Q_B(1) = 1.73$; 0.21 for clinic staff or of the research team, (in absence of this source, $d = 0.27$), $Q_B(1) = 3.86$; and 0.32 for teachers and social workers, (in absence of this source, $d = 0.26$), $Q_B(1) = 20.06$.

Unconfounding the effects of age and ethnicity from educational level. It was also important to determine whether the group differences we identified could be due to differences in education level. Because high school completion was largely correlated with age ($r = .48$, $k = 98$) and with African ethnicity ($r = –.41$, $k = 91$), it seemed possible that effects we attributed to young age or African ethnicity could be the result of low education. However, if education has an impact even when only younger or African-ethnic

Table 5
Effects of Risk-Group Inclusion and Source Factors

Variable	*d.*		Q_B				*k*
			Simple effects of source variable	Main effect of source variable	Main effect of recipient variable	Interaction	
Men who have sex with men							
Expertise	Expert	Nonexpert					
Included	0.30	0.07	46.81***				
Not included	0.35	0.24	44.92***	83.48***	31.63***	9.37***	152
Lay community membership	Not a lay community member	Lay community member					
Included	0.33	0.07	56.55***				
Not included	0.36	0.24	52.58***	97.07***	29.37***	14.66***	152
Risk-group similarity	Likely similar	Dissimilar					
Included	0.09	0.06	1.38				
Not included	0.30	0.17	29.17***	18.56***	75.24***	6.16*	94
Intravenous drug users							
Expertise	Expert	Nonexpert					
Included	0.29	0.12	36.29***				
Not included	0.35	0.17	113.63***	114.30***	12.38***	0.16	152
Lay community membership	Not a lay community member	Lay community member					
Included	0.31	0.12	46.67***				
Not included	0.36	0.19	113.25***	119.61***	16.93***	0.39	152
Risk-group similarity	Likely similar	Dissimilar					
Included	0.25	0.13	5.90*				
Not included	0.21	0.14	12.84***	12.75***	0.36	0.91	94
Partners of intravenous drug users							
Expertise	Expert	Nonexpert					
Included	0.42	0.10	106.33***				
Not included	0.34	0.19	82.73***	179.19***	0.31	22.94***	152
Lay community membership	Not a lay community member	Lay community member					
Included	0.40	0.11	75.64***				
Not included	0.35	0.19	104.13***	148.42***	0.62	12.94***	152
Risk-group similarity	Likely similar	Dissimilar					
Included	0.47	0.11	29.55***				
Not included	0.20	0.15	6.55*	35.07***	11.21***	20.05***	94
Multiple-partner heterosexuals							
Expertise	Expert	Nonexpert					
Included	0.33	0.25	6.67**				
Not included	0.35	0.12	279.61***	85.92***	11.80***	20.87***	152
Lay community membership	Not a lay community member	Lay community member					
Included	0.32	0.28	1.74				
Not included	0.36	0.13	299.45***	70.66***	11.32***	36.09***	152
Risk-group similarity	Likely similar	Dissimilar					
Included	0.47	0.29	6.34*				
Not included	0.20	0.12	18.19***	12.15***	34.25***	1.94	94
Commercial sex workers							
Expertise	Expert	Nonexpert					
Included	0.36	0.10	61.14***				
Not included	0.35	0.18	117.32***	136.26***	3.17	6.20*	152
Lay community membership	Not a lay community member	Lay community member					
Included	0.37	0.10	63.19***				
Not included	0.36	0.19	121.57***	135.79***	4.00*	8.75**	152
Risk-group similarity	Likely similar	Dissimilar					
Included	0.62	0.13	92.63***				
Not included	0.17	0.14	2.59	91.27***	63.11***	70.34***	94

Table 5 (*continued*)

Variable	*d.*		Q_B				*k*
			Simple effects of source variable	Main effect of source variable	Main effect of recipient variable	Interaction	
		Past condom use					
Expertise	Expert	Nonexpert					
Higher	0.45	0.24	100.61***				
Lower	0.24	0.15	5.46*	50.33***	54.88***	9.39**	108
Lay community membership	Not a lay community member	Lay community member					
Higher	0.48	0.23	164.03***				
Lower	0.24	0.16	4.12*	60.67***	58.89***	17.66***	108

Note. All factors were dummy coded (expert or not a lay community member = 1; nonexpert or lay community member = 0; likely similar = 1; dissimilar = 0). Significant Q_Bs indicate significant effects of the involved factors. Control means were *d.* = 0.10 for men who have sex with men, *d.* = 0.17 for intravenous drug users, *d.* = 0.16 for partners of intravenous drug users, *d.* = 0.13 for multiple-partner heterosexuals, *d.* = 0.35 for commercial sex workers, and *d.* = 0.11 for low-condom users. *d.* = fixed-effects weighted model means adjusted for all other effects; Q_B for simple and main effect = homogeneity coefficient for the difference across levels of a factor, distributed as a chi-square with number of factor levels − 1 degree of freedom; Q_B for interaction = homogeneity coefficient for the interaction between factors, distributed as a chi-square with (number of levels of factor A − 1) × (number of levels of factor B − 1) degree of freedom; k = number of conditions in analysis.
* $p < .05$. ** $p < .01$. *** $p < .001$.

samples are considered, the effects of age and education, or of age and ethnicity, are likely to be additive. If, in contrast, the effects of education and age or ethnicity are entirely confounded, education should have no effect when only younger or African-ethnic individuals enter the analysis. For that purpose, we ran additional ANOVAs of behavior change as a function of expertise, lay community membership, and similarity, each crossed with education (less or equal than 50% of high school completers vs. more than 50% of high school completers), concentrating on samples with a mean age of at least 21 years and for individuals from predominantly African ethnicities.

The top section of Table 7 summarizes the effects of education level for people under 21. As can be seen from the top section of the table, the patterns of change differed across education levels even when only younger groups were considered. Individuals with higher education were more positively influenced by experts than peers and by gender-similar sources than dissimilar sources. Compared with young individuals with higher education, young individuals with lower education were more influenced by ethnically similar sources than ethnically dissimilar ones, equally influenced by lay community and noncommunity members, and equally negatively impacted by risk-group-similar and dissimilar sources. Although interesting, the patterns of influence for high education are not the same as the ones we identified for higher age.

The second section of Table 7 presents a summary of the effects of educational level in the analyses restricted to individuals with predominantly African ethnicities. Like the results in the top section of the table, people with higher education were more influenced by experts than community members, whereas people with lower levels of education were influenced equally by both types of sources. With respect to similarity, the analyses were limited by incomplete cells. However, among lower education participants, gender similarity did not influence behavior change, whereas the source's age, ethnic similarity, and behavior-risk-group similarity had more favorable effects. In other words, the findings for similarity among lower education participants resembled the findings among participants with African ethnicity, but the findings for expertise were opposite in direction. Consequently, these results provided reassurance that the patterns of effects of ethnicity, age, and education were fairly additive.

Effects of ethnic group in the United States, Africa, and other areas. Another important question concerning the effects of the ethnicity of the interventionist and the recipient concerns the generalizability of these effects outside of the United States. For that purpose, we replicated the earlier analyses separately for samples from the United States and not from the United States, and also for samples from African countries. The analyses for expertise and lay community membership (see top panel of Figure 7) revealed that the advantage of experts for populations from African ethnicities was present for populations in the United States but not for populations outside of the United States, including African countries. Unfortunately, the analyses for the effect of ethnic similarity were incomplete because non-United States countries with ethnic source information were predominantly Black in all cases. However, as the lower panel of Figure 7 suggests, the advantage of ethnically similar sources for Black recipients appeared to be true regardless of the geographic setting.

Assessment of publication and eligibility biases. Of course, publication and report practices as well as eligibility criteria shape the sample of reports that are included in a meta-analysis. Most notably, our search excluded 96 research reports that were eligible on all counts except for the absence of a description of the source. Thus, it appears that half of the reports of HIV-prevention research provide no information on the age, ethnicity, gender, or behavioral-risk group of the source, nor do they describe the selection of the interventionist in a way that would allow readers to determine whether the sources were professional experts. Moreover, even when description of at least one source characteristic allowed for the inclusion of a research report, of the 166 included intervention groups, only 38% specified the source's age, only 42% mentioned their ethnicity, only 64% described their gender, and only 57% described their behavioral-risk group.

Table 6
Influence of Potential Confound Factors Relative to the Intervention Strategies and Setup

Variable	Q_R	β
Intervention strategies and setup		
Intervention strategies		
Threat-inducing arguments	92.99***	−0.16
Attitudinal arguments	1.98	−0.02
Normative arguments	227.58***	−0.25
Any kind of information	3.91*	0.03
Behavioral skills arguments	176.79***	0.22
Condom distribution		
Condom use skills training	153.50***	0.20
Interpersonal skills training	67.12***	0.14
Self-management training	371.50***	0.32
HIV counseling and testing	875.16***	0.49
Setting of exposure		
School	199.25***	−0.23
Community (e.g., gay bar)	215.19***	−0.24
Clinic	714.64***	0.44
Media of delivery		
Face to face	19.56***	0.07
Videos	87.79***	0.15
Treatment applied to groups	90.19***	0.16
Duration of intervention in hours[a]	0.35	0.01
Other methodological features		
Payment received ($ U.S.)	0.51	0.01
Theoretical basis for intervention	55.32***	0.12
Formative research was conducted	25.08***	−0.08
Specific population targeted	0.99	0.02
Sample targeted by ethnicity	0.48	−0.01
Sample targeted by gender	84.45***	0.15
Self-selected samples	81.63***	0.15

Note. With the exception of number of hours and payment, all variables were dummy coded, with greater numbers indicating the presence of that moderator. The number of conditions (k) in each analysis was 166. Q_R = homogeneity coefficient for regression line, distributed as a chi-square with number of conditions − 1 degree of freedom; β = standardized regression coefficient; k = number of conditions in analysis.
[a] $k = 103$.

To estimate potential biases in the report of findings and study inclusion, we examined the funnel plot of behavior change effect sizes (see Figure 8) and the normality of the distribution under examination (see Figure 9). If no bias is present, the plot takes the form of a funnel centered on the mean effect size, with smaller variability as the sample size increases. Instead, in the presence of publication or selection bias, there is a distortion in the shape of the funnel. If the true effect size is zero and there is bias, the plot has a hollow in the middle. If the true effect size is not zero, the plot tends to be asymmetrical, having a large and empty section where the estimates from studies with small sample sizes and small effect sizes would otherwise be located. Following these guidelines, a subjective examination of the plot in Figure 9 thus suggests no publication or selection bias in our meta-analysis.

In addition to examining the funnel plot, we used the normal quantile plot method to uncover evidence of bias (Wang & Bushman, 1999). In a normal quantile plot, the observed values of a variable are plotted against the expected values given normality. If the sample of effect sizes is from a normal distribution, data points cluster around the diagonal; if the sample of effect sizes is biased by publication practices or eligibility criteria, data points deviate from the diagonal (Wang & Bushman, 1999). As can be seen from Figure 9, the standardized behavior effect sizes followed a straight line and generally fell within the 95% CIs of the normality line. This conclusion was also supported by the fact that our findings remained unaltered after excluding the most extreme outliers from the sample of conditions (see the six extreme observations in Figure 9). In sum, there was convincing evidence that even if one determined that a large number of studies has been kept in the researchers' drawers, or that researchers have purposely withheld information about the source, inclusion of these studies would be unlikely to alter our conclusions about the effectiveness of different HIV-prevention interventionists.

Discussion

The purpose of the present article was to examine the relation between various characteristics of the source and of the recipients of a program to promote behavioral change. We thus examined the professional expertise of the interventionist and their similarity to the recipients in gender, ethnicity, and age. These analyses were conducted while also taking into account the gender, ethnicity, and age of the recipients of the intervention, which can be expected to interact with the source's characteristics. In addition, we studied the effects of using interventionists who exhibit some of the behaviors that either directly or indirectly pose health risk for a given group of individuals. Because our focus in these analyses was outcome research on HIV prevention, the behavioral risk groups of interest were men who have sex with men, intravenous drug users, partners of intravenous drug users, commercial sex workers, and inconsistent condom users.

Overview of Critical Findings

For the first time, this meta-analysis integrated and compared the influence of the interventionist's expertise and similarity to the recipient on the behavior change that interventions manage to elicit among different populations. We found that the characteristics of the source are much more important than the scarcity of systematic past research syntheses in the area might suggest. A summary of the influences of these characteristics appears below, organized in relation to professional expertise and recipient–source similarity in demographics and behaviors.

Professional expertise of the interventionist for audiences of different genders, ages, and ethnic groups. Independently of the population characteristics in question, expert sources promote greater behavioral change than lay sources such as those selected because they belong to the community. As a result, if one must make a decision without having information about the characteristics of the target population or must deliver interventions to general population audiences, the wisest decision is probably to recruit qualified health professionals. Although the popularity of peer education programs may appear to contradict this conclusion, the analyses we conducted are much more precise and generalizable than prior reviews advocating peer education.

In addition, various demographic characteristics of the target audience appear to intensify the positive influence of expert inter-

Table 7
Effects of Source's Expertise, Lay Community Membership, and Similarity to Recipients as a Function of Recipients' Education

Variable	*d.*		Q_B				*k*
			Simple effects of source variable	Main effect of source variable	Main effect of recipient variable	Interaction	
Participants <21 years of age							
Expertise	Expert	Nonexpert					
Higher education	0.65	0.23	241.13***				
Lower education	0.41	—	—	241.13***	69.47***	—	44
Lay community membership	Not a lay community member	Lay community member					
Higher education	0.65	0.23	241.13***				
Lower education	0.39	0.52	3.39	17.08***	0.26	56.93***	44
Gender similarity	Likely similar	Dissimilar					
Higher education	0.59	0.12	7.09**				
Lower education	0.32	0.26	1.32	0.44	8.34**	4.74*	27
Age similarity	Likely similar	Dissimilar					
Higher education	0.09	0.30	1.14				
Lower education	—	0.24	—	0.47	1.14	—	10
Ethnic similarity	Likely similar	Dissimilar					
Higher education	0.19	0.12	0.16				
Lower education	1.27	0.26	140.92***	38.66***	30.47***	23.00***	13
Risk-group similarity	Likely similar	Dissimilar					
Higher education	0.04	0.29	18.29***				
Lower education	0.35	0.50	8.37**	43.80***	26.06***	1.40	22
Ethnic minority participants							
Expertise	Expert	Nonexpert					
Higher education	0.74	0.19	330.01***				
Lower education	0.28	0.19	2.06	87.27***	46.59***	46.30***	46
Lay community membership	Not a lay community member	Lay community member					
Higher education	0.74	0.19	330.01***				
Lower education	0.25	0.33	3.61	76.17***	42.94***	140.59***	46
Gender similarity	Likely similar	Dissimilar					
Higher education	0.65	—	—				
Lower education	0.21	0.24	0.40	200.49***	0.40	—	30
Age similarity	Likely similar	Dissimilar					
Higher education	—	—	—				
Lower education	0.45	0.14	19.49***	19.49***	—	—	322
Ethnic similarity	Likely similar	Dissimilar					
Higher education	0.19	—	—				
Lower education	0.51	0.24	24.85***	24.85***	54.79***	—	19
Risk-group similarity	Likely similar	Dissimilar					
Higher education	0.04	0.20	2.45				
Lower education	0.53	0.23	30.42***	1.28	18.15***	15.33***	27

Note. All factors were dummy coded (expert or not a lay community member = 1; nonexpert or lay community member = 0; likely similar = 1; dissimilar = 0). Significant Q_Bs indicate significant effects of the involved factors. When participants over 21 were selected, control means were *d.* = 0.20 for higher education and *d.* = 0.17 for lower education. When Blacks were selected, control means were *d.* = 0.22 for higher education and *d.* = 0.02 for lower education. A dash indicates that there were no cases, thus no effect. *d.* = fixed-effects weighted model means adjusted for all other effects; Q_B for simple and main effect = homogeneity coefficient for the difference across levels of a factor, distributed as a chi-square with number of factor levels − 1 degree of freedom; Q_B for interaction = homogeneity coefficient for the interaction between factors, distributed as a chi-square with (number of levels of factor A − 1) × (number of levels of factor B − 1) degree of freedom; k = number of conditions in analysis.
* $p < .05$. ** $p < .01$. *** $p < .001$.

vention facilitators compared with nonexpert intervention facilitators. In particular, being female and African American as well as being over 21 years of age were associated with more beneficial effects from the presence of an expert (vs. a nonexpert) facilitator. In contrast, males were less positively affected by expertise, people from European ethnicities were either not affected or negatively affected by expertise, and people under 21 were unaffected by expertise (see Table 4). Therefore, when practitioners know the demographic composition of their audience, the findings from our meta-analysis can provide important guidance for the selection of the most appropriate interventionist. In particular, the selection of a nonexpert community source may be justified for groups from European ethnicities, but is either irrelevant or detrimental for all other demographic groups.

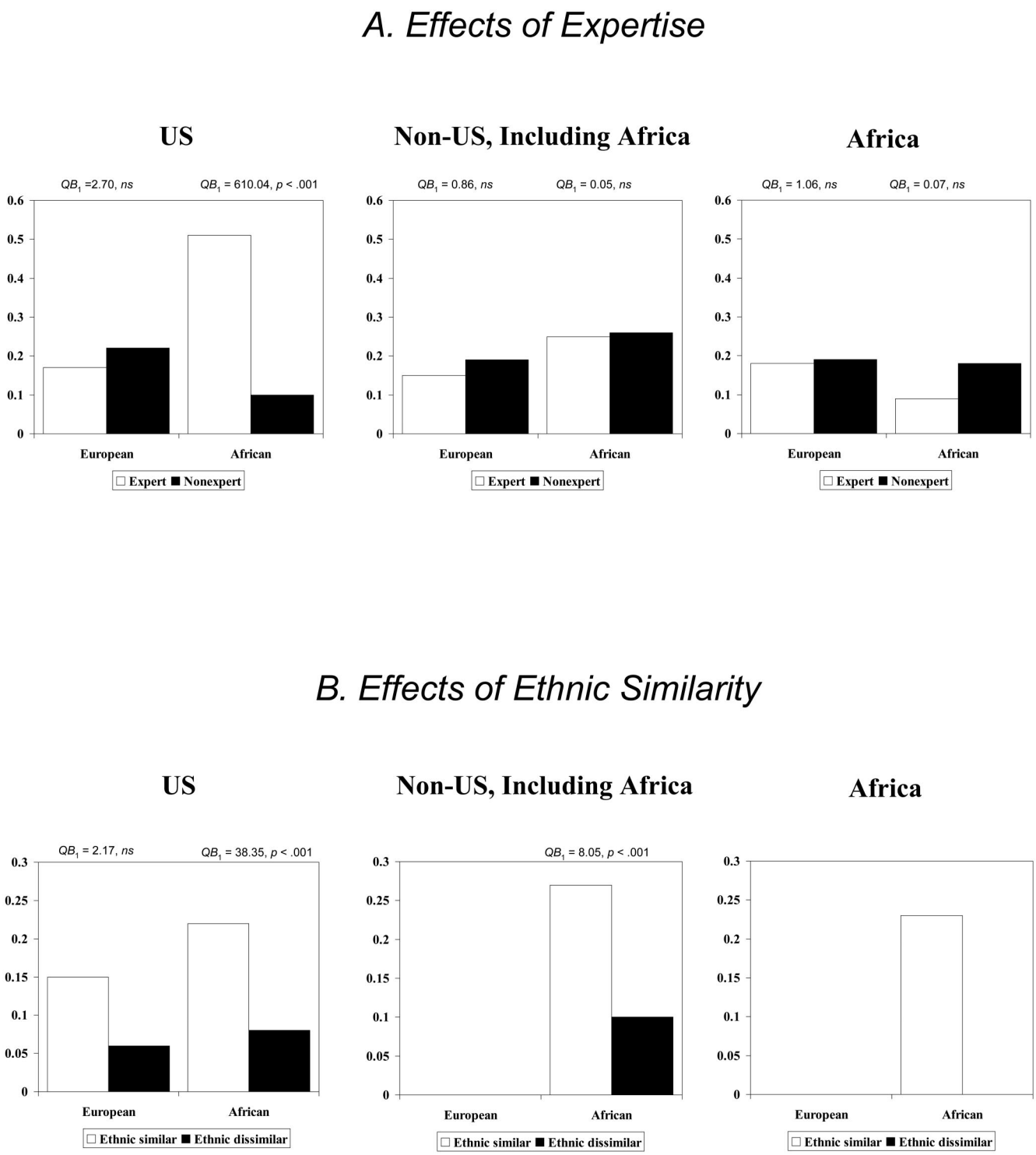

Figure 7. Effects of expertise and ethnic similarity in the United States, Africa, and other countries. The *y*-axis represents *d*.

Professional expertise of the interventionist for different behavioral risk groups. Several interesting findings emerged concerning the interplay between the professional expertise of the source and the behavioral risk group of the intervention recipients. Certain behavioral risk groups were associated with greater effectiveness of experts compared with peers. When gay men, partners of intravenous drug users, and commercial sex workers were included, experts were more effective than lay members of the community. Other behavioral risk groups, however, correlated with equal or depressed influence of experts relative to peers. For

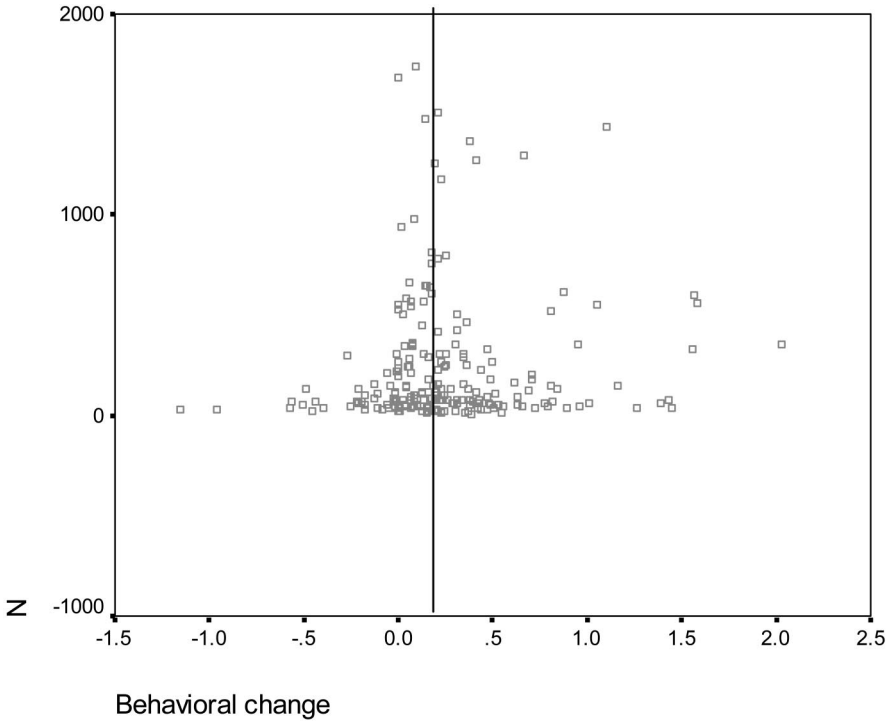

Figure 8. Funnel plot. Two effects with extremely large sample sizes were excluded to make the shape of the plot more apparent. These large sample groups had average effect sizes.

instance, the inclusion of intravenous drug users neither increased nor decreased the influence of experts relative to lay community members. In addition, the influence of experts relative to lay community members decreased when multiple-partner heterosexuals were included in a sample.

Source–recipient similarity in gender, age, and ethnicity. Our review indicated that in addition to the expertise of the source, the gender, ethnicity, and age of the intervention facilitator also matter. First, women and girls changed their behavior more in response to female interventionists and interventionists of the same ethnic group than in response to male interventionists and to interventionists of a different ethnic group. Second, young people were more persuaded to use condoms when the interventionists were also young than when the interventionists were older than them. Third, interventions were more effective for people with African ethnicities when the interventionist was also from an African ethnicity than when the interventionist was from a European ethnicity. Thus, the findings about the influence of the source's gender, ethnicity, and age have important implications for the designs of preventive campaigns for those societal groups. In particular, women and people from African ethnicities require experts who are demographically similar to them, whereas individuals under 21 require young lay persons.

Source–recipient similarity in behavioral risk. The use of intervention sources from the same behavioral group as participants has also been popular in the domain of community and health psychology. In this regard, our meta-analysis confirms that behavior-risk matching is likely to be a successful strategy, as most of the samples we analyzed increased condom use when the source was from their own behavioral group than when it was not. Of all samples, however, female sex partners of intravenous drug users and commercial sex workers showed stronger benefits from the use of behaviorally similar sources than other groups. In addition, teens also exhibited more change when the interventionist shared some of the behaviors that put teens at risk for HIV.

Decision trees for the selection of different agents of change for specific populations. The analyses we present suggest that the influence of expertise and similarity vary across groups. On the basis of these analyses, we constructed a decision tree to represent the results in a fashion that is accessible for practitioners in charge of intervention design and implementation (see Figure 10). As can be seen, experts are advisable in all cases, with the exception of groups of people under 21 years old. In addition, women and girls respond best to sources of the same gender, ethnicity, and behavior-risk group, whereas men and boys respond best to sources of either gender and of different ethnicity and behavior-risk group. Both Blacks and Whites change more when sources match their ethnicity and their risk group, although African Americans change more in response to experts than both European American and foreign samples of European and African ethnicities. People over 21 respond better to sources of their same gender, ethnicity, and behavior-risk group, and people under 21 respond better to sources of the same age in addition to the same gender, ethnicity, and behavior-risk group. Finally, all of the risk groups in all our analyses changed more when sources included experts and individuals from the same risk groups. The only exception was men who have sex with men, who showed greater change when the

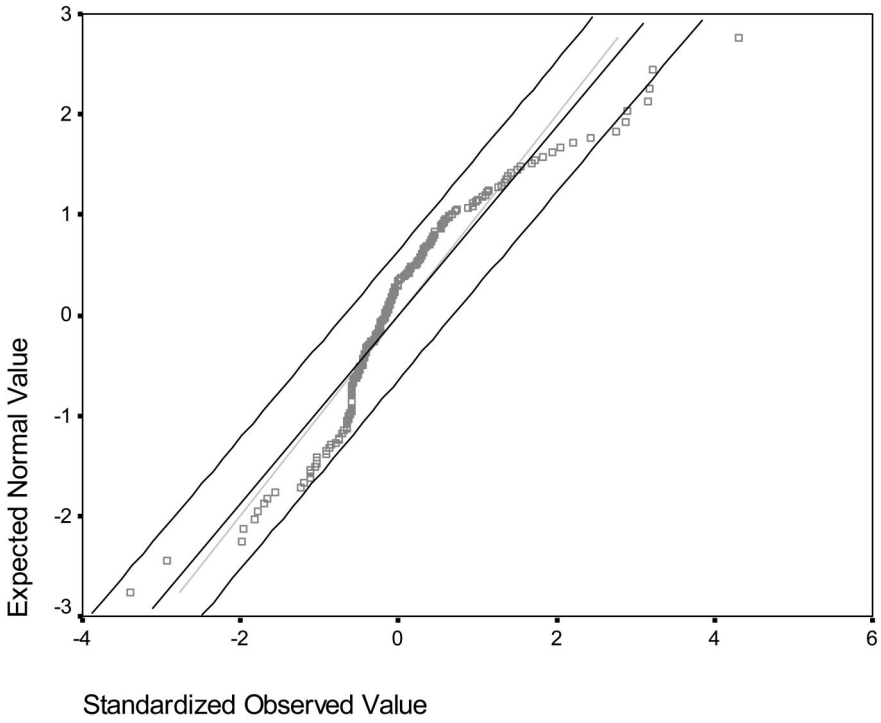

Figure 9. Normal quantile plot. The line on the diagonal indicates normality; the lines around the diagonal represent the 95% CI around the normality line.

source included an expert but were unaffected by the inclusion of a behavior-risk-similar source.

Theoretical Implications of Our Findings

The meta-analysis we present has not only major technological implications but also implications for theoretical understanding of behavior change through the development of a formal relationship between an interventionist and an intervention recipient. Thus, although up to this point, theorizing about behavior change has emphasized the content and techniques of the intervention, our work developed and tested some fundamental assumptions about the moderators and mediators of key features of the interventionists.

Theoretical implications of the influence of the social agent of change for different social groups. First, we proposed and tested a model with the simple assumption that groups that lack power are likely to be more compliant with social agents because these agents can facilitate their change and general access to resources in various ways. Thus, women and African Americans, who enjoy fewer social resources than men and European Americans, respond particularly well when the source of an intervention has expert power and also when this source is demographically and behaviorally similar to the recipients. Although these findings are consistent with general definitions of power as a situation in which one person can influence the behavior of another, or when there is conflict, such as different opinions about condom use, they may represent the first meta-analytic demonstration of the effects of power on behavior change.

The processes affected by choices about interventionists. Various cognitive and motivational processes can underlie the influence of an effective agent of change. First, contact with communicators and interventionists may lead to the development of internalized attitudes and of normative perceptions that other people want one to perform a given behavior (Fishbein & Ajzen, 1975). Second, effective communicators may instill the confidence and skills that people need to change their behavior patterns (Bandura, 1998). Third, effective interventionists may be better teachers, and the resulting increases in knowledge can under some conditions improve behavioral compliance.

In our analyses, we examined whether professional expertise and source–recipient similarity affected the mediators in Figure 1. For instance, source expertise may impact behavior because, compared with nonexperts, experts in behavior change may make a greater effort to influence recipients' attitudes, control perceptions, and behavioral skills. Consistent with this possibility, the effects of the expertise of the interventionist were actually mediated by each of these factors (see Figure 5). In this regard, our meta-analysis revealed that experts produced more behavioral change because they increased norms, attitudes and intentions, perceived control and behavioral skills, as well as knowledge.

With respect to similar sources, our review clarified that similar sources may simply be more important referents for the recipients, thus having an influence that is mediated by social norms. As shown in Figure 6, whereas normative change significantly mediated the effects of source–recipient similarity, no other variable had this mediating effect. Given this finding, future research might

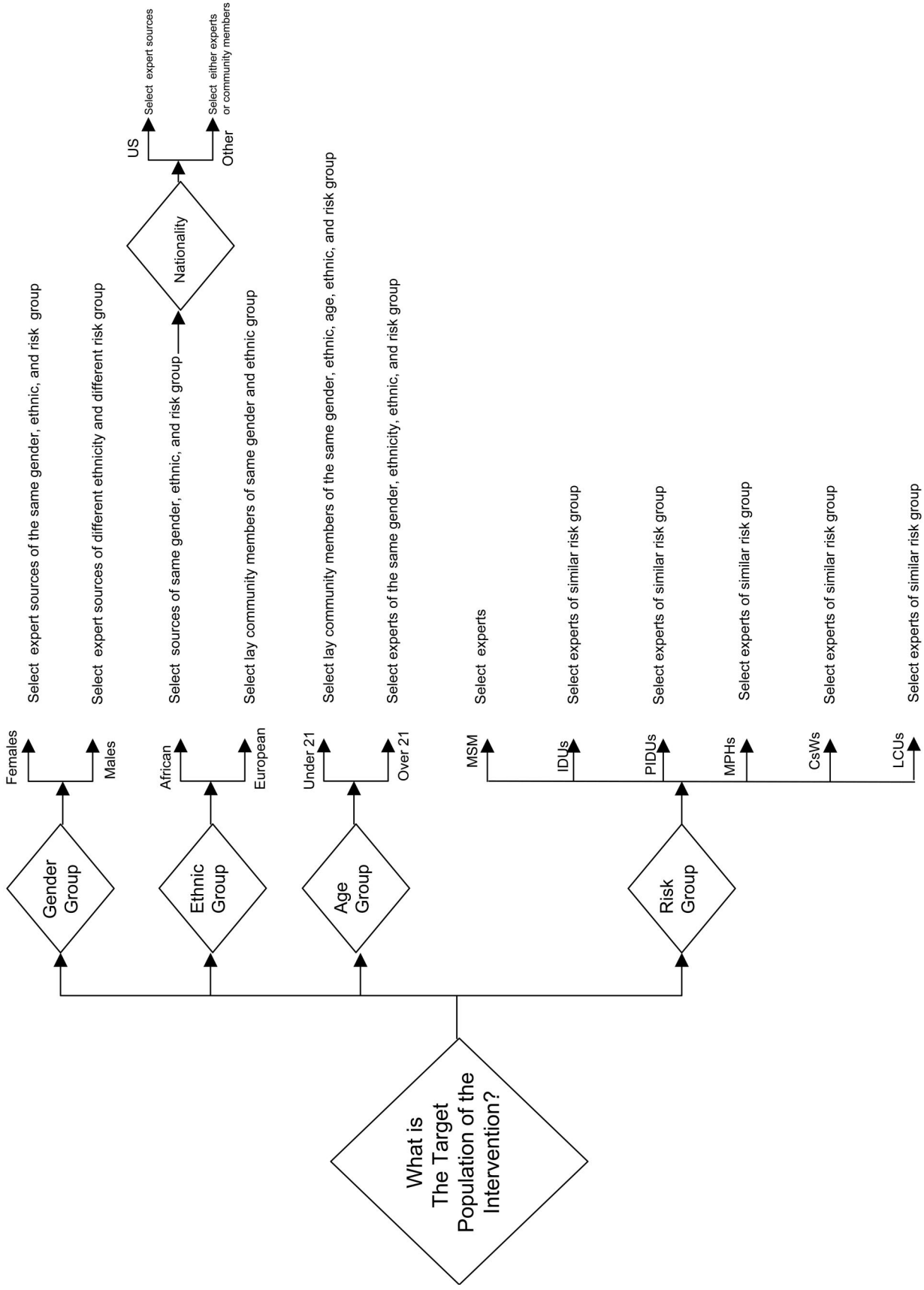

Figure 10. Decision tree for the selection of agents of change. MSM = men who have sex with men; IDUs = intravenous drug users. PIDUs = partners of intravenous drug users; MPHs = multiple-partner heterosexuals; = CWS = commercial sex workers; LCUs = low condom users.

establish the conditions for other types of influences of similarity that were not present in our analyses.

Another facet that our meta-analysis tangentially addresses is whether different mediational patterns may be apparent for different groups. An inspection of Figures 5 and 6 suggests that the influence of expertise on control perceptions, knowledge, and behavioral skills were similar across groups with different levels of societal power (men and boys and Whites vs. women and girls and Blacks). The mediational role of attitudes and norms, however, was different across these groups. In fact, expert sources made attitudes more positive for women and girls and Blacks but more negative for men and boys and Whites. This difference suggests that experts produced less behavioral change among men and boys and Whites because they did not induce the expected favorable attitudes but, rather, instilled some reactance. Similarly, the size of the influence of expertise on attitudes was stronger for women and girls and Blacks than for men and boys and Whites, even when norms had a mediating influence in both cases. Again, these differences appear to underlie the disparate effects of expertise across different groups.

A similar conclusion arises from visually inspecting the path analyses for the effects of similarity across groups with higher and lower power. The influence of similarity on norms is responsible for both the effect and lack of effect of similarity in groups with higher and lower societal power. As shown in Figure 6, the only mediator of the effect of similarity on behavior change was the effect of similarity on norms, and both of these effects were present among females and Blacks. Neither effect, however, was verified for men and boys and Whites, suggesting that the lack of a normative influence on similarity prevented any favorable effect of demographic matching when the recipients enjoyed greater power.

Implications for the information, motivation, behavioral skills model and theorizing about behavior change. To our knowledge, the mediational evidence obtained in this work is the first application of the information, motivation, and behavioral skills model, as well as models of behavior change in general (see Albarracín et al., 2005), to the domain of interventionist (rather than intervention) effects. As such, it confirms that current theorizing about behavioral change is broad enough to guide various intervention implementation decisions. Given the demonstration that expert sources change recipients' behavior because they produce corresponding changes in motivation, knowledge, and behavioral skills, whereas interventionists similar to the recipients change behavior only if they manage to change normative motivations, the present work provides an interesting extension of the applicability of J. D. Fisher and Fisher's (1992) model as well as prior models of behavior change (Ajzen & Fishbein, 1980; Bandura, 1989).

The role of normative change in HIV-prevention interventions. A meta-analysis of a broad set of HIV-prevention outcome studies—of which the present data set is part—suggested that the inclusion of normative arguments in condom-use-promotion interventions has no effect except when the participants are teenagers. Because such a conclusion may appear to contradict the contention that normative change can stimulate behavioral change (see, e.g., Ajzen & Fishbein, 1980, 2005; see Albarracín, Johnson, Fishbein, & Muellerleile, 2001), the present meta-analysis contributes to clarify the role of normative change. Clearly, simply telling recipients that their friends, partners, and family want them to use condoms has limited effect (see Albarracín et al., 2005), and perhaps even limited credibility. However, the presence of a real interventionist is possibly the most social of all factors of a behavioral intervention, and, thus, it not surprising that both expertise and source–recipient similarity have clear socionormative effects.

The role of African ethnicity in the United States and other countries. As the analyses in Figure 7 indicate, the differential effects of expertise across ethnic groups were apparent only in the United States. This finding may derive from various differences across countries. First, interventions in countries other than the United States seem to be less effective than interventions in the United States (see Figure 7). To this extent, it could be that behavioral interventions will not produce the necessary movement to condom use unless structural factors like poverty are resolved first (South Africa Inter-Ministerial Committee on AIDS, 2000). Second, it may be that professional expertise only matters in societies in which knowledge and expertise are valued, such as the United States. In other places, however, religious leaders may be as, if not more, respected than professional health experts (see Kagimu et al., 1998), thus explaining the lack of differences between experts and lay people in African countries.

Because these issues are essential for the design of culturally appropriate interventions and the application of U.S.-initiated programs in other countries, the processes underlying the influence of interventionists on intervention recipients need to be addressed in much deeper ways. For instance, in addition to potential differences in the meaning of expertise, the effects of ethnic similarity across different areas of the globe are presently unknown. Although the bottom panel of Figure 7 suggests similar, favorable impact of ethnic similar and dissimilar sources for African populations in and out of the United States, adequate comparisons are not presently available for countries outside the United States. We have no doubt that given the emphasis on international HIV research by U.S. and international funding agencies, a better understanding of these important processes will emerge soon.

Public Health Implications of Our Findings

Probable health consequences of the identified effects. Readers may wonder how much of a difference interventionists might make in practical terms. Considering the findings in Table 3, the effect size obtained for expert interventionists represents a 1.88 to 1 likelihood that participants will increase their condom use in the next 5 months. Given an average condom use of 31.40 over total intercourse occasions ($SD = 20.27$; see Table 1), an effect size of 0.35 implies an average 7.09 increase in condom use. With respect to the number of participants who are likely to improve, given an initial 29.4% of participants using condoms at least sometimes (see Table 1), an effect size of 0.35 implies that 15% of the participants will move from the low condom use category to using condoms at least sometimes. Such an increase when the average HIV seroprevalence is 14.01 ($SD = 22.01$) is suggestive of great public health gains as well as the prevention of significant social and financial losses for the affected communities (for similar conclusions, see Kahn, Kegeles, Hays, & Beltzer, 2001; Pinkerton et al., 2000; Sweet, O'Donnell, & O'Donnell, 2001).

Similar calculations are informative of the practical effects of using expert sources for different groups. For instance, if one

attempts to reach populations from an African ethnicity, using an expert source yields an effect size of 0.44 (odd of change = 2.22 to 1), whereas using a lay community member yields an effect size of 0.12 (odd of change = 1.24 to 1). These effect sizes respectively imply that from a baseline 29.4% of participants using condoms at least sometimes, an expert source will produce movement to condom use in 18.6% of the African-ethnic participants, whereas a lay community member will produce movement to condom use in only 4.6% of the African-ethnic participants.

Considering the effects of similarity is also illustrative of the importance of source characteristics for some groups. For women, using a gender-similar source yields an effect size of 0.40 (odd of change = 2.06 to 1), whereas using a gender-dissimilar source yields an effect size of 0.04 (odd of change = 1.08 to 1). These effects respectively imply that from a baseline 29.4% of participants using condoms at least sometimes, among women and girls, a gender-similar source will produce movement to condom use in 16.6% of the recipients, whereas a gender-dissimilar source will produce movement in only 1.6% of the recipients. Clearly, these differences are far from being negligible and suggest that a careful selection of intervention sources is imperative for the design and implementation of behavioral change interventions.

Practical ways of increasing similarity between interventionists and recipients. Two means are available to increase the similarity between demographic and behavioral characteristics of audiences and interventionists. One option is to train lay community members and ensure that they develop into competent interventionists. For example, peer-led health-promotion programs in Ghana have employed trained lay community members (Wolf et al., 2000) who can easily reach their community. In this study, younger educators contacted the greatest numbers of younger participants, educators of the Akan ethnicity recruited the most members of the Akan ethnicity, and Catholic educators had the greatest success at involving Catholic participants.

Sometimes the selected lay community members have other special characteristics. For example, members of a community may be selected on the basis of their popularity and trained to play the role of opinion leaders who influence the norms, attitudes, perceived personal risk, behavior change intentions, and self-efficacy of others. Kelly, Murphy, et al. (1997) used this procedure to reach gay communities in the southern United States, and Kegeles, Hays, and Coates (1996) used this procedure to reach gay communities in the western United States (for recent criticisms, see Hart, Williamson, & Flowers, 2004; Kelly, 2004). Similarly, influential or high-status members of a group can be ideal to impart the information and create the norms one desires to instill. To intervene in community, Kagimu et al. (1998) trained priests (i.e., the community imams) and their helpers, because these are the only community actors who have access to the sexual intimacy of the target families.

Given the findings from this meta-analysis, however, a second, most desirable option to ensure demographic and behavioral matching between interventionists and audiences is to select experts who are demographically similar to the target audiences. For instance, Kalichman et al. (1999) reported positive results from a brief behavioral-skills-building intervention in which African American women with expertise in public health education and prevention of STIs were selected to reach other African American women. In a study of use of psychotherapeutic services, Dalton (2001) observed that African Americans underutilize psychological services and are more likely than European Americans to terminate therapy prematurely, particularly when matched with an European American therapist. In the same study, African American therapists were perceived as more effective, competent, and likable than European American therapists, especially when participants had high acculturative stress (for possible solutions for the outcomes of mismatched therapists, see Dyche & Zayas, 1995; Nikelly, 1997; for the effects of matching behavioral risk group, see Frost-Pineda et al., 2004).

Our Findings in the Context of the Past Literature

The prior meta-analyses and reviews in the area of HIV prevention have focused on many important issues, including (a) the influence of the intervention quality (Juárez & Diez, 1999); (b) the effects of interventions on various protective behaviors (Albarracín et al., 2003, 2005; Coyle et al., 1998; Gibson et al., 1998; B. T. Johnson et al., 2003; Ickovics & Yoshikawa, 1998; Kalichman, Carey, & Johnson, 1996; Kirby et al., 1994; Oakley et al., 1995; Robin et al., 2004; Weinhardt, Carey, & Johnson, 1999; Wingood & DiClemente, 1996); (c) the influence of the selected channel, the content of the message, or the percentage of a population that is actually exposed (Albarracín et al., 2003, 2005; B. T. Johnson et al., 2003; Kalichman, Rompa, & Coley, 1996; Myhre & Flora, 2000); (d) the influence of HIV-prevention programs for different populations (Albarracín et al., 2003, 2005; Kalichman, Carey, & Johnson, 1996; Merson et al., 2000; Rotheram-Borus et al., 2000); and (e) the strengths and limitations of different approaches, such as the use of individual, group, and community formats (Albarracín et al., 2003, 2005; Kegeles & Graham, 1998). Despite the abundance of prior research syntheses, no previous meta-analysis has examined the impact of the source characteristics on the ultimate effectiveness of a preventive program.

A similar picture emerges when one considers the lack of extensive primary research on the influence of the characteristics of the sources of HIV-prevention interventions. Most of the available evidence comes from surveys and questionnaires in which participants report the sources that usually provide information about HIV. For example, Krauss, Wolitski, Tross, Corby, and Fishbein (1999) described outcomes of a survey of 3,442 Hispanic and African American women from Manhattan and Long Beach whose sex partners were injection drug users. Most of these participants reported receiving information about HIV from TV, friends, family members, and health care professionals, as well as brochures and posters. Although important, this survey provided no indication of the participants' preferences about, or of the effectiveness of, different sources. Consequently, this exploratory research offered little guidance concerning the selection of the most appropriate types of communicators.

Like our meta-analysis, however, some of the available research on the self-reported effects of different intervention sources appears to point to the advantages of using health professionals to deliver HIV-prevention programs. For instance, Scottish teenagers indicated that they learned most about HIV from the mass media, but nevertheless preferred to receive information from health professionals (Abraham, Sheeran, Abrahams, Spears, & Marks, 1991). Similarly, a sample of U.S. community college students surveyed by Rich, Homes, and Hodges (1996) indicated that the

most trusted providers as sources of information about HIV were physicians and nurses, even when African American and Latino students showed less trust in health care professionals than students from other ethnic groups. Finally, among members of a community sample in the state of Florida, 55% of the participants selected hospitals and clinics as the best places to receive information about HIV, 31% selected schools, and only 13% selected family or friends (Albarracín, Durantini, & Glasman, 2004).

One possible explanation for the greater effectiveness of mismatched interventionists for men could derive from an attributional analysis of persuasion, which dominated the field of social psychology in the 1970s (Kelley, 1973; Schneider, 1973). According to this theory and to recent empirical demonstrations, a source's unexpected position (one that counters self-interest) is perceived as more trustworthy and accurate than a source's predictable position (Petty, Fleming, Priester, & Harasty, 2001; but see Miller & Ratner, 1998). Given this possibility, in the domain of condom use, men may expect women to not be specially interested in men using condoms. Thus, a female source who promotes condom use could be perceived as more honest and thus constitute a more successful interventionist. Although we have no reason to believe that this particular situation might be the case, other extensions of attributional analyses might be explored in the future.

Finally, the available evidence from the field of psychotherapy, communication, and education is also limited. In one of the very few reviews that considered source effects, Cuijpers (2002) found that peer-led drug prevention programs in schools were somewhat more effective than adult-led programs, but found large variability between studies. Because that review could not clarify the reasons for the variability of the effects of peer-led programs across studies, our review makes a pioneer contribution to knowledge about health-intervention design.

Limitations of This Meta-Analysis and Future Directions

Prior to concluding, there are several limitations of this study to discuss. These limitations concern the interpretation of the negative effects of similarity among men and boys, selection of the behavioral measures, the correlational nature of the results, the validity of self-reports of condom use, the impossibility of analyzing more complex interactions involving source characteristics, and the generalizability of the current conclusions to the sample of studies and to the population of potential studies on the topic.

Expertise as a role versus expertise as improved behavioral change technique. In this article, the category of "expert" was created on the basis of the identity of the source. Unfortunately, even when identity involves both a "role" of which recipients are aware as well as technical knowledge, this meta-analysis did not allow us to determine which aspect of the interventionist identity is most influential. In the future, a systematic trial should assess the independent and interactive effects of actual expertise and perceived expertise on the part of the audience.

It also seems possible that social and economic status, rather than expertise, might have driven the results we reported. However, the findings of different types of experts rule out this possibility. As detailed before, of different types of "experts," public health educators produced the greatest effect on behavior change, followed by physicians in the second place. Clearly, should status be the driving force, physicians should be the ones with the greatest impact. It seems more likely that training in the performance of preventive activities, including counseling, are responsible for these effects. In any case, future research should address the issue of status in greater detail.

Negative effects of ethnic and behavioral similarity among men and boys. One unexpected finding was that samples with greater proportion of male participants were much less positively affected by interventionists of their own ethnic and risk-behavior group than by interventionists of a different ethnic and risk-behavior group. Although at present, we lack data to explain this pattern, one can speculate about the reasons underlying it. First, it may be that male participants establish a more competitive relationship with interventionists who are similar to them. After all, competitive socialization patterns that are prevalent for males would predict a more difficult relationship with others in a more powerful position (Chorbajian, 1978; O'Neil, 1981). In addition, it may be that easy identification with the source of the intervention might lead male participants to suspect hypocrisy on the part of the source (J. D. Fisher et al., 2002). Both of these processes, which undoubtedly deserve attention in the future, would explain the slight reversals in the effects of similarity in the case of male intervention recipients.

Selection of behavioral measures. Whereas the proportion of condom use over number of sexual acts correlates with the actual number of unprotected sex occasions, it is the actual number of unprotected occasions that ultimately predicts infection with HIV (see Schroeder, Carey, & Vanable, in press-a). Thus, one limitation of our meta-analysis may derive from the focus on measures of self-reported change in condom use that predict HIV infection with various degrees of precision. Specifically, our measure of behavior change actually comprised various standardized indicants of condom use, including (a) the frequency of condom use (typically from *never* to *always*), (b) the percentage of condom use occasions during a specified period (e.g., last month, last 3 months, last year), and (c) the use or lack of use of condoms during the last intercourse. In addition, our measure of behavior change also entailed reverse-scored indicants of unprotected intercourse, including the number of unprotected acts in a determined period, and the number of participants having unprotected acts in a given sample. As a result, future reviews of this literature could investigate differences among these measures, and replicate our findings with the particular measures with which researchers might be preoccupied.

Correlational nature of our results. An obvious limitation of our work is the correlational nature of the analyses we reported. Although the assignment to interventions and control groups was often conducted at random, the specific characteristics of the sources and the participants are contingent on the preferences of particular researchers, and can covary with other characteristics of the studies or the methods being used. Fortunately, however, this limitation is mitigated by the use of mediational analysis and the various controls implemented to rule out spurious findings. In this light, our conclusions represent important insights to the role of agents of change in health prevention and behavior change in general and come to fill a large gap present in both the intervention and social psychological literatures.

Inaccuracy of self-report. The third limitation, also noticed by Schroeder, Carey, and Vanable (in press-b), refers to the inaccuracy of the recipients' self-reported behavior. To respect the pri-

vacy of participants, data regarding sexual behavior are usually obtained by self-report. However, various factors influence the accuracy of self-reports, such as the length of the time interval and the social context of the evaluation (Schroeder, Carey & Vanable, in press-b), as well as the order in which participants answer questions (Schwarz, Groves, & Schuman, 1998). The accuracy of self-reports may also differ across groups. For example, if groups have particularly high alcohol or drug consumption, reports by their members can be less reliable than reports by other persons. Given these possibilities, a future meta-analysis may validate our findings from self-reported data by using interpartner reports (Coates et al., 1986; Jaccard & Wan, 1995; McLaws, Oldenburg, Ross, & Cooper, 1990), infection rates (CDC, 1997; Winkelstein et al., 1987), and diary methodologies (Jaccard, McDonald, Wan, Dittus, & Quinlan, 2002).

Further mediation analyses. As discussed by Albarracín et al. (2005), another limitation of our meta-analysis is that, even when we used mediation analyses, the number of effect sizes available for the mediators did not allow for separate consideration of potentially distinct constructs. For instance, to increase the power of some analyses, change in attitudes was combined with change in intentions, as were change in perceived behavioral control and change in self-efficacy. Clearly, attitudes and intentions reflect different levels of behavioral commitment, and perceived behavioral control has been suggested to be different from self-efficacy (Armitage & Conner, 1999; Armitage, Conner, & Loach, 1999; Povey, Conner, Sparks, James, & Shepherd, 2000; but see Ajzen, 2002). In light of these subtleties, future reviews as well as primary research should examine other mediational models that we were unable to fit.

Impossibility of analyzing more complex interactions, including other source factors. One important objective of this article was to analyze the extent to which characteristics of the source impact different populations. For example, we examined the effects of the source expertise as a function of gender, ethnicity, age, and behavior-risk group, and drew some conclusions about what is most effective for each group. Despite the important contribution of these findings, the reality of the potential influences of intervention facilitators may be even more complex. Consequently, as new findings accumulate in the literature, researchers could consider higher order interactions that our meta-analysis was not well-suited to study.

A related concern is that the decision trees we generated are not specific enough to indicate whether, for example, same gender, same ethnicity, and expertise are all required for African American women to change their behavior. Given the size of the existing literature, these higher order combinations could not be analyzed. Thus, future primary or meta-analytic research should more precisely determine how much matching is necessary and sufficient for which group, or what combination of expertise and matching is most effective in each case.

Potential sleeper effects. Another limitation of this meta-analysis is that we only considered change in condom use at the immediate follow-up. Because it seems possible that some effects might change over longer periods of time, future research should examine the possibility of "sleeper effects" in this domain (see Kumkale & Albarracín, 2004). For example, nonexpert sources may be unconvincing in the beginning but become more effective over time, and expert sources may be convincing in the beginning but become less effective over time. These effects will be important to analyze across populations as more intervention research is conducted.

Generalizability to the study sample and to the population of all possible studies. By synthesizing the largest number of studies on HIV-prevention interventions that provide source information, the findings from our meta-analysis are probably the most generalizable to date. In particular, the mean comparisons suggest that expert sources are more effective in many of the populations we examined. The described analyses of the effects of specific characteristics of the source and populations, however, were obtained with fixed-effects models. To complement these findings, future research may offer a sufficiently large number of effect sizes to estimate the population variance and establish the tenability of our conclusions in the broader universe of all possible studies.

Closing Note

As our meta-analysis clearly shows, the decision of who intervenes to change the behavior of an audience is highly consequential. Yet at to this point, this decision was largely based on personal preference, or on the intuition of individual researchers based on claims that had not undergone strong tests. Many of these decisions were in the line of increasing similarity between intervention sources and recipients, and our work confirms that demographic similarity generally has a health-promoting effect. Behavioral-risk group similarity between intervention sources and recipients is also beneficial, and generally increases compliance with the intervention's recommendation.

Some of the intuitions that have guided past research, however, have received much less support from this meta-analysis. In particular, past doubt in the use of experts as a catalyst for behavior change may be misguided because experts appear to be uniquely qualified to facilitate change. In particular, women and African Americans are the ones who most benefit from the use of physicians, nurses, or professional health educators, while also benefiting from exposure to intervention sources who are similar to them. Given this finding, comprehensive efforts to combat HIV must necessarily address the shortage of professionals who will effectively promote change in their own communities.

References

References marked by an asterisk indicate studies included in the meta-analysis.

Abraham, C., Sheeran, P., Abrahams, D., Spears, R., & Marks, D. (1991). Young people learning about AIDS: A study of beliefs and information sources. *Health Education Research, 6,* 19–29.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50,* 179–211.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology, 32,* 665–683.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice Hall.

Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *Handbook of attitudes and attitude change: Basic principles* (pp. 173–222). Mahwah, NJ: Erlbaum.

Albarracín, D., Durantini, M. R., & Glasman, L. R. (2004). *Grant #R01 NR 08325-02 Progress Report to National Institutes of Health Department*

of Health and Human Services, Public Health Services. Gainesville: University of Florida.

Albarracín, D., Gillette, J., Earl, A., Glasman, L. R., Durantini, M. R., & Ho., M. H. (2005). A test of major assumptions about behavior change: A comprehensive look at HIV prevention interventions since the beginning of the epidemic. *Psychological Bulletin, 131,* 856–897.

Albarracín, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin, 127,* 142–161.

Albarracín, D., Kumkale, G. T., & Johnson, B. T. (2004). Influences of social power and normative support on condom use decisions: A research synthesis. *AIDS Care, 16,* 700–723.

Albarracín, D., McNatt, P. S., Findley-Klein, C., Ho, R., Mitchell, A., & Kumkale, G. T. (2003). Persuasive communications to change actions: An analysis of behavioral and cognitive impact in HIV prevention. *Health Psychology, 22,* 166–177.

*Allen, S., Serufilira, A., Bogaerts, J., Van de Perre, P., Nsengumuremyi, F., Lindan, C., et al. (1992). Confidential HIV testing and condom promotion in Africa. *Journal of the American Medical Association, 68,* 3338–3343.

*Allen, S., Tice, J., Van de Perre, P., Serufilira, A., Hudes, E., Nsengumuremyi, F., et al. (1992). Effect of serotesting with counselling on condom use and seroconversion among HIV discordant couples in Africa. *British Medical Journal, 304,* 1605–1609.

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

Amaro, H. (2000). On the margin: Power and women's HIV risk reduction strategies. *Sex Roles, 42,* 723–749.

Armitage, C. J., & Conner, C. (1999). Distinguishing perceptions of control from self-efficacy: Predicting consumption of a low-fat diet using the theory of planned behavior. *Journal of Applied Social Psychology, 29,* 72–90.

Armitage, C. J., Conner, C., & Loach, J. (1999). Different perceptions of control: Applying an extended theory of planned behavior to legal and illegal drug use. *Basic and Applied Social Psychology, 21,* 301–316.

*Asamoah-Adu, A., Weir, S., Pappoe, M., Kanlisi, N., Neequaye, A., & Lamptey, P. (1994). Evaluation of a targeted AIDS prevention intervention to increase condom use among prostitutes in Ghana. *AIDS, 8,* 239–246.

*Baldwin, J. I., Whiteley, S., & Baldwin, J. D. (1990). Changing AIDS-and fertility-related behavior: The effectiveness of sexual education. *Journal of Sex Research, 2,* 245–262.

Bandura, A. (1989). Perceived self-efficacy in the exercise of control over AIDS infection. In V. M. Mays, G. W. Albee, & S. F. Schneider (Eds.), *The primary prevention of AIDS: Psychological approaches* (pp. 128–141). Newbury Park, CA: Sage.

Bandura, A. (1992). Social-cognitive approach of thought to the exercise of control over AIDS infection. In J. R. DiClemente (Ed.), *Adolescents and AIDS: A generation in jeopardy* (pp. 89–116). Newbury Park, CA: Sage.

Bandura, A. (1998). Personal and collective efficacy in human adaptation and change. In J. G. Adair & D. Belanger (Eds.), *Advances in psychological science. Vol. 1: Social, personal, and cultural aspects.* Hove, England: Psychology Press/Erlbaum.

*Basen-Engquist, K. (1994). Evaluation of a theory-based HIV prevention intervention for college students. *AIDS Education and Prevention, 6,* 412–424.

Becker, B. J. (1988). Synthesizing standardized mean-change measures. *British Journal of Mathematical & Statistical Psychology, 41,* 257–278.

*Belcher, L., Kalichman, S., Topping, M., Smith, S., Emshoff, J., Norris, F., & Nurss, J. (1998). A randomized trial of a brief HIV risk reduction counseling intervention for women. *Journal of Consulting and Clinical Psychology, 66,* 856–861.

*Bellingham, K., & Gillies, P. (1993). Evaluation of an AIDS education programme for young adults. *Journal of Epidemiology and Community Health, 47,* 134–138.

Bentler, P. M., & Wu, E. J. C. (1995). *EQS for Windows user's guide.* Encino, CA: Multivariate Software.

*Bentley, M. E., Spratt, K., Shepherd, M. E., Gangakhedkar, R. R., Thilikavathi, S., Bollinger, R. C., & Mehendale, S. M. (1998). HIV testing and counseling among men attending sexually transmitted disease clinics in Pune, India: Changes in condom use and sexual behavior over time. *AIDS, 1,* 1869–1877.

Berger, J., Fisek, M. H., Norman, R. Z., & Zelditch, M., Jr. (1977). *Status characteristics and social interaction: An expectation-states approach.* New York: Elsevier.

*Bhave, G., Lindan, C. P., Hudes, E. S., Desai, S., Wagle, U., Tripathi, S. P., & Mandel, J. S. (1995). Impact of an intervention on HIV, sexually transmitted diseases, and condom use among sex workers in Bombay, India. *AIDS, 9,* 521–530.

Bichsel, R. J. (1998). Native American clients' preferences in choosing counselors. *Dissertation Abstracts International, 58,* 3916B.

*Boekeloo, B. O., Schamus, L. A., Simmens, S. J., Cheng, T. L., O'Connor, K., & D'Angelo, L. J. (1999). A STD/HIV prevention trial among adolescents in managed care. *Pediatrics, 103,* 107–115.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *The handbook of theory: Research for the sociology of education* (pp. 241–258). New York: Greenwood Press.

*Boyer, C., Barrett, D. C., Peterman, T. A., & Bolan, G. (1997). Sexually transmitted disease (STD) and HIV risk in heterosexual adults attending a public STD clinic: Evaluation of a randomized controlled behavioral risk-reduction intervention trial. *AIDS, 11,* 359–367.

*Boyer, C. B., Shafer, M. A., & Tschann, J. M. (1997). Evaluation of a knowledge and cognitive-behavioral skills-building intervention to prevent STDs and HIV infection in high school students. *Adolescence, 32,* 25–42.

Bradley, P. H. (1980). Sex, competence, and opinion deviation: An expectation states approach. *Communication Monographs, 47,* 101–110.

*Branson, B. M., Peterman, T. A., Cannon, R. O., Ransom, R., & Zaidi, A. A. (1998). Group counselling to prevent sexually transmitted disease and HIV: A randomized trial. *Sexually Transmitted Disease, 25,* 553–560.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32,* 513–531.

*Brown, L. K., Barone, V. J., Fritz, G. K., Cebollero, P., & Nassau, J. H. (1991). AIDS education: The Rhode Island experience. *Health Education Quarterly, 18,* 195–206.

*Brown, L. K., Reynolds, L. A., & Lourie, K. J. (1997). A pilot HIV prevention program for adolescents in a psychiatric hospital. *Psychiatric Services, 48,* 531–533.

*Calsyn, D. A., Saxon, A. J., Freeman Jr., G., & Whittaker, S. (1992). Ineffectiveness of AIDS education and HIV antibody testing in reducing high-risk behaviors among injection drug users. *American Journal of Public Health, 82,* 573–575.

*Carey, M. P., Maisto, S. A., Kalichman, S. C., Forsyth, A. D., Wright, E. M., & Johnson, B. T. (1997). Enhancing motivation to reduce the risk of HIV infection for economically disadvantaged urban women. *Journal of Consulting and Clinical Psychology, 65,* 531–541.

Cartwright, D. (1959). A field theoretical conception of power. In D. Cartwright (Ed.), *Studies in social power* (pp. 183–220). Ann Arbor, MI: Institute for Social Research.

Centers for Disease Control and Prevention. (1993). *Documentation for the brief street intercept and coffee shop interview questionnaires.* Atlanta, GA: Community Demonstration Projects Research Group.

Centers for Diseases Control and Prevention. (1997). *Project respect: Preliminary outcome study.* Atlanta, GA: Project Respect Group.

Chaiken, S. (1980). Heuristic versus systematic information processing and

the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39,* 752–766.

*Choi, K. H., Lew, S., Vittinghoff, E., Catania, J. A., Barrett, D., & Coates, T. J. (1996). The efficacy of brief group counseling in HIV risk reduction among homosexual Asian and Pacific Islander men. *AIDS, 10,* 81–87.

Chorbajian, L. (1978). The social psychology of American *males* and spectator sports. *International Journal of Sport Psychology, 9,* 165–175.

*Clark, L. R., Brasseux, C., Richmond, D., Getson, P., & D'Angelo, L. J. (1998). Effect of HIV counseling and testing on sexually transmitted diseases and condom use in an urban adolescent population. *Archive of Pediatrics and Adolescence Medicine, 152,* 269–273.

Clore, G. L., & Byrne, D. (1974). The reinforcement affect model of attraction. In T. L. Huston (Ed.), *Foundations of interpersonal attraction* (pp. 143–170). New York: Academic Press.

Coates, R. A., Soskilne, C. L., Calzavara, L., Read, S. E., Fanning, M. M., Shepherd, F. A., et al. (1986). The reliability of sexual histories in AIDS-related research: Evaluation of an interview-administered questionnaire. *Canadian Journal of Public Health, 77,* 343–348.

Coleman, J. S. (1990). *Foundations of social theory.* Cambridge, MA: Harvard University Press.

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

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin.

*Cottler, L. B., Compton, W. M., Ben Abdallah, A., Cunningham-Williams, R., Abram, F., Fichtenbaum, C., & Dotson, W. (1998). Peer-delivered interventions reduce HIV risk behaviors among out-of-treatment drug abusers. *Public Health Reports, 113,* 31–41.

*Cottler, L. B., Leukefeld, C., Hoffman, J., Desmond, D., Wechsberg, W., Inciardi, J., et al. (1998). Effectiveness of HIV risk-reduction initiatives among out-of-treatment non-injection drug users. *Journal of Psychoactive Drugs, 30,* 279–290.

Coyle, S., Needle, R. H., & Normand, J. (1998). Outreach-based HIV prevention for injecting drug users: A review of published outcome data. *Public Health Reports, 113*(1), 19–29.

Cuijpers, P. (2002). Peer-led and adult-led school drug prevention: A meta-analytic comparison. *Journal of Drug Education, 32,* 107–119.

Dalton, I. E. (2001). Acculturative stress, cultural content and race of the therapist: Its effects on African-American women's ratings of therapist credibility and competence. *Dissertation Abstracts International, 51,* 6128B.

Darbes, L. A., Kennedy, G. E., Peersman, G., Zohrabyan, L., & Rutherford, G. W. (2002). *Systematic review of HIV behavioral prevention research in Latinos*. Retrieved November 10, 2004, from http://hivinsite.ucsf.edu/InSite.jsp?page=kb-07–04-11.

Department for Education & Skills, U. K. (2000). *Sex and relationship education guidance.* Nottingham, United Kingdom: DfEE. Retrieved November 24, 2004, from http://www.dfes.gov.uk/sreguidance/sexeducation/pdf

*Deren, S., Davis, W. R., Beardsley, M., Tortu, S., & Clatts, M. (1995). Outcomes of a risk-reduction intervention with HIV-risk populations: The Harlem AIDS project. *AIDS Education and Prevention, 7,* 379–390.

*Diers, J. A. (1999). *Efficacy of a stage-based counseling intervention to reduce the risk of HIV in women.* Unpublished doctoral dissertation, Princeton University, Princeton, NJ.

*Dilley, J. W., Woods, W. J., Sabatino, J., Lihatsh, T., Adler, B., Casey, S., et al. (2002). Changing sexual behavior among gay male repeat testers for HIV. *Journal of Acquired Immune Deficiency Syndrome, 30,* 177–186.

*Dommeyer, C. J., Marquardt, J. L., Gibson, J. E., & Taylor, R. L. (1989). The effectiveness of an AIDS education campaign on a college campus. *College Health, 38,* 131–135.

Dyche, L., & Zayas, L. H. (1995). The value of curiosity and naiveté for the cross-cultural psychotherapist. *Family Processes, 34,* 389–399.

Eagly, A. (1974). Comprehensibility of persuasive arguments as a determinant of opinion change. *Journal of Personality and Social Psychology, 29,* 758–773.

Eldridge, G. D., St. Lawrence, J. S., Little, C. E., Shelby, M. C., Brasfield, T. L., Service, J. W., & Sly, K. (1997). Evaluation of an HIV risk reduction intervention for women entering inpatient substance abuse treatment. *AIDS Education and Prevention, 9,* 62–76.

Elford, J., Sherr, L., Bolding, G., Serle, F., & Maguire, M. (2002). Peer-led HIV prevention among gay men in London: Process evaluation. *AIDS Care, 14,* 331–360.

*Elkins, D., Maticka-Tyndale, E., Kuyyakanond, T., Miller, P., & Haswell-Elkins, M. (1997). Toward reducing the spread of HIV in northeastern Thai villages: Evaluation of a village-based intervention. *AIDS Education and Prevention, 9,* 49–67.

*Fawole, J. O., Asuzu, M. C., Oduntan, S. O., & Brieger, W. R. (1999). A school-based AIDS education programme for secondary school students in Nigeria: A review of effectiveness. *Health Education Research, 14,* 675–683.

Fenaughty, A. M., & Namyniuk, L. (2004). "Here's what I'd do. . .": Condom promotion strategies proposed by high-risk women in Anchorage, AK. *Qualitative Health Research, 14,* 23–38.

*Ferreira-Pinto, J. B., & Ramos, R. (1995). HIV/AIDS prevention among female sexual partners of injection drug users in Ciudad Juarez, Mexico. *AIDS Care, 7,* 477–488.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison Wesley.

Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin, 111,* 455–474.

Fisher, J. D., & Fisher, W. A. (2000). Theoretical approaches to individual-level change in HIV risk behavior. In J. Peterson & R. DiClemente (Eds.) *Handbook of HIV prevention* (pp. 3–55). New York: Klumer Academic/Plenum Press.

Fisher, J. D., Fisher, W. A., Bryan, A. D., & Misovich, S. J. (2002). Information-motivation-behavioral skills model-based HIV risk behavior change intervention for inner-city high school youth. *Health Psychology, 21,* 177–186.

Fisher, J. D., Fisher, W. A., Misovich, S. J., Kimble, D. L., & Malloy, T. E. (1996). Changing AIDS risk behavior: Effects of an intervention emphasizing AIDS risk reduction information, motivation, and behavioral skills in a college student population. *Health Psychology, 15,* 114–123.

Fisher, J. D., Fisher, W. A., Williams, S. S., & Malloy, T. E. (1994). Empirical tests of an information-motivation-behavioral skills model of AIDS-preventive behavior with gay men and heterosexual university students. *Health Psychology, 13,* 238–250.

Fisher, W. A., Williams, S. S., Fisher, J. D., & Malloy, T. E. (1999). Understanding AIDS risk behavior among sexually active urban adolescents: An empirical test of the information-motivation-behavioral skills model. *AIDS and Behavior, 3,* 13–23.

*Fitzgerald, A. M., Stanton, B. F., Terreri, N., Shipena, H., Li, W., Kahihuata, J., et al. (1999). Use of Western-based HIV risk-reduction interventions targeting adolescents in an African setting. *Journal of Adolescent Health, 25,* 52–61.

*Flaskerud, J. H., & Nyamathi, A. M., & Uman, G. C. (1997). Longitudinal effects of an HIV testing and counseling programme for low-income Latina women. *Ethnicity and Health, 2,* 89–103.

Foa, U., & Foa, E. (1974). *Societal structures of the mind.* Springfield, IL: Thomas.

*Ford, N., & Koetsawang, S. (1999). A pragmatic intervention to promote condom use by female sex workers in Thailand. *Bulletin of the World Health Organization, 77,* 888–894.

*Fox, L. J., Bailey, P. E., Clarke-Martínez, K. L., Coello, M., Ordoñez, F. N., & Barahona, F. (1993). Condom use among high-risk women in Honduras: Evaluation of an AIDS prevention program. *AIDS Education and Prevention, 5,* 1–10.

Freire, P. (1972). *Pedagogy of the Oppressed.* Harmondsworth, England: Penguin.

French, J. R. P., & Raven, B. H. (1959). The bases of the social power. In D. Cartwright (Ed.), *Studies in social power* (pp. 150–167). Ann Arbor, MI: Institute for Social Research.

Frost-Pineda, K., Van Susteren, T., & Gold, M. S. (2004). Are physicians and medical students prepared to educate patients about alcohol consumption? *Journal of Addictive Diseases, 23,* 1–13.

Gibson, D. R., McCusker, J., & Chesney, M. (1998). Effectiveness of psychosocial interventions in preventing HIV risk behavior in injecting drug users. *AIDS, 12,* 919–929.

*Gielen, A. C., Faden, R. R., Kass, N. E., O'Campo, P., Chaisson, R., & Watkinson, L. (1997). Evaluation of an HIV/AIDS education program in an urban prenatal clinic. *Women's Health Issues, 7,* 269–279.

Gielen, A. C., Fogarty, L. A., Armstrong, K., Green, B. M., Cabral, R., Milstein, B., et al. (2001). Promoting condom use with main partners: A behavioral intervention trial for women. *AIDS and Behavior, 5,* 193–204.

*Goertzel, T. G., & Bluebond-Langner, M. (1991). What is the impact of a campus AIDS education course? *College Health, 40,* 87–92.

*Gold, R. S., & Rosenthal, D. A. (1995). Preventing unprotected anal intercourse in gay men: A comparison of two intervention techniques. *International Journal of STD and AIDS, 6,* 89–94.

Grinstead, O., Faigeles, B., & Zack, B. (1997). The effectiveness of peer HIV education for male inmates entering state prison. *Journal of Health Education, 28,* 31–36.

Gyarmathy, V. A., McNutt, L. A., Molnár, A., Morse, D., DeHovitz, J., Ujhelyi, E., & Szamadó, S. (2002). Evaluation of a comprehensive AIDS education curriculum in Hungary–the role of good educators. *Journal of Adolescence, 25,* 495–508.

Harding, R., Dockrell, M. J. D., Dockrell, J., & Corrigan, N. (2001). Motivational interviewing for HIV risk reduction among gay men in commercial and public settings. *AIDS CARE, 13,* 493–501.

*Harris, R. M., Barker Bausell, R., Scott, D. E., Hetherington, S. E., & Kavanagh, K. H. (1998). An intervention for changing high-risk HIV behaviors of African-American drug-dependent women. *Research in Nursing & Health, 21,* 239–250.

Hart, G. J., Williamson, L. M., & Flowers, P. (2004). Goods in parts: The Gay Men's Task Force in Glasgow—a response to Kelly. *AIDS Care, 16,* 159–165.

*Harvey, B., Stuart, J., & Suan, T. (2000). Evaluation of a drama-in-education programme to increase AIDS awareness in South African high schools: A randomized community intervention trial. *International Journal of STD and AIDS, 11,* 105–111.

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis.* Orlando, FL: Academic Press.

Hennessy, M., Mercier, M., Williams, S. P., & Arno, J. N. (2002). Client preferences for STD/HIV prevention programs. *Evaluation & Program Planning, 25,* 117–124.

*Hobfoll, S. E., & Jackson, A. P. (2002). Effects of generalizability of communally oriented HIV-AIDS prevention versus general health promotion groups for single, inner-city women in urban clinics. *Journal of Consulting and Clinical Psychology, 70,* 950–960.

*Hobfoll, S. E., Jackson, A. P., Lavin, J., Britton, P., & Shepherd, J. B. (1994). Reducing inner-city women's AIDS risk activities: A study of single, pregnant women. *Health Psychology, 13,* 397–403.

*Hoffman, J. A., Klein, H., Crosby, H., & Clark, D. C. (1999). Project neighborhoods in action: An HIV-related intervention project targeting drug abusers in Washington, DC. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 76,* 419–434.

Hom, K. L. (1998). Investigating the influence of individualism-collectivism and acculturation on counselor preference and attitudes toward seeking counseling among Asian-Americans. *Dissertation Abstracts International,* 58, 4451B.

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change.* New Haven, CT: Yale University Press.

Howard, M., & McCabe, J. (1990). Helping teenagers postpone sexual involvement. *Family Planning Perspectives, 22,* 21–26.

Ickovics, J. R., & Yoshikawa, H. (1998). Preventive interventions to reduce heterosexual HIV for women: Current perspectives, future directions. *AIDS, 12,* S197–S208.

Jaccard, J., McDonald, R., Wan, C. K., Dittus, P. J., & Quinlan, S. (2002). The accuracy of self-reports of condom use and sexual behavior. *Journal of Applied Social Psychology, 39,* 1863–1905.

Jaccard, J., & Wan, C. K. (1995). A paradigm for studying the accuracy of self-reports of risk behavior relevant to AIDS: Empirical perspectives on stability, recall bias, and transitory influences. *Journal of Applied Social Psychology, 25,* 1831–1858.

*Jackson, D. J., Rakwar, J. P., Richardson, B. A., Mandaliya, K., Chohan, B., Bwayo, J. J., et al. (1997). Decreased incidence of sexually transmitted diseases among trucking company workers in Kenya: Results of a behavioural risk-reduction programme. *AIDS, 11,* 903–909.

*James, N. J., Gillies, P. A., & Bignell, C. J. (1998). Evaluation of a randomized controlled trial of HIV and sexually transmitted disease prevention in a genitourinary medicine clinic setting. *AIDS, 12,* 1235–1242.

Jemmott, J. B., III, Jemmott, L. S., & Fong, G. T. (1998). Abstinence and safer sex HIV risk-reduction intervention for African-American adolescents. *Journal of the American Medical Association, 279,* 1529–1536.

Jenkins, R. A., & Kim, B. (2004). Cultural norms and risk: Lessons learned from HIV in Thailand. *Journal of Primary Prevention, 25,* 17–40.

Johnson, B. T. (1993). *DSTAT 1.10: Software for the meta-analytic review of research literatures* [Computer software]. Hillsdale, NJ: Erlbaum.

Johnson, B. T., Carey, M. P., Marsh, K. L., Levin, K. D., & Scott-Sheldon, L. A. (2003). Interventions to reduce sexual risk for the human immunodeficiency virus in adolescents, 1985–2000: A research synthesis. *Archives of Pediatrics and Adolescent Medicine, 157,* 381–388.

Johnson, P. (1976). Women and power: Toward a theory of effectiveness. *Journal of Social Issues, 32*(3), 99–110.

Joint United Nations Programme on HIV/AIDS. (1999). *A review of household and community responses to the HIV/AIDS epidemic in the rural areas of Sub-Saharan Africa.* Retrieved November 24, 2004 from http://www.unaids.org

Juárez, O., & Diez, E. (1999). Prevención del SIDA en adolescentes escolarizados: Una revision sistemática de la efectividad de las intervenciones [Prevention of AIDS in adolescent students: A systems review of the effectiveness of the interventions]. *Gaceta Sanitaria, 13,* 150–162.

*Kagimu, M., Marum, E., Wabwire-Mangen, F., Nakyanjo, N., Walakira, Y., & Hogle, J. (1998). Evaluation of the effectiveness of AIDS health education interventions in the Muslim community in Uganda. *AIDS Education and Prevention, 10,* 215–228.

Kahn, J. G., Kegeles, S. M., Hays, R., & Beltzer, N. (2001). Cost-effectiveness of the Mpowerment Project, a community-level intervention for young gay men. *Journal of Acquired Immune Deficiency Syndromes, 27,* 482–491.

Kalafat, J., & Elias, M. J. (1994). An evaluation of a school-based suicide awareness intervention. *Suicide and Life-Threatening Behavior, 25,* 224–233.

Kalichman, S. C., Carey, M. P., & Johnson, B. T. (1996). Prevention of sexually transmitted HIV infection: A meta-analytic review of the behavioral outcome literature. *Annals of Behavioral Medicine, 18,* 6–15.

Kalichman, S. C., Kelly, J. A., Hunter, T. L., Murphy, D. A., & Tyler, R.

(1993). Culturally tailored HIV-AIDS risk-reduction messages targeted to African-American urban women: Impact of risk sensitization and risk reduction. *Journal of Consulting and Clinical Psychology, 61,* 291–295.

*Kalichman, S. C., Rompa, D., & Coley, B. (1996). Experimental component analysis of a behavioral HIV-AIDS prevention intervention for inner-city women. *Journal of Consulting and Clinical Psychology, 4,* 687–693.

*Kalichman, S. C., Rompa, D., & Coley, B. (1997). Lack of positive outcomes from a cognitive-behavioral HIV and AIDS prevention intervention for inner-city men: Lessons from a controlled pilot study. *AIDS Education and Prevention, 9,* 299–313.

*Kalichman, S. C., Sikkema, K. J., Kelly, J. A., & Bulto, M. (1995). Use of a brief behavioral skills intervention to prevent HIV infection among chronic mentally ill adults. *Psychiatric Services, 46,* 275–280.

Kalichman, S. C., Williams, E., & Nachimson, D. (1999). Brief behavioral skills building intervention for female controlled methods of STD-HIV prevention: Outcomes of a randomized clinical field trial. *International Journal of STD and AIDS, 10,* 174–181.

Kamb, M. L., Fishbein, M., Douglas, J., Jr., Rhodes, F., Rogers, J., Bolan, G., et al. (1998). Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: A randomized controlled trial. Project RESPECT Study Group. *Journal of the Amercian Medical Association, 280,* 1161–1167.

Katz, I., Goldston, J., & Benjamin, L. (1958). Behavior and productivity in bi-racial work groups. *Human Relations, 11,* 123–141.

Kawachi, I., Kennedy, B. P., & Glass, R. (1999). Social capital and self-rated health: A contextual analysis. *American Journal of Public Health, 89,* 1187–1193.

Kawachi, I., Kennedy, B. P., Lochner, K., & Prothrow-Stith, D. (1997). Social capital, income inequality, and mortality. *American Journal of Public Health, 87,* 1491–1498.

Kegeles, S. M., & Graham, J. H. (1998). Recent HIV-prevention interventions for gay men, individual, small-group and community based study. *AIDS, 12,* S211–S215.

*Kegeles, S. M., Hays, R. B., & Coates, T. J. (1996). The Mpowerment project: A community-level HIV prevention intervention for young gay men. *American Journal of Public Health, 86,* 1129–1136.

Kelley, H. H. (1973). The process of causal attribution. *American Psychologist, 28,* 107–128.

Kelly, J. A. (2004). Popular opinion leaders and HIV prevention peer education: Resolving discrepant findings, and implications for the development of effective community programs. *AIDS CARE, 16,* 139–150.

*Kelly, J. A., McAuliffe, T. L., Sikkema, K. J., Murphy, D. A., Somlai, A. M., Mahy, G. M., Miller, J. G., Stevenson, L. Y., & Fernandez, M. I. (1997). Reduction in risk behavior among adults with severe mental illness who learned to advocate for HIV prevention. *Psychiatric Services, 18,* 1283–1288.

*Kelly, J. A., Murphy, D. A., Sikkema, K. J., McAuliffe, T. L., Roffman, R. A., Solomon, L. J., et al. (1997). Randomized, controlled, community-level HIV-prevention intervention for sexual-risk behavior among homosexual men in US cities. *The Lancet, 350,* 1500–1505.

*Kelly, J. A., Murphy, D. A., Washington, C. D., Wilson, T. S., Koob, J. J., Davis, D. R., et al. (1994). The effect of HIV/AIDS intervention groups for high-risk women in urban clinics. *American Journal of Public Health, 84,* 1918–1922.

*Kelly, J. A., St. Lawrence, J. S., Diaz, Y. E., Stevenson, L. Y., Hauth, A. C., Brasfield, T. L., et al. (1991). HIV risk behavior reduction following intervention with key opinion leaders of population: An experimental analysis. *American Journal of Public Health, 81,* 168–171.

*Kelly, J. A., St. Lawrence, J. S., Hood, H. V., & Brasfield, T. L. (1989). Behavioral intervention to reduce AIDS risk activities. *Journal of Consulting and Clinical Psychology, 57,* 60–67.

Kelly, J. A., St. Lawrence, J. S., Betts, R., Brasfield, T. L., & Hood, H. V. (1990). A skills-training group intervention model to assist persons in reducing risk behaviors for HIV infection. *AIDS Education and Prevention, 1,* 24–35.

*Kelly, J. A., St. Lawrence, J. S., Stevenson, L. Y., Hauth, A. C., Kalichman, S. C., Diaz, Y. E., et al. (1992). Community AIDS/HIV risk reduction: The effects of endorsements by popular people in three cities. *American Journal of Public Health, 82,* 1483–1489.

Kelman, H. C. (1961). Processes of opinion change. *Public Opinion Quarterly, 25,* 57–78.

Kelman, H. C., & Hovland, C. I. (1953). "Reinstatement" of the communicator in delayed measurement of opinion change. *Journal of Abnormal and Social Psychology, 48,* 327–335.

Kerr, M., Stattin, H., Bisecker, G., & Ferrer-Wreder, L. (2002). Parents and peers as developmental context. In R. M. Lerner, M. A. Easterbrooks, J. Mistry, & I. B. Weiner (Eds.), *Comprehensive handbook of psychology: Developmental psychology* (17–46). New York: Wiley.

Kerrigan, D. (1999). *Peer education and HIV/AIDS: Concepts, uses and challenges.* Washington, DC: HORIZONS/Population Council.

*Kipke, M. D., Boyer, C., & Hein, K. (1993). An evaluation of an AIDS risk reduction education and skills training (ARREST) program. *Journal of Adolescent Health, 14,* 533–539.

*Kirby, D., Korpi, M., Adivi, C., & Weissman, J. (1997). An impact evaluation of project SNAPP: An AIDS and pregnancy prevention middle school program. *AIDS Education and Prevention, 9,* 44–61.

Kirby, D., Short, L., Collins, J., Rugg, D., Kolbe, L., Howard, M., et al. (1994). School-based programs to reduce sexual risk behaviors: A review of effectiveness. *Public Health Reports, 109,* 339–360.

*Kotranski, L., Semaan, S., Collier, K., Lauby, J., Halbert, J., & Feighan, K. (1998). Effectiveness of an HIV risk reduction counseling intervention for out-of-treatment drug users. *AIDS Education and Prevention, 10,* 19–33.

Krauss, B. J., Wolitski, R. J., Tross, S., Corby, N. H., & Fishbein, M. (1999). Getting the message: HIV information sources of women who have sex with injecting drug users–a two site study. *Applied Psychology: And International Review, 48,* 153–173.

Kumkale, G. T., & Albarracín, D. (2004). The sleeper effect in persuasion: A meta-analysis. *Psychological Bulletin, 130,* 143–172.

*Landis, S. E., Earp, J. L., & Koch, G. G. (1992). Impact of HIV testing and counseling on subsequent sexual behavior. *AIDS Education and Prevention, 4,* 61–70.

*Lauby, J. L., Smith, P. J., Stark, M., Person, B., & Adams, J. (2000). A community-level HIV prevention intervention for inner-city women: Results of the Women and Infants Demonstration Projects. *American Journal of Public Health, 90,* 216–222.

Lee, M. T., & Ofshe, R. (1981). The impact of behavioral style and status characteristics on social influence: A test of two competing theories. *Social Psychology Quarterly, 44,* 73–82.

*Leonard, L., Ndiaye, I., Kapadia, A., Eisen, G., Diop, O., Mbourp, S., & Kanki, P. (2000). HIV prevention among male clients of female sex workers in Kaolack, Senegal: Results of a peer education program. *AIDS Education and Prevention, 12,* 21–37.

*Lindenberg, C. S., Solorzano, R. M., Bear, D., Strickland, O., Galvis, C., & Pittman, K. (2002). Reducing substance use and risky sexual behavior among young, low-income, Mexican-American women: Comparison of two interventions. *Applied Nursing Research, 16,* 137–148.

Lockheed, M. E. (1985). Sex and social influence: A meta-analysis guided by theory. In J. Berger & M. Zelditch Jr. (Eds.), *Status, rewards, and influence* (pp. 406–427). San Francisco: Jossey-Bass.

*Ma, S., Dukers, N. H. T. M., van den Hoek, A., Yuliang, F., Zhiheng, C., Jiangting, F., Lina, Z., & Xiuxing, Z. (2002). Decreasing STD incidence and increasing condom use among Chinese sex workers following a short term intervention: A prospective cohort study. *Sexual Transmitted Infections, 78,* 110–114.

*MacNair-Semands, R. R., Cody, W. K., & Simono, R. B. (1997). Sexual

behavior change associated with a college HIV course. *AIDS Care, 9,* 727–738.

*Mansfield, C. J., Conroy, M. E., Emans, S. J., & Woods, E. R. (1993). A Pilot study of AIDS education and counseling of high-risk adolescents in an office setting. *Journal of Adolescent Health, 14,* 115–119.

McKee, J. P., & Sherriffs, A. C. (1957). The differential evaluation of males and females. *Journal of Personality, 25,* 356–371.

McLaws, M. L., Oldenburg, B., Ross, M. W., & Cooper, D. A. (1990). Sexual behaviour in AIDS-related research: Reliability and validity of recall and diary measures. *Journal of Sex Research, 27,* 265–281.

*McMahon, R. C., Malow, R. M., Jennings, T. E., & Gómez, C. J. (2001). Effects of a cognitive-behavioral HIV prevention intervention among HIV negative male substance abusers in VA residential treatment. *AIDS Education and Prevention, 13,* 91–107.

Merriam-Webster Dictionary. (1985). Springfield, MA: Merriam-Webster.

Merson, M. H., Dayton, J. M., & O'Reilly, K. (2000). Effectiveness of HIV prevention interventions in developing countries. *AIDS, 14,* S68–S84.

Milburn, K. (1995). A critical review of peer education with young people with special reference to sexual health. *Health Education Research, 10,* 407–420.

Miller, D. T., & Ratner, R. K. (1998). The disparity between the actual and assumed power of self-interest. *Journal of Personality and Social Psychology, 74,* 53–62.

*Miller, R. L. (1995). Assisting gay men to maintain safer sex: An evaluation of an AIDS service organization's safer sex maintenance program. *AIDS Education and Prevention, 7,* 48–63.

*Miller, R. L., Klotz, D., & Eckholdt, H. M. (1998). HIV prevention with male prostitutes and patrons of hustler bars: Replication of an HIV preventive intervention. *American Journal of Community Psychology, 26,* 97–131.

Morris, S. B. (2000). Distribution of the standardized mean change effect size for meta-analysis on repeated measures. *British Journal of Mathematical & Statistical Psychology, 53,* 17–29.

Myhre, S. L., & Flora, J. A. (2000). HIV/AIDS communication campaigns: Progress and prospects. *Journal of Health Communication, 5,* 29–45.

Myrick, R. (1996). Speaking from the margins: Communication strategies used in African American HIV prevention campaigns in Alabama. *Howard Journal of Communications, 7,* 241–255.

Myrick, R. D., & Folk, B. E. (1991). *The power of PEER intervention: A manual for training of peer facilitators.* Minneapolis, MN: Educational Media.

National Institutes of Health. (2003). Excellence in partnerships for community outreach, research on health disparities and training. Retrieved November 24, 2004, from http://grants2.nih.gov/grants/guide/rfa-files/RFA-MD-03–001.html.

*Ngugi, E. N., Plummer, F. A., Simonsen, J. N., Cameron, D. W., Bosire, M., Waiyaki, P., Ronald, A. R., & Ndinya-Achola, J. O. (1988). Prevention of transmission of human immunodeficiency virus in Africa: Effectiveness of condom promotion and health education among prostitutes. *The Lancet, 15,* 887–890.

Nikelly, A. G. (1997). Cultural Babel: The challenge of immigrants to the helping professions. *Cultural Diversity & Mental Health, 3,* 221–233.

*NIMH Multisite HIV Prevention Trial Group. (1998). Social-cognitive theory mediators of behavior change in the National Institute of Mental Health Multisite HIV Prevention Trial. *Health Psychology, 20,* 369–376.

*Nyamathi, A. M., Flaskerud, J. H., Leake, B., Dixon, E. L., & Lu, A. (2001). Evaluating the impact of peer, nurse case-managed, and standard HIV risk-reduction programs on psychosocial and health-promoting behavioral outcomes among homeless women. *Research in Nursing and Health, 24,* 410–422.

*Nyamathi, A. M., & Stein, J. A. (1997). Assessing the impact of HIV risk reduction counseling in impoverished African American women: A structural equations approach. *AIDS Education and Prevention, 9,* 253–273.

O'Neil, J. M. (1981). Male sex role conflicts, sexism, and masculinity: Psychological implications for men, women, and the counseling psychologist. *Counseling Psychologist, 9,* 61–80.

*O'Leary, A., Ambrose, T. K., Raffaelli, M., Mailbach, E., Jemmott, L. S., Jemmott, J. B., III, et al. (1998). Effects of an HIV risk reduction project on sexual risk behavior of low-income STD patients. *AIDS Education and Prevention, 10,* 483–492.

*O'Leary, A., Jemmott, L. S., Goodhart, F., & Gebelt, J. (1996). Effects of an institutional AIDS prevention intervention: Moderation by gender. *AIDS Education and Prevention, 8,* 516–528.

*O'Hara, P., Messick, B., Fichtner, R. R., & Parris, D. (1996). A peer-led AIDS prevention program for students in an alternative school. *Journal of School Health, 66,* 176–182.

Oakley, A., Fullerton, D., & Holland, J. (1995). Behavioural interventions for HIV/AIDS prevention. *AIDS, 9,* 479–486.

*Orr, D., Langefeld, C. D., Katz, B. P., & Caine, V. A. (1996). Behavioral intervention to increase condom use among high-risk female adolescents. *Journal of Pediatrics, 128,* 288–295.

*Otto-Salaj, L. L., Kelly, J. A., Stevenson, L. Y., Hoffmann, R., & Kalichman, S. C. (2001). Outcomes of a randomized small-group HIV prevention intervention trial for people with serious mental illness. *Community Mental Health Journal, 37,* 123–144.

Ozer, E. J., Weinstein, R. S., Maslack, C., & Siegel, D. (1997). Adolescent AIDS prevention in context: Impact of peer educator qualities and classroom environments on interventions efficacy. *American Journal of Community Psychology, 25,* 289–323.

*Papaevangelou, G., Roumeliotou, A., Kallinikos, G., Papoutsakis, G., Trichopoulou, E., & Stefanou, T. (1988). Education in preventing HIV infection in Greek registered prostitutes. *Journal of Acquired Immune Deficiency Syndromes, 1,* 386–389.

*Pauw, J., Ferrie, J., Rivera Villegas, R., Medrano Martínez, J., Gorter, A., & Egger, M. (1996). A controlled HIV/AIDS-related health education programme in Managua, Nicaragua. *AIDS, 10,* 537–544.

Pealer, L. N., Peterman, T. A., Newman, D. R., Kamb, M. L., Dillon, B., Malotte, C. K., et al. (2004). Are counselor demographics associated with successful human immunodeficiency virus/sexually transmitted disease prevention counseling? *Sexually Transmitted Diseases, 31,* 52–56.

*Peterson, J. L., Coates, T. J., Catania, J., Hauck, W. W., Acree, M., Daigle, D., et al. (1996). Education of an HIV risk reduction intervention among African-American homosexual and bisexual men. *AIDS, 10,* 319–325.

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change.* New York: Springer/Verlag.

Petty, R. E., Fleming, M. A., Priester, J. R., & Harasty, A. (2001). Individual versus group interest violation: Surprise as a determinant of argument scrutiny and persuasion. *Social Cognition, 19,* 418–442.

Philliber, S. (1999). In search of peer power: A review of research on peer-based interventions for teens. In P. Bearman, H. Bruckner, B. B. Brown, W. Theobald, & S. Philliber (Eds.), *Peer potential: Making the most of how teens influence each other* (pp. 81–111). Washington, DC: National Campaign to Prevent Teen Pregnancy.

*Picciano, J. F., Roffman, R. A., Kalichman, S. C., Rutledge, S. E., & Berghuis, J. P. (2001). A telephone based brief intervention using motivational enhancement to facilitate HIV risk reduction among MSM: A pilot study. *AIDS and Behavior, 5,* 251–262.

Pinkerton, S. D., Holtgrave, D. R., DiFrancesco, W., Semaan, S., Coyle, S. L., & Johnson-Masotti, A. P. (2000). Cost-threshold analyses of the National AIDS Demonstration Research HIV Prevention Interventions. *AIDS, 14,* 1257–1268.

Ploem, C., & Byers, S. (1997). The effects of two AIDS risk-reduction

interventions on heterosexual college women's AIDS-related knowledge, attitudes and condom use. *Journal of Psychology and Human Sexuality, 9,* 1–23.

Povey, R. Conner, M. Sparks, P. James, R., & Shepherd, R. (2000). Application of the theory of planned behaviour to two dietary behaviours: Roles of perceived control and self-efficacy. *British Journal of Health Psychology, 5,* 121–139.

Prendergast, M. L., Urada, D., & Podus, D. (2001). Meta-analysis of HIV risk-reduction interventions within drug abuse treatment programs. *Journal of Consulting and Clinical Psychology, 69,* 389–405.

Prochaska, J. O., Velicer, W. F., Rossi, J. S., Redding, C. A., Greene, G. W., Rossi, S. R., et al. (2004). Multiple risk expert systems interventions: Impact of simultaneous stage-matched expert system interventions for smoking, high-fat diet, and sun exposure in a population of parents. *Health Psychology, 23,* 503–516.

Putnam, R. D. (1911). *Making democracy work.* Princeton, NJ: Princeton University Press.

Quirk, M. E., Godkin, M. A., & Schwenzfeier, E. (1993). Evaluation of two AIDS prevention interventions for inner-city adolescent and young adult women. *American Journal of Preventive Medicine, 9,* 21–26.

*Rao, A. V., Swaminathan, R., Baskaran, S., Belinda, C., Andla, G., & Saleem, K. (1991). Behaviour change in HIV infected subjects following health education. *Indian Journal of Medical Research, 93,* 345–349.

Reeder, G. D., Pryor, J. B., & Harsh, L. (1997). Activity and similarity in safer-sex workshops led by peer educators. *AIDS Education and Prevention, 9,* 77–89.

Rich, J. A., Homes, M. D., & Hodges, D. M. (1996). Preferred sources of AIDS information, risk perceptions, and risk behaviors among inner-city community college students. *Journal of the National Medical Association, 88,* 87–93.

Rickert, V. J., Jay, M. S., & Gottlieb, A. (1991). Effect of a peer-counseled AIDS education program on knowledge, attitudes, and satisfaction of adolescents. *Journal of Adolescent Health, 12,* 38–43.

Rigby, K., Brown, M., Anagnostou, P., Ross, M. W., & Rosser, B. R. S. (1989). Shock tactics to counter AIDS: The Australian experience. *Psychology and Health, 3,* 145–159.

Robin, L., Dittus, P., Whitaker, D., Crosby, R., Ethier, K., Mezoff, J., Miller, K., & Pappas-Deluca, K. (2004). Behavioral interventions to reduce incidence of HIV, STD, and pregnancy among adolescents: A decade in review. *Journal of Adolescent Health, 34,* 3–26.

*Roffman, R. A., Stephens, R. S., Curtin, L., Gordon, J. R., Craver, J. N., Stern, M., Beadnell, B., & Downey, L. (1998). Relapse prevention as an interventive model for HIV risk reduction in gay and bisexual men. *AIDS Education and Prevention, 10,* 1–18.

Rosenthal, R. (1995). Writing meta-analytic reviews. *Psychological Bulletin, 118,* 183–192.

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

*Rotheram-Borus, M. J., Koopman, C., Haignere, C., & Davies, M. (1991). Reducing HIV sexual risk behaviors among runaway adolescents. *Journal of the American Medical Association, 266,* 1237–1242.

*Rotheram-Borus, M. J., Lee, M. B., Murphy, D. A., Futterman, D., Duan, N., Birnbaum, J. M., et al. (2001). Efficacy of a preventive intervention for youth living with HIV. *American Journal of Public Health, 91,* 400–405.

*Rotheram-Borus, M. J., Murphy, D. A., Fernández, M. I., & Srinivasan, S. (1998). A brief HIV intervention for adolescents and young adults. *American Journal of Orthopsychiatry, 68,* 553–563.

*Sampaio, M., Brites, C., Stall, R., Hudes, E. S., & Hearst, N. (2002). Reducing AIDS risk among men who have sex with men in Salvador, Brazil. *AIDS and Behavior, 6,* 173–181.

Schaalma, H. P., Abraham, C., Gillmore, M. R., & Kok, G. (2004). Sex education as health promotion: What does it take? *Archives of Sexual Behavior, 33*(3), 259–269.

Schneider, D. J. (1973). Implicit personality theory. *Psychological Bulletin, 79,* 294–309.

Schroeder, K. E. E., Carey, M. P., & Vanable, P. A. (in press-a). Methodological challenges in research on sexual risk behavior: I. Item content, scaling, and data analytical options. *Annals of Behavioral Medicine.*

Schroeder, K. E. E., Carey, M. P., & Vanable, P. A. (in press-b) Methodological challenges in research on sexual risk behavior: II. Accuracy of self-reports. *Annals of Behavioral Medicine.*

Schwarz, N., Groves, R. M., & Schuman, H. (1998). Survey methods. In D. T. Gilber, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology,* (Vol. 1, pp. 143–179). New York: McGraw-Hill.

Shadish, W. R. (1996). Meta-analysis and the exploration of causal mediating processes: A primer of examples, methods, and issues. *Psychological Methods, 1,* 47–65.

*Shrier, L. A., Ancheta, R., Goodman, E., Chiou, V. M., Lyden, M. R., & Emans, S. J. (2001). Randomized controlled trial of a safer sex intervention for high-risk adolescent girls. *Archive of Pediatrics and Adolescent Medicine, 155,* 73–79.

Siegel, D. M., Aten, M. J., Roghmann, K. J., & Enaharo, M. (1998). Early effects of school-based human immunodeficiency virus infection and sexual risk prevention intervention. *Archive of Pediatrics and Adolescent Medicine, 132,* 961–970.

*Sikkema, K. J., Kelly, J. A., Winett, R. A., Solomon, L. J., Cargill, V. A., Roffman, R. A., et al. (2000). Outcomes of a randomized community-level HIV prevention intervention for women living in 18 low-income housing developments. *American Journal of Public Health, 90,* 57–63.

*Sikkema, K. J., Winett, R. A., & Lombard, D. N. (1995). Development and evaluation of an HIV-risk reduction program for female college students. *AIDS Education and Prevention, 7,* 145–159.

*Singh, Y. N., & Malaviya, A. N. (1994). Experience of HIV prevention interventions among female sex workers in Delhi, India. *International Journal of STD and AIDS, 5,* 56–57.

*Slap, G. B., Plotkin, S. L., Najma, K., Michelman, D. F., & Forke, C. (1992). A human immunodeficiency virus peer education program for adolescent females. *Journal of Adolescent Health, 12,* 434–441.

*Smith, M. U., Dane, F. C., Archer, M. E., Devereaux, R. S., & Katner, H. P. (2000). Students together against negative decisions (STAND): Evaluation of a school-based sexual risk-reduction intervention in the rural south. *AIDS Education and Prevention, 12,* 49–70.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* 1982 (pp. 290–312). Washington, DC: American Sociological Association.

South Africa Inter-Ministerial Committee on AIDS. (2000). HIV/AID/STD strategic plan for South Africa, 2000–2005. Retrieved November 24, 2004 from http://www.unaids.org

*St. Lawrence, J. S., Brasfield, T. L., Jefferson, K. W., Alleyne, E., & O'Bannon, R. E., III. (1995). Cognitive-behavioral intervention to reduce African-American adolescents' risk for HIV infection. *Journal of Consulting and Clinical Psychology, 63,* 221–237.

*Stall, R. D., Paul, J. P., Barrett, D. C., Crosby, G. M., & Bein, E. (1999). An outcome evaluation to measure changes in sexual risk-taking among gay men undergoing substance use disorder treatment. *Journal of Studies on Alcohol, 60,* 837–844.

*Stanton, B. F., Li, X., Ricardo, I., Galbraith, J., Feigelman, S., & Kaljee, L. (1996). A randomized, controlled effectiveness trial of an AIDS prevention program for low-income African-American youths. *Archives of Pediatrics and Adolescent Medicine, 150,* 363–372.

Sterk, C. E., Theall, K. P., Elifson, K. W., & Kidder, D. (2003). HIV risk reduction among African-American women who inject drugs: A randomized controlled trial. *AIDS and Behavior, 7,* 73–86.

Stuart, C., Waalen, J. K., & Haelstromm, E. (2003). Many helping hearts: An evaluation of peer gatekeeper training in suicide risk assessment. *Death Studies, 27,* 321–333.

Sweet, M., O'Donnell, C., & O'Donnell, L. (2001). Cost-effectiveness of a brief video-based HIV intervention for African American and Latino sexually transmitted disease clinic clients. *AIDS, 15,* 781–787.

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

Tindal, J. A., & Salmon-White, S. (1990). *Peers helping peers: Program for the pre-adolescent.* Bristol, PA: Accelerated Development.

*Toro-Alfonso, J., Varas-Díaz, N., & Andújar-Bello, I. (2002). Evaluation of an HIV/AIDS prevention intervention targeting Latino gay men and men who have sex with men in Puerto Rico. *AIDS Education and Prevention, 14,* 445–456.

Turner, G., & Shepherd, J. (1999). A method in search of a theory: Peer education and health promotion. *Health Education Research, 14,* 235–247.

*Turner, J. C., Garrison, C. Z., Korpita, E., Waller, J., Addy, C., Hill, W. R., & Mohn, L. A. (1994). Promoting responsible sexual behavior through a college freshman seminar. *AIDS Education and Prevention, 6,* 266–277.

Tuzlak, A. S. (1989). Joint effects of race and confidence on perceptions and influence. *Canadian Ethnic Studies, 21,* 103–119.

United Nations Development Fund for Women. (2001). *Turning the tide: CEDAW and the gender dimensions of the HIV/AIDS pandemic.* Retrieved November 24, 2004 from http://www.unifem.org/index.php?f_page_pid=33

*Van Griensven, G. J. P., Limanonda, B., Ngaokeow, S., Ayuthaya, S. I. N., & Poshyachinda, V. (1998). Evaluation of a targeted HIV prevention programme among female commercial sex workers in the south of Thailand. *Sexually Transmitted Infections, 74,* 54–58.

*Walden, V. M., Mwangulube, K., & Makhumula-Nkhoma, P. (1999). Measuring the impact of a behaviour change intervention for commercial sex workers and their potential clients in Malawi. *Health Education Research, 14,* 545–554.

Walter, H. J., & Vaughn, R. D. (1993). AIDS risk reduction among a multi-ethnic sample of urban high school students. *Journal of the American Medical Association, 270,* 1017–1024.

Wang, M. C., & Bushman, B. J. (1999). *Integrating results through meta-analytic review using SAS software.* Cary, NC: SAS Institute Inc.

Weber, M. (1994 version). Political writings. Edited and translated by P. Lassman, R. Geuss, Q. Skinner, & R. Speirs. Cambridge, New York: Cambridge University Press.

*Weeks, K., Levy, S. R., Zhu, C., Perhats, C., Handler, A., & Flay, B. R. (1995). Impact of a school-based AIDS prevention program on young adolescents' self-efficacy skills. *Health Education Research, 10*(3), 329–344.

*Weinhardt, L. S., Carey, M. P., Carey, K. B., & Verdecias, R. N. (1998). Increasing assertiveness skills to reduce HIV risk among women living with a severe and persistent mental illness. *Journal of Consulting and Clinical Psychology, 66,* 680–684.

Weinhardt, L. S., Carey, M. P., & Johnson, B. T. (1999). Effects of HIV counseling and testing on sexual risk behavior: A meta-analytic review of published research, 1985–1997. *American Journal of Public Health, 89,* 1397–1405.

*Wenger, N. S., Linn, L. S., Epstein, M., & Shapiro, M. F. (1991). Reduction of high-risk sexual behavior among heterosexuals undergoing HIV antibody testing: A randomized clinical trial. *American Journal of Public Health, 81,* 1580–1585.

Wingood, G. M., & DiClemente, R. J. (1996). HIV sexual risk reduction interventions for women: A review. *American Journal of Preventive Medicine, 12,* 209–217.

Winkelstein, W. Jr., Samuel, M., Padian, N., Wiley, J. A., Lang, W., Anderson, R. E., & Levy, J. A. (1987). The San Francisco men's health study: III. Reduction in human immunodeficiency virus transmission among homosexual/bisexual men, 1982–1986. *American Journal of Public Health, 76,* 685–689.

Wolf, R. C., Bond, K. C., & Tawfik, L. A. (2000). Peer promotion programs and social networks in Ghana: Methods for monitoring and evaluating AIDS prevention and reproductive health programs among adolescents and young adults. *Journal of Health Communications, 5,* 61–80.

*Xiaoming, S., Yong, W., Choi, K. H., Lurie, P., & Mandel, J. (2000). Integrating HIV prevention education into existing family planning services: Results of a controlled trial of a community-level intervention for young adults. *AIDS and Behavior, 4,* 103–110.

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