

Risk perception of students concerning HIV infection

Lorenz Stucki

Department of Psychology, Lund University

Abstract

The present article deals with the risk perception of students within the field of HIV and AIDS. A questionnaire study with a 2 x 2 x 2 experimental design was conducted in order to assess the perceived risk of contracting HIV. The goal of the questionnaires was to measure the possible influence with regard to the texts (HIV prevention versus HIV causes economical problems in Africa), the optimistic bias (I myself in the situation vs. someone else in the situation) and gender. A further investigation concerned the manner of integration of information about the number of sexual partners and the safety of sex. The results suggested no difference between the 2 texts. No optimistic bias was found. In fact, men felt more at risk if it concerned themselves rather than someone else, a reversal of an optimistic bias, while women tended to make little or no differentiation. On the other hand, female participants perceived the risk of becoming infected with HIV higher than males did. The given information was integrated in a multiplicative way. All information was important, influenced each other and helped to form the risk perception.

In recent years, a considerable amount of research has been carried out within the field of risk perception. A consequence of this development has been an increased study of risk analysis. One possible explanation is that the notion of risk is becoming increasingly important in the daily life of Western society. This has perhaps been partly caused by the strong influence of mass media upon the public, as the coverage of such risk information

deeply affects modern society. The public receives information about many accidents and happenings all over the world and they feel far less secure, despite private and public institutions trying to make our lives as safe as possible. In former days, people did not appreciate or realize the risk or danger which could affect them. As the study of risk analysis was extended, new risks and uncertainties were revealed, many of which had often never been given any significant amount of thought. Slovic (1997, p. 390) argues that “these individuals see themselves as exposed to more serious risks than were faced by people in the past, and they believe that this situation is getting worse rather than better”.

One important factor, which Sjöberg (1998) identifies, is that people pay more attention to risk than to chance. They often spend more time reflecting upon negative scenarios and incidents compared with the time spent thinking of positive chances and possibilities. A person’s assumptions will determine their mood, Sjöberg further claims. As a conclusion of these findings, people are more likely to be anxious and therefore watchful rather than being open to adopting a more optimistic outlook. This could perhaps be seen as a survival technique in our life. It has been suggested that it is more important to expect a negative outcome than a positive consequence in order to be prepared for and survive any impending incident. As Slovic (1987, p. 280) states: “The ability to sense and avoid harmful environmental conditions is necessary for the survival of all living organisms. Survival is also aided by an ability to codify and learn from past experience”. Some failures will only happen once and because it has been learned in an extremely physical way that touching a hotplate hurts, a little warning signal is activated whenever one is near and this helps to act as a reminder of the past experience. However, not every experience has to be carried out by oneself; it can also be learnt from observing or hearing. Such a method of learning can be termed “prevention talk.”

Risk can be defined as “a situation in which an action will result in an outcome that is not known with certainty, but the set of possible outcomes and their associated probabilities are known or can be estimated” (Oxford Dictionary of Psychology, 2003, p. 641). The important factor here is that this definition refers to situations in which more than one possible outcome exists and that it is not clear which one will prevail. If for example a gambler participates in a game of toss, the probabilities are known as, 1/6 for

each number on the dice but it is not certain in advance on which number one should bet to win. The gambler takes the risk to either lose or win. If he bets on the wrong number and loses some money it is not life threatening although it is still a loss nonetheless. What comes maybe more spontaneously to our minds when we think about risk is the fact that risk taking often involves a danger or novelty which usually stimulates anxious feelings in people (Levenson, 1990).

So when a closer look is taken at the hazardous side of risk, a line could be drawn between man-made disasters and natural catastrophes as mentioned by Drottz-Sjöberg (1991c). More man-made risks are introduced in our life by the increasing developments in science, technology and industry compared to the more “stable” natural risks. This distinction should be refined because not everything that looks like a natural catastrophe is one. There are natural disasters such as volcanic eruptions and earthquakes which can not be prevented and there are also catastrophes that appear as though they have been brought about naturally but which are in fact man-made. This category contains for example the greenhouse effect and acid rain. One way to make a distinction between the two types of catastrophes is through the identification of responsibility. No-one is responsible for natural catastrophes; they only occur occasionally. However, this is different where man-made disasters are concerned as someone will be held accountable because a safety policy has failed, an individual has made a mistake or a terrorist attack has happened, and so on.

Another distinction would be, according to Baum (1987), the variance along dimensions which determine how someone experiences an event. For example the lack of visible damage according to radioactivity or the spread of a virus like HIV. Human sense organs can not detect it.

Four definitions of risk were proposed by Drottz-Sjöberg (1991a, p.32-33) “a) risk as mainly a question of probability of an event, b) as a combination of probability and consequences of an event, c) as a question of mainly the consequences of an event and d) that its meaning is entirely due to the kind or the nature of an event” (letters added to the citation to make the distinction more clear). Examples for the definitions are: a) the risk that an airplane crashes is very low if you focus on the probability; b) the risk of an accident in a nuclear power plant has a low probability but the consequences would be

devastating; c) the risk of dying in parachute jump, so the person considering only the consequences avoids the activity; and d) if the participants do not have a straight line, they change the use of the term with every new situation, one time focusing on the consequences and the next time on the probability, depending on the event. In this study the participants had to answer some questions concerning risk in everyday life to classify how they use the term risk. The results showed that people who define risk according to their consequences perceive the risk as high as others who focus on the probability. In short, it means that people differ in how they define risk and that this point of view is related to how they perceive such a risk.

Many attempts have been successful, through the use of texts and articles, in affecting people's perception. Yzer, Fisher, Bakker, Siero & Misovich (1998) tested the influence of different texts on the intention to engage in an AIDS preventive behavior. Female students were given 2 articles concerning contracting HIV to read, one about vulnerability and the other about self-efficacy. There existed 2 different vulnerability texts. The message tried to either increase the risk perception of women or not to change it at all. One text focused on the women's increasing risk of getting infected with HIV. The other did not contain information that was relevant to their AIDS-risk perception and concentrated on a needle-exchange program to prevent injection drug users from getting infected. The other 2 texts focused on self-efficacy. One emphasized that women have a great potential to practice AIDS preventive behavior and the other text did not mention relevant information and tried not to affect the perceived self-efficacy. The study found differences in the intention to engage in a preventive behavior according to the given texts combinations. Women that felt themselves at risk and at the same time felt a great self-efficacy were more likely to practice preventive behaviour than the other cases.

Gender differences are extremely common in risk perception; Drottz-Sjöberg (1991a). Women tend to rate risk significantly higher and are more focused on consequences compared with the perceptions of men. People rated the risk of contracting the deadly AIDS virus in an equal way to that of being assaulted. The results showed that women usually perceived the risk as being higher than men did. In another study, carried out by the same author, the perceived risk related to accidents involving radioactive waste. Results also pointed out that a significantly greater number of women rated the risk more

highly. The data suggested that subjects classed the risks as especially high when they defined it in terms of consequences. The findings of Fisher and Misovich (1990) are perhaps of even more interest. In their survey they asked the subjects how likely it would be for a friend to contract AIDS. The data showed significant gender differences. Women rated the probability higher than men. However, when the subjects had to answer the questions with regard to their own anxiety of contracting the virus, the data pointed in the opposite direction. Men were significantly more afraid than women. Baldwin & Baldwin (1988) found that in connection with cautious sexual behavior gender is a reliable predictor. Women take more sexual precautions than men. This is largely due to the more direct and tangible consequence of pregnancy, not to mention STDs (Sexually Transmitted Diseases). They learn to be more careful.

Another easily identifiable phenomenon is the optimistic bias or unrealistic optimism. This means that a person considers that a particular incident is more likely to occur to another person than to oneself. Weinstein (1988) found 4 major characteristics which determine the amount of bias and the conclusion that oneself is less at risk than surrounding people. Firstly, persons suppose that if they have not faced a certain risk up until the given point, it is unlikely to ever happen. Secondly, people think that a problem is preventable by an action that they perform. Thirdly, the infrequency of a danger that individuals perceive. Finally, the lack of any past experience with a certain risk that one has. For example if a driver believes that he drives more safely than other people, he will probably also think that the risk of becoming involved in an accident is far less for him than his fellow motorists. Since he has never had a car accident, he holds the belief that he can prevent such an event as he has always done, and this confidence may well give him the feeling that he does not have to wear a seatbelt. There is a discrepancy between the actual risk and the risk which people perceive. In the survey that was conducted by Fisher and Misovich (1990) several sources of AIDS fear were measured. The data suggests that students believe that the risk for the people with which they engage in sexual behaviour increases although this perception does not include them. Drottz-Sjöberg (1991b) found similar results in a study in which the risk perception to fall ill with AIDS was estimated. The risk concerning the own person was perceived considerably smaller compared to the risk for people in general.

As the present study deals with the risk perception to contract HIV, some information must be given about this disease.

AIDS (Acquired immune deficiency syndrome) is a deadly disease which is caused by HIV (Human immunodeficiency virus). According to AIDS.ORG (Frequently asked questions), this virus can be transmitted from an infected person to another through bodily fluids like blood, semen, vaginal secretion or breast milk. The concentration decreases from blood with the highest to the breast milk with the lowest of these four. The most common ways, which can result in a transmission of HIV, are a) having unprotected sexual contact, b) getting in direct contact with blood (including injection drug needles, blood transfusions, accidents in health care settings or certain blood products) and c) a transmission from the mother to the baby before or during birth, or through breast milk. People infected with HIV may have no symptoms for ten or more years, but they can still transmit the infection to others during this symptom-free period. The potential to infect others lasts lifelong. Meanwhile, their immune system, the part of the body which works as a defense against germs such as bacteria and viruses, gradually weakens until they develop AIDS, which is the final and most serious stage of the HIV disease. The immune system, by this stage, has been adversely affected and this will lead to a breakdown of the endogenous defense, resulting sooner or later in death.

Since the report of the first cases of AIDS in 1981 (Centers for Disease Control, 1981) many more followed. The WHO (World Health Organization) and UNAIDS (Joint United Nations Programme on HIV/AIDS) reported at the end of 2003 that about 40 million people in the whole world are infected with HIV, among them 2.5 million children under the age of 15. In the year 2003, AIDS laid its claim on about 5 million newly infected people and the death toll of this deadly virus approached nearly 3 million. Since its discovery, about 30 million people have fallen victim to this incurable disease. “Sub-Saharan Africa, the most severely affected region of the world, accounted for over 3 million of these new infections and 2.3 million AIDS deaths. Every day in 2003 an estimated 14,000 people were newly infected with HIV” reported the WHO (2003). AIDS is now the most frequent cause of death in South Africa and worldwide the fourth-most frequent cause of death. It is also Europe’s most important sexually transmitted

infection according to Nicoll & Hamers (2002). Everyday, 8000 people die because of AIDS.

This increase considers homosexual as well as heterosexual persons. In the early 1980s the extent of the AIDS disease was restricted. It concerned only the male homosexual population although gradually it started to spread among drug users and made its way through their sexual partners to the heterosexual population (Fisher & Misovich, 1990). In most cases nowadays, almost 80% of HIV infections will be transmitted sexually and heterosexual contact is now the number one cause of the HIV transmission reported AIDS-Hilfe Schweiz (2002). A consequence of it is that the amount of infected women has also increased.

A maximum of positive HIV tests was reached in 1992. After that, the yearly amount of people tested positive of HIV decreased steadily. The year 2001 was the first year in which an increase was noticed again. This trend-change was confirmed clearly in 2002 as reported by the Bundesamt für Gesundheit (2004). So, HIV and AIDS have increased in reality and risk once again.

Methods often used to assess risk perception are questionnaires which can contain multiple choice boxes, scales with different amount of points, true/false questions or questions with a blank to fill in. For example Joseph et al. (1987) used a self-administrative questionnaire. A further possibility is the use of the interview, as employed by Weisman et al. (1989).

When evaluating a risk one often has to combine different information. According to Anderson (1996), information integration is conducted by algebraic rules. “The technical side of cognitive algebra rests on a simple logic. If 2 variables are integrated by some algebraic rule, the *pattern of response* can reveal the form of the rule. A *pattern of parallelism* points to addition or subtraction; a *linear fan pattern* points to multiplication or division; and averaging can be distinguished from adding by a *crossover pattern*”; (Anderson, 1996, p. 37).

There are 3 possibilities how the students integrate the information of the number of sex partners and the safety of sex in the present study of risk perception. The participants integrate the given information multiplicative according to the cognitive algebra of Anderson (1996). That means that they consider both the number of sexual partners and

the practice of safer sex in an equal way, but on each level the lines do not run parallel, they disperse and that results in a fan pattern. An ANOVA will show an interactive effect with no line crossing. The second possibility would be that they integrate the information additive, demonstrated by a parallel pattern. The third kind of integration would result in a crossover pattern according to the averaging rule. This leads to the following question: Do students integrate the given information in an additive, multiplicative or averaging way?

In order to better understand how students integrate given information, the aim of this study is to analyze the connection between risk perception and various variables which could affect the individual risk perception. This will help to understand more clearly how sexually active people perceive a situation in which a possible risk exists to become infected with HIV. Students represent a population that, with a few exceptions, is sexually active and engages in risky behavior (Baldwin & Baldwin, 1988). In this study, the influence of a text concerning HIV, the optimistic bias as well as gender differences will be considered.

The following hypotheses will be checked in this study.

1: The participants who read the text about “HIV prevention” will rate the risk higher compared to the ones who read the text about “HIV causes economical problems in Africa”.

2: Subjects who rate the risk for themselves perceive it as lower as subjects who rate the risk for someone else in the same situation (optimistic bias).

3: Women will perceive the risk significantly higher than men.

Variables (summary)

Independent variables

Within subject

- Number of partners (1, 10 or 30)
- Safer sex (2 times with condom, 1 time with and 1 time without condom or 2 times without condom)

Risk perception of students

Between subject

- Gender (masculine or feminine)
- Text (HIV prevention or HIV causes economical problems in Africa)
- Optimistic bias (I myself in the situation or someone else in the situation)

Dependent variable

Risk perception (scale, percentage)

The design of the study concerning the between subject variables is summarized in Figure 1.

Methods

Subjects

139 students on a first semester course in Psychology participated in this study at the University of Lund in Sweden although only the responses of 131 of these students were available for use. Since this study intends to measure the risk perception of heterosexual participants, all people with a different orientation were excluded and in general people who did not fill out the last page which concerned personal information about the subject. The perception of the risk could have been biased because it is possible that a person with a different sexual orientation perceives the described situation differently or can not imagine it because the gender of the figure in the task is the opposite to the preferred one. The composition in the beginning consisted of 71 women (51%) and 68 men (49%) and after the exclusion 68 women (52%) and 63 men (48%). All were students in the first semester of Psychology. The average age was 23 although the age range extended from 19 to 46. The response rate varied between 35% and 60%. The number of subjects who were assigned to each of these variables is stated in brackets in Figure 1. In version a, b and c participated a total of 131 students, 63 of which were male and 68 of which were

female. For the text, 65 filled out the questionnaire with the “HIV prevention” text and the remaining 66 were given a different text to consider, “HIV causes economical problems in Africa”. The questions in which one had to imagine “I myself in the situation” were returned from 62 participants and from 69 of the people who were given “someone else in the situation” questions. As it is shown, it is well balanced. The structure of the between subject variables of the versions shows which possible compositions existed for the different questionnaires. Each branch represents one questionnaire, so there were 8 different types of questionnaires for each version, which amounts to 24 (3 x 8) different types in total.

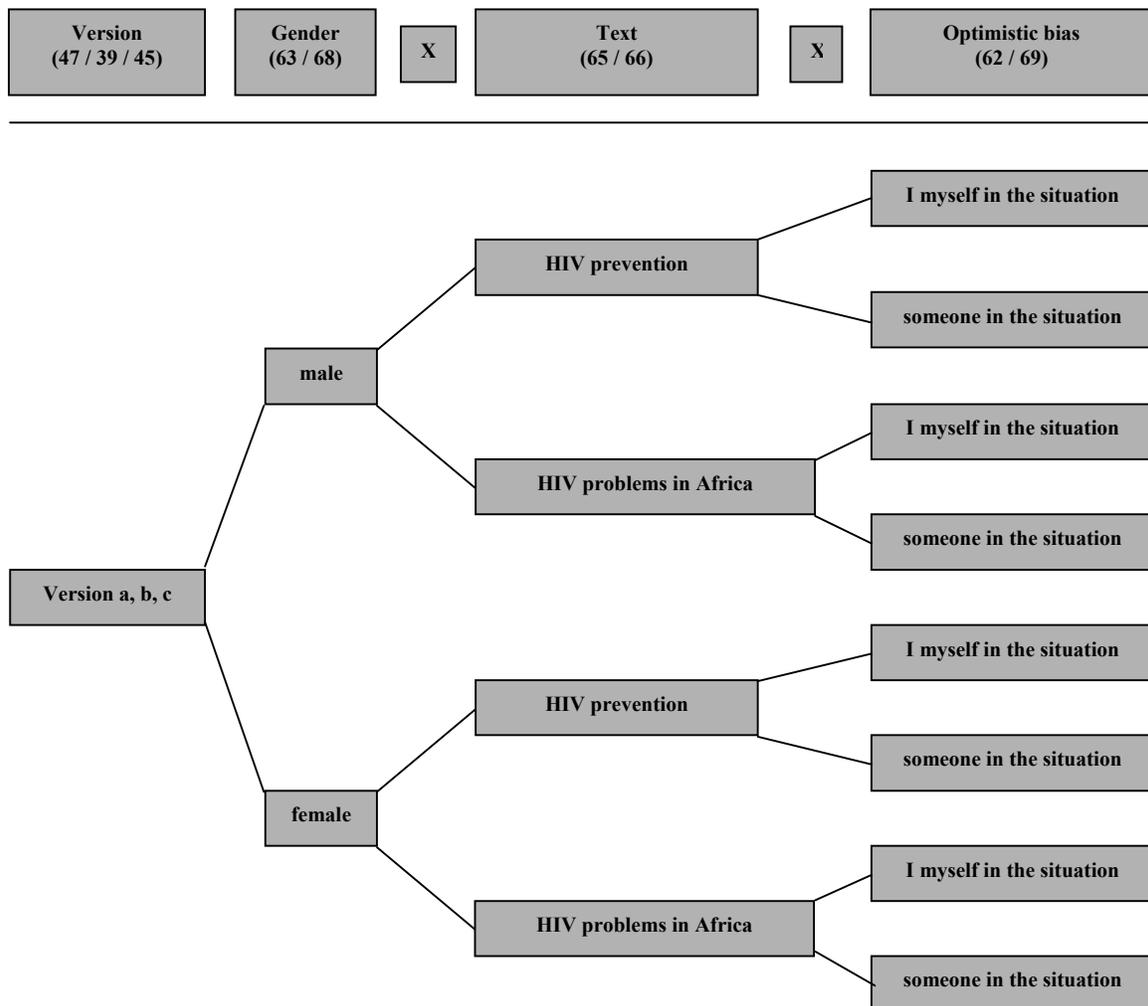


Figure 1. Structure of version a, b and c of the 2 x 2 x 2 experimental design (number of participants for each between subject variable are stated in brackets. As each variable had 2 values, there are 2 numbers).

The number of participants in combination with the between subject variables text and optimistic bias divided into male and female resulted in the following even distribution. A total of 14 males and 17 females (31) filled out the “HIV prevention” combined with “I myself in the situation” questionnaires. The “HIV prevention” and “someone else in the situation” questionnaires were completed by 16 men and 18 women (34). There were 16 males and 15 females (31) which returned the “HIV causes economical problems in Africa” combined with “I myself in the situation” questionnaires and finally 17 men and 18 women (35) for the “HIV causes economical problems in Africa” and “someone else in the situation” questionnaires.

Material

The basis of the questionnaire formed 9 questions which all described the same scenario but differed in the value of the within subject variables. Each question was presented twice (repeated measurement) in a random order. It was checked that a question was not directly followed by an identical one. So the 18 questions consisted of 2 times 9 identical questions. The scenario for men was for example: “a man meets a woman at a party. They talk and he gets to know how many partners she has had already. They enjoy the party and afterwards go back to her place and have sex 2 times.” Only the within subject variables “number of sex partners” and “safety of sex” changed. This scenario was followed with the question “how risky do you think this behavior is in terms of contracting an HIV infection?”, and was measured with a scale that has a length of 10 cm and the anchor points “low” on the left side and “high” on the right side. Number 19-27 described the same situation like the first 18 but had a different question, namely “how high do you think is the probability to get a HIV infection with this behavior?” and was measured with a percentage number, like in the questions 1-18, only the within subject variables changed. These tasks were not repeated.

At the end, the subjects had to answer some questions about HIV and AIDS to find out their state of knowledge in this field, followed by some questions that involved the extraction of personal data.

The questionnaires were handed out in envelopes with the address and stamps on it to make it as easy as possible to send it back.

Three different versions (a, b, c) were created in respect to a possible order effect. The order of the questions in each version were randomly mixed and differed from each other. There were also 2 different versions of gender, text (HIV prevention vs. HIV causes economical problems in Africa) and optimistic bias (I myself in the situation vs. someone else in the situation).

All in all, there existed with all combinations 24 different versions of the questionnaire. An example of a questionnaire will be found in the Appendix A.

Before the main study took place, a manipulation check and a pilot study were conducted.

Manipulation check. To get to know if participants understood the questions in the way they were meant to be, the researcher went through the questions with 2 different participants, each time with one alone and asked the subjects to speak out aloud their thoughts and to tell if something was unclear or misleading. The questionnaire was also handed out to the project group of general and development psychology students, filled out and discussed afterwards.

Pilot study. Before the main study, a pilot study was conducted with psychology students at the University of Lund to check if people could comprehend and fill out all the questions. Around 12 people participated at this study and it satisfied the need to enable continuation with the main study.

Procedure

It was checked during the 2 weeks before the handout of the questionnaires if any incident had occurred that would make the certain subjects more sensitive to the risk of an HIV infection, or indeed to the issue itself. All in all, 8 handout sessions took place in the time between the 10th of November and the 16th of February.

The envelopes were handed out to the students by 2 assistants after a short explanation at the end of a Psychology lecture. In this speech the researcher told the students the main

theme that concerns the study. The students were also instructed as to how these handouts should be filled in. One assistant handed out the envelopes for the women and another the envelopes for the men. The whole procedure took about 5 to 10 minutes.

The students took the questionnaires home where they filled it out. First they read the instruction and then a short text. Afterwards the participants had to estimate in each task, how high they rated the risk of an HIV infection by making a cross on a scale (question 1-18) or the probability for an HIV infection by writing down a percentage number (question 19-27). Then they filled out the questions concerning the extent of their knowledge concerning HIV and AIDS and the personal data as well. Afterwards they put the questionnaire back in the envelope and sent it back.

Results

In what follows, the hypotheses described and contained within the proceeding paragraphs are set alongside the results of the order effect, within subject variables and between subject variables, which emerged from a series of analysis of variance (ANOVA) set with a significance level of 5%. From this data, conclusions will be proposed and considered.

Order effect check of the tasks in each version and block. Version a, b and c were created to prevent the results from a possible order effect of the tasks. In all questionnaires of one version, the questions were in the same order although this order varied from one version to another. In version a, 47 students participated, in version b 39 and in version c 45. That gives a grand total of 131 participants. The check for order effects suggested no significant differences between versions a, b and c with $F(2, 46) = 1.399, p = .257$. This now justifies the merging of the data of version a, b and c. So, from now on all data will be treated in the same way and no further distinction will be made between each version. Another check was performed regarding the 2 blocks of identical questions and from this, no significant differences were identified between the first block with its nine questions and the second block with the repetition of these questions with F

(1, 90) = .56, $p = .456$. The further data analyzes will therefore be conducted by using the average of the identical questions.

The principle interest of this study concerned the information integration of the within subjects. Do students integrate the given information in an additive, multiplicative or averaging way?

The number of sexual partners. On average, the risk of contracting an HIV infection after intercourse with someone who has already had 1 sexual partner is perceived overall as a 19% chance (not divided into the 3 safety levels), for 10 sexual partners 29% and for 30 it adds up to 38%. It is about the same span between the 3 values. In general, the risk of contracting HIV is perceived as being higher, the more sexual relationships the partner has already had. Sexual partners were highly significant with $F(2, 246) = 214.324$, $p < .001$.

Safety of sex. The results of the analysis of the safety of sex are as follows. The risk of infection is perceived as a chance of 10% when having had sex “2 times with a condom”, 36% for “1 time with a condom and 1 time without” and 41% for “2 times without a condom”. The first space from “2 times with a condom” to “1 time with a condom and 1 time without” is an increase of 26%. The second increase consists only of 5%. It appears that, from the practice of safe sex to once or twice without a condom, there lies an extremely significant difference in a person’s risk perception. If unsafe behavior were conducted, it would not really matter all that much if it were only once or twice, there would still be a little increase in the risk perception. However, as it has already been indicated, the most dramatic increase in risk perception would be identified if the sexual behavior underwent the transformation from being safe to unsafe. Thus, the safety of sex was highly significant with $F(2, 246) = 252.187$, $p < .001$.

Interaction of number of sexual partner and safety of sex. The interaction of the number of sexual partners and the safety of sex was highly significant with $F(4, 492) = 53.659$, $p < .001$. People use the multiplicative integration rather than the additive or the averaging integration. The interaction in relation to the risk perception in percent is presented in Figure 2.

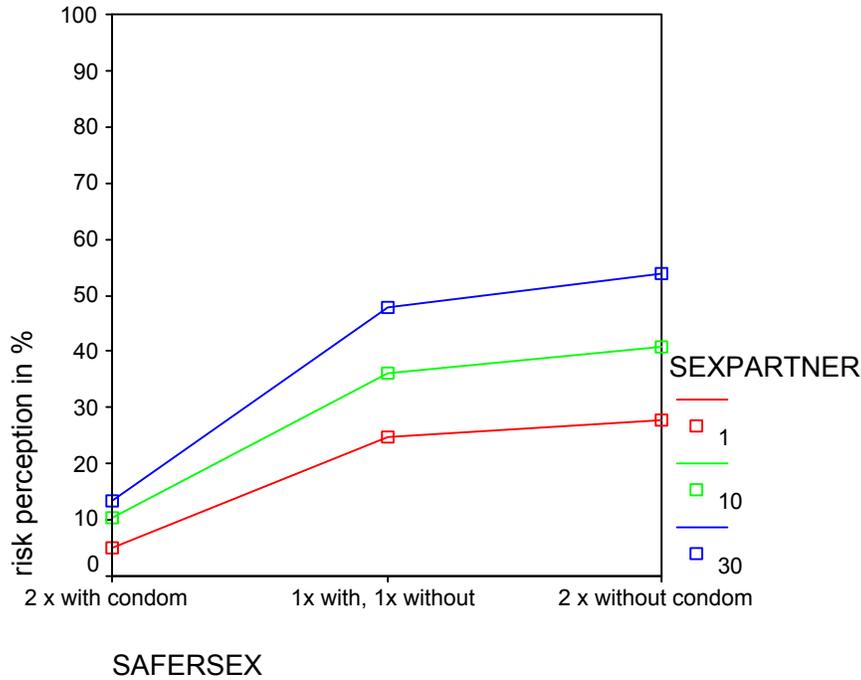


Figure 2: Risk perception in percent as a function of the number of sex partners and the safety of sex.

Of special interest in this 2 x 2 x 2 experimental design were the between subjects variables gender (male vs. female), text (HIV prevention vs. HIV causes economical problems in Africa) and optimistic bias (I myself in the situation vs. someone else in the situation) as presented in the Figure 1. In the next step, these between subject variables and therefore the hypotheses will be considered. Each one will be stated followed by the results concerning it.

Hypothesis 1: The participants who read the text about “HIV prevention” will rate the risk higher compared with the students who read the text about “HIV causes economical problems in Africa”.

The influence of the text showed that, contrary to the prediction, there was no significant effect with $F(1, 123) = 0.536, p = .465$. People did not appear to perceive the risk as being any different after having had exposure to the text, before answering the questions.

Hypothesis 2: Subjects who rate the risk for themselves perceive it as being lower than subjects who rate the risk for someone else in the same situation.

This hypothesis was contradicted by the results in general. There was no significant difference overall with $F(1, 123) = 0.403, p = .527$. The average of a person's risk perception of becoming infected for "I myself in the situation" was 29.8% and for "someone else in the situation" 27.9%. ANOVAs were conducted to check both gender separately and revealed a reversal of an optimistic bias effect in the risk perception of men with $F(1, 59) = 5.056, p = .028$. This bias existed only for males and in the opposite direction than the optimistic bias and therefore contrary to the prediction of the hypothesis. They perceived the risk of a HIV infection as higher if it concerned themselves (mean 22.5%), than if it was referred to someone else (mean 13.5%). Corresponding results for women presented no significant difference at all with $F(1, 66) = 1.357, p = .248$.

Hypothesis 3: Women will perceive the risk significantly higher than men.

Female participants rated the risk of contracting HIV as 40%, twice as high as their male fellows whose risk perception stood at 18%. Overall, the difference between males and females was highly significant with $F(1, 123) = 52.149, p < .001$. Women perceived the risk of a possible HIV infection higher in connection with the number of sexual partners. The gender became significant with $F(2, 246) = 5.422, p = .005$. The increase is about the same for men and women for 1 to 30 past sex partners, although for men this rise is activated from a considerably lower level of risk perception compared with that of women. Another factor arises if the safety of sex is on the focus. The first increase from "2 times with condom" to "1 time with condom and 1 time without" is much steeper here for women than for men, as it is shown in Figure 3. However, in the second increase it flattens out and runs almost parallel with the risk perception of the male subjects although on a higher level. Safety of sex in relation to gender is also significant with $F(2, 246) = 40.423, p < .001$.

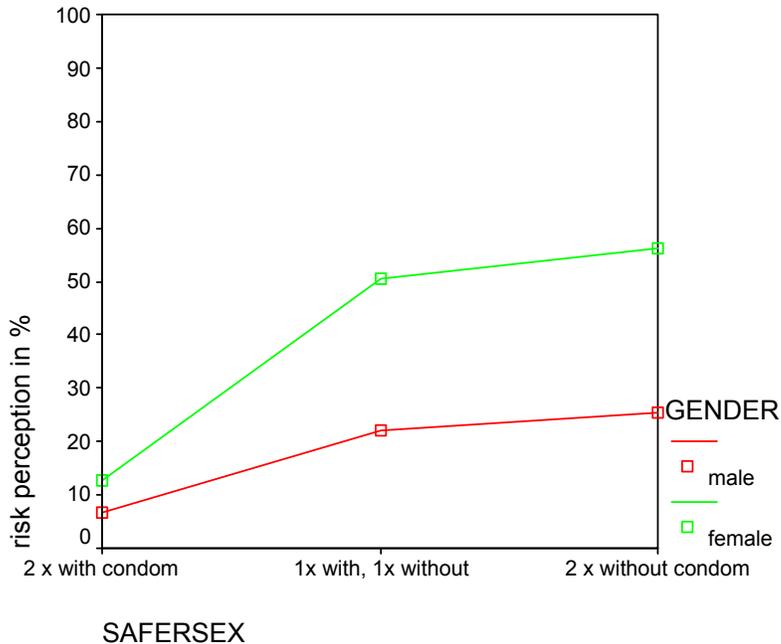


Figure 3: Risk perception in percent as a function of the safety of sex and gender.

The analysis of the 8 questions about the knowledge of HIV and AIDS revealed that all subjects possessed either a basic or an advanced level of knowledge about this theme. The levels were divided in “no knowledge” with 0-2 points, “basic knowledge” with 3-5 points and “advanced knowledge” with 6-8 points. To the “basic knowledge” level were 73 subjects assigned and 58 to the “advanced knowledge” level. The minimal amount of points was 0 and the maximal 8. The average number of points received was 5.6 with a range from 3.8 to 7. Nobody could answer all 8 questions correctly but all of them got at least 3 questions right.

Discussion

As this study involved only the participation of psychology students, the results are therefore limited to this segment of people and should not be generalized any further.

Overview of the main findings. According to the “number of sexual partners results”, people feel safest if their momentary partner has only had a few sexual relationships. This is completely reasonable. The fewer partners someone already had, the lower the chance

that this person has become infected with HIV, compared with a person who has already had varied and multiple sexual experiences. The second piece of information given in the questions concerned the safety of sex. Participants paid attention to this value as well as to the first mentioned above. This alertness is again fully understandable. If a condom is used during sex, the chance of becoming infected with HIV tends to be 0, and a feeling of safety and security is founded. But if, on the other hand, unprotected sex is practiced, there exists the possibility that a person could contract HIV. Behavior that was deemed to be obviously unsafe heightened a person's perception of risk.

In the combination of having sex 2 times without a condom and only 1 sexual experience in advance, the second factor will lower the risk perception although it only counts if the partner is already infected or not. At that moment, it does not matter how many partners one has had in the past, if you do not know the HIV status of the counterpart. There could always be a risk with unprotected sex. Roughly the same image will be shown from another point of view. If protected sex is taking place and the one with whom it is practiced has had many partners, the risk will still be perceived as higher than with a person that has only had one experience before. This may also be owed to the fact that one imagines a worst case scenario. Again, the safest perceived possibility pictured unprotected sex with a partner who had only had intercourse once before.

This information about the number of sex partners and the safety of sex was integrated in a multiplicative way. Both factors are considered to be important and influence each other. The pattern resulted in a fan formation and this suggests that both safer sex and the number of partners are regarded equally. If the participants had have integrated the information additive, the space between these 3 lines in the diagram would have been the same distance, resulting in a parallel pattern and not in a fan as shown in Figure 2. The averaging integration can also be eliminated because it would have produced a crossover pattern (Anderson, 1996). What ought to be identified as being important is the leap in the risk perception from having sex "2 times with a condom" to "1 time with a condom and 1 time without". It is much higher than the one from "1 time with a condom and 1 time without" to "2 times without a condom". If people protect themselves, they feel secure, but this changes rapidly with the practice of unprotected sex. Whether it be only

once or twice without a condom is of little significance. It is the change from safe to unsafe behavior that marks the real change in perception.

As a summary, the following can be stated. The investigation into how students integrate the information about the number of sexual partners and the safety of sex resolved this question. According to the results, the students who participated in this study integrated the given information in a multiplicative way and not in an additive or averaging one. Both the number of sex partners and the safety of sex were taken into account and influenced the risk perception of contracting HIV.

Concerning the texts, the results showed no significant difference between the “HIV prevention” text and the “HIV causes economical problems in Africa” one, contrary to the stated hypothesis. It does not matter if students read a prevention text that points out the increase of the spread of HIV and how to prevent it or a text that was only slightly related to HIV and therefore did not concern the readers directly. This could be explained through the student’s own level of existing knowledge. It could be argued that nothing that was written in the texts was new or not known before but rather that the information refreshed their memory. Students are well educated regarding HIV. Maybe the term HIV was the keyword that reactivated the knowledge or brought it back to the forefront of the student’s mind and therefore did not matter in which way it had been presented (if with actual danger and prevention or with economical problems). This subject, HIV and AIDS, affects normal life. Mass media publishes articles about new scientific researches, tests and results, campaigns circulate every now and then and so on. In the study of Yzer et al. (1998), the influence of the text was increased first by the presence of 2 texts (vulnerability and self-efficacy) which participants read and second by writing down a prevention suggestion concerning the infection of HIV. This could have made the difference of the risk perception regarding the texts.

Of particular interest were the results of the optimistic bias check, although these were contradictory findings regarding the hypothesis and former results by Fisher and Misovich (1990). Female and male participants seemed not to take any account for a possible optimistic bias although a difference between the genders existed. For women it did not matter, regarding their risk perception of a possible HIV infection, if they answered the questions suggesting themselves in the situation or any other person. On the

other hand, males differed in this respect. Contrary to the stated hypothesis and therefore to the optimistic bias, the risk was perceived as higher if they presumed themselves to be in the situation rather than if it were someone else. Their sense of risk could be explained through the increase in the spread of AIDS and the consequent prevention activities which they may have experienced. However men still perceived the risk on average lower than women. Therefore it did not confirm the results of Fisher and Misovich (1990) who found that males were significantly more afraid of contracting HIV than females if it concerns themselves.

Supporting the hypothesis concerning gender differences, the results provide evidence that this group of women perceive the risk of contracting HIV higher than men do. This corresponds to the findings of Baldwin & Baldwin (1988). It makes sense since women take more risk when having sexual intercourse because they suffer more directly from the consequences of pregnancy and STDs. This corresponds to the results of Drottz-Sjöberg (1991a) and confirms a possible trend in this field that women pay more attention to the consequences and men to the probabilities of contracting HIV.

Implications of the findings for theories of risk perception. These results for the optimistic bias point out the importance of research in different populations and fields. An optimistic bias can exist, as it is often found, for a certain domain or group and may not for another that is investigated. It is dangerous to rely on the universality of results. A generalization is not justified until the evidence is proven by conducting new and exhaustive studies.

Suggestions for future research. In this study, 2 within subject variables and 3 between subject variables were checked for their influence on risk perception. Further research should be done on other variables in interaction with the perception of risk for an infection. There certainly will be other information that play a certain role that is integrated to form the risk perception. Many single parts, some with more influence and some with less, combine to the whole perception and finally building up the decision and perspective. If the risk is perceived as small, the probability of engaging in risky behavior increases. The influence of certain stimuli like alcohol or other drugs on risk perception should be examined further. They often play an underestimated role. Another direction that the study could take would be to examine the effectiveness of prevention

information. If prevention campaigns, posters, texts etc. still have an effect. It would be interesting to determine how and in what capacity they influence a person's judgment or perception of risk.

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Appendix A

Important parts of the questionnaire are presented here to get an impression on how the questionnaire looked like. Both text versions are included here as well as different types of questions concerning the optimistic bias variable, but this was not the case in the study. Participants got either the prevention text or the other, but not both. The same with the questions.

Frågeformulär

Version för män

Förord:

Alla uppgifter i denna undersökning kommer att användas med stort förtroende samt förbli anonyma.

Jag skulle vilja be dig att först läsa genom texten på nästa sida. Därefter ber jag dig att spontant och ärligt besvara de följande 27 frågorna. Här handlar det om att bedöma riskfaktorn, vilken du i uppgift 1-18 markerar genom att sätta ett streck på den skala som finns i anknytning till varje fråga. I uppgifterna 19-27 ska du bedöma sannolikheten genom att ange ett procenttal. Försök att föreställa dig situationen och svara med ditt hjärtas mening. Uppgifterna förekommer många gånger i texten. Ibland kan det vara så att man ger ett annat svar på en fråga i början än vad man gör vid en senare tidpunkt. Detta är helt normalt; åsikter är föränderliga. Jag ber dig därför att inte bläddra tillbaka för att jämföra eller ändra dina redan angivna svar. Vidare vore jag tacksam om du läser genom uppgifterna uppmärksam och besvarar dem i den ordning de kommer. För min vetenskapliga utvärdering är det viktigt att alla frågorna besvaras.

Stort tack för din medverkan.

Text 1

Ökning av antalet positivt HIV-smittade under år 2002

Enligt uppgifter från laboratorier ökade antalet positiva HIV-test under år 2002 tydligt. Nittioalets trend då man kunnat se att antalet smittade i stället minskade hade nu definitivt nått sitt slut.

Ökning redan år 2001

Den sexuella smittvägen kan ses som en tydlig grund för denna utveckling. I 80 % av fallen sprids nämligen HIV-viruset via sexuella kontakter. Följande faktorer kan ses som riskfaktorer:

- 1) oskyddat samlag (båda delaktiga),
- 2) oskyddat analsex (båda delaktiga),
- 3) oralsex, när sperma eller menstruationsblod kommer i munnen

Redan vid ett enda oskyddat samlag med en HIV-positiv partner är det möjligt att smittas. Ju oftare detta förekommer, desto större blir sannolikheten att man smittas av HIV. Om du vill undvika infektionsrisken måste du använda kondom vid varje könsumgänge eller konsekvent se till att din partner använder det. För en HIV-infektion kan inte botas och obehandlad – eventuellt efter flera år utan besvär – kan HIV leda till svåra sjukdomsfall samt till döden. De behandlingsmöjligheter som finns kan endast fördröja sjukdomsförloppet.

Text 2

Aids försvårar Afrikas ekonomi

I de delar av Afrika som ligger söder om Sahara börjar man bli medveten om de ekonomiska konsekvenserna av HIV / aids: inkomsten per person sjunker enligt världsbanken med ungefär 1 procent per år.

Nästan 30 miljoner människor i Afrika är smittade av HIV / aids och omkring 6500 människor dör dagligen av olika sjukdomar som har en anknytning till aids, såsom tuberkulos och lungsjukdomar. Det mänskliga lidande som gömmer sig bakom dessa siffror kan man bara ana. Vad som däremot är konstaterat, är de stora sociala och ekonomiska konsekvenser som sjukdomen orsakar. Världsbanken uppskattar att inkomsten per person, som en följd av HIV / aids, sjunker med minst 1 procent om året för människorna i de delar av Afrika som befinner sig söder om Sahara. Sina vetenskapliga uppgifter stödjer de på studier genomförda i Kamerun, Kenya, Swaziland, Tanzania och Zambia.

Aids hindrar Afrika i deras kamp mot fattigdom och hunger samt reducerar tillväxten. Dessa bedömningar från Kingsley Amoako, chefen för ECA, närmar sig de vid millenniumskiftet fastställda målen för Afrikas utveckling. Dessa mål är uppdelade på tre områden: att halvera det antal människor som lever i fattigdom, uppfostran samt att gynna kvinnor.

Risk perception of students

Examples of questions that were used.

Du går på en fest en kväll och lär känna en kvinna. Från henne får du reda på att hon fram tills denna tidpunkt har haft **10** partner. Kvällen blir trevlig och ni går hem till henne. Där har ni sex 2 gånger, **2 gånger med kondom.**

Hur hög anser du risken för en HIV-infektion vara?



En man går på en fest en kväll och lär känna en kvinna. Från henne får han reda på att hon fram tills denna tidpunkt har haft **30** partner. Kvällen blir trevlig och de går hem till henne. Där har de sex 2 gånger, **1 gång med kondom och en gång utan.**

Hur hög anser du risken för en HIV-infektion vara?



Du går på en fest en kväll och lär känna en kvinna. Från henne får du reda på att hon fram tills denna tidpunkt har haft **1** partner. Kvällen blir trevlig och ni går hem till henne. Där har ni sex 2 gånger, **2 gånger med kondom.**

Hur hög anser du sannolikheten för en HIV-infektion vara?

_____ %

En man går på en fest en kväll och lär känna en kvinna. Från henne får han reda på att hon fram tills denna tidpunkt har haft **10** partner. Kvällen blir trevlig och de går hem till henne. Där har de sex 2 gånger, **2 gånger utan kondom.**

Hur hög anser du sannolikheten för en HIV-infektion vara?

_____ %

Några allmänna frågor till temat HIV/Aids:

Är sannolikheten för en HIV-infektion lika hög för män som för kvinnor?

- ja
- högre för män
- högre för kvinnor

Om du hade sex igår och om du nästa dag gör ett aids-test, kan en infektion då konstateras?

- ja
- nej

Hur länge dröjer det i genomsnitt tills en person som är HIV-smittad får aids?

- 1 år
- 5 år
- 10 år
- 15 år

Vad betyder förkortningarna HIV och Aids?

HIV: _____

Aids: _____

Kan man se på er person, om han/hon är smittad?

- ja
- nej

Skyddar p-piller mot en HIV-infektion?

- ja
- nej

Finns det något botemedel mot aids?

- ja
- nej

Kryssa för de punkter som du tror kan orsaka en HIV-infektion

- ett myggbett
- en kyss
- använda gemensamma sprutor
- sex
- petting
- blodtransfusion
- beröring

Risk perception of students

Några personuppgifter:

Ålder: _____

Kön: man
 kvinna

Studier: _____

Har du ett fast förhållande? ja
 nej

Sedan när? _____

Med hur många personer hade du de senaste 2 åren

- oskyddat sex? _____

- skyddat sex? _____

Hur många HIV-test har du gjort?: _____

HIV-status: positiv
 negativ

Sexuell läggning: hetrosexuell
 bisexuell
 homosexuell

Kommentarer: _____

Tack för din medverkan!!!