AIDS and Me, Never the Twain Shall Meet: The Effects of Information Accessibility on Judgments of Risk and Advertising Effectiveness

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The HIV virus is now an international killer, but individuals perceive that they are less likely to contract the virus than are others (the self-positivity bias). Three studies investigate the antecedents and consequences of the self-positivity bias in judgments of the risk of contracting AIDS. We show that the perceived similarity of another person to oneself and the ease with which related information can be retrieved from memory (the accessibility of information) moderate self-perceptions of risk in an absolute sense and reduce the self-positivity bias. We then demonstrate that increasing the accessibility of a cause of AIDS, in an advertisement propounding safe sex, increases perceptions of one's own risk of contracting AIDS, reduces the self-positivity bias, leads to more favorable attitudes and intentions toward practicing precautionary behaviors (e.g., using condoms, taking an HIV test), and also leads to deeper processing of AIDS educational material. Theoretical implications regarding the use of the accessibility of information as a cue and the self-positivity bias are discussed, and recommendations for social marketing communications are offered.

The contraction of AIDS, or the HIV virus, is undoubtedly one of the most frightening prospects for an individual in today's society. For males between the ages of 15 and 44 in the United States, HIV infection and AIDS are among the top three causes of death (Eckholm 1992). According to a 1997 World Health Organization (WHO) report, about 1.5 million people died of HIV/AIDS in 1996. The WHO also conservatively estimates that about 40 million people in the world will be infected with HIV by the year 2000, with Asia soon overtaking Africa as the continent with the most cases. In some African cities, one in 10 people are estimated to be HIV positive (Masters, Johnson, and Kolodny 1995, pp. 387–388). The statistics do not support the stereotype that AIDS is primarily a problem for gay men; HIV is spreading rapidly among some groups of teenagers, equally for males and females (Kolata 1989). The 1997 WHO report estimates that 75–85 percent of HIV infections in adults have been transmitted through unprotected sexual intercourse, with heterosexual intercourse accounting for more than 70 percent. The Joint United Nations Programme on HIV/AIDS reports that women are becoming increasingly affected by HIV. As of January 1997, it reports that 42 percent of the 21 million adults living with AIDS are women. Numerous instances document infection occurring with a single episode of heterosexual intercourse (Glaser, Strange, and Rosati 1989).

However stark these figures may be and the concomitant risk they imply, people's self-perceptions of risk can best be characterized by an ''it cannot happen to *me*'' syndrome. The social psychology literature can explain this phenomenon in terms of the tendency on the part of people to lean toward perceptions of oneself that are, in general, self-enhancing (Taylor and Brown 1988). This ''self-positivity bias'' is of critical concern to social mar-

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keters because it implies that people have a tendency to assume that they are special and, hence, impervious to the social marketing issues being advertised (see DiClemente and Peterson 1994; Fisher and Fisher 1992). If the self-positivity bias is in operation, the audience exposed to social issue advertising may discount the likelihood that the advertised negative outcome can occur to them. This diminishes the effectiveness of advertising aimed at encouraging consumers to take preventive action.

In this article we suggest an approach that can be used by social marketers to influence perceptions of risk: increasing the accessibility of AIDS-related information. In study 1, we demonstrate the self-positivity bias: people believe that others are at higher risk of contracting AIDS than themselves. Moreover, the bias is greater with respect to others who are perceived to be dissimilar rather than similar to oneself. Attempting to reduce this bias, study 2 examines the effect of increasing the accessibility of causal behaviors in memory on self-perceptions of risk. Results show that when people focus on instances of AIDS-related behaviors before judging their own risk level, their estimates for their own risk are higher, and this reduces the self-positivity bias. However, as recalling AIDS-related behaviors becomes more difficult, perceptions of risk for oneself also decrease. Taken together, the results suggest that communication about AIDS should cue behaviors that cause AIDS. Nonetheless, this strategy of cuing behaviors can backfire if behaviors with lower risk likelihoods are recalled and these behaviors are inaccessible in the minds of the audience. Study 3 tests this implication for AIDS advertising aimed at increasing safer sex practices.

THEORETICAL FRAMEWORK

In this section, we present the theory on which we draw to derive hypotheses regarding the self-positivity bias, the effect of information accessibility on the bias, and the consequences of the bias. Each of these sets of hypotheses are subsequently tested in three studies.

The Self-Positivity Bias

The finding that people's self-perceptions are in general self-enhancing, even in the face of reality, is robust and has been found in contexts ranging from self (vs. other) personality assessments, people's illusion of control over chance events, and assessments of the future (see Taylor and Brown [1988] for a review). One of the explanations of the self-positivity bias is that it is a method to maintain self-esteem (Taylor and Brown 1988). Weinstein (1980) found that people estimated the likelihood of something pleasant happening (e.g., having a gifted child) as greater for themselves than for their peers, while they estimated the likelihood of something negative happening (e.g., having trouble finding a job) as lower for themselves than for their peers. He observed that people ''expect others to be victims of misfortune, not themselves. Such ideas imply not merely a hopeful outlook on life, but an error in judgment that can be labelled *unrealistic optimism*'' (p. 806; emphasis added). Similar effects have been demonstrated for predictions of other negative events such as becoming ill (Perloff and Fetzer 1986), having an accident (Robertson 1977), and getting depressed (Kuiper, MacDonald, and Derry 1983). For example, Perloff and Fetzer (1986) investigated the existence of this effect for 10 negative events including developing hypertension, being diagnosed with cancer, having a heart attack, developing a drinking problem, getting divorced, having a venereal disease, being mugged, having a car accident, having a nervous breakdown, and developing diabetes. They found the effect for seven of the 10 events (study 1; estimated likelihood of a car accident, a nervous breakdown, and diabetes were not susceptible to the bias). The risk of AIDS may, however, be in a class of its own as the consequence of being diagnosed HIV positive is, at the time of this article going to press, almost determinate and fatal, with curative measures still not widely available. Eight of the 10 medical problems tested by Perloff and Fetzer were not ones leading directly to death. They did not find the self-positivity bias relative to a known, similar other (e.g., one's best friend) in the two fatal domains tested: cancer and heart attack. From an individual's point of view, both of these are less controllable than contracting AIDS. Both the fatal nature of AIDS and its controllability should lead an individual to maintain self-esteem by believing that they are less at risk of contracting AIDS than all others, even known and similar others, such as a best friend.

An interesting question is how this positivity bias translates to people's judgments about others. The literature suggests that people have a tendency to assume that those similar to themselves share their own attitudes and behaviors. Menon et al. (1995a) found that people tend to anchor on their own judgments, basing reports of their spouse's attitudes and frequency of performing behaviors on their own attitudes and behavioral frequencies (see also Bickart et al. 1994). Menon, Raghubir, and Schwarz (1995b) demonstrated that people overweigh their own behavioral frequency when arriving at a frequency estimate for another person, and this overweighing is greater the more similar the other person is to oneself. Therefore, estimates of other's risk are likely to be based on estimates of one's own risk, and this effect is likely to be exacerbated the more similar the other person is to oneself. Therefore, the more similar the other person, the lower their estimated risk. However, because of self-positivity, people should perceive themselves as being less risk-prone than even known and similar others.

Information Accessibility

Perceptions of one's own risk should theoretically be a function of the number and type of AIDS-related behaviors that are accessible in memory. The greater the number of behaviors that are accessible, the higher should be

the perception of one's own risk, as people should sum individual risk estimates of each behavior retrieved. There is evidence to show that decomposing a domain into subdomains is associated with more accurate assessments. For example, Menon (1997) demonstrated that eliciting behavioral frequencies at the subcategory level rather than at the category level leads to more accurate frequency judgments for behaviors for which relevant information is not easily accessible in memory. Therefore, the more AIDS-related behaviors that can be retrieved, the higher one's perception of the risk of AIDS should be. This argument assumes that the differential accessibility of behaviors in different subdomains is not informative.

Accessibility, however, is a direct function of the frequency and recency of activation of information in memory (Higgins 1989). The higher the information accessibility, the more easily information should come to mind. When information comes to mind easily, people are more confident about responses based on this information, even when these responses are inaccurate (Kelley and Lindsay 1993). Ease of retrieval of information has also been shown to affect judgments of the probability of an event occurring, with these being higher when information comes to mind easily (Tversky and Kahneman 1973). This phenomenon is based on the subjective experience of remembering. This subjective experience leads people to misattribute the reason why information is highly accessible. For example, Hoch (1984) demonstrated that when subjects generated reasons why a future event may or may not happen, the first set of reasons were easier to generate and these reasons subsequently affected subjects' likelihood predictions. Similar effects have been demonstrated in the literature on calibration of subjective probabilities (Koriat, Lichtenstein, and Fischoff 1980) and in theories of causal judgment (Sherman and Titus 1982; Wells and Gavanski 1989) and subsequent behavior (Sherman 1980).

Since higher-frequency behaviors are more accessible and easier to recall, the converse suggests that the less accessible a behavior, the lower its perceived frequency. The perceived difficulty of recalling a behavior may imply that the behavior is not performed very often and hence may be used as a proxy for estimating the overall population size (Schwarz et al. 1991). In Schwarz et al.'s (1991) studies, when subjects were asked to recall six examples of assertive behaviors, they rated themselves as more assertive than when they were asked to recall 12 examples. Schwarz et al. explained their results in terms of the informative function of the ease of recall of the behaviors: as the length of the recall task increased, the behaviors became increasingly difficult to recall, leading subjects to infer that they had less of the trait exemplifying that behavior. Using a different experimental manipulation, Wänke, Bohner, and Jurkowitsch (1997) have shown that when people list aspects of a product or service that they like (e.g., what they like about a BMW car), they are more satisfied when they perceive the number of items they have listed to be high versus low. This is because when they perceive that they have listed a large number of items, it is easy to attribute the effort involved to task difficulty rather than to the inaccessibility of information in one's own memory. This attribution impedes the inference that the overall frequency of likable service aspects is small and leads to improved ratings.

In the current context, if AIDS-related behaviors are more accessible in memory (i.e., easier to retrieve), people should realize that the risk of AIDS is less far removed than they might have otherwise perceived it to be. Thus, higher information accessibility should lead them to magnify estimates of their own risk of contracting AIDS. However, if people are asked to recall AIDS-related behaviors and these behaviors are difficult to bring to mind, the reverse should happen. This suggests that making AIDS-related information accessible should initially increase estimates of the risk of AIDS for oneself but might eventually backfire if people experience difficulties bringing such reasons to mind.

On theoretical grounds, information accessibility should affect perceptions of risk to oneself to a stronger degree than perceptions of risk to others, since it is a more diagnostic input for self-judgments (Menon et al. 1995b). Therefore, higher accessibility of information should reduce the difference between estimates of risk to oneself and another person, thereby reducing the self-positivity bias. In an analogous manner, as it becomes increasingly difficult to retrieve such behaviors, people should infer that they do not perform very many AIDS-related behaviors. This should lead them to depress their judgments of the risk of AIDS in general, but to a greater extent for themselves as compared to others. Note that this implies an anchor and adjustment process, where the anchor is one's own risk estimate, which is based on the use of specific information in memory and its accessibility, and this estimate is adjusted by similarity to reflect other's risk estimates.

Consequences of the Self-Positivity Bias

So far we have argued that there exists a self-positivity bias in predictions of the risk of AIDS. We have also suggested that if people do not think that they belong to the target group for the message that is being communicated to them, this would have unfavorable effects on their processing of AIDS-preventive communication. In this section, we elaborate on the possible consequences of the self-positivity bias.

Some of the challenges facing social marketers today are that target audiences do not attend to AIDS-related advertising. Even when they attend to the message being advertised, they inadequately process the content of such advertising. Thus, they remain insufficiently motivated to change their attitudes, let alone their behavioral patterns regarding preventive behaviors. Ideally, an effective advertisement regarding AIDS should result in an individual increasing his/her likelihood of practicing safe sex and other preventive behaviors. Failing that, an ad might still

be effective if it could result in individuals being motivated to educate themselves more about the virus through deeper processing of information presented to them. Even if an ad was not successful in achieving any of the above objectives, it might still be considered effective if it urged people to have themselves tested for HIV because some HIV-positive individuals may be unknowingly passing it on to others. This might itself slow the transmission of the HIV virus. If nothing else, an ad might still be effective if it made attitudes toward the use of a condom more favorable.

Although expecting a single advertisement to achieve all of the above ideal consequences may be overly ambitious in practice, if increasing the accessibility of an AIDS-causal behavior increases the self-perceptions of risk, theoretically an advertisement increasing the accessibility of AIDS-causal behaviors should have beneficial consequences for each of these ideal outcomes. In short, we expect that reducing the self-positivity bias will lead to audiences being more receptive to advertising promoting AIDS-preventive behaviors, leading to their forming more favorable attitudes toward such behaviors, and increasing their intention to perform them. These ads should finally result in adaptive behavior change.

Summary

On the basis of the self-positivity bias, we argue that (i) individuals estimate that they are at lower risk of contracting AIDS than are others, and (ii) the more similar the other person, the lower that person's estimated risk. Study 1 examines these two propositions. Drawing from the literature on information accessibility we argue that (iii) recalling AIDS-related behaviors magnifies risk estimates, but (iv) as these behaviors become increasingly difficult to recall, risk estimates are reduced, with (v) the accessibility effects stronger for oneself than for others. Study 2 examines all five propositions. We also argue that to the extent people are prone to the self-positivity bias, they are less persuaded by social advertising. Accordingly, (vi) increasing the accessibility of AIDS-related information leads to more persuasive advertising regarding attitudes toward, and intentions to perform, AIDS-preventive behaviors. Study 3 examines this proposition. These studies are now described and are followed by implications of our findings for theory and practice.

STUDY 1: ''IT *CANNOT* HAPPEN TO *ME* OR TO PEOPLE *LIKE* ME''

In the context of the risk of contracting AIDS, study 1 tests that people judge (*a*) themselves as being at lower risk than others and (*b*) people they consider to be more similar to them to be at lower risk than those less similar to them.

Method

We used a 4 (target person) $\times$ 2 (order of elicitation) mixed design, with the target person manipulated within subjects and the order of elicitation manipulated between subjects. Twenty-eight undergraduate students who were enrolled in an introductory marketing class at the Hong Kong University of Science and Technology participated in this study for partial course credit. They were randomly assigned to the two order-of-elicitation conditions. After a brief introduction to the study stating that it was related to AIDS awareness among undergraduates, subjects were asked to estimate the risk of contracting AIDS on a scale from 0 to 100 (not at all/very probable) for each of the four targets. To rule out the possibility that lower risk estimates for oneself reflected reality (i.e., a lower actual risk level), we elicited estimates of the risk of other people who belong to the same low-risk category as oneself. We chose four target persons: self, one's best friend, the average undergraduate student, and an average person in the country. The first three target persons can be regarded as belonging to the same peer group. Similar operationalizations by Menon et al. (1995b) and Perloff and Fetzer (1986) indicate that the best friend should be rated more similar to oneself than the average undergraduate, who should be rated more similar than the average person. To control for anchoring effects, we used two orders of elicitation: in the self first condition, subjects rated their own risk followed by others in descending order of similarity. In the average person first condition, the order was reversed. As a manipulation check, subjects rated the similarity of the three target others to oneself using a seven-point scale anchored at ''not at all/very similar.'' Subjects were then debriefed.

Results and Discussion

Manipulation Check. The similarity ratings of the three target others to oneself were subjected to a 3 (target other) $\times$ 2 (order of elicitation) repeated-measures analysis of variance (ANOVA) to assess whether the best friend was rated as most similar to oneself, and the average person was rated as the least similar to oneself. This analysis revealed a main effect of target other ($F(2, 52) = 36.59$, $p < .001$), but this was qualified by an interaction with order of elicitation ($F(2, 52) = 6.48$, $p < .01$). The main effect of order of elicitation was also significant ($F(1, 26) = 6.35$, $p < .05$). Across the two order-of-elicitation conditions, the best friend was rated as most similar to oneself ($\bar{X} = 5.57$), followed by the average undergraduate student ($\bar{X} = 4.50$), with the average person rated the least similar ($\bar{X} = 3.86$). Given significant order effects, we confirmed that the manipulation was significant within each order (p's $< .05$) and included it as a factor in subsequent analyses. Cell means are presented in Table 1.

Hypothesis Tests. A 4 (target) $\times$ 2 (order) repeated-measures ANOVA on estimates of risk indicated a sig-

TABLE 1

RESULTS OF STUDIES 1 AND 2

		Study 2—accessibility of information		
	Study 1 (n = 28)	Control (no recall) (n = 26)	High (recall three) (n = 21)	Low (recall five) (n = 29)
Manipulation checks:				
Effort index		. . .	3.51[a]	4.45[b]
Similarity ratings of:				
One's best friend	5.57[a]	5.35[a]	5.12[a]	5.10[a]
An average undergraduate student	4.50[b]	4.31[b]	4.20[b]	4.17[b]
An average person	3.86[c]	3.50[c]	3.68[c]	3.57[c]
Dependent measure:				
Perceptions of risk for:				
Self	7.04[a]	8.73[a]	15.04[b]	8.10[a]
Best friend	11.36[b]	11.35[b]	14.57[b]	15.27[b]
Average undergraduate	24.57[c]	22.81[c]	21.52[c]	18.62[c]
Average person in the country	31.64[d]	30.31[d]	32.29[d]	27.24[d]

NOTE.—In study 1, means within a measure with different letter superscripts are significantly different, $p < .05$. In study 2, effort index means across a row with different letter superscripts are different from each other at $p < .10$; similarity ratings means within a column with different letter superscripts are different from each other at $p < .05$; risk perception means across a row and within a column with different letter superscripts are significantly different from each other at $p < .10$.

nificant main effect of target person ($F(3, 78) = 16.81$; $p < .001$), demonstrating that risk estimates differ for the four targets. As predicted, risk estimates increased as the similarity of the other person to oneself decreased, with each mean significantly different from the other three ($\bar{X}$'s: self = 7.04, best friend = 11.36, average undergraduate = 24.57, and average person = 31.64; all pairwise contrast p's $<.01$). No other effects were significant (p's $> .15$).

Results support the theory of a positivity bias in perceptions of the risk of AIDS and show that risk estimates are inversely related to the similarity of another person to oneself. We also find evidence that the self-positivity effect remains at play, with perceptions of risk for oneself lower than *all* others—including the known and similar best friend. These results indicate that people perceive themselves and people like them to be relatively less vulnerable to AIDS than others. It is highly likely, therefore, that public service messages may be ignored because people assume that the messages are not targeted at them. The important issue, then, is to make people realize that they are not any less vulnerable than unknown others. Study 2 tests the implications of increasing the accessibility of AIDS-related behaviors on self- and other perceptions of risk.

STUDY 2: ''IT *COULD* HAPPEN TO ME''

Study 2 examines whether making consumers focus on AIDS-related behaviors (a) increases perceptions of risk when these behaviors are easily accessible, (b) decreases risk perceptions as the behaviors become increasingly difficult to recall, and (c) has a greater effect on perceptions of risk to oneself compared to others and therefore moderates the self-positivity bias (i.e., reduces the bias when the behaviors are easily recalled by increasing perceptions of one's own risk to a greater extent than perceptions of others' risk, but backfires when behaviors are difficult to recall).

Method

Seventy-six undergraduate students who were enrolled in an introductory marketing class at the Hong Kong University of Science and Technology participated in this study for partial course credit. We used a 3 (accessibility: low, high, and control) × 2 (order of elicitation) × 4 (target person) mixed design, with the latter two factors manipulated as in study 1, and accessibility manipulated between subjects by asking subjects to list either three AIDS-related behaviors (easy to retrieve, high-accessibility condition) or five such behaviors (difficult to retrieve, low-accessibility condition). In the control condition, subjects were not asked to perform the listing task. We expected that in the five-behaviors condition, subjects would find it increasingly difficult to recall the fourth and fifth behaviors and, accordingly, the marginal accessibility of behaviors recalled would be lower (Schwarz et al. 1991). After completing the listing task, subjects estimated the risk of AIDS for the four target persons (the subject plus three others) and rated how similar the three others were to themselves, as in study 1. As a check for the accessibility manipulation, subjects rated the difficulty of the recall task using four seven-point scales anchored at ''not at all (very) difficult,'' and ''no (a lot of) effort/

time/thought.'' These scales were combined to form the effort index ($\alpha = 0.84$).

Results and Discussion

Manipulation Checks. A 2 (accessibility) × 2 (order of elicitation) ANOVA using the effort index as the dependent variable revealed the desired main effect of accessibility ($F(1, 46) = 14.14$, $p < .001$). As expected, listing five behaviors was found to be more difficult ($\bar{X} = 4.45$) than listing three behaviors ($\bar{X} = 3.51$). No other effects were significant (p's $> .15$).

A 3 (accessibility) × 2 (order) × 3 (target person) repeated-measures analysis using similarity ratings as the dependent variable revealed a main effect of target other ($F(2, 140) = 82.28$, $p < .001$). The only other significant effect was the interaction between order and target other ($F(2, 140) = 6.81$, $p < .01$). The simple effects of target person within each order were significant ($p < .05$), indicating successful manipulations. Given the significant effects of order on the manipulation checks, the remaining analyses incorporate order as a design factor.

Hypotheses Tests. A 3 (accessibility) × 2 (order) × 4 (target person) repeated-measures ANOVA using risk estimates as the dependent measure allows us to test the self-positivity bias, assessing the replicability of study 1 results. The same analysis also allows the examination of the differential effect of accessibility on self and others. Whereas the self-positivity bias predicts a main effect of the target factor, the differential effect of accessibility predicts an interaction between the target and accessibility factor. Both effects were significant ($F(3, 210) = 40.01$, and $F(6, 210) = 2.20$, respectively, p's $< .05$ for both) and are discussed below before follow-up contrast analyses. The only other significant effect of the overall analysis was a significant three-way interaction ($F(6, 210) = 2.26$, $p < .05$). Follow-up analyses of this interaction reveal that the results have an identical pattern in each of the order conditions but are stronger in the self-first condition. All subsequent contrasts conducted include order as an independent variable.

As predicted by the self-positivity bias, estimates of risk for oneself were lowest and those of others increased as an inverse function of their similarity to oneself ($\bar{X}$'s averaged across accessibility: self = 10.24, best friend = 13.74, average undergraduate = 20.85, and average person = 29.68; all pairwise contrasts within each accessibility condition significant at $p < .05$), which is consistent with study 1.

Further, in accordance with the predicted effects of accessibility, (i) making AIDS-related behaviors highly accessible (recall three condition vs. no recall condition) increased perceptions of one's own risk ($\bar{X}$'s: recall three = 15.04 vs. control = 8.73, $F(1, 71) = 2.91$, $p < .10$), whereas (ii) when the listing task became long and the behaviors increasingly difficult to recall, perceptions of one's own risk reduced ($\bar{X}$'s: recall five = 8.10 vs. recall three = 15.04, $F(1, 70) = 3.69$, $p < .05$). (iii) Finally, perceptions of others' risk were unaffected by the accessibility manipulations (p's $> .30$). Thus, the perception of relative risk for oneself (the difference between the estimated risk of another person less the estimated risk for oneself) varied as a function of accessibility. This differential risk of a target other went from 2.61 to −.47 back to 7.17 compared to that of one's best friend when zero, three, and five AIDS-related behaviors were recalled, respectively. In an analogous manner, the differential risk between self and other was reduced from 14.08 to 6.48 but rebounded to 10.52 compared to the average undergraduate, went from 21.58 down to 17.24, and increased to 19.14 compared to the average person for recall of zero, three, and five behaviors, respectively. Note that the self-positivity bias remained positive and significant in size in eight of nine conditions ($p < .05$, the exception being self vs. best friend in the high-accessibility condition). In sum, as predicted, accessibility of AIDS-related behaviors affects risk perceptions of oneself to a greater degree than risk perceptions of others.

The results of this study indicate that estimates of one's own risk magnify in absolute and relative terms the greater the number of AIDS-related behaviors recalled, but only up to the point at which they are easy to recall. Recalling a larger number of difficult-to-recall behaviors could actually diminish perceptions of one's own risk. We suggest that the ease of retrieval of such behaviors from memory is a factor accounting for this result, as evinced by these risk estimates increasing when subjects are made to recall AIDS-related behaviors but decreasing when these behaviors are more difficult to recall. More important, apart from estimates of risk for oneself increasing in absolute terms, they also increase in relative terms. Therefore, although the self-positivity bias was robust, it was moderated by the accessibility of AIDS-related behaviors and in one instance, self versus best friend, the accessibility manipulation was successful at eliminating the bias entirely.

STUDY 3: ''*I* NEED TO BE MORE CAREFUL''

Studies 1 and 2 demonstrated the self-positivity bias in predictions of the risk of AIDS and argued that this may lead people to not pay attention to a social communication encouraging AIDS-preventive behaviors. We have demonstrated through studies 1 and 2 that the accessibility of information in memory affects self-perceptions of risk and moderates the self-positivity bias. The underlying assumption was that if people's self-perceptions of risk are higher in absolute and relative terms, they are more likely to engage in precautionary behaviors. This leads to the question, How can advertisers use these results to increase advertising effectiveness?

In this study, we examine the consequences of the self-positivity bias by exploring whether the ease of retrieval of behavioral causes of AIDS at the time of processing

an ad affects the persuasiveness of the ad. Gilbert, Giesler, and Morris (1995) indicate that social comparisons are relatively spontaneous and effortless. If this is the case, then exposure to an AIDS ad might automatically trigger a social comparison process by which the audience might discount the relevance of the ad campaign to themselves. This is because the results of studies 1 and 2 indicate that the social comparison process of formulating a risk estimate will make the audience perceive that they are at a lower risk than other people.

We directly investigate the effects of the strategy of increasing the accessibility of AIDS-related information on people's perceptions of the risk of AIDS, on their attitudes toward the use of condoms, on their intention to behave in a different way in the future, and on their actual behavior. Further, we also examine the consequences of priming less accessible behaviors on attitudes and intentions toward safer sex practices. Based on the effect of information accessibility on perception of own risk in an absolute and relative sense, we expect that advertising will be more effective when AIDS-related behaviors are evoked in the audience's memory, but that this strategy might backfire when the behaviors are difficult to recall.

Method

One hundred nine students who were enrolled in a consumer behavior course at the Hong Kong University of Science and Technology took part in the study for partial course credit. They were run in small groups of eight to 13, with groups randomly assigned to experimental conditions. There were two experimental conditions manipulating the accessibility of AIDS-related behaviors and two control conditions. Accessibility was operationalized by asking subjects to recall one or three AIDS-related behaviors. The number of behaviors subjects had to recall was lower than in study 2 to make the task more realistic given the advertising context. Accessibility was operationalized by starting a 90-second TV ad with the question, ''Can you think of one way in which HIV is transmitted?'' Subjects in the lower-accessibility condition were also asked, ''Another way?'' and ''Yet another way?'' There was a two-second pause after each question to allow subjects to engage in the recall task. Subjects then heard, ''Now that was easy, wasn't it?'' while the previous question was still on the screen. This was done to strengthen the accessibility manipulation and was reinforced in the last screen by reminding subjects, ''Remember how easy it was for you to think of a way [three ways] in which the HIV virus could be transmitted!'' Note that when subjects had to recall only one behavior, this should have been easy, but when they had to recall three behaviors the task should have been difficult. This difficulty of recall should have been particularly informative when subjects were informed that the recall task was easy.

The main body of the ad focused on unprotected heterosexual contact:

> One of the major routes through which HIV is transmitted is through unprotected heterosexual contact. Any time you have unprotected sex you expose yourself to the HIV virus. This is because if you have unprotected sex, you expose yourself to all the partners your partner has had! If a person is infected with the HIV virus, they can then carry it and transmit it to others too. The HIV virus can prove to be fatal, and can ultimately result in death! Protect yourself! Insist on a condom!

One control condition used the ad without the prime (the ''recall 0'' condition), while the other control condition had no ad.

After responding to two sets of measures (described below), subjects read the official ''Facts about AIDS'' booklet provided by the Hong Kong Education Department. This was followed by a 20-minute distractor task, after which a third set of measures was administered. The three sets of dependent variables were:

1. *Risk Perceptions.* Subjects estimated their own risk and the risk of an average undergraduate using the 100-point scale used in earlier studies.

2. *Attitudes and Intentions.* Subjects first rated how annoying they found the use of condoms during sex on a seven-point scale anchored at ''not at all/very annoying.'' They also rated their intentions to engage in safer sex through two questions. The first asked, ''Of all the times you intend to have sex in the future, what percentage of times do you intend to use a condom?'' The second required subjects to rate their intent to use a condom on their next sexual encounter measured on a seven-point scale anchored at ''definitely will not/will.'' Subjects then rated their likelihood of taking an HIV blood test in the next year, on a seven-point scale anchored at ''definitely will not/will.''

3. *Behavior.* The time (number of minutes) each subject spent reading the AIDS booklet was unobtrusively recorded by the experimenter. We then measured the elaboration of AIDS-related information. A battery of 24 statements based on facts from the booklet was administered after the distractor task. Subjects could respond ''true,'' ''false,'' or ''don't know.'' The number of correct answers served as the measure for accuracy of recall, a proxy for depth of processing.

At the end of the experiment, manipulation check information was collected. To check the effectiveness of the accessibility manipulation, we elicited measures identical to those in study 2 to compute the effort index ($\alpha = 0.90$). We also asked whether they had tested HIV positive. (The data for one person who had tested positive were discarded.) The procedure took one hour. Subjects were collectively debriefed the week following data collection.

Results and Discussion

Manipulation Checks. A one-way ANOVA using the accessibility manipulation as the independent variable and

the effort index as the dependent variable revealed a significant main effect of accessibility ($F(1, 59) = 27.47$, $p < .01$; see Table 2). As intended, subjects found it easier to recall one behavior ($\bar{X} = 2.98$) as compared to three behaviors ($\bar{X} = 4.62$).

Hypotheses Tests. We first replicated the self-positivity bias (as per studies 1 and 2) and the effects of information accessibility on risk perceptions (as per study 2) before examining the consequences of information accessibility on attitudes, intentions, and behavior.

1. *Risk Perceptions.* Consistent with the results of studies 1 and 2, across the four experimental conditions, subjects rated themselves as having a lower risk of contracting AIDS ($\bar{X} = 14.30$) when they compared themselves with the average undergraduate ($\bar{X} = 30.85$, ($F(1, 96) = 91.62$, $p < .001$). This difference was significant in each of the four experimental conditions (contrast p's $< .05$).

In addition, consistent with the results of study 2, the self-positivity bias was moderated by the accessibility of the information primed in the ad, evinced by a significant two-way interaction between target person and the four-level ad factor ($F(3, 96) = 2.73$, $p < .05$). Subjects rated their likelihood of contracting AIDS as higher when they were asked to recall one behavior ($\bar{X} = 20.15$) as compared to the two conditions when they were not primed (recall zero = 14.00, $F(1, 96) = 2.79$, $p < .10$; no ad = 9.32, $F(1, 96) = 7.85$, $p < .01$) or when the information primed was less accessible (recall three = 10.32, $F(1, 96) = 5.91$, $p < .05$). However, the estimated risk of the average undergraduate did not vary significantly across the prime versus other conditions (p's $> .30$). Therefore, perceptions of one's own risk were affected in an absolute and in a relative sense.

2. *Attitudes and Intentions.* We tested the effectiveness of the four different ads using a one-way, four-level multivariate repeated-measures ANOVA for the four attitudinal measures. Across measures, there was a main effect (averaged univariate $F(12, 376) = 4.20$, $p < .001$). The overall contrasts for the recall one versus recall zero condition ($F(4, 376) = 2.67$, $p < .05$), as well as the recall one versus the no ad condition ($F(4, 376) = 3.44$, $p < .01$), were significant. As predicted, in the recall one versus recall zero conditions, subjects rated using condoms as less annoying ($\bar{X}$'s = 3.83 vs. 4.22), reported a higher intent to use condoms in the future ($\bar{X}$'s: percent times = 88.72 vs. 78.91; next time = 6.24 vs. 5.78), and reported higher intentions to take the HIV test ($\bar{X}$'s = 2.00 vs. 1.61).

We also predicted that the priming strategy could backfire as information became less accessible. Overall, the data suggest that priming less accessible information leads to deleterious effects (recall one vs. recall three averaged univariate test: $F(4, 376) = 12.34$, $p < .001$). As predicted, subjects in the recall three condition rated the use of condoms as more annoying ($\bar{X} = 4.45$) and reported lower intentions not only to practice safer sex ($\bar{X}$'s: percent times = 68.86; next time = 5.50) but also to take an HIV test ($\bar{X} = 1.45$) as compared to those in the recall one condition.

3. *Behavior.* The depth-of-processing measures indicate a significant overall effect of the four experimental conditions on both measures: time spent reading the AIDS material ($F(3, 102) = 15.88$, $p < .001$) and accuracy of responses to the surprise quiz ($F(3, 102) = 3.01$, p

TABLE 2

STUDY 3 RESULTS

	Ad with prime		Controls	
	Recall one (n = 36)	Recall three (n = 25)	Recall zero (n = 26)	No ad (n = 21)
Manipulation check:				
Effort index[a]	2.98[A]	4.62	. . .	. . .
Perceptions of risk:[b]				
Self	20.15[A,B,C]	10.32	14.00	9.32
Average undergraduate	32.04	30.53	33.81	29.09
Attitudes and intentions toward safe sex:				
Using condoms is annoying[c]	3.83[A]	4.45	4.22	3.48
Percentage times intend to use condoms	88.72[A,B,C]	68.86	78.91	77.52
Intent to use condom *next* time[c]	6.24[A,C]	5.50	5.78	5.57
Intent to take HIV test in the next year[c]	2.00[A,C]	1.45	1.61	1.45
Depth of processing of the AIDS booklet:				
Time taken to read (minutes)	15.23[A,B,C]	11.21	14.04	14.00
Accuracy (number correct out of 24)	16.32[A,B,C]	15.04	14.72	15.00

NOTE.—The following directional contrasts are significant ($p < .10$): A = recall one versus recall three; B = recall one versus recall zero; C = recall one versus no ad.

[a] Identical to study 2.

[b] Identical to study 1.

[c] Elicited using a seven-point semantic-differential scale anchored at "definitely not/definitely."

$< .05$). Subjects in the recall one condition took 15.23 minutes to read the AIDS booklet, which is significantly higher than the recall zero condition ($\bar{X} = 14.04$; $F(1, 102) = 4.18$, $p < .05$) and appears to be significantly better spent as reflected by their higher accuracy in the quiz ($\bar{X}$'s = 16.32 vs. 14.72, $F(1, 102) = 7.08$, $p < .01$). They also spent more time on the booklet than subjects in the recall three condition (vs. 11.21; $F(1, 102) = 46.65$, $p < .001$) and were more accurate than these subjects (vs. 15.04, $F(1, 102) = 4.54$, $p < .05$). These results are consistent with the accessibility-as-information theory (Schwarz et al. 1991).

Across measures, an ad using a highly accessible prime (i.e., recall one) was more effective than an ad without a prime. A post hoc examination of the means shows that the two control conditions operate in a similar manner, indicating that an ad carrying AIDS educational messages without a prime may be ineffective in changing people's intentions, attitudes, and behaviors. Further, the means suggest that advertising using a less accessible prime might in fact be worse than no advertising at all (see Table 2). This cautions an advertiser against using a priming manipulation unless the information to be recalled by the audience is highly accessible. At best, it works as well as the condition in which no advertising is implemented, a point that speaks for wasted advertising dollars. At worst, such advertising might be counterproductive, making attitudes unfavorable and reducing intentions to perform preventive behaviors.

The findings of this study attest to the robustness of the phenomena observed in studies 1 and 2. We demonstrated that manipulating accessibility was effective in an advertising context in a manner similar to the laboratory context in terms of affecting risk perceptions in an absolute and relative sense. The results show that increasing the accessibility of AIDS-related information not only increases perceptions of one's own risk and reduces the self-positivity bias but also fosters more precautionary attitudes and intentions and instigates people to behave in a more responsible manner. However, priming, when the content is not highly accessible, may result in less effective communication than not advertising at all, indicating that it may be better not to advertise than to advertise using an inaccessible prime.

GENERAL DISCUSSION

Our proposed framework suggests that people estimate their own risk of contracting AIDS as lower than that of others, and that these perceptions can be brought more in line with reality by priming AIDS-related behaviors. However, this strategy might backfire as behaviors become difficult to recall. In the three studies reported in this article, we found convergent evidence that people are prone to systematic biases while estimating their risk of contracting AIDS. We found that (*a*) people tend to underestimate their risk relative to the level of risk estimated for other people, referred to as the self-positivity bias; (*b*) the perceived (dis)similarity of the other person influences the extent to which others are seen as more at risk than oneself; (*c*) an increase in the accessibility of AIDS-related behaviors increases risk perceptions for oneself proportionately higher than that for other people and reduces the self-positivity bias; (*d*) the ease with which AIDS-related behaviors can be brought to mind provides diagnostic information relevant to one's own judgments, such that risk perceptions only increase when AIDS-related behaviors can be retrieved fairly easily, and (*e*) increasing the accessibility of AIDS-related information through a prime at the beginning of AIDS-related advertising substantially and variously improves the effectiveness of such advertising in terms of attitudes toward condoms, intentions to engage in socially responsible practices, and depth of processing of persuasive and educative AIDS-related communications. Our results show that since people who recognize the risks associated with certain behaviors are significantly more likely to use appropriate risk-reduction strategies, increasing people's deflated perceptions of their susceptibility to AIDS should be an important public policy objective and that an accessibility-diagnosticity perspective has useful implications for accomplishing this goal.

Theoretical Contributions

The literature has established that unrealistic optimism is reduced when subjects experience a negative personal event (Burger and Palmer 1992). This is probably the route through which the manipulation of accessibility worked in our experiments. While listing the potential routes through which the HIV virus could be transmitted, subjects should have recalled personal experiences where they had engaged in those specific behaviors, which led them to a higher estimate of self-risk. This is desirable from a public policy point of view. Ideally, the social marketer would like to reduce the likelihood of engaging in a high-risk activity for low-risk persons and reduce the frequency of engaging in high-risk behaviors for high-risk persons. To the extent that the priming manipulation leads the people engaging in risky behaviors to think of their own actions, it should lead them to be more realistic about their risk estimates. The results of studies 2 and 3 suggest that the accessibility of information regarding AIDS moderates the self-positivity bias.

In this article we add to the literature on the self-positivity bias by demonstrating that the ease of retrieval of AIDS-related information at the time of processing an ad would serve to reduce the self-positivity that people have about their own risk of contracting AIDS and consequently would serve to modify their behavior in the future. This research also extends the theory of the self-positivity bias into a more generalizable theory of a positivity bias applicable to known and similar others, while demonstrating that the self-positivity bias remains at play. This finding relates to Menon et al.'s (1995b) conclusion that the false consensus bias comes into play considerably

more when making judgments about other people (cf. Perloff and Brickman 1982).

The article also makes a contribution to our understanding of the manner in which accessibility of information affects judgments. Feldman and Lynch (1988) developed a framework predicting that the use of one input for a judgment is directly related to its own accessibility and diagnosticity and inversely related to the accessibility and diagnosticity of alternate inputs. However, building on the work of Schwarz and his colleagues (Schwarz 1990; Schwarz et al. 1991), we suggest that the accessibility of information is itself informative; that is, it is a diagnostic cue that affects the manner in which the content of the retrieved information affects related judgments. Our findings suggest that accessibility and diagnosticity may not be independent or orthogonal constructs. The relationship between these two constructs may be a multiplicative rather than an additive one, with diagnostic information being even more diagnostic when it is easily accessible or not accessible at all.

Practical Implications

AIDS is an international problem. By the turn of the century, each one of us is likely to know a person who is HIV positive. The HIV epidemic can be arrested if people abstain from IV drug use and follow safe sex guidelines. With the self-positivity bias in operation, as demonstrated by the findings of this article, a lot of the information that is being communicated to the target population may be going unheeded. Couple that with the problem that respondents often will not accurately admit the extent to which they undertake AIDS-causal behaviors, such as unsafe sex (Raghubir and Menon 1996), and it is clear that unless people can be made to believe that they are at risk, the problem will continue to grow unabated.

If people only process information they believe is of relevance to them and the self-positivity bias is in operation, then communicating a message about drug use or unsafe sex may not be successful unless more forceful strategies are used. Recent research in effective advertising has indicated that creating an element of empathy before actually communicating the message encourages the affect associated with the experience recalled to transfer to the object being evaluated (Baumgartner, Sujan, and Bettman 1992; Sujan, Bettman, and Baumgartner 1993). We now propose that a variant of this strategy can be used by social marketers to communicate to their audience that negative outcomes can happen to them personally and to encourage individuals to engage in precautionary behaviors.

Accordingly, communication aimed at encouraging AIDS-preventive behaviors needs to first ensure that the audience will not filter it through an ''it does not relate to me'' strategy but rather will process it deeply. Our findings suggest methods by which to increase the self-perception of the risk of AIDS, which is a precursor for people to start taking preventive action. We show that increasing the accessibility of behaviors that cause AIDS leads to higher estimates of the risk of AIDS for oneself. The results of study 3 show that communication can be made more persuasive by increasing the accessibility of AIDS-related behaviors through priming messages of the type, ''The HIV virus can be transmitted through unprotected sex. Have you ever had unprotected sex?'' or more indirectly using messages such as, ''Do you know someone who has had unprotected sex?''

Note, however, that the positivity bias has been shown to be positively related to mental health (Taylor and Brown 1988). Throughout this article we have argued in favor of reducing the self-positivity bias so as to induce behavior change at the individual level. This might come at the cost of mental health and is an issue that should be kept in mind by social advertisers who are interested in reducing the self-positivity bias in a bid to change behavioral patterns.

Limitations and Areas for Future Research

A limitation of this article is that the self-positivity bias was tested using a within-subjects design, which could potentially lead to an exacerbation of the effect, making the bias difficult to eliminate. Future research may be more successful at using some of the manipulations introduced here to eliminate the self-positivity bias. We also found a robust order effect on the similarity ratings collected as manipulation check data. The manipulation appeared to be stronger when ratings of the best friend were collected before ratings of the average person. This unexpected result needs further investigation by researchers interested in questionnaire design–related issues.

We manipulated accessibility through the length of a listing task. It is possible that the mean likelihood of contracting AIDS through the longer listing tasks was lower because the later behaviors listed were less related to the subjects' experiences. Note that if the marginal likelihood of contracting AIDS through the fourth and fifth behavior were lower than that of the first three behaviors, and this led to the lower risk estimates, this still is normatively inappropriate, as the probabilities of independent risk-prone behaviors should be added rather than averaged.[1] Future research could address this limitation by using alternative methods to manipulate accessibility (e.g., part-list cuing: Alba and Chattopadhyay 1985; priming using an unrelated task: Higgins, Rholes, and Jones 1977; subliminal exposure: Devine 1989) to establish the nomological validity for the accessibility construct as a source of information.

In addition, this research determined one factor that moderated the positivity bias: the ease of accessing related information in memory. The diagnosticity of the ease of recall as a source of information should also affect the

[1]We thank a reviewer for pointing this out.

extent to which information accessibility rather than information content is used as a source of information to make risk judgments. It is also very likely that there are other factors that lay down the boundary conditions to the operation of the self-positivity bias. The boundary conditions of the effect of inaccessibility on judgments also need to be established.

A related issue is whether the self-perception or the other-perception is biased. The term ''self-positivity bias'' suggests the former. However, in our studies the average-person perceptions seemed to be vastly exaggerated. Further research is needed to understand the operation of this bias more fully so that it may be controlled. In addition, the impact of the self-positivity bias on the perception of the risk of AIDS needs to be replicated in collectivist cultures such as Japan, because cross-cultural research suggests that such cultures place a higher premium on group harmony than on self-enhancement (Markus and Kitayama 1991).

In a more commercial domain, some of the techniques proposed in this article might assist in the sale of insurance products, both at the stage of attracting attention through mass media communication like advertising and later in the sales process. By increasing the accessibility of causal behaviors that might contribute to a negative consequence (e.g., death, disability, etc.), insurance marketers may be able to make their task easier. This is an issue for future research.

At a more general level, social marketing research addressing public policy issues is limited. In a recent article, Goldberg (1995) urges, ''Are we as researchers fiddling while Rome burns? There are clearly many fires that social marketers can fight'' (p. 367). Future research might examine theoretically interesting issues in the context of socially relevant problems.

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