Perceived Risk of AIDS: Unrealistic Optimism and Self-Protective Action

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AIDS has produced a sense of urgency in the medical, biological, and social sciences. The scale of the AIDS epidemic and the absence of successful medical treatments justifies the necessity to assess the riskiness of specific (sexual) practices, to understand the antecedents of these behaviors, and to identify (sub)populations to be targeted for preventive programs (see also Catania, Gibson, Chitwood, & Coats, 1990).

From an individual standpoint, however, assessing one's personal risk for HIV infection tends to be complicated and unreliable. Knowledge about transmission routes is essential, but quite often the relevant risk factors remain concealed (e.g., lack of information about sexual partners). This lack of knowledge about the behavioral history and serostatus of sexual partners should lead to risk-avoiding strategies. Quite often, however, people seem to make risk appraisals on the basis of less relevant factors such as the physical appearance of their sexual partners. Moreover, even those who are likely to be relatively well-informed about AIDS-related risks often err in their subjective appraisal of the riskiness of their own behavior. For instance, Bauman and Siegel (1987) found that gay men practicing hazardous sex tend to underestimate the risks associated with their behaviors. These misappraisals of the riskiness of one's sexual practices can result in underestimating one's personal susceptibility to HIV-infection. The difficulty of adequate risk appraisals is further enhanced by the simple fact that sexual partners do not always provide correct information about their behavioral history (see e.g., Cochran & Mays, 1990).

Reducing the possible underestimation of one's susceptibility to AIDS-related risks is one of the major aims of health education programs. Many of the prevailing media campaigns designed to persuade those at risk to adopt safe-sex
practices are risky, and stress the vulnerability of people who do not practice safe sex. Perceived vulnerability plays a crucial role in most models of preventive health behavior. Many of the campaigns designed to persuade those at risk to adopt less risky behaviors are based on these models of preventive health behavior.

The Health Belief Model (the framework most widely used to explain preventive health behaviors; see e.g., Kirsch, 1983) distinguishes five factors that influence the adoption of preventive, risk-reducing behavioral practices (see also Gerrard, Gibbons, & Warner, this volume). These are (a) perceived susceptibility or vulnerability to developing a health problem, (b) perceived severity of the problem, (c) perceived benefits of changes in behavior, (d) perceived barriers and/or possible negative consequences of these changes and (e) specific cues to action, such as a symptom or a health communication (see Janz & Becker, 1984).

More general models focus on vulnerability and risks as threatening and fear-arousing elements that can lead to a variety of cognitive, emotional, and behavioral responses. For instance, the Fear Drive Model is based on the assumption that fear produces subjective discomfort and tension that leads to action (Leventhal, Safer, & Panagis, 1983). Janis and Mann’s (1977) Conflict Theory also describes decisions in threatening circumstances and focuses on adaptive and maladaptive coping styles. More recently, Rogers and his associates (Rippetoe & Rogers, 1987; Rogers, 1975) introduced Protection Motivation Theory to account for individual reactions to information about health risks (for a more extensive review of these models, see Gerrard, Gibbons, & Warner, this volume).

All in all, most models of preventive health behavior incorporate the recognition of one’s own risk status or vulnerability as an important condition for adopting behaviors that reduce these risks. Quite a few of these models focus on the role of anxiety or fear triggered by threatening information about personal risks as a motivator of behavioral action, and on adaptive versus maladaptive coping styles.

In this chapter, we focus on perceived risk. More specifically, we focus on subjective perceptions of the riskiness of one’s sexual practices. We look at the accuracy of these judgments and also discuss comparative risk appraisals. These comparative risk appraisals are related to what Weinstein (1980) called unrealistic optimism. Weinstein argued that people tend to think they are “invulnerable”; others are more likely to experience negative health consequences than oneself. Usually it is extremely difficult to objectively assess the accuracy of an individual’s assessment of his or her risk for experiencing a specific event. Each individual could be right in assuming that his or her risks are smaller than those of comparable others. On a group level, however, one could detect unrealistic optimism. If most people in a specific population rate their risk below average, a substantial part of them must be wrong.

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cussed. Second, we concentrate on possible determinants of unrealistic optimism and describe empirical evidence about possible ways to reduce unrealistic optimism. Next, we take a closer look at the relationship between perceived risk of AIDS and behavioral risk reduction. In the final section we present some conclusions and possible implications for both research and practice.

2. PERCEIVED RISK OF AIDS

NATURE AND PREVALENCE OF UNREALISTIC OPTIMISM

Risk perception has been studied for a wide variety of negative events, such as being a victim of crime (Perloff, 1982; Weinstein, 1980), divorce (Perloff & Farbik, 1985), traffic accidents (Svenson, 1981), and natural disasters (Kunzreuther, 1979). Most investigations in this area focus on health risks (e.g., Harris & Guten, 1979; Knopf, 1976; Slovic, Fishhoff, & Lichtenstein, 1978; Weinstein, 1982, 1983). A number of conclusions can be drawn from this research.

First, perceptions of risk of disease or accident vary considerably among people and often show little correspondence to epidemiological findings or accident statistics. Absolute, quantitative risk judgments are prone to a number of biases. Small probabilities are overestimated, large probabilities are underestimated. Furthermore, risks that are more available due to personal experience or media coverage, for example, tend to be overestimated. In other words, quantitative risk appraisals need to be treated with caution. This is underlined by the significant influence of the response format on risk estimates. Quantitative appraisals of risk tend to be relatively unstable and influenced by the way the question is asked and by context variables such as judgmental anchors. It needs to be added, however, that people have a reasonable idea of the relative frequency of causes of death. Their orderings are similar to official statistics. Major errors occur primarily in their estimates of the magnitude of the risks.

Second, although people are quite aware of the relative risk of specific activities or behaviors, things change dramatically when this knowledge is applied to their own behavior. For instance, many smokers accept the association between smoking cigarettes and disease, but do not believe themselves to be personally vulnerable (Pechacek & Danaher, 1979). When asked to compare their risk to the “average” person or to comparable others, many more people assess their risk of experiencing a negative event as below average than as above average. This illusion of invulnerability has been obtained for a wide variety of health risks, including AIDS-related risks. Moreover, a few studies attempted to compare subjective risk appraisals with objective risk estimates based on reported sexual practices. This research also suggests an underestimation of the riskiness of one’s sexual practices. For instance, Bauman and Siegel (1987) interviewed 160 gay men who were asymptomatic with respect to AIDS. The interviews included questions about the frequency of specific sexual practices
and the number of different partners over a fixed time period. On the basis of epidemiological studies and available risk-reduction guidelines, the "objective" riskiness of each individual's behavior was assessed. Behaviors were classified as "risky," "low risk," and "safe." Their findings showed that 42% of the sample engaged in "high-risk" sexual activities, 33% in "low-risk" activities, and 25% in only safe sex practices. The distribution of subjective risk assessment in this sample was very different. More than 75% of the subjects rated their behavior as relatively safe. Only 9% scored their own behavior on the risky half of a 10-point scale running from "not risky at all" to "most risky." Bauman and Siegel (1987) concluded that especially those practicing risky sex underestimatethe riskiness of their sexual behavior. In their study, subjects were also asked to evaluate their own risk of getting AIDS, relative to other gay men. Their results were in accordance with what Weinstein (1980) termed unrealistic optimism, and showed that the majority of the sample thought their own risk to be smaller than that of other gay men. Gerrard and Warner (1991) compared the mean risk estimate of becoming infected with HIV of women Marines with the actual incidence of HIV infection in the military. Their findings showed an optimistic bias. We use the term unrealistic optimism to refer to relative risk comparisons of self to others. Most research in this domain focuses on these self–other comparisons. Only a few studies attempted to compare people's perception of risk to their objective risk. Research by Bauman and Siegel (1987) and Gerrard and Warner (1991) are examples of the latter. These studies show an underestimation on one's own risk as compared to objective risk assessments on the basis of their behavioral practices or epidemiological findings. Given the difficulties in assessing an individual's objective risk most research deals with comparative risk appraisal.

In the following pages, we take a closer look at this phenomenon of unrealistic optimism and investigate its prevalence and magnitude in various groups. Unrealistic optimism is assessed in a variety of ways. Sometimes subjects are simply asked whether their risks are lower or higher than comparable others on a 7-point scale. In other studies, subjects are asked to indicate how much higher or lower their risk is (in percentage estimates) as compared to others. In our own studies we asked subjects to give a numerical estimate of their own risk and that of an average other of the same gender and age. These estimates could range from 0 to 100%. Table 2.1 summarizes these findings, and presents subjective risk assessments for HIV and two other sexually transmitted diseases (STDs) for a variety of groups.

A more detailed account of these findings can be found in Hooijkaas, van der Pligt, van Doornum, van der Linden, and Coutinho (1989), van der Pligt (1991), and van der Velde, van der Pligt, & Hooijkaas (1992). All samples showed significant levels of unrealistic optimism. Optimism is relatively modest in Sample D. This group consisted of visitors of the largest STD clinic in Amsterdam who participated in a longitudinal study on AIDS-related risks and the role of
TABLE 2.1
Estimated Risk (%) for Self and Comparable Others in Low-and High-Risk Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk</th>
<th>Self</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>A (n = 156)</td>
<td>STDs</td>
<td>4.9</td>
<td>18.6*</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>5.9</td>
<td>16.4*</td>
</tr>
<tr>
<td>B (n = 85)</td>
<td>syphilis</td>
<td>11.1</td>
<td>25.9*</td>
</tr>
<tr>
<td></td>
<td>gonorrhea</td>
<td>12.5</td>
<td>29.2*</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>9.4</td>
<td>22.9*</td>
</tr>
<tr>
<td>C (n = 80)</td>
<td>syphilis</td>
<td>22.1</td>
<td>35.6*</td>
</tr>
<tr>
<td></td>
<td>gonorrhea</td>
<td>24.2</td>
<td>42.8*</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>18.8</td>
<td>26.9*</td>
</tr>
<tr>
<td>D (n = 635)</td>
<td>syphilis</td>
<td>24.2</td>
<td>27.3*</td>
</tr>
<tr>
<td></td>
<td>gonorrhea</td>
<td>30.9</td>
<td>31.2</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>26.2</td>
<td>26.0*</td>
</tr>
<tr>
<td>E (n = 147)</td>
<td>syphilis</td>
<td>17.4</td>
<td>23.9*</td>
</tr>
<tr>
<td></td>
<td>gonorrhea</td>
<td>18.9</td>
<td>27.8*</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>14.8</td>
<td>25.2*</td>
</tr>
</tbody>
</table>

*p < .05.

A heterosexual low-risk sample
B heterosexual sample with multiple sexual partners in previous months.
C heterosexual sample of outpatients of an STD clinic in Amsterdam (a sizeable proportion of subjects were prostitutes and their customers).
D heterosexual sample of outpatients of an STD clinic in Amsterdam (with similar characteristics as Sample C).
E homosexual sample of men with multiple sexual partners in previous months.

sexual practices. Subjects were tested for HIV and a variety of STDs. The sample included a sizeable proportion of prostitutes and their visitors. In this sample, subjects were asked to rate their own risk and that for an average Dutch person of their own age and gender. Although modest, the obtained optimism is still remarkable given the fact that 26% of this sample had one or more STDs at entry of the study, whereas nearly 50% had a history of STDs in the past 5 years. Moreover, nearly 70% engaged in prostitution contacts and nearly 25% had contacts with AIDS risk groups such as intravenous (IV) drug users (see van der Velde et al., 1992). All in all, these results are in accordance with Weinstein’s findings and show unrealistic optimism in a variety of groups with different levels of objective risk. Results also indicate some awareness of the risk of one’s own sexual practices. Group A had the lowest perceived risk for STDs and HIV infection, Group B the second lowest. All other groups were objectively more at risk than these first two samples, and also rated their risk higher. These higher levels of perceived risk were, however, accompanied by even higher estimates for others. Finally, it needs to be noted that, for all groups, the perceived risk of HIV infections was higher than that indicated by epidemiological findings. Let us now turn to the possible causes of this unrealistic optimism.
DETERMINANTS OF UNREALISTIC OPTIMISM

Unrealistic optimism has been related to a variety of possible causes. There is some conceptual overlap between these causes. Moreover, most research uses correlational designs with the usual drawbacks for conclusions about the possible causal role of specific factors. In this section, we briefly describe six possible causes mentioned in the literature. In the next section, we briefly describe experimental research on the possible effects of these causal factors. More specifically, in this section we discuss the possible role of perceived control, egocentric biases, personal experience, stereotyped beliefs about victims, self-esteem maintenance, and defensive coping styles. The first four causes refer to cognitive mechanisms, whereas the remaining two causes stress the role of motivational processes.

Perceived Control

Weinstein (1980) noted that optimism is greatest for risks with which subjects have little personal experience, for risk rated low in probability, and for the risks judged to be controllable by personal action. When rating their own risk status as compared to others, optimism tends to be greater for those risks judged to be under personal control (Weinstein, 1982). Other findings indicate that for each specific hazard those who rate its controllability higher are also more optimistic. This relation between perceived controllability and optimism is confirmed by research on risk appraisals in the context of AIDS (van der Velde et al., 1992). In their study, perceived control over the possibility of an HIV infection was significantly related to optimism. In other words, respondents who thought they could control this specific risk were also more optimistic about their chances to get infected with HIV as compared to others of their own gender and age. Bauman and Siegel's (1987) findings indicate that illusory perceived control is also related to optimistic risk appraisals. Their findings showed that the belief in ineffective risk-reducing practices such as showering and inspecting one's partner for lesions can result in a false sense of security.

Controllability could also be enhanced by the simple thought that social and physical appearances are good indicators of the serostatus of sexual partners. In other words, people could think it very unlikely that they would meet infected persons, and if so, that they would recognize them as such. Some indirect evidence for the role of perceived control is provided by the results described in van der Pligt (1991). When people are asked to give specific risk estimates for unprotected sexual contacts with infected partners their estimates increase dramatically and the frequently obtained optimism disappears completely. In this case subjects were not asked to give a general risk estimate of contracting an HIV infection for themselves and the average other, but were asked to assess the riskiness of unprotected sexual contact with infected others. Factors enhancing
perceived control such as the idea that one simply would not meet infected persons, would "recognize" them, or would discuss each other's sexual history before deciding to have intercourse, cannot play a role in this conditional risk assessment. Table 2.2 summarizes these findings, and shows that people assess their own chances of contracting HIV after 1, 10, or 100 unprotected sexual encounters to be higher than those of others (of their gender and age) who would engage in the same number of unprotected sexual encounters with infected others.

This sample consisted of (heterosexual) first-year psychology students. As can be seen in Table 2.2 their risk estimates were far too high. Furthermore, the data reveal a lack of understanding of cumulative risks and confirm the findings obtained by Shackle and Fischhoff (1990). Overall, these subjects were pessimistic about their chances of contracting the AIDS virus. This finding is in contrast with responses to more general questions about one's own risk as compared to others. As argued before, this divergence could be related to perceptions of the controllability of the risk; one simply overestimates one's control over having unprotected sexual contacts with infected partners. This divergence could also be related to stereotyped beliefs about AIDS risk groups. Before turning to that issue, however, we discuss another cognitive explanation of unrealistic optimism (i.e., egocentrism).

Egocentric Bias

Another factor that could be related to optimism is what Weinstein (1980) termed an egocentric bias. When people are asked to assess their risks and those of others, they simply have more knowledge about their own protective actions than those of others. It seems that people tend to focus on personal actions reducing their own risks while they tend to forget personal actions or circumstances that increase their risks. Moreover, one's own actions are more available than those of others, (i.e., one tends to forget that most other people also take protective action). This bias is also related to cognitive availability. We simply have more knowledge about our own precautionary actions than those of others. All in all,

| TABLE 2.2 |
| Risk of Getting HIV After 1, 10, and 100 Unprotected Sexual Encounters With Infected Others |

<table>
<thead>
<tr>
<th>Perceived Risk (%)</th>
<th>Self</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>1 unprotected contact</td>
<td>59.9</td>
<td>51.4</td>
</tr>
<tr>
<td>10 unprotected contacts</td>
<td>76.9</td>
<td>69.3</td>
</tr>
<tr>
<td>100 unprotected contacts</td>
<td>87.8</td>
<td>82.1</td>
</tr>
</tbody>
</table>

Note. Scores could range between 0–100%.
people seem to give themselves credit for factors that reduce their own risk, but often forget to assess whether other people might have as many or even more factors in their favor.

Personal Experience

Weinstein (1980, 1982) concluded that lack of previous personal experience tends to increase unrealistic optimism. Personal experience is a powerful stimulus to action (see Weinstein, 1989, for a review). Personal experience tends to be relatively vivid as compared to statistical information about risks, and enhances both availability and recall. Possible negative consequences for health and well-being that have been experienced more directly (oneself, close friends, or relatives as victims) tend to result in less optimistic risk appraisals. This effect has been obtained for a wide variety of risks such as automobile accidents and seat belt use, criminal victimization, natural hazards, and a variety of health risks. It is likely that more direct experience with the consequences of AIDS (friends, relatives) will also reduce optimism about vulnerability.

Stereotyped Beliefs

Another factor that could produce unrealistic optimism is related to stereotypical or prototypical judgment. People might have a relatively extreme image of those suffering from specific diseases. This extreme prototype is unlikely to fit one’s self-image, hence the conclusion that the risk does not apply to oneself but primarily to others. The results of one of our studies are consistent with this line of reasoning. In this study (van der Pligt, 1991) we asked subjects (a relatively low-risk group) to characterize a variety of health risks on several dimensions including threat, controllability, known–unknown, and the extent to which the risk applied to specific groups. In this way it was possible to derive a risk profile for each of these risks. The risks of HIV infection and STDs showed a very similar profile: Both were seen as highly controllable and restricted to specific groups. HIV infection and STDs were seen as the two health risks (out of 12) that were most clearly associated with specific groups. Stereotypical beliefs about people at risk might induce people to think that they would simply recognize others who are HIV positive. This scenario does not apply to the more specific question discussed in the section about perceived control (see also Table 2.2). Asking people about the risk of having unprotected sexual contact with an HIV-positive partner excludes a possible (optimistic) bias due to illusory control and stereotypical beliefs. Other evidence of stereotyped beliefs or extreme prototypes is provided by Hamilton (1988), who showed that the tendency of the (U.S.) news media to link AIDS with homosexuality without referring to gender resulted in a significant overestimation of the risks of lesbians.
Self-Esteem Maintenance

Weinstein (1984) suggested that self-esteem maintenance or enhancement plays a crucial role as a determinant of unrealistic optimism. Generally, people seem to think that their actions, lifestyle, and personality are more advantageous than those of their peers. This mechanism would explain the fact that people are not optimistic about hereditary and environmental health risks. The latter do not constitute a threat to one's self-esteem. In contrast, a high-risk lifestyle implies that we are ignorant of what we should do or are simply unable to exercise self-control. These factors concern a person's ability to cope effectively with life demands and have clear-cut links to self-esteem. Self-esteem maintenance is clearly related to stereotyped beliefs. Both involve social comparison processes.

Self-esteem enhancement has not been studied explicitly in the context of AIDS-related risks. One could, however, relate the findings of Bauman and Siegel (1987) to this factor. In their study, high-risk respondents could maintain their self-esteem because they were convinced that their (unprotective actions) were efficient in reducing their risks. Motivational factors also play a role in another possible antecedent of unrealistic optimism: defensive coping styles. In fact, Bauman and Siegel's findings could be interpreted as the result of a defensive coping strategy.

Defensive Coping

Under conditions of high stress or threat, denial is a response often used to protect against anxiety and worry. Denial can reduce emotional distress but can also hinder direct behavioral actions, which may be necessary to reduce one's risks. Taylor and Brown (1988) argued that exaggerated perceptions of control and unrealistic optimism are illusions that can help the individual to adapt successfully to threatening events. For instance Taylor, Lichtman, and Wood (1984) found that optimism was positively related to recovery processes after major surgery. Positive illusions such as optimism, however, are not always functional. Although these illusions can reduce emotional distress, they can also interfere with taking direct action.

There is some evidence for the role of defensive coping strategies. In a study in which optimism about each of 45 different health- and life-threatening problems was related to characteristics of these problems, Weinstein (1982) obtained a relationship between the seriousness of the different health risks and optimism. In other words, more threatening events resulted in increased levels of optimism. On the other hand, results of this study also showed that increased worry about health risks was associated with less optimism. The latter reaction seems perfectly rational and contradicts the obtained relationship between seriousness of consequences and optimism. Bauman and Siegel (1987) investigated defensive
denial in a sample of gay men. They found that men who deny or underestimate their risk of an HIV infection experienced lower anxiety. On the basis of this (correlational) finding they concluded that denial is used as a strategy to manage anxiety.

Bauman and Siegel’s findings suggest that defensive denial may occur primarily when people already have some reason for believing that they are at risk. This obviously poses a problem for health education. A direct confrontational approach could have potentially adverse consequences for those who perceive themselves to be at greater risk for an HIV infection. These adverse consequences include psychological distress, barriers to behavioral change, social role impairment and more intrusive worries and concerns about AIDS (see e.g., Joseph et al., 1987). The complicated dual aim of health education programs is to create and maintain a level of anxiety that is sufficient to motivate risk-reducing behaviors while at the same time these levels of anxiety should not be too high.

In our research we found defensive avoidance (one of the “maladaptive” coping styles of Janis and Mann’s, 1977, Conflict Theory) to be positively related to optimism about AIDS risks (van der Velde, van der Pligt, & Hooijkaas, 1992). In another study (van der Velde & van der Pligt, 1991) we found that subjects who scored high on defensive avoidance, perceived the possible consequences of an HIV infection as less severe and were less convinced that they could exercise personal control over their actions in order to reduce their risks.

In the first study (van der Velde et al., 1992), we assessed defensive avoidance with seven items (e.g., “you leave it to your sexual partner to practice safe sex or not?”) scored on a 5-point scale ranging from “does not apply to me at all” (1) to “applies to me very much” (5). Cronbach’s alpha for this measure was .70. Results of this study on 535 heterosexual subjects with multiple partners (STD clinic visitors) showed that a defensive coping style was one of the factors enhancing optimism.

The second study (van der Velde & van der Pligt, 1991) used a similar measure of defensive avoidance (in this instance Cronbach’s alpha was .71). Heterosexual subjects with multiple sexual partners perceived the consequences of an HIV infection as less severe and scored lower on the factor self-efficacy (perceived ability to control the risks by employing safe sex techniques only). Moreover, subjects who scored higher on defensive avoidance were also less fearful of the consequences of HIV infection. Of these factors, increased fear and self-efficacy were positively related to the willingness to engage in protective actions (safe sex techniques and/or using a condom). In the same study we found that for a subsample of homosexual subjects defensive avoidance was directly related to behavioral intentions to practice safe sex. In this case, however, increased levels of defensive coping were negatively related to the intention to practice safe sex.

Both these studies focused on medium- to high-risk groups, and together with Bauman and Siegel’s (1987) findings, support the view that motivational, defen-
sive denial strategies are likely to be more pronounced if people have some reason for believing that they are at risk and the specific risk is associated with dread.

How can we summarize the possible antecedent of optimism discussed in this section? All six seem to play a role in the formation and maintenance of unrealistic optimism. Some weaknesses need to be mentioned, however. First, the six factors are obviously not mutually exclusive. Conceptually, there is considerable overlap between some of the factors. Moreover, the causal role of most factors is not well established and requires further empirical documentation. The evidence tends to be sparse and is largely correlational. All in all, it seems difficult to disentangle the various cognitive and motivational processes that could produce unrealistic optimism. Unrealistic optimism refers to a comparative risk assessment, suggesting that social comparison processes play an important role. Overestimating one's personal control and selective stereotyping others as potential victims could be seen as mechanisms to enhance one's self-esteem. Another option is to interpret these findings as the result of a defensive coping style. Similarly, a defensive coping style could result in stereotyped beliefs about possible victims and an egocentric bias in assessing one's own risks and those of others. The overall result seems confusing. It is possible, however, to summarize the six factors under three more general headings.

1. **Positive Illusions.** People have a general tendency to overestimate their abilities, have exaggerated expectations about the future, and have optimistic illusions about the extent to which they can control life's outcomes. Taylor and Brown (1988) discussed a wide variety of these positive illusions and pointed out their functional value (e.g., in relation to well-being). Similar ideas have been put forward in the achievement-motivation literature concerning the effects of outcome expectations on behavior. The literature on self-efficacy can also be related to this general idea of positive illusions. It seems essential in all these circumstances not to be overly optimistic. Baumeister (1989) argued that there is an optimal margin of illusion. This optimal margin would have beneficial effects for behavior (e.g., persistence) and well-being. Unrealistic optimism can be seen as another example of a positive illusion. This provides an explanation of optimism in terms of its functional value. As argued before, in the context of health risks, optimism could be less functional.

2. **Availability.** Personal experience with a specific hazard and/or its consequences enhances the availability of the hazard and reduces optimism. Similarly, not having experienced negative consensus of one's life style or (sexual) practices in the past, makes possible negative consequences less available. Extreme cases of AIDS victims portrayed in the media are likely to make specific groups more available as potential victims and could result in the view that the risk does not apply to oneself. Cognitive availability due to personal experiences is likely to play an important role in risk appraisals. Availability is bound to differ be-
between high- and low-risk groups due to confrontations with the disease in their immediate social environment. Availability is likely to lead to two separate effects. First, specific characteristics of AIDS (extreme, uncontrollable consequences that receive quite a bit of media coverage) are expected to lead to an overestimation of the absolute risk (for self and others) of contracting HIV. Personal experience is expected to affect appraisals of one’s personal risk. Data presented in this chapter seem to confirm this tendency. First, risk appraisals are generally too high. Groups that are more likely to have direct experiences with AIDS victims have even higher estimates of their own risk. This increased availability cannot, however, explain the fact that individuals at risk still show an unrealistic optimism about contracting HIV.

3. Ego-Defensive Mechanisms. Two separate processes can be categorized under this heading. First, self-esteem maintenance or enhancement. We all want to be (slightly) better than most comparable others. This mechanism especially applies to controllable health risks such as HIV infection. Acknowledging that one’s risks are higher than comparable others is also an acknowledgment of one’s incompetence to control these risks. Such acknowledgments provide a threat to one’s self-esteem. Self-esteem maintenance is likely to have an impact on comparative risk appraisals and will generally lead to an enhancement of the differences between the perceived risks for oneself vs. others. Second, denial strategies are likely to be prevalent under conditions of severe threat. Denial strategies do not necessarily affect comparative risk appraisals. Denial focuses on underestimating one’s own risk in comparison to “objective” risk assessments.

In the next section we discuss a few studies attempting to investigate the possible causal role of some factors mentioned in this section.

REDUCING UNREALISTIC OPTIMISM

A few studies attempted to test the causal role of some of the variables discussed in the previous section. Weinstein (1983) examined the effectiveness of an intervention designed to eliminate unrealistic optimism. In this study, subjects (college students) rated themselves on risk factors relevant to each of a series of health problems (11 different health and safety hazards were included). Next they received information about the standing of a typical student on these risk factors and were asked to make comparative risk judgments.

Results showed that when college students describe their own standing on risk factors and are given explicit information about the risk status of their peers on these factors, optimistic biases are considerably reduced. Because the procedure had little effect on judgments for threats that do not normally evoke unrealistic optimism, Weinstein (1983) concluded that the treatment eliminated a bias and not simply created (overall) pessimism. Receiving feedback about the risk status
of others was essential and reduced egocentrism by providing information about others. Asking subjects to consider their own standing on risk factors without providing them with information about comparable others substantially increased optimistic biases. This could be due to the fact that the manipulation increased the awareness of risk factors for which they fell into a low-risk classification. It could be argued that exclusive attention to one's own risk status may prevent people from realizing that most others fall in the same category. As argued before, self-esteem maintenance and social desirability factors might play a role in enhanced optimism when focusing on one's own risk status.

One study (van der Pliigt et al., in press) attempted to investigate the effect of perceived control on unrealistic optimism. We argued that increasing the salience of the controllability and predictability of specific risk (by asking subjects to indicate to what extent these terms applied to each of 11 positive and negative life events) would enhance optimism. Focusing on the uncontrollability and unpredictability of these events (including HIV infection) was expected to reduce optimism. In the latter condition subjects were simply asked to indicate to what extent the terms uncontrollable and unpredictable applied to each of the events. Results confirmed our prediction and showed that 63% of the subjects were generally optimistic after rating the various events in terms of controllability and predictability. This percentage dropped considerably for subjects who rated the events in terms of uncontrollability and unpredictability. A third group was first asked to give risk estimates for themselves and others. Next, they were asked to select adjectives to describe each of these risks. It was predicted that optimists would show a greater preference for terms such as controllable and predictable than pessimists. Results confirmed our predictions and provide further evidence for the notion that perceived control plays an important role in optimistic biases.

Perloff and Fetzer (1986) showed that comparative risk assessment or optimism is also affected by the group or individual with which one compares one's own risk. Comparison others who are more similar tend to reduce optimism. In summary, there is evidence that optimism can be reduced. Both the reduction of egocentrism, stressing the uncontrollability and unpredictability of risks, and selecting specific comparison others reduce optimism. These effects support the claims about the causal role of egocentrism and perceived control. In the next section we focus on the behavioral consequences of unrealistic optimism.

RISK PERCEPTION, PERCEIVED VULNERABILITY, AND BEHAVIOR

All in all, there is an extensive literature about the possible determinants of unrealistic optimism. As argued in the previous section, the precise causal role of these antecedents remains relatively unclear. Both cognitive and motivational factors seem to play a role. Motivational factors such as defensive denial seem to
be most prominent when the health threat is extreme. In this section, we focus on the consequences of unrealistic optimism. The basic rationale for research on the phenomenon of unrealistic optimism is that optimism could make people think they are relatively invulnerable. This perceived invulnerability, in turn, could undermine the motivation to take precautions.

There is some evidence showing that perceptions of vulnerability predict preventive health behavior (Becker et al., 1977; Cummings, Jette, Brock, Haefner, 1979; Kasl, 1975). There is less evidence, however, for the proposed relationships between unrealistic optimism, perceived vulnerability, and behavior. Lee (1989) found a direct link between risk appraisals and smoking. Smokers’ ratings of the risks of smoking to the average smoker were lower than nonsmokers’ ratings, and smokers’ ratings of their own risk were lower still. Studies that deal with AIDS risks tend to focus on possible antecedents of unrealistic optimism and pay only marginal attention to the consequences of unrealistic optimism for behavior and psychosocial functioning.

One exception is a study conducted by Joseph et al. (1987). This study presented longitudinal analyses exploring the risk perception and behavioral, social, and psychological consequences. Data were obtained from more than 600 homosexual men living in Chicago who completed two questionnaires (time between the two interviews was six months). Although univariate analyses showed that perceived risk was related to several measures of subsequent behavioral risk reduction, these effects disappeared after adjustment for sociodemographic variables, initial behavior, and other factors such as knowledge about AIDS, perceived self-efficacy, barriers to behavioral change, and social norms. Initial sexual behavior was strongly related to subsequent behavior. Overall, their findings did not show any adverse behavioral consequences of optimism. On the contrary, those who were pessimistic and perceived themselves to be at greater risk for AIDS were more prone to a range of potentially adverse consequences such as relatively extreme anxiety about AIDS, increased barriers to behavioral change, and social role impairment. These findings suggest that there is little or no observable benefit to an increased sense of risk for existing at-risk populations. This is not supported by Bauman and Siegel’s (1987) findings. Their study did not deal with the effects of optimism on future behavior but their results suggest that people at risk, who employ defensive denial as a coping strategy and are optimistic about their vulnerability, tend to engage in more risky sexual practices, and focus on irrelevant precautions to enhance their feeling of safety.

Both studies reported in this section deal with at-risk samples and provide only a partial answer concerning the relationship between optimism, perceived vulnerability, behavioral intentions, and future behavior. As described earlier, Joseph et al. (1987) did not find a relationship between optimism and subsequent risk behavior. Their findings show that increased levels of perceived vulnerability can have disfunctional, adverse consequences for the individual. Bauman and Siegel’s (1987) findings deal with explanations of concurrent behavior.
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and suggest that positive illusions and illusions of control could hinder behavioral change (see also Garrard, Gibbons, & Warner, this volume).

In a series of studies we attempted to investigate the role of perceived risk and optimism as determinants of behavioral intentions and behavior. These studies focused on low-, medium-, and high-risk groups (van der Velde & van der Pligt, 1991; van der Velde et al., 1992). Findings in the low-risk group show a clear effect of optimism on behavioral intentions to engage in safe sex techniques. This sample consisted of heterosexual subjects with multiple sexual partners. Safe sex was defined as using a condom when having sex with a casual partner (see van der Velde & van der Pligt, 1991). Decreased optimism led to increased intentions to use a condom. Optimism, self-efficacy (perceived personal control over AIDS-related risks), and response efficacy (belief that using a condom reduces the likelihood of HIV infection) were the prime determinants of behavioral intentions. This simple model explained nearly 50% of the variance in behavioral intentions to reduce the riskiness of one’s sexual practices. When a similar model (with optimism, response efficacy, and self-efficacy as the major predictors) was tested in a high-risk sample (van der Velde & van der Pligt, 1991) its predictive power was reduced dramatically. This sample consisted of homosexual subjects participating in a longitudinal study on AIDS. In this sample less optimistic comparative risk appraisals led to lower intentions to adopt safe sex techniques. This finding seems to be in accordance with the conclusions of Joseph et al. (1987), who argued that extreme awareness of being at risk might result in maladaptive behavioral responses. Combined together, these results suggest a curvilinear relationship between (relative) optimism and intentions to reduce the riskiness of one’s sexual practices with reduced willingness to change one’s sexual practices at very high and very low levels of optimism.

A cautious note seems in order, however. Perceived risk seems to play a more modest role as a determinant of actual (safe) behavior as opposed to behavioral intentions to take precautionary measures. In the study described earlier we also attempted to relate perceived risk and optimism to actual behavior over a 4-month time span (van der Velde, 1992). This study focused on visitors of a STD clinic in Amsterdam. More than 500 subjects (mostly prostitutes and their visitors) participated in the study. After adjustment for other variables, perceived risk and optimism were not related to subsequent behavior. Our research on adolescents' risk appraisals and sexual practices confirmed these findings (Richard & van der Pligt, 1991). Factors such as self-efficacy (e.g., Bandura, 1989) and anticipated regret were far more important predictors of sexual practices. Anticipated regret is a factor based on Janis and Mann's (1977) work and refers to the worries that are associated with choosing a specific behavioral alternative (in this case, unprotected sexual intercourse with a casual partner). When the role of perceived risk and optimism was investigated in the context of both self-efficacy and anticipated regret the latter factors had a much more profound impact on behavioral expectations about both safe sex techniques and the use of condoms.
Our research shows the expected relation between optimism and behavioral intentions to engage in safe sex techniques. Unilateral analyses generally confirm predicted effects of optimism on intention to adopt safe sex techniques and/or the intention to use condoms. The picture becomes more complex when we look at individuals whose sexual behavior is relatively risky. In this case, perceived risk and optimism can also lead to maladaptive responses. A further conclusion of the research presented in this section concerns the relatively modest role of perceived risk as a determinant of sexual practices. We did obtain effects on behavioral intentions, but the relation between optimism and actual (self-reported) behavior was modest. When the role of perceived risk is tested in the context of other cognitive variables such as self-efficacy, demographic variables, and existing behavioral practices, its effect on behavior seems negligible.

CONCLUSION

There is considerable evidence showing that people have an optimistic bias in risk perception (i.e., risks apply more to others than to oneself). This unrealistic optimism has been obtained for a wide variety of health risks. Our findings indicate that this optimism also includes AIDS-related risks. On average, low-, medium-, and high-risk groups assumed their risks to be lower than average.

In this chapter we reviewed the possible causes of this optimism and tested some of these explanations in the context of AIDS-related risks. Cognitive factors such as perceived control over specific health risks, personal experience with the specific risk, the tendency to use a relatively egocentric frame of reference, and the existence of extreme prototypes of those at risk, all seem to play a role in optimism about health risks in general. Some of these have been investigated in the context of AIDS. Results of the studies suggest that both perceived control and stereotyped beliefs about AIDS victims tend to increase optimism.

Motivational factors such as self-esteem maintenance and defensive coping styles also affect optimism. These two factors have been less extensively studied in the context of AIDS. Our own findings suggest that defensive coping styles enhance optimism about AIDS-related risks. A number of experimental studies focused on ways to reduce optimism. Reducing egocentric biases and stressing the uncontrollability of health risks both tend to reduce optimism. These results confirm the findings of correlational research. The major factors causing optimism seem to have been identified. Although most research used correlational designs with the usual drawbacks for conclusions about the possible causal role of these factors, a number of factors seem to play a major role in determining optimism. Personal experience, perceived control, and egocentric biases are the prime determinants.

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An important question that remains is whether optimism is related to behavior. A variety of studies underline the functional value of optimism. Moderate de-
degrees of optimism positively affect performance, recovery processes, and well-being (see e.g., Taylor & Brown, 1988). In the present context, the crucial question concerns the relationship between optimism about AIDS-related risks, behavioral intentions, and behavior. Unfortunately, this relationship between optimism and preventive behavior is less clear. Low- and medium-risk groups' behavioral intentions can be adequately predicted by simple models that include optimism or perceived vulnerability. For these groups, perceived vulnerability is related to the intention to engage in safe sexual practices. In high-risk groups, however, the findings reveal a different pattern. First, the predictive power of these models decreases dramatically. Second, perceived risk shows an unexpected relationship with behavioral intentions. Lower levels of optimism about AIDS risks seemed to be related to increased behavioral intentions to engage in risky practices. This finding, combined with those obtained by Joseph et al. (1987) and Bauman and Siegel (1987) suggests that motivational factors play a more prominent role in situations where the risk or threat is perceived as more severe. Defensive coping styles seem to play a more pronounced role in these circumstances. Increased defensiveness is associated with high levels of risky practices. More research into the exact role of coping processes and their effects on behavior seems necessary.

Moreover, even when perceived risk and optimism are related to behavioral intentions and subsequent behavior, the role of these factors seems very modest. Previous behavior seems to be the prime determinant of future behavior, suggesting that habitual aspects of sexual practices should not be underestimated. Factors such as self-efficacy and anticipated regret seem to have a more pronounced impact on behavioral expectations about safe practices and actual safe behavior.

These findings pose some serious problems for health education programs. It seems essential to differentiate between various groups. First, high-risk and low-risk groups need a different approach focusing on the specific determinants of risky sexual practices of each group. Stressing the vulnerability of high-risk individuals who are already aware of their risk could trigger maladaptive responses. Second, after adjustment for other variables, perceived risk and optimism are related to behavioral intentions, but only marginally or not at all to actual behavior (in this instance safe sexual practices). It could well be that some level of perceived risk and/or relative optimism is a necessary condition for behavioral adjustment. However, perceiving risks associated with one's behavior, does not seem sufficient to produce behavioral change.

Further research is needed to investigate the effects of health education efforts that stress the risks of specific practices as opposed to approaches that attempt to increase the self-efficacy of individuals to actually insist on safe sex techniques and/or stress the possible regret they could experience due to risky sexual practices. Self-efficacy (i.e., one's perceived control over the employment of safe, protective techniques when having sex with casual or first-time partners) seems a prime determinant of (safe) sexual behavior. Next, anticipated regret about the
possible negative consequences of unprotected sexual contact with casual partners, seems a more powerful predictor of safe sex behavior than the perceived risk of contracting HIV. Our findings suggest that variables such as self-efficacy and anticipated regret are more important determinants of behavioral intentions and behavior than comparative risk appraisals. Again, pointing out the risks of specific sexual practices seem a necessary but not a sufficient reason for behavioral change. Stressing anticipated regret about possible adverse consequences of unsafe practices and helping people to exercise control over the safety of their sexual encounters could make media campaigns more effective.

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