

ORIGINAL ARTICLE

**Media as Educator, Media as Disruptor:
Conceptualizing the Role of Social Context
in Media Effects**Rajiv N. Rimal¹, Adrienne H. Chung¹, & Nimesh Dhungana²

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We document how social contexts serve to refract media effects. We theorized the relationship between media use and individual-level knowledge (and attitude) would be stronger when community-level knowledge (and attitude) was low than when it was high. Data come from a national survey (N = 12,608 women and 1,237 men) conducted in Nepal. Knowledge and stigma toward people living with HIV were the 2 dependent variables. Hypotheses were tested 12 times: across the use of 3 media (newspaper, radio, television) × 2 study outcomes (knowledge and attitudes) × 2 genders. Predicted interactions were supported in 9 of the 12 tests. Findings point to the need to take into account the role of community factors in theorizing about media effects.

Keywords: Media Effects, Knowledge, Stigma, Social Context, Nepal, Community Norms.

doi:10.1111/jcom.12175

Of the many conceptualizations of media, a compelling and intuitive one is to view them as agents of change (McQuail, 1987). Indeed, this constitutes a central assumption in many public information campaigns, including entertainment education approaches (Singhal & Rogers, 1999; Slater & Rouner, 2002), that use mass media for social change (Hansen, 1991; Hornik, 2002; Rimal, Flora, & Schooler, 1999; Sampei & Aoyagi-Usui, 2009; Viswanath & Finnegan, 2002). The potential for media to affect individuals positively has been demonstrated in many contexts, though the focus tends to be on the impact of a particular show or media program, rather than media exposure as a whole. In this article, we link media use as a behavior—remaining agnostic about media content—with knowledge and attitudes that vary according to the social context in which the media use occurs.

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Media bring information about the outside world into people's homes, communities, and networks, but this incoming information does not fall into a social vacuum. Rather, much like light that bends according to the density of the medium through which it travels, mediated messages are subject to *interpretive refraction* when they encounter environments that vary in beliefs, values, and social contexts (Gunther & Schmitt, 2004). As the literature on the hostile media perception (Vallone, Ross, & Lepper, 1985) shows, people's backgrounds and beliefs actively interact with media messages to produce polarization and other heterogeneous effects. Individuals highly involved in a particular issue (e.g., politics) are more likely to process information in a manner that supports their existing view (LaMarre, Landreville, & Beam, 2009). Involved audience members, for example, tend to perceive a news bias even when news content is well balanced (Gunther & Schmitt, 2004; Vallone et al., 1985). These studies speak to the differential interpretation of media content as a function of individual-level differences (in political beliefs or outlooks), but not as a function of social contexts. In this article, we seek to document how social context can influence the association between media use, on the one hand, and knowledge and attitudes, on the other.

The influence of social contexts on human behavior has been extensively studied in social network research, in domains ranging from obesity to depression to drug use (Christakis & Fowler, 2007; Mednick, Christakis, & Fowler, 2010; Rosenquist, Fowler, & Christakis, 2010). Social network theory conceptualizes relationships as interconnected nodes and ties, where individual actors constitute the nodes, and the relationships between them the ties (Kadushin, 2012). This conceptualization of social structure emphasizes the influence that individuals and groups have on one another, and it points to the fact that the influence of external agents, such as media, needs to be understood through a lens that acknowledges the existing social context.

One way of characterizing social context is through the interpersonal and mass media communications that occur within a community and between community members and external agents, respectively. Interpersonal communication within social networks serves an instrumental function (Carey, 1989) by circulating information and reinforcing group norms (Real & Rimal, 2007). It can also amplify mass media and intervention effects and the effect of community norms on behavior (Rimal, Limaye, Roberts, Brown, & Mkandawire, 2013; Southwell & Yzer, 2007). Thus, higher levels of interpersonal communication within a social network can be linked with stronger associations between individual-level and group-level outcomes (Rimal et al., 2013).

Beyond the interpersonal communication that occurs between individuals within a community, information and ideas are also transmitted through external agents, such as media outlets. Social network theory addresses this notion through the concept of a "bridge," a form of social tie that connects two or more groups by transmitting information between them (Granovetter, 1982). Mass media, particularly when they emanate from outside the network, can serve this function as external agents of change. In this conceptualization, media function as a bridge, linking individuals to

sources of information outside their own in-group. This idea is particularly intriguing in the context of geographically isolated communities that may be at an informational disadvantage because of their lack of resources and their limited access to the outside world.

Indeed, geographical isolation is yet another way to characterize social contexts. In geographically isolated communities, it is reasonable to expect greater within-group homogeneity in opinion and outlook, as compared to communities with higher levels of access to the outside world. After all, when opportunities for engagement with the outside world are limited, reliance on in-group members for day-to-day functioning is likely to be greater. This also means that when interactions with the outside world are limited, a greater reliance is likely placed on available mass media as sources of information and exposure to lifestyles beyond what people encounter in their daily lives. Media enable audiences to vicariously interact with others and experience novel situations, which may contribute to an expanded perspective that goes beyond the confines of lived experiences (Chung & Slater, 2013; Slater, Johnson, Cohen, Comello, & Ewoldsen, 2014). In the parlance of network theory, media can serve as a bridge that exposes individuals and communities to nodes and networks that may otherwise be inaccessible. In its most potent and idealized form, by introducing perspectives that challenge existing notions, media's ability to function as a community's bridge to new sources of knowledge and attitudes can serve as a catalyst for social transformation.

Study hypotheses

Use of media to expand one's perspective is consistent with the surveillance function articulated in the uses and gratifications approach, which highlights media's information-circulating role (Katz, Blumler, & Gurevitch, 1973). We expect this function to be especially important in relatively isolated communities where the media serve as one of few links with the outside world, and where interpersonal discussion with other community members may play a particularly significant role in disseminating information. In such communities, individuals' knowledge about an issue will likely be associated with the knowledge at the community level about the issue. This may be particularly true for members of the community whose use of media is minimal. When the community itself constitutes the primary source of information, we would expect individual-level and community-level knowledge to be similar. Among individuals who frequently use media, the association between individual-level knowledge and community-level knowledge would likely become attenuated because of the external influences that impinge on those who use more media. Hence, our first two hypotheses are:

H1A: Community-level knowledge will be associated with individual-level knowledge on the same topic.

H1B: The relationship between community-level knowledge and individual-level knowledge will be stronger when media use is low than when media use is high.

Findings from social network research (Christakis & Fowler, 2008; Keating, O'Malley, Murabito, Smith, & Christakis, 2011; McFerran, Dahl, Fitzsimons, & Morales, 2010; Rosenquist, Murabito, Fowler, & Christakis, 2010) demonstrate the influence of socionormative environments on individual attitudes. For example, people who are surrounded by happy people are more likely to be happy in the future (Fowler & Christakis, 2008). Either because people seek others with attitudes similar to their own or because their in-group members' attitudes seep into them—similar to the process that occurs during emotion contagion (Parkinson, 2011)—it is reasonable to expect community attitudes to be correlated with individual members' own attitudes. The question we grapple with is how media can disrupt the homogeneity of attitudes in a community, as might be a necessary first step if the prevailing attitudes in the community, reinforced through discussions, are stigmatizing, negative, or otherwise unhealthy.

When community members' contacts with the outside world are limited (because they live in relatively isolated communities), we expect more homogeneous attitudes within the community. The idea is that individuals are more likely to adopt the attitudes of those in their social networks when those networks constitute the primary (if not exclusive) source of information. This homogeneity, however, can be disrupted, to some extent, by community members' media use. The prediction here is not straightforward, as the outcome likely depends on the extent to which the issue is controversial and evokes a sense of affective involvement (Matthes, 2013), which emanates from feelings associated with an attitude object (Krosnick, Judd, & Wittenbrink, 2005). When affective involvement is high, media messages perceived to support one's point of view are assimilated into, and those perceived to be in opposition to one's point of view are contrasted with, one's beliefs (Sherif & Hovland, 1961), resulting in an overall polarization of beliefs. For noncontroversial issues, when individuals' ego involvement in the issue is low (Petty & Cacioppo, 1979), we expect individuals' media use to expose them and thereby promote more receptivity to a range of opinions, viewpoints, and attitudes, many of which will likely be different from those circulating within their communities. Hence, media use will likely attenuate the extent to which individuals' attitudes align with those of others' in their social networks. Hence, our hypotheses are:

H2A: Community-level attitude will be associated with individual-level attitude on the same topic.

H2B: The relationship between community-level attitude and individual-level attitude will be weaker when media use is high than when media use is low.

We tested these hypotheses within the context of HIV/AIDS. For the first two hypotheses, we focused on knowledge about HIV/AIDS and for the second two hypotheses, we focused on attitudes toward people living with HIV. Focusing on HIV/AIDS gave us the opportunity to examine mass media's influence on a stigmatized issue, which, by definition, indicates a socially constructed attitude about a negatively perceived condition (Goffman, 1963; Link & Phelan, 2001, 2006).

Characterizing stigmas as “social constructions serving social functions” to protect one’s in-group, Smith (2007, p. 467) notes that the role of communication in disseminating norms surrounding stigma includes four content cues: “marking” (i.e., identifying) the stigmatized group; characterizing the group as an “other”; posing the group as a threat to in-group members; and expressing support for collective efforts to eliminate the threat. All four components of this framework can be easily understood as being applicable in stigmatizing persons living with HIV. In the absence of an external intervention, one can expect internal communications to enforce and reinforce these attitudes, particularly in communities isolated from the outside world. In such communities, external media can serve as agents of change, and the first step in that change is the disruption of the existing social order. Such change may occur, for example, at the cognitive level through observational learning (Bandura, 2009); seeing or reading about other societies with HIV-positive individuals within them functioning normally (a social learning function people derive from the media) can serve as the cue able to disrupt the stigmatizing patterns within one’s community.

As an initial test of our underlying theoretical notion, we sought a setting that provided a sufficient number of internally vibrant (i.e., close-knit and culturally unique) but externally isolated communities (those that were relatively alienated from the outside world because of geographical and transportation constraints), but where residents had reasonable access to various forms of mass media. We sought to investigate how media can disrupt in-group attitudes that are developed through social interactions. We also sought to contrast such attitudes with those that are more objective in nature—such as knowledge of well-established facts—that are less subject to refractive interpretations based on social interactions. We explored these issues at the village level in Nepal.

Nepal’s HIV/AIDS and media environment

Nepal is a south Asian country bordered by China and India. Three distinct ecological zones (high mountains, hills, and the plains) characterize Nepal’s geography. The mountainous terrain and lack of a transportation infrastructure ensures that many communities are isolated from each other. For example, the mountain zone (35% of the land), characterized by a harsh terrain, has limited transportation and communication facilities. The hill zone, covering 42% of the land, is also rugged, but transportation and communication facilities are somewhat better developed; 43% of the total population resides in this area. Finally, the plains (known as the Terai) are characterized by a tropical to subtropical climate, which includes dense forests, national parks, wildlife reserves, and conservation areas. About half the population lives in the Terai, and this area, compared to the hilly and mountainous regions, has the most developed transportation and communication facilities. Within these three ecological zones, Nepal is divided into 75 districts, which are further divided into villages (MOHP, 2012).

HIV prevalence in Nepal is 0.3% (UNAIDS, 2013), and it tends to be concentrated among certain high-risk population groups, including female sex workers,

intravenous drug users, and men who have sex with men (Government of Nepal, 2011). Male migrants traveling to and from India and clients of female sex workers are considered “bridge populations” that transmit infections from higher to lower risk groups. In 2011, the National Center for AIDS & STD Control (NCASC), the central body under the Ministry of Health that oversees HIV/AIDS issues in Nepal, adopted a comprehensive approach to address both individual-level behavioral factors and underlying structural factors that produce HIV risk. Stigma reduction is a key strategic goal of the effort.

Scholarship about HIV in Nepal tends to be focused on people living with HIV or those officially categorized as high-risk groups (Jha & Madison, 2009; Nepal & Ross, 2010; Silverman *et al.*, 2008; Wilson, Pant, Comfort, & Ekstrand, 2011), and little is known about the general population’s perceptions about people living with HIV (Hannum, 1997). Coverage of HIV issues in the media has been minimal—HIV is typically not featured as a topic in television, radio, or print news unless a high-ranking official is involved (NCASC, The POLICY Project, & Samuha, 2004).

We must consider Nepal’s media climate as the backdrop for testing our hypotheses. Unlike countries that benefit from more diverse, progressive, and international sources of entertainment and information, Nepal has seen an increasing number of newspapers close to political parties and editors of national newspapers subject to political deals (Onta, 2001). Although media have seen an impressive growth since the democratization of Nepal in the early 1990s, media access is still low and availability is concentrated in large towns and cities (Thapa & Mishra, 2003). Similarly, regulation of the broadcast sector is limited, but the sector includes over 300 independent radio stations, the state-run radio station, and about a dozen television channels (International Media Support, 2012). Although freedom of speech is an ongoing issue in Nepal, media options are diverse and able to offer varied sources of information and perspectives to audiences, especially through the radio, which the majority of both men (86.3%) and women (83.2%) in our sample listened to. Because media outlets are concentrated in a few large urban areas, it is safe to assume that most media accessed by individuals in our sample were situated externally, outside our respondents’ communities.

Methods

Data for this study come from the 2011 Demographic and Health Surveys (DHS) collected from all 75 districts in Nepal. DHS are designed to be nationally representative, and they provide data to monitor the population and health situation in more than 90 countries. The United States Agency for International Development (USAID) provides funding for these surveys. The Nepal DHS was implemented by New ERA, a data collection and research firm in Nepal, with support from Nepal’s Ministry of Health and Population, ICF International, and USAID. Data were collected between February and June 2011, with a 98% response rate for women and a 95% response

rate for men (MOHP, 2012), ages 15–49. The survey used a two-stage selection process based on an updated version of the 2001 Population Census conducted by the Central Bureau of Statistics. More details about the methodology are published elsewhere (MOHP, 2012).

Because of the different sampling procedures adopted for women and men, we conducted all our analyses separately for the two groups. This also allowed us to replicate our results obtained from one party by conducting similar tests on data collected from the other party. Given the different sampling procedures adopted for women and men, direct comparisons between the two groups can pose problems in generalizability. This issue is of lesser importance in testing the underlying theoretical relationships for each of the two groups separately.

Measurement

Standard demographic measures used in this study included age, urban or rural area of residence, religion, years of formal education, and wealth.

Wealth

A proxy for socioeconomic status, wealth was measured as the number of household possessions (scored 1 for ownership of each item, 0 otherwise) reported by the respondent. It included items such as a radio, a refrigerator, various modes of transportation, and so on. Calculation of the wealth index involved a number of steps. First, a subset of categorical and continuous indicators common to urban and rural areas was used to create wealth scores for all households. These indicators were then examined using a principal components analysis to produce a common factor score for each household. In the second step, separate factor scores were produced for households in urban and rural areas using area-specific indicators. Finally, the third step combined the separate area-specific factor scores to produce a nationally applicable combined wealth index by adjusting area-specific scores through a regression on the common factor scores (MOHP, 2012). This wealth index is a standard measure used in multiple countries, and it was already computed for each respondent in the publicly accessible dataset we downloaded.

Once the wealth index is computed, quintiles (based on percentiles) are created, with scores ranging from 1 to 5, which we used in our study. Measuring wealth through household assets in this way is thought to be a more accurate and elegant method of analyzing economic status (because it is more permanent and quantifiable) than consumption expenditures or income (Rasbash, Steele, Browne, & Prosser, 2005; Rutstein & Johnston, 2004).

Media consumption

Participants reported the frequency with which they used three media: how often they read *newspapers*, listened to the *radio*, and watched *television*. Answers for each medium were scored as never (0), less than once a week (1), at least once a week (2), or almost every day (3).

Travel previous year

In order to control for respondents' contacts with the outside world in ways other than through media use, we included the measure of how frequently in the past year respondents had traveled outside their village or town of residence.

Knowledge about HIV

Eight questions asked participants about their knowledge about HIV transmission (through pregnancy, during delivery, by sharing food, by mosquitos, and through touching), prevention (the role of condoms and efficacy of monogamy), and whether or not a healthy looking person can be HIV-positive. Correct responses were assigned a score of 1 and incorrect and "don't know" responses a score of 0. Scores ranged from 0 to 8 (women, $\alpha = .61$; men, $\alpha = .56$).

Community-level knowledge

We calculated community-level knowledge following the "non-self-mean" procedures outlined by Kaggwa, Diop, and Storey (2008) and Rimal et al. (2013). Within each village, we added the individual knowledge scores across all respondents in the village, except the target respondent, and then computed the average. Thus, in this procedure, the community-level knowledge includes the scores of everyone in the target person's village (who was in the sample) except the target person himself or herself. Following recommendations made by Kaggwa et al. (2008), we limited our sample to villages that contributed at least 25 respondents. The reason for excluding very small villages is that, when the number of individuals in a group (for calculating the nonself mean) is small, the value of the mean and that of individuals become unstable.¹

Stigma

Stigma toward people living with HIV was measured with three yes/no items: "If a member of your family became sick with HIV, would you be willing to care for him or her in your household?" "If a teacher has HIV but is not sick, should he or she be allowed to continue teaching in school?" And "If you knew that a shopkeeper or food-seller had HIV, would you buy fresh vegetables from him or her?" "Yes" was assigned a score of 0 (signifying an absence of stigma), "Don't know" was assigned a score of 0.5, and "No" was assigned a score of 1, such that higher scores represented greater stigma. Scores across the three items were averaged to obtain a stigma score (women, $\alpha = .67$; men, $\alpha = .57$).

Community-level stigma

Using the same procedures used to calculate community-level knowledge (described above), we calculated the "non-self mean" score for stigma: It was the average stigma score across everyone in the village, except the target person himself or herself.

Statistical analyses

Hypothesis 1A predicted a positive association between knowledge about HIV at the individual level with knowledge about HIV at the community level. We tested this

hypothesis first by calculating the zero-order correlation between the two variables; we conducted two separate tests, one for women and one for men. We tested this hypothesis again through hierarchical regression equations with knowledge at the individual level as the dependent variable. In the regression, we controlled for demographic variables in the first block and then added the community-level knowledge in the second block; the increment in variance was then tested for its significance, which constituted the test of the hypothesis. This test was done separately for women and men.

Hypothesis 1B predicted that use of the media would attenuate the relationship between community-level knowledge and individual-level knowledge. This hypothesis was tested three times for women and three times for men, corresponding to the three media—newspaper, radio, and television. Tests were conducted through hierarchical regression equations that first controlled for demographics and community-level knowledge (the same analyses done to test H1A). We then added the three media use variables—frequency of newspaper use, radio listening, and TV watching. The actual test of the hypothesis was done by adding the community variable \times media interaction term. To avoid multicollinearity, we included only one interaction term in the equation (e.g., the community-level knowledge \times newspaper use), removing it before adding the second interaction term (community-level knowledge \times radio use). When the interaction term was significant, we used the method recommended by Aiken and West (1991) to plot the pattern of the interaction. This involves centering (around the mean), standardizing the two variables, and then plotting the relationship between the independent and dependent variables at three values of the moderator—at one standard deviation above the mean, at the mean, and at one standard deviation below the mean (corresponding to the high, medium, and low values).

Hypothesis 2A and 2B were tested in exactly the same way as H1A and H1B, respectively, except that stigma (as opposed to knowledge) was the dependent variable.

Results

Preliminary analyses

Table 1 shows the description of the sample, separated by women and men. Because of the DHS interest in maternal and child health, the sampling procedure includes significantly more women than men, which was also reflected in our data; we included 12,608 women and 1,237 men. These numbers are lower than the total sample because we restricted our analyses to those who came from villages that contributed at least 25 persons to the dataset (this was done to maintain the stability of the nonself mean calculations of community-level variables, as explained previously). This resulted in a higher proportion of women from rural than urban areas and a higher proportion of men from urban than rural areas. Our women's sample contained 230 villages, and our men's sample contained 27 villages. In the women's sample, the average number of

Table 1 Description of the Sample

Variable		Women (<i>N</i> = 12,608)	Men (<i>N</i> = 1,237)
Age	<i>M</i> (<i>SD</i>)	28.73 (9.60)	28.23 (9.37)
Urban location	%	29.4	83.3
Travel last year	%	71.5	70.2
Religion			
Hindu	%	85.8	84.2
Buddhist	%	8.0	7.3
Muslim	%	2.6	4.4
Other	%	3.6	4.1
Education			
None	%	38.3	6.5
Primary	%	17.0	15.4
Secondary	%	36.3	52.1
>Secondary	%	8.4	25.9
Newspaper			
<Once a week	%	86.1	46.6
Once a week or more	%	13.9	53.4
Radio			
<Once a week	%	52.5	46.9
Once a week or more	%	47.5	53.1
Television			
<Once a week	%	51.6	28.8
Once a week or more	%	48.4	71.2
Knowledge (0 to 8)	<i>M</i> (<i>SD</i>)	6.18 (1.54)	6.63 (1.46)
Stigma (0 to 1)	<i>M</i> (<i>SD</i>)	.20 (.30)	.09 (.21)

participants per village was 74.28 (*SD* = 61.46), and in the men's sample, it was 60.49 (*SD* = 39.33).

Approximately 16% of the women in our sample lived in the mountain region, 39% lived in the hill region, and 45% lived in the Terai region. In our men's sample, 5.3% lived in the mountain region, 33% lived in the hill region, and 61% lived in the Terai region. According to the census, 7% of Nepal's population resides in the mountains, 43% in the hills, and 50% in the Terai (Nepal Census, 2011).

The average age of our sample was approximately 28 years, and our sample comprised predominantly Hindus (85%). Among women, 38% had received no formal education, whereas the corresponding proportion among men was 6.5%. A quarter of the men in our sample had education beyond a secondary level, whereas the corresponding proportion among women was 8%. Men, thus, were better educated than women.

Approximately 86% of women and 47% of men reported reading newspapers less frequently than once a week; more than half the men and only 14% of the women reported reading newspapers more often than once a week. Radio listening patterns

were somewhat similar between men and women: Approximately half reported listening to the radio once a week or more often. Roughly half the women and 71% of the men reported watching television once a week or more. For both men and women, television was utilized with the greatest frequency (men: 71.2% watch at least once a week; women: 48.4% watch at least once a week). Also, television was the most preferred source of media for health-related information for both women (44.2%) and men (53.2%). Newspaper or magazines were the least preferred source of health-related information for both women (2.5%) and men (9.7%).

Knowledge about HIV was rather high: On an 8-point scale, women scored 6.18 ($SD = 1.54$) and men scored 6.63 ($SD = 1.46$). Stigma toward people living with HIV was low. On a scale from 0 to 1, women scored 0.2 and men scored .09.

Table 2 shows the zero-order correlations among the various predictors in our models. A few observations are noteworthy. First, the table shows the privilege of education. Those who were better educated had higher levels of knowledge ($r = .48$, $p < .001$ for both women and men) and lower levels of stigma ($r = -.37$, $p < .001$ for women and $r = -.28$, $p < .001$ for men). Education was also positively correlated with use of all three media (newspaper, radio, and television) for both women and men, and higher education tended to be a characteristic of younger people (reflecting a generational trend in Nepal). Second, media use patterns across channels were intercorrelated: For both men and women, those who tended to read more newspapers also watched more television ($r = .30$, $p < .01$ for men and $r = .43$, $p < .01$ for women) and listened to the radio more often ($r = .26$, $p < .01$ for men and $r = .23$, $p < .01$ for women). Use of all three media channels was associated with higher knowledge and lower stigma for both men and women. Given that our media consumption measure did not take into account media content, the pattern of positive correlations across media types suggests that media use may be tapping into individuals' curiosity about the outside world. In addition, positive associations between media consumption and education suggest that those more privileged may be using media more often.

Hypothesis 1A

Hypothesis H1A predicted a relationship between community-level knowledge and individual-level knowledge. It was tested first through a Pearson correlation. For women, the correlation between knowledge at the individual level and community level was $r = .33$, $p < .001$. For men, the corresponding correlation was $r = .23$, $p < .001$.

Table 3 shows results from a multivariate analysis that predicted knowledge about HIV at the individual level. We first controlled for demographics, which explained 24.1% of the variance in knowledge for women and 26.2% of the variance for men. In the second block, we added community-level knowledge. This variable was significantly associated with individual-level knowledge for both women ($\beta = .22$, $p < .001$) and men ($\beta = .16$, $p < .001$). Hence, Hypothesis 1A was supported at both the bivariate and multivariate levels for both women and men.

Table 2 Zero-Order Correlations (women, $N = 12,608$, above the diagonal; men $N = 1,237$, below the diagonal)

	Age	Urban	Travel	Hindu	Muslim	Educ.	Wealth	Newspaper	Radio	TV	Knowledge	Stigma
Age	1.00	-.00	-.09***	.01	-.03***	-.46***	.01	-.26***	-.12***	-.10***	-.19***	.15***
Urban	-.02	1.00	.05***	.03**	.03**	.24***	.49***	.32***	-.01	.36***	.14***	-.16***
Travel	.04	.04	1.00	.04***	-.05***	.22***	.18***	.08***	.12***	.12***	.12***	-.09***
Hindu	.02	.10***	-.02	1.00	-.41***	.05***	.03**	.04***	.01	.04***	.04***	-.01
Muslim	-.04	.08**	.02	-.50***	1.00	-.10***	.03**	-.07***	-.10***	-.03**	-.04***	.04***
Education	-.20***	.05	.13***	.10***	-.13***	1.00	.46***	.66***	.25***	.43***	.48***	-.37***
Wealth	.06	.27***	.14***	.05	-.01	.44***	1.00	.48***	.06**	.65***	.32***	-.32***
Newspaper	-.03	.04	.14***	.06*	-.07*	.62***	.45***	1.00	.23***	.43***	.37***	-.30***
Radio	-.09**	-.07*	.05	.01	-.06*	.21***	.09**	.26***	1.00	.17***	.17***	-.12***
TV	-.01	.11***	.09**	.02	.03	.27***	.44***	.30***	.09**	1.00	.29***	-.28***
Knowledge	-.04	-.01	.08**	.03	-.05	.48***	.36***	.41***	.18***	.23***	1.00	-.52***
Stigma	-.02	-.06*	-.07*	-.05	.04	-.28***	-.20***	-.28***	-.07*	-.11***	-.41***	1.00

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3 Predictors of Knowledge About HIV From Regression Equations^a

Predictors	Women, N = 12,608			Men, N = 1,237		
	β_1	β_2	β_3	β_1	β_2	β_3
Block 1						
Age	.01	-.01	-.01	.02	.01	.01
Urban	-.03*	-.06***	-.06***	-.08**	-.07**	-.06*
Hindu	.01	.02	.02	-.02	-.02	-.02
Muslim	-.02	.02*	.03**	.00	.03	.02
Education	.41***	.38***	.34***	.40***	.40***	.33***
Wealth	.15***	.09***	.07***	.21***	.16***	.12***
Travel last year	.01	.01	.01	-.01	.00	-.01
(Block 1 R^2)	(.241***)			(.262***)		
Block 2						
Community knowledge (CK) ^b	.22***	.21***		.16***	.16***	
(Block 2 ΔR^2)	(.038***)			(.023***)		
Block 3						
Newspaper (NP)			.05***			.11**
Radio (R)			.07***			.07**
TV			.03*			.06*
(Block 3 ΔR^2)			(.006***)			(.017***)
CK \times NP ^c			-.29***			-.97**
CK \times R ^c			-.26***			-.04
CK \times TV ^c			-.21***			-.04

^aCell entries are standardized β s from regression equations. β_1 , β_2 , and β_3 , represent coefficients with all variables in Block 1, Block 2, and Block 3 entered into the equation, respectively.

^bCommunity-level knowledge pertains to average knowledge in village without the target person.

^cOnly one of the three interactions was entered each time; it was removed before entering the subsequent interaction term. For the interaction terms, because of multicollinearity, it is advisable to interpret only the polarity and significance of the coefficient, not its absolute magnitude (Aiken & West, 1991).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Hypothesis 1B

H1B predicted an interaction between media use and community-level knowledge, with individual-level knowledge as the dependent variable. Tests of the hypothesis are shown in Table 3. In Block 3, we added the three media main-effects—frequency of use of newspaper, radio, and television. Each of the three main-effects was significant for both women and men, explaining .6% ($p < .001$) and 2.3% ($p < .001$) of the variance, respectively.

Among women, each of the three interaction terms was significant: newspaper \times community-level knowledge, $\beta = -.29$, $p < .001$; radio \times community-level knowledge, $\beta = -.26$, $p < .001$; and television \times community-level knowledge, $\beta = -.29$, $p < .001$.

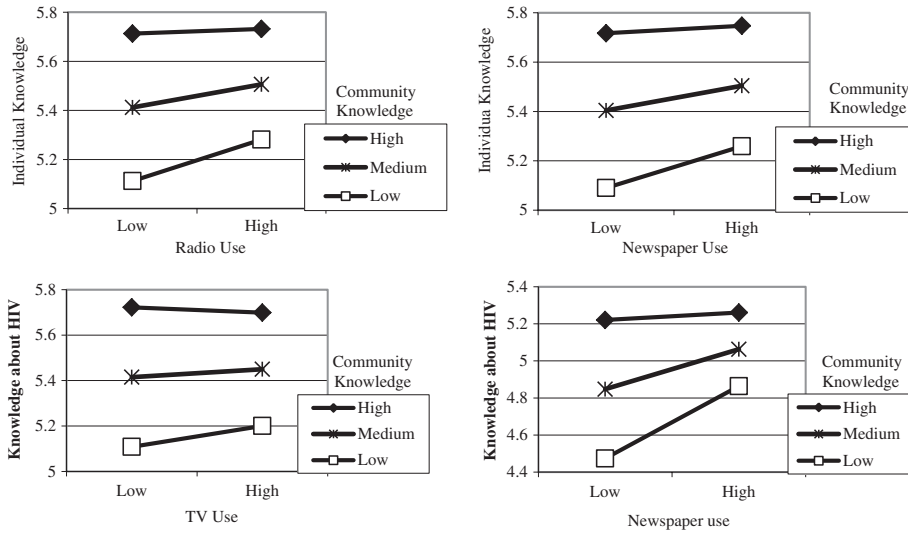


Figure 1 Relationships among media use and community-level knowledge. All charts except the bottom right are for women; the bottom right chart pertains to men.

Among men, the interaction between community-level knowledge and newspaper use was significantly correlated with individual knowledge $\beta = -.97, p < .001$, but the other two media (radio and television) did not have significant interaction effects.

The nature of the statistically significant interactions is shown in Figure 1. The first panel in Figure 1 shows that when women resided in highly knowledgeable villages, the relationship between their newspaper use and their own knowledge was not significant ($\beta = .01, p > .05$). If they resided in communities with moderate levels of knowledge, newspaper use was positively associated with knowledge ($\beta = .06, p < .001$), which was even stronger if they resided in communities with low levels of knowledge ($\beta = .11, p < .001$). Hence, the relationship between newspaper use and knowledge was stronger in communities with lower levels of collective knowledge than in communities with higher levels of collective knowledge.

We see a similar pattern for radio use, as shown in the second panel in the first row of Figure 1. The relationship between radio use and knowledge got stronger when community-level knowledge got weaker: It was not significant if women came from highly knowledgeable communities ($\beta = .03, p > .05$), it was significant if they came from communities with moderate levels of knowledge ($\beta = 0.1, p < .001$), and it was strongest if women came from communities that were least knowledgeable ($\beta = .17, p < .001$).

Use of television showed similar patterns as well. The relationship between television use and individual-level knowledge was not significant when women came from highly knowledgeable communities ($\beta = -.02, p > .05$), but this relationship got stronger as the communities got weaker in knowledge: $\beta = .04, p < .05$ for

the moderate-knowledge community and $\beta = .09$, $p < .001$ for the low-knowledge community.

For men, only newspaper use showed this pattern (radio and television use did not). As shown in the last panel in Figure 1, the relationship between newspaper use and individual-level knowledge got weaker as men came from communities that were more knowledgeable: $\beta = .03$, $p > .05$ for high-knowledge communities; $\beta = .14$, $p < .001$ for medium-knowledge communities; and $\beta = .26$, $p < .001$ for low-knowledge communities.

Overall, then, H1B was supported for all three tests among women and for newspapers, but not radio or television, among men.

Hypothesis 2A

H2A predicted an association between community-level stigma and individual-level stigma. The Pearson correlation between these two variables was $r = .34$, $p < .001$ for women and $r = .17$, $p < .001$ for men. Results from the multivariate analyses are shown in Table 4. Demographic variables accounted for 16.6% of the variance in women ($p < .001$) and 8.9% of the variance in men ($p < .001$). The community-level stigma was associated with individual-level stigma for both women ($\beta = .24$, $p < .001$) and men ($\beta = .15$, $p < .001$). Hence Hypothesis 2A was supported at both the bivariate and multivariate levels for both women and men.

Hypothesis H2B

Results of the analyses conducted to test H2B, with stigma as the dependent variable, are shown in Block 3 in Table 4. For women, there was a significant main-effect for use of newspapers, radio, and television, and these variables explained .6% of the variance in stigma ($p < .001$) among women and 2.1% ($p < .001$) among men.

Among women, there was a significant interaction between newspaper use and community-level stigma on individual-level stigma. The nature of the relationship is shown in the first panel in Figure 2. For women from high-stigma communities, newspaper use was negatively associated with their own stigma ($\beta = -.13$, $p < .001$). This relationship was weaker (though remained significant) for women from medium-level stigma communities ($\beta = -.07$, $p < .001$), and it was not significant for women from low-level stigma communities ($\beta = -.01$, $p > .05$).

A similar pattern was found for women's use of radio, which was significantly associated with stigma in high-stigma communities ($\beta = -.09$, $p < .001$). This relationship was lower, though significant, in medium-stigma communities ($\beta = -.06$, $p < .001$), and lowest in low-stigma communities ($\beta = -.04$, $p < .01$).

Women's use of television did not display the pattern found for newspaper and radio.

Men's newspaper reading, shown in the second row in Figure 2, also varied by the community-level stigma. In high-stigma communities, the relationship between newspaper reading and stigma was significant ($\beta = -.13$, $p < .001$), which was lower,

Table 4 Predictors of Stigma Toward People Living With HIV From Regression Equations^a

Predictors	Women, N = 12,608			Men, N = 1,237		
	β_1	β_2	β_3	β_1	β_2	β_3
Block 1						
Age	.03**	.03**	.03**	-.06*	-.06*	-.06*
Urban	.00	.02*	.03**	-.03	.01	.00
Hindu	.02**	.02*	.02	-.02	.01	.01
Muslim	.04***	.04***	.04***	.00	.00	.00
Education	-.26***	-.26***	-.22***	-.25***	-.25***	-.317***
Wealth	-.320***	-.307***	-.304**	-.307*	-.307*	-.304
Travel last year	-.301	-.301	-.301	-.302	-.304	-.303
(Block 1 R^2)	(.166***)			(.089***)		
Block 2						
Community stigma (CS) ^b		.24***	.25***		.15***	.15***
(Block 2 ΔR^2)		(.039***)			(.021***)	
Block 3						
Newspaper (NP)			-.305***			-.314***
Radio (R)			-.306***			-.301
TV			-.304**			.00
(Block 3 ΔR^2)			(.006***)			(.012**)
CS \times NP ^c			-.310***			-.325***
CS \times R ^c			-.307**			-.320**
CS \times TV ^c			-.303			-.322***

^aCell entries are standardized β s from regression equations. β_1 , β_2 , and β_3 , represent coefficients with all variables in Block 1, Block 2, and Block 3 entered into the equation, respectively.

^bCommunity-level stigma pertains to average stigma in village without the target person.

^cOnly one of the three interactions was entered each time; it was removed before entering the subsequent interaction term. For the interaction terms, because of multicollinearity, it is advisable to interpret only the polarity and significance of the coefficient, not its absolute magnitude (Aiken & West, 1991).

* $p < .05$. ** $p < .01$. *** $p < .001$.

though also significant, in medium-stigma communities ($\beta = -.07$, $p < .001$), and it was not significant in low-stigma communities ($\beta = -.01$, $p > .05$).

The relationship between men's radio use and stigma also varied by community-level stigma. When community-level stigma was high, the relationship between radio use and stigma was significant ($\beta = -.23$, $p < .001$), but this relationship was not significant for both the medium-stigma communities ($\beta = -.09$, $p > .05$) and the low-stigma communities ($\beta = .06$, $p > .05$). This is shown in the second panel of the second row in Figure 2.

Finally, the relationship between men's television use and stigma also varied by community-level stigma. When men came from high-stigma communities, the relationship between television use and stigma was negative and significant ($\beta = -.22$,

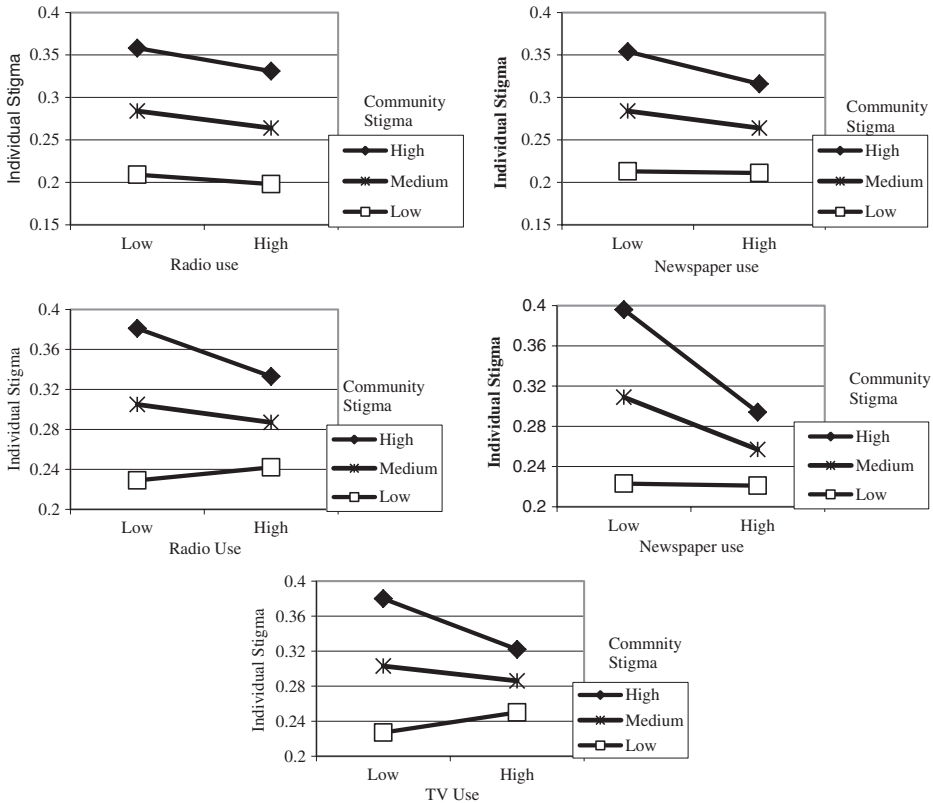


Figure 2 Relationships among media use and community-level stigma. The top row pertains to women and the second two rows pertain to men.

$p < .001$), and this relationship was not significant for medium-stigma communities ($\beta = -.07, p > .05$). For low-stigma communities, the relationship became positive and significant ($\beta = .09, p < .05$).

Thus, H2B was supported for two of the three tests among women (for newspapers and radio but not for television), and it was supported for all three tests among men.

Discussion

This article was based on the idea that the within-community homogeneity in knowledge and stigma would be lower when individual-level media use was higher than when it was lower. In our conceptualization of media as either educator (for knowledge) or disruptor (for stigma), we theorized that the relationship between community knowledge (or attitude) and individual knowledge (or attitude) would be higher when individuals were receiving most of their information from within the community—that is, when they were not using the media very much. When individuals used media to a greater extent, we predicted that the otherwise

well-coupled relationship between community-level knowledge (or attitude) and individual-level knowledge (or attitude) would be attenuated. We tested this proposition 12 times—across three media and two outcomes for men and women—and found support across nine of these tests.

Our results lend support to the idea that social context moderates how media's effects are received by the audience, which we call the *refraction of media effects*. Though various media effects theories (e.g., agenda setting, cultivation theory, framing theory) have indirectly suggested the influence of social context on individual outcomes, none have explicitly examined how the social environment interacts with media exposure. Instead, when they do, theories of mass media tend to focus on individual-level moderators, such as political orientation (Scheufele, 1999), majority or minority group status (Gerbner & Gross, 1976), or victimization (Slater, 2007). These moderators, of course, could have been shaped by the social context, but the social context itself is not theorized to affect how media effects are realized. Thus, we contribute to the mass communication literature by uniquely positioning social context at the center of our understanding of media effects, and by examining its influence directly rather than through indirect, individual-level proxies.

Our results indicate that media's role as conduits of information is more acute when people's immediate community lacks high levels of knowledge about a topic. The disparate influence of media exposure on communities with lower versus higher levels of knowledge supports the notion that the extent to which media shape individuals' knowledge is associated with the information available within the community that can typically be accessed through interpersonal discussion. This makes intuitive sense. For individuals who live in highly informed communities, the need for media to act as additional sources of knowledge—as educators—is not as critical; instead, individuals can turn to their neighbors and gain information directly through interpersonal discussions.

Our results on stigma toward people living with HIV echo our findings about knowledge. Among individuals living in communities with lower levels of stigma, media use (for television, radio, and newspapers) was not associated with individual-level stigma; in contrast, among individuals in high-stigma communities, media use was negatively associated with individual-level stigma. The moderating role of media exposure on community-level stigma suggests a socially significant and progressive function of mass media. In communities characterized by high stigma toward people living with HIV, greater media exposure may help disrupt negative attitudes by exposing audiences to alternative perspectives. In contrast, communities that were already low on stigma toward people living with HIV may have subscribed to a more open-minded perspective to begin with, diminishing the need for media to facilitate exploration and understanding.

Our notions about media as disruptor are based on the idea that bringing about change in the existing social order requires, as a first step, a disruption in that order. In the context of stigma toward people living with HIV, without disruption, social interactions can serve to enforce existing stigmatizing beliefs (Smith, 2007). In this

context, external media can function as the first step in that disruption process by modeling appropriate behaviors and their functional outcomes—by depicting, for example, societies with HIV-positive persons functioning normally, productively. Future research should explore these possibilities through qualitative interviews to enhance our understanding of the role that media play in shaping people's knowledge, attitudes, and perceptions.

It is worth revisiting our operationalization of media use—as frequency of weekly exposure to radio, television, and newspapers—that did not include content-specific exposure. Given the low HIV prevalence in Nepal (0.3%), HIV-related content in Nepali media remains minimal and hence a content-specific measure would likely not have been very meaningful. The associations we found in line with our hypotheses suggest that our measure was likely tapping into some individual-level outlook (e.g., curiosity about the outside world) or privilege (owning a television, ability to read a newspaper, etc.). This indicates that the positive associations with HIV knowledge and negative associations with HIV stigma did not depend on consuming specific media content that directly addressed HIV. Rather, these positive outcomes were associated with consuming media in general. This suggests that media may have an overall gestalt influence by exposing individuals to more information and perspectives than could be obtained through interpersonal discussions with community members alone. Perhaps media use serves to expose individuals to diverse opinions, topics, situations, and people, which encourage the cultivation of a more cosmopolitan perspective that is antithetical to narrow views about others. The topical content of media (e.g., whether the media content was about HIV or not) appears to be less important than the fact that individuals were using media *per se*. Future research could disentangle the two pathways we are proposing (that media use results in the infusion of new information or that media use is a proxy for a progressive characteristic) by controlling for the underlying individual differences.

The vicarious learning component of social cognitive theory offers another possible explanation for the positive effect of general media consumption on the attitudes of individuals living in relatively isolated communities. Bandura (1986) posited that much learning occurs by observing models. Similar to in-person observational models, media can enable mediated experiences that encourage vicarious learning by exposing audiences to narratives that serve informational as well as entertainment purposes. Then, in a sense, media can act as substitutes for lived experiences by allowing readers, listeners, and viewers to consider hypothetical situations that they have yet to encounter. By providing the opportunity to practice perspective-taking with unfamiliar others (Chung & Slater, 2013), media may help discourage the tendency to perceive differences as threatening, thereby decreasing stigma. Future studies should explore these relationships between media, vicarious learning, and stigma in greater depth.

We note that the relationship between community-level knowledge and individual-level knowledge was associated with frequency of newspaper reading for men, whereas all three forms of media exposure interacted with community-level

knowledge in correlating with women's individual-level knowledge. This may have been due to the differences in men and women's literacy (90 vs. 61%, respectively) and education levels. Whereas lower literacy and less education may be associated with the perception that newspaper, television, and radio are equally reliable sources of information, men—especially those who are better educated—may be more inclined to discriminate among the three. The majority of Nepali men may have deemed newspapers to be a credible information source due to their awareness about the journalism standards that guide the publication of most news stories—a privileged perspective that their higher education levels may have conferred. As a result, only frequency of newspaper exposure significantly moderated the relationship between community-level knowledge and individual-level knowledge.

All three media sources interacted with community-level stigma in showing the association with men's individual-level stigma. This indicates that although men may discount radio and television as credible information sources, they do not discount it as a practical way to learn about other people. In support of the research on entertainment education, which argues that media can provide vicarious social experiences and encourage prosocial outcomes (Singhal & Rogers, 2004), audiences do not dismiss the emotional experiences and cognitive revelations they have while immersed in entertainment media. Rather, these vicarious experiences can have real, long-lasting consequences on viewers. Our findings suggest that media may help reduce stigma toward people living with HIV and emphasize the need for media to disseminate socially responsible messages. Future research should further explore these issues by asking respondents about the ways in which they perceive and utilize different types of media in order to refine their knowledge and shape their attitudes about health topics and out-group members.

Programmatic implications

Our findings have important practical and programmatic implications, two of which appear rather salient from our findings. First, it is clear that interventions need to take seriously and incorporate into their design the prevailing opinion and attitudinal climate in communities slated to receive the intervention. It would be erroneous to assume homogeneity in comprehension of intervention messages. Rather, those with low levels of existing knowledge living in less knowledgeable communities appear to have the greatest information deficit. For these individuals, interventions may need to come up with creative methods to reach them—perhaps by augmenting their messages through interpersonal channels. Second, in order to reduce stigma, external media (or interventions) have to play a critical role in serving as the disrupting force. If observational learning is the underlying mechanism through which media use results in reductions in stigma, as we have assumed in this article, then media messages have to present appropriate role models who are able to depict positive and “normal” outcomes from interactions with stigmatized individuals.

Limitations

The primary limitation of this study is the use of a cross-sectional design, which limits our ability to make causal claims. Thus, we do not know whether consuming media resulted in lower levels of stigma or that those with lower levels of stigma were more open to consuming media. Similarly, it may be that more knowledgeable people were more likely to consume more media (rather than greater media consumption resulting in higher knowledge). Although these alternative explanations are plausible, strong theoretical arguments (from social cognitive theory, for example) would lend credence to the idea that media exposure provides vicarious experiences and observational learning opportunities, which, in turn, result in improvements in knowledge and reductions in stigma. It is also worth noting that the media effects we are proposing in this article pertain not only to the main-effects, but also to the interaction effects: We theorized that the *relationship* between community-level and individual-level knowledge (and attitude) would be altered. It is more difficult to imagine that such a relationship would be the driver of media use. Nevertheless, future studies could adopt a longitudinal design to determine whether the change in knowledge (or attitude) over time would be affected by the earlier media use.

Our hypotheses were tested in the context of geographically isolated communities in Nepal—ones where the mass media served as important links with the outside world. The extent to which our findings would generalize to other, better-linked communities remains to be seen. The question we hope future researchers will raise pertains to whether and to what extent media can serve as disruptors or educators when communities are better able to communicate with each other and when media constitute one of many other sources of information and influence.

Another limitation of the study was that our sample may have become more homogenous because we limited our analyses to those who came from villages with at least 26 respondents. It may well be that those who came from smaller villages, who were not included in our sample, would have weaker links with their communities. This is also worthy of further inquiry.

Like any other survey, our study is also subject to social desirability bias. This is particularly problematic when we assess issues such as stigma about which people generally know the appropriate response when asked in a survey. We should note, however, that knowledge about HIV would be less subject to social desirability bias because, after all, it is a test with correct and incorrect answers. Given that knowledge and stigma showed similar results, we have greater confidence that the theoretical propositions proposed in this article may, indeed, constitute the most parsimonious explanation of the underlying process.

Finally, we note that women in our sample included only those of reproductive age, which also limited our operationalization of community. The extent to which our findings generalize to younger and older women (outside reproductive age range) remains to be seen.

Conclusion

In this study, we tested how media use moderates the relationship between community-level factors and individual-level factors. We found that, in highly knowledgeable communities, high levels of media use were not associated with greater individual knowledge; in such communities, individuals may have been acquiring knowledge from their peers, or it could be that information they received from the media was redundant with the high-level knowledge that already existed in their communities. In less knowledgeable communities, however, higher levels of media use were associated with greater individual knowledge. This likely indicates that the media served to provide information other than what was circulating in the community. The pattern we found with stigma was also similar: When collective stigma was low, media use was not associated with individual-level stigma. When collective stigma was high, however, individuals' use of the media was associated with lower levels of stigma.

Our findings clearly indicate that theories of media effects can increase their explanatory power by incorporating social processes in an integral way. It is these social processes that serve as the filter through which individuals process, and therefore refract, media messages.

Note

1 Consider the extreme when only three individuals, with scores 1, 1, and 7 are included. The group mean is 3, but when the last individual (with a score of 7) is taken out, the mean drops to 1, and when the first individual is taken out, the mean increases to 4. Thus, in order to keep the mean relatively stable, Kaggwa et al. (2008) rightly recommend that only groups with 25 individuals be considered in calculating the nonsell mean.

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