

HIV/AIDS preventive self-efficacy and self-determination effect on risky sexual behavior of South-African adolescents

Thesis report

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Abstract

This paper reports on the construction and outcome of a baseline questionnaire presented to 280 South-African high school students, aged 15-18. The questionnaire used scales to measure constructs from both Social Cognitive Theory (Bandura) and Self-Determination Theory (Deci & Ryan). Its goal was to explore the predictive values of self-efficacy for safe sexual behavior and self-determination for condom use on actual sexual behavior. The included demographic variables were gender, age, sexual intercourse experience, grade, and substance use (drugs and/or alcohol). Variables from self-determination theory, namely autonomous motivation and perceived competence, were found to have a significant effect on sexual behavior - the higher the scores on the constructs measuring these variables, the lower the risky sexual behavior. Gender was found to have a moderating effect on these findings. The ultimate aim of this study is to provide a clearer picture of which socio-psychological theories and concepts may benefit educational practice to decrease unhealthy sexual behavior of South-African adolescents who are at high risk of getting infected with HIV/AIDS.

The NDLOVU Care Group

The Ndlovu (meaning 'elephant' in Zulu) Care Group is an innovative, multi award winning nongovernmental organization (NGO) and community development group that has been operating in rural areas in South Africa since 1994. It consists of researchers, teachers and care-workers of different nationalities and ethnicities. It draws on medical, socio-psychological, and economical research from several renowned universities, done among South-Africans of all age groups. Its main targets are rural, poorer areas, and it strives to enhance the quality of life of the people of these areas by means of an integrated model of care. This model consists of both clinical and community services, including education. Its main community project is called the CHAMP (Community Health Awareness Mobilization and Prevention program), mainly situated in Elandsdoorn, Limpopo Province. It focuses on children and high-risk adolescents and aims to develop life-skills and the means to imprint these into the community for sustainability. Students from Utrecht University (located in Utrecht, The Netherlands) have the opportunity to graduate as a Master of Science (MSc) in several social sciences by supporting the project. This is done by doing research in collaboration with Ndlovu Care Group. The research reported on in this paper is primarily to contribute to the knowledge and understanding of useful scientific theories and tools that may be applied through educational practice, to ultimately benefit the target groups involved.

1. Introduction to this research

HIV/AIDS is a worldwide problem that still spreads especially in the poorer parts of the world, like Africa and south-east Asia (WHO, 2006). In South Africa, HIV prevalence in the total population stabilized at a level of 11%, but this percentage is higher in rural areas like Limpopo. Here, an estimated one in four is HIV-positive (Tempelman et al., 2010). Especially South-African adolescents are at risk of becoming infected. Not only are they at a stage in life where sexual behavior becomes an important physical and social behavior (Koller, 2000), they also suffer under financial, social and emotional problems as a result of poverty and loss of relatives (Carter & May, 1999; Ebersöhn, 2010). A lack of effective guidance may lead them to engaging in more life-threatening behaviors, like risky sexual behavior combined with substance abuse. Because educational, medical, and psychological aid is often scarce (Ebersöhn, 2010) it is imperative to educate them about the dangers of HIV/AIDS and ways to prevent becoming infected. Because this study is essentially to benefit educational science, the educational environment present was first explored. Unfortunately, the educational environment present in Elandsdoorn, South Africa is difficult to report on because of its unstable nature. Classes, exercises, and interventions that may have been part of school curriculums during their installation phase, are often discarded when their perceived need or guidance decreases. Education about sex in the Elandsdoorn area is therefore still unclarified and limited, and has not led to the necessary changes in sexual behavior.

Some research shows that, although people are informed on the dangers of HIV/AIDS, they do not necessarily use prevention or attend medical check-ups (Tempelman et al., 2010). Effective education must cause people to act and show an actual change in behavior. The aim of this research is to explore theoretical socio-psychological concepts that may contribute to the extrinsic and intrinsic motivation necessary for making a change in behavior. This way these theories and constructs may be used to improve the present educational environment and to help to design more effective future educational interventions and programs.

2. Theoretical background

Considering socio-psychological and educational research, a number of studies have explored health-related behaviors, the motivation behind those behaviors, and the effect of several educational interventions and programs. *Social Cognitive Theory* (SCT) (Bandura, 1997) is one of those theories, that may be combined with educational practice to influence behavior. SCT describes that knowledge and understanding about life is being gained by

observation within the context of social interactions, experiences, and media influences (Bandura, 1989). Education can be offered in such a way that it influences these. Moral development can be enhanced by practicing behavior that is 'right' for someone and his/her group, within educational contexts.

Bandura recognized that there is a big difference between being able to perform moral behavior versus actually doing it in daily life. According to SCT this is influenced by incentives/rewards and outcome expectancies (cognitions) of people. The rewards, some being obvious (like not becoming infected with HIV), are not always enough for people to actually engage in healthy sexual behavior. In the case of high-risk adolescents in South-Africa, even if they know that moral sexual behavior includes abstinence or using a condom to protect themselves, they may find the 'costs' too high and/or the benefits too low. They may also feel physically or emotionally incapable of practicing the healthy behavior. SCT states that it is therefore necessary that people also believe that they are capable of performing a behavior. This is called their *self-efficacy* for a behavior. People with a high self-efficacy are generally of the opinion that their own actions and decisions shape their lives and are therefore more inclined to engage in behaviors they know are good for them. People with low self-efficacy may see their lives as out of their hands and therefore often do not follow through with the behavior. Self-efficacy influences the effort one puts forth to change risky behavior and the persistence to continue striving towards certain goals despite barriers and setbacks that may undermine motivation (Bandura, 1989).

There have been several studies on self-efficacy that are relevant in the context of this research. Some research has shown that self-efficacy for preventing risky sexual behavior, predicts actual sexual behavior (Kasen et al., 1992; Lee et al., 2009). This means that increasing self-efficacy may lead to an increase in the desired behavior. The learning environment can have a substantial impact on this. An experiment by Givaudan et al. (2006) among high school adolescents in Mexico showed that an AIDS prevention program to enhance AIDS awareness led to an increase in self-efficacy for using condoms, as well as knowledge and accurate norms about AIDS and communication about sex. If self-efficacy predicts the likelihood of performing actual behavior, increasing it through educational means might improve the changes of young adolescent South Africans using protection or avoiding other risky sexual behaviors.

This research aims to find out what degrees of self-efficacy young people in South-Africa experience with regard to health-related behaviors, and more importantly, how it influences their actual sexual behavior. Some research has already studied and discussed the effects of self-efficacy for avoiding risky behavior like overeating or substance abuse, and some on sexual behavior (Kasen et al., 1992; Lee et al., 2009). However, so far no research on self-efficacy for avoiding risky sexual behavior could be found within the context of South

Africa. This research therefore seems the first to measure these constructs within this context.

Self-efficacy from SCT is not the only concept this research uses when considering behavior change and motivation. Self-efficacy is, according to Social Cognitive Theory (described above), primarily an *extrinsic* concept. SCT uses a mechanistic approach to changing behavior, which means it argues that people can be instructed from the outside (like a mechanistic 'machine') what is good or bad for them, and that calculations can be made that predict behavior according to that. But according to recent theories, behavior is also *intrinsically* motivated. *Self-Determination Theory* (SDT) (Deci & Ryan, 1985) suggests that, when considering behavior and motivation, an organismic approach, as opposed to a mechanistic approach, should be applied. Using an organismic approach, one includes in the equation internal motivators that come naturally (from the organism itself), which cause a human being to grow and evolve. This way people are also *self-determined* when they consider engaging in behaviors. According to SDT, people initiate in an activity for its own sake because it is interesting and satisfying in itself (caused by intrinsic motivation), as opposed to doing an activity to obtain an external goal (caused by extrinsic motivation) (Deci & Ryan, 2000). Deci and Ryan (1985) propose three main intrinsic needs involved in self-determination, which motivate the self to initiate behavior and specify nutrients that are essential for physical and psychological health and well-being of an individual. These needs are said to be universal, innate and psychological and include the need for *autonomy*, *competence*, and *relatedness*. SDT propositions focus on how social and cultural factors facilitate or undermine people's sense of volition and initiative, related to their well-being and the quality of their performance. Conditions supporting the individual's experience of autonomy, competence, and relatedness are argued to foster the most volitional and high quality forms of motivation and engagement for behavioral activities. SDT proposes that the degree to which any of these three psychological needs is unsupported or thwarted within a social context will have a robust detrimental impact on wellness in that setting (Ryan & Deci, 2000). This seems also very much applicable in the educational context of the target group of this study. Using a more autonomous, organismic approach in the learning environment may increase self-determination to decrease risky sexual behavior.

Because motivation is both extrinsically and intrinsically motivated, this research deems it very relevant for this research to use SDT as a theoretical framework as well. This way, both theories may be used in combination to arrive at a more complete explanation of behavior and motivation, and more effective educational and learning strategies. This research argues that self-efficacy alone, as an extrinsic concept, needs to be complemented by concepts that focus on intrinsic needs. The intrinsic psychological needs have already been measured for the advancement of several health-related behaviors like smoking,

dieting and exercising, and drinking responsibly (Williams et al., 1996; Williams et al., 1999), but not for South-Africa, nor for relevant HIV/AIDS related health behaviors, such as using condoms. Using condoms is seen as the most important factor in stopping HIV/AIDS from spreading (Tempelman et al., 2010). This research will therefore conceptualize self-determination in South Africa's context. Of the main intrinsic needs that people need fulfilled, both autonomy and perceived competence on condom use will be measured in the South-African context by slightly changing the scales that previously measured other health-related behaviors elsewhere. The scale for relatedness (the third intrinsic need) is not quite applicable for this research, as it focuses on perceived support from providers or physicians (or counselors or health-care program leaders), which youngsters in the poor areas of South-Africa unfortunately tend not to have.

Concluding, this research argues that education on HIV/AIDS awareness may benefit when it accounts for both external and internal motivational factors as described by leading psychosocial theories, using constructs like self-efficacy, autonomy, and perceived competence. A more complete picture can be gained by including multiple theories and constructs and assess their combined effects on sexual behavior, benefitting future educational and learning strategies. Koestner et al. (2006) for example, were able to increase the effectiveness of making long-term goals by boosting either self-efficacy and/or autonomy before setting these goals during planning exercises. Long term planning did not seem to work at first, until it was combined with boosting one or a combination of these constructs. This shows promise for increasing the effectiveness of similar educational strategies in South Africa.

3. Aim

The concrete aim of this study is to measure constructs based on Social Cognitive Theory (SCT) and Self Determination Theory (SDT) and their predicative values on actual risky sexual behavior among high-risk adolescents in South-Africa. These include self-efficacy for safe sex behaviors, autonomy for using condoms, and perceived competence to using condoms. The first is derived from SCT, the latter two from SDT. Next to autonomous reasons, controlled reasons (outside reasons) for using condoms are also measured for comparison. Gender, age, and substance used are checked for interaction effects. Consequently this research will focus on the following questions:

1. *What is the degree of self-efficacy for avoiding risky sexual behavior among adolescents and what effect does this have on actual risky sexual behavior?*

Hypothesis: Research has shown that the degree of self-efficacy for avoiding risky sexual behavior has significant predictive value on actual sexual behavior (Lee et al., 2009) in sexually active Taiwanese adolescents, aged 16-18 years old. This means that the higher their self-efficacy degrees are, the less likely it is they engage in actual risky sexual behavior. This same hypothesis is expected to be valid here as well, but for 15-18 year old South African adolescents.

2. *What is the degree of self-determination, measured by autonomous versus controlled motivation to use condoms, as well as perceived competence to using condoms, and what effect do these factors have on actual risky sexual behavior?*

Hypothesis: Research has shown that self-determination has a significant predictive effect on several health related behaviors, like dieting and smoking (Levesque et al., 2007). This means that the higher their scores for constructs that encourage self-determined choice to engage in, or change a certain health related behavior, the more it influences actual behavior positively. In the case of this research, the higher people's self-determined autonomous motivation and perceived competence, the higher their score on safe sexual behavior. The behavior conceptualized is using condoms because it is seen as the most important behavior in limiting risky sexual behavior.

3. *What are important demographic variables that predict/explain differences in degrees of self-efficacy and self-determination and their effects on actual risky sexual behavior?*

Hypothesis: Age, gender and substance use have previously been measured for their effect on risky sexual behavior in previous studies (Lee et. al, 2009; Bachanas et al., 2002b; Tapert, 2001). They are relevant in the context of this research as well and will therefore be controlled as covariates. For example, substance use and a higher age have been shown to have a detrimental effect on safe sexual behavior (Bachanas et al., 2002b; Tapert, 2001).

4. Methods

Participants

A non-probability, convenience sampling method was used to recruit a sample of 280 students from five grades distributed in two secondary schools in the Elandsdoorn area in Limpopo, South-Africa. These students belong to the same group that future educational interventions or programs could be offered to. Their age is also appropriate, namely between 15 to 18 years old. According to the NDLOVU Care Group, at this age they are highly sexually active. Also, starting from 15 years old, their understanding of English is high

enough for them to understand the procedure and the statements and questions that are offered to them. Some studies, like those done by Lee et. al, (2009) used similar age groups in countries where English is not the main language. The participants were given a small incentive (a pencil, eraser and candy) for participating.

Procedure

First, a pilot was done with eight 20-25 year old so called *life-skill trainers* (a name given to them by Ndlovu Care Group). Trained, recruited and paid by Ndlovu Care Group, these youngsters have educated students on sexual behavior and the risks of HIV/AIDS. The life-skill trainers have also had close personal contact with the students, meaning that they assumingly know about the understanding and attitudes of students with regard to sex and sexual behavior. Also, as English is not the native language of the target group, the proposed questionnaire and all its items were checked at length and understandability before it was used with the target group.

In cooperation with the school's teachers and principals the best possible days and times were selected for data collection. The researcher informed the students on the purposes of the study and the associated risks and benefits of participation, and the students were assured of confidentiality, anonymity, and voluntary participation both orally and in writing. The researcher was present during the filling in of the questionnaire, supported by the above-mentioned life-skill trainers where things were unclear. The researcher explained the procedure to the participating students, and answered their questions before and during the filling in of the questionnaire.

Measurements

The Safe Sex Behavior Questionnaire (SSBQ) (Dilorio et al., 1992), developed to detect safe sexual practices (Dilorio, 2009), was used to measure risky sexual behavior. Risky sexual behavior is defined as the infrequent practice of safe sex behaviors in the realm of contracting HIV. These safe behaviors included protected sex during intercourse, avoiding hazardous behaviors such as anal sex, and interpersonal skill to discuss sexual history and the use of condoms. SSBQ is originally composed of 24 items with nine negatively formulated, and 15 positively formulated items. One item was added to complement the scale to make it more applicable for this particular study. Participants rated on a four- point Likert scale the degree of safe sex practices from 1. "never" to 4. "always". The averages were used, with higher scores indicating less risky sexual behavior and lower scores indicating more risky sexual behavior. The SSBQ has been used in previous research among Taiwanese adolescents with reported Cronbach's alpha of 0.86 (Lee et al., 2009).

Self-Efficacy for Limiting HIV Risk Behaviors (LHRB) (Smith et al., 1996) was measured by a nine-item scale, that has been used to assess self-efficacy for limiting HIV risk behavior among adolescents. HIV/AIDS preventive self-efficacy is defined as the individual's belief about his/her ability to successfully avoid HIV/AIDS-related risky sexual behavior. Participants are asked about their beliefs regarding their ability to perform the HIV/AIDS preventive behaviors on a five-point scale (1. "not sure at all"- 5. "very sure"). The averages were used, with higher scores indicating higher self-efficacy to perform HIV/AIDS preventive behaviors. Reliability scores of Cronbach's Alpha 0.75 (Baseline) and 0.77 (follow-up) have been reported (Smith et al., 1996).

For measuring autonomous motivation and perceived competence, the Health-Care, Self-Determination Theory Questionnaire Packet (Geoffrey C. Williams, Richard M. Ryan, & Edward L. Deci) was used. This packet contains two questionnaires that have been developed to assess constructs contained within Self-Determination Theory (SDT) as the theory relates to health-care behavior that may be fostered by educational methods (Deci & Ryan, 1985; Williams, Deci, & Ryan, 1999). The first is the Treatment Self-Regulation Questionnaire (TSRQ). The second is the Perceived Competence Scale (PCS). Both are measured by a five-point scale (1. "strongly disagree"- 5. "strongly agree"). The TSRQ utilizes a general approach to assessing autonomous versus controlled self-regulation developed by Ryan and Connell (1989). It is a set of questionnaires concerning why people do or would do some healthy behavior. They have the same purpose, to assess the degree to which a person's motivation for a particular behavior or set of behaviors is relatively autonomous (or self-determined). There are two subscales to the scale: the autonomous regulatory style and the controlled regulatory style. The autonomous style represents the most self-determined form of motivation and has consistently been associated with maintained behavior change and positive health-care outcomes. This scale is adapted slightly for the relevant behavior, which for this study is using condoms when having sex. A validation article of the TSRQ was published by Levesque et al. (2007), where Cronbach's Alpha was reported to be 0.85. The responses on the autonomous items are averaged to form the reflection of autonomous motivation for using condoms and the responses on the controlled items are averaged to form the reflection of controlled motivation for using condoms. The subscale scores can and will be used separately in this research to get a clear picture of the influence of autonomy. This scale has 12 items: six that assess autonomous motivation and six that assess controlled motivation.

The Perceived Competence Scale (PCS) concerns feelings about behaving in healthy ways. This is a short four-item questionnaire that assesses the degree to which participants feel confident about being able to make (or maintain) a change towards a healthy behavior. Consistently, people who feel more competent with regard to a particular behavior have been

found to be more likely to make and maintain the change and to evidence positive health care outcomes. As with the TSRQ, for this study the PCS was adapted to measure condom use, and the average score is used to form the reflection of perceived competence for using condoms. The scale has been used in several studies, like in the one done by Williams, Freedman, & Deci (1998), where the Cronbach's Alpha reliability for the perceived competence items was 0.90.

Demographic variables measured in this study include age, gender, grade, yes/no regarding ever having sexual intercourse experience, yes/no regarding having history of substance use (alcohol drinking and drug use).

To clarify, all variables are set in their appropriate relation with each other in the following model:

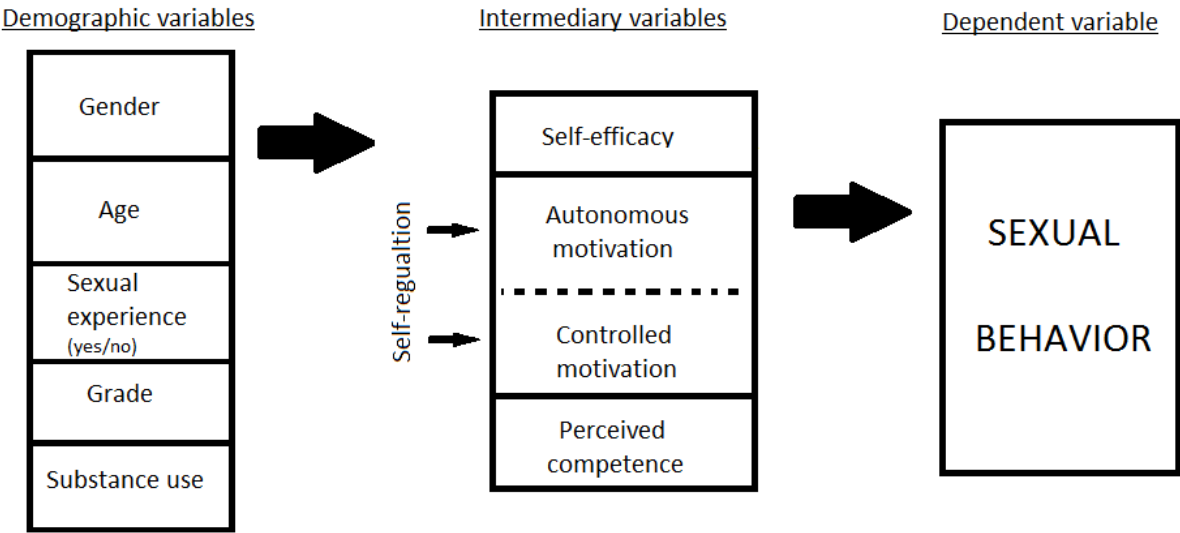


Figure 1: An integrative model for predictive variables on risky sexual behavior.

5. Data-analysis

Descriptive statistics were used to describe the sample characteristics. These included frequencies and percentages for demographic variables, and mean scores and standard deviations for scale scores. By means of factor analysis was controlled if the variables measured the same construct('s), and Cronbach's Alpha was used to determine reliability for all used scales. Multiple regression analysis was used to examine the predictive value effect of HIV/AIDS preventive self-efficacy, autonomous and controlled motivational reasons for using condoms, and perceived competence for using condoms (as independent variables) on actual risky sexual behavior (as the dependent variable). Age, gender, and substance use were statistically controlled as covariates because of their known effects on the variables

being studied as suggested by previous studies (Bachanas et al., 2002b; Tapert, 2001). The effects of the interactions were observed by way of stepwise regression analyses. The independent variables were centered to prevent multicollinearity. When a significant effect seemed apparent, differences between groups were further analyzed to get a clearer picture of the perceived effects.

6. Results

Description of the sample

The average unadjusted age of the 280 participants was 16.75 years old, consisting of 138 male (49.3%) and 142 female (50.7%) South-African adolescents. Social-demographic characteristics of female and male participants are reported in Table 1.

Of all 280 participants, 142 (50.7%) had sexual intercourse experience. 96 (69.7%) of these 142 participants also used alcohol. However, of the 138 people who did not have had sexual intercourse experience, 34 (32.6%) used alcohol. Alcohol use was also higher for boys. 18.3% of participants who had sexual intercourse experience also used drugs, while 3.6% of those who did not have sexual intercourse experience used drugs. Again, boys used drugs more often. The average unadjusted age of participants who did not have sexual intercourse experience was 16.33 years old with a standard deviation of 1.15; whereas, the mean unadjusted age of students who had sexual intercourse experience was 17.16 years old (S.D. = 0.96).

Table 1

The characteristics of participants ($n = 280$)

Characters	Total		Males ($n = 138$)		Females ($n = 142$)	
	n	%	n	%	n	%
Grade						
8 th	54	19.3	33	23.9	21	14.8
9 th	97	34.6	48	34.8	49	34.5
10 th	43	15.4	18	13	25	17.6
11 th	31	11.1	15	10.9	16	11.3
12 th	38	13.6	13	9.4	25	17.6
Missing	17	6.1	22	15.9	6	4.2
Alcohol						

No	136	48.6	55	39.9	81	57
Yes	140	50	81	58.7	59	41.6
Missing	4	1.4	2	1.4	2	1.4
Drugs						
No	247	88.2	114	82.6	133	93.7
Yes	31	11.1	23	16.6	8	5.6
Missing	2	0.7	1	0.7	1	0.7
Had sexual intercourse						
No	138	49.3	60	43.5	78	54.9
Yes	142	50.7	78	56.5	64	45.1

Scores on all scales and CA

Mean and standard deviation scores of all scales are reported in Table 2.

Table 2

Descriptions of the scale-scores

Groups	Total (<i>n</i> = 280)		Males (<i>n</i> = 138)		Females (<i>n</i> = 142)	
	Mean	SD	Mean	SD	Mean	SD
Self-efficacy (CA = 0.77)						
With sexual experience (<i>n</i> = 142)	3.71	0.79	3.59	0.68	3.86	0.88
Without sexual experience (<i>n</i> = 138)	3.36	0.99	3.22	1.00	3.47	0.98
Autonomous motivation (CA = 0.79)						
With sexual experience (<i>n</i> = 142)	3.93	0.81	3.88	0.68	4.01	0.94
Without sexual experience (<i>n</i> = 138)	3.81	0.83	3.55	0.81	4.02	0.79
Controlled motivation (CA = 0.62)						
With sexual experience (<i>n</i> = 142)	3.53	0.73	3.55	0.69	3.50	0.78
Without sexual experience (<i>n</i> = 138)	3.52	0.78	3.41	0.78	3.61	0.77
Perceived competence (CA = 0.75)						
With sexual experience (<i>n</i> = 142)	3.88	0.82	3.88	0.77	3.87	0.88

Without sexual experience (<i>n</i> = 138)	3.62	0.91	3.50	0.87	3.72	0.93
Safe sexual behavior (CA = 0.75)						
With sexual experience (<i>n</i> = 142)	2.90	0.41	2.90	0.39	2.91	0.44

The mean total of HIV/AIDS preventive self-efficacy scores in all participants (*n* = 280) were 3.62 (S.D. = 0.94). Male students had an average score of 3.59 (S.D. = 0.93), and the mean score in female students was 3.65 (S.D. = 0.95). The mean scores in the HIV/AIDS Preventive Self-efficacy scale for different grade level of students were: 3.26 (S.D. = 0.95) for the 8th graders, 3.48 (S.D. = 0.98) for the 9th graders, 3.89 (S.D. = 0.86) for the 10th graders, 3.94 (S.D. = 0.82) for the 11th graders, and 4.01 (S.D. = 0.77) for the 12th graders. Participants who reported a history of substance use (drinking alcohol and drug use) had a mean score of 3.76 (S.D. = 0.82) in the HIV/AIDS Preventive Self-efficacy scale while an average HIV/AIDS preventive self-efficacy score of 3.46 (S.D. = 1.03) was found in participants without substance use history.

On average, the participants (*n* = 280) had a mean score of 3.76 (S.D. = 0.75) for the Treatment Self-Regulation Questionnaire (TRSQ) that measured autonomous motivation for using condoms, and 3.73 (S.D. = 0.82) for the scale that measured controlled motivation. The average scores were 3.64 (S.D. = 0.70) in male students and 3.88 (S.D. = 0.79) in female students for the autonomy scale, and 3.67 (S.D. = 0.76) in male students and 3.79 (S.D. = 0.87) in female students for the controlled motivation scale. Participants in 8th, 9th, 10th, 11th and 12th grade reported averaged scores as: 3.22 (S.D. = 0.74), 3.78 (S.D. = 0.74), 4.08 (S.D. = 0.63), 4.00 (S.D. = 0.61), and 4.07 (S.D. = 0.53) respectively for the autonomy scale, and: 3.28 (S.D. = 0.76), 3.68 (S.D. = 0.79), 3.83 (S.D. = 0.75), 4.07 (S.D. = 0.73), 4.27 (S.D. = 0.55) respectively for the controlled motivation scale. The average score in students with substance use history was 3.84 (S.D. = 0.66), while this was 3.67 (S.D. = 0.83) in students without substance use history for the autonomy scale. For the controlled motivation scale these were and 3.82 (S.D. = 0.78) and 3.60 (S.D. = 0.85) respectively.

The average mean scores for the Perceived Competence scale in all participants were 3.58 (S.D. = 0.82). Male students had an average score of 3.53 (S.D. = 0.77) and female students had an average score of 3.62 (S.D. = 0.87). The mean scale scores for perceived competence for using condoms in the different grade levels of students were: 3.19 (S.D. = 0.93) for 8th grade, 3.66 (S.D. = 0.80) for 9th grade, 3.76 (S.D. = 0.84) for 10th grade, 3.70 (S.D. = 0.67) for 11th grade, and 3.73. (S.D. = 0.63) for 12th grade. Participants who reported a history of substance use had a mean score of 3.69 (S.D. = 0.72) for the Perceived

Competence scale while an average scores of 3.44 (S.D. = 0.91) were found in participants without substance use history.

The average scores of SSBQ in all participants with sexual intercourse experience ($n = 142$) were 2.90 (S.D. = 0.41). Students in the 8th grade had mean scores of 2.70 (S.D. = 0.42) in the SSBQ scale, and the 9th, 10th, 11th graders and the 12th graders had averaged SSBQ scores as 2.80, (S.D. = 0.44), 2.86 (S.D. = 0.53), 2.83, (S.D. = 0.39), and 3.04 (S.D. = 0.46) respectively. Students with substance use history reported slightly more risky sexual behavior (mean score in SSBQ scale = 2.88, S.D. = 0.38) than their non-substance use counterparts (Mean scores in SSBQ = 2.93, S.D. = 0.47). The mean scores in the HIV/AIDS Preventive Self-efficacy scale, self-determination scales, and SSBQ for female and male students in the sexually experienced and non-sexually experienced groups are presented in Table 2.

Effects on risky sexual behavior

Multiple regression analysis was used, taking the average scores on the Safe Sex Behavior Questionnaire as the dependent variable. The average scores on the scales measuring self-efficacy, autonomous motivation and perceived competence, and behavioral intention of students who have had sexual intercourse experience were taken as independent variables. The following results were found:

Self-efficacy, measured by the Self-Efficacy for Limiting HIV Risk Behaviors scale, has no significant effect on risky sexual behavior ($p = .60$). This is contrary to what was expected, namely that a higher score on self-efficacy would result in less actual risky sexual behavior.

Autonomous motivation, measured by a subscale of the Treatment Self-Regulation Questionnaire, has a significant effect on risky sexual behavior ($p = .05$). This is not true for controlled motivation, which has no significant effect on risky sexual behavior ($p = .79$). As expected, the higher the autonomous motivation, the lower the actual risky sexual behavior. When checking the interaction with gender by doing a stepwise regression analysis, it seemed that gender significantly affects the effect of autonomous motivation on sexual behavior ($p = .04$). When analyzing both groups separately, sexual behavior of female adolescents is significantly affected by autonomous reasons ($p = .01$), while this is not the case for male participants ($p = .89$).

Perceived competence, measured by the Perceived Competence Scale, has a significant effect on risky sexual behavior ($p = .02$). As expected, the higher the perceived competence, the lower the risky sexual behavior. When checking the interaction with gender by doing a stepwise regression analysis, it does not become apparent that gender significantly affects the effect of perceived competence on sexual behavior ($p = .16$). However, when analyzing both groups separately, sexual behavior of male adolescents is

significantly affected by autonomous reasons ($p < .001$), while this is not the case for female participants ($p = .51$).

7. Discussion / Conclusion

This research was done to explore the effects of several constructs from two theories considering behavioral motivation on risky sexual behavior of 15-18 year old South-African adolescents from the Elandsdoorn area. The effect of constructs from Social Cognitive theory (SCT) and Self Determination Theory (SDT) were measured combined to allow for a more complete analysis. In contrast with findings from Lee et al. (2009), self-efficacy did not have a significant effect on risky sexual behavior. However, both autonomous motivation on using condoms and perceived competence on condom use, had a significant effect on actual risky sexual behavior. This means that the higher the scores on these constructs, the lower the actual risky sexual behavior.

Self-efficacy not having a significant effect on risky sexual behavior may be explained by the theory behind the model used in this research. As stated before, self-efficacy is primarily an extrinsic concept. By including constructs based on intrinsic motivation, the influence of self-efficacy as an extrinsic motivator may be negated. Self-efficacy as a single variable (factor) does influence sexual behavior ($p < 0.001$), but not in combination with the other variables. This is in agreement with what Deci & Ryan (1985) say, namely that self-efficacy does indeed predict healthy behavior, but only a part of it, as it does not include internal reasons for changing or engaging behavior.

A difference was found when controlling for gender. When analyzed separately, male participants were significantly influenced by perceived competence to using protection while female participants were not. In addition, when analyzed separately, female participants were significantly influenced by autonomy when engaging in safe sexual behavior, while males were not. This difference can probably be explained by looking at South-Africa's culture and gender differences. South Africa's society is strongly dominated by men, especially in the poorer rural areas, and especially when sex is concerned. Values and norms in African culture cause pressure on both sexes to behave and act in a certain way. There are still many accounts of rape and sexual violation in the Elandsdoorn area in Limpopo Province (Tempelman et al., 2010). Perceived competence may be important for male adolescents as it is a sign of strength and dominance, while this is less important for females. Women may care less about their competence to use protection as that is usually the male's decision to make.

However, autonomy may well be very important for female South-Africans when deciding on their sexual behavior. It makes sense that using protection or having sex out of

one's own volition may lead to less risky sexual behavior, as opposed to being coerced or forced into it. There are also still many cases of teenage pregnancies. This is catastrophic for young female students because they cannot finish their education and must find the financial means to take care of their child. This makes using protection even more attractive, and leads to more intrinsic motivation to use protection. Males may be less moved by autonomous reasons to use condoms because they rather not use condoms unless they have to or are told by others, and have less to worry about power distance and pregnancies.

Whatever the reasons, the findings of this study suggest that there is a need to consider gender specific approaches while developing HIV/AIDS preventive programs for South-African adolescents. The primary goal of this study was to explore the predictive values of self-efficacy and self-determination on actual sexual behavior, in order to provide suggestions for improving educational practices to decrease risky sexual behavior of South-African adolescents. Therefore it is relevant to establish a link between the outcome of this research and educational practices in the Ndlovu project. This study hopes to stimulate and to contribute to the development of more successful ways of educating adolescents about HIV/AIDS and risky sexual behavior, using the right interventions and programs.

A longitudinal follow up project is suggested, designing an improved sex education curriculum based on the outcome of this study and testing its effects during a longer period of time. When designing this new curriculum, a thorough didactical analysis is needed to effectively approach the challenge at hand (Westhoff, 1981), bearing the results of this study in mind. Such an analysis consists of a few important steps. First of all the educational objectives have to be carefully specified, differentiated for male and female students, since both seem have different learning needs. Secondly, learning contents are worked out and - based on an analysis of the learning styles of these adolescents - a suitable educational program has to be designed. This should be an attractive and evoking program, with well considered, stimulating didactical working forms and appealing learning materials. There should be constant guiding and evaluation during the program to make sure that the students reach the education objectives step by step. One may argue that from the results discussed in this study, a unique approach is necessary for the students at hand, taking into account self-efficacy, self-determination, and cultural influences. From this research, it seems that self-efficacy is less determining for the targeted behavior than concepts like autonomy. Possibilities include either not use self-efficacy or address possible factors that may undermine its influence on sexual behavior. When doing the latter, it makes sense to look at the external factors that may influence the target group, as the construct of self-efficacy measured by this study is primarily extrinsically influenced. It is important to make sure that the teachers fully understand these principles and run the program with the right mindset. In advance they must be well informed on the outcome of the research and the characteristics

of the newly developed educational program. Furthermore, it is important to report on the success or failure of different didactical approaches, for future continuation.

Research (Ferreira et al., 2010; Ebersohn, 2010) contends that teachers are well-positioned to manage school based psychosocial support in order to create relevant and caring spaces for vulnerable school-community individuals. Therefore, it is highly recommended that adequate teachers are used or trained that understand culturally sensitive issues and are able to attend work for longer periods of time. These teachers may be taught how to develop fruitful learning environments based on the findings of this research. For example, Deci et al. (1981) have developed an instrument to assess adults' orientations toward control versus autonomy with children. This may be used to assess the teachers orientation when educating students about sexual behavior. As this research suggests that autonomy has a significant effect on risky sexual behavior in female adolescents, educating teachers on how to create more autonomous learning environments in their classroom during sex education seems an effective way of stimulating this motivation.

On another note, Koestner et al. (2006) were able to increase the effectiveness of making long-term goals by boosting self-efficacy and autonomy. According to this research, the effectiveness of setting goals decreases as they span over a larger amount of time. If concepts like those can be boosted before introducing an exercise in the classroom, this seems like an effective way to enhance the effectiveness of long term goals during sex education, like using condoms for longer periods of time.

There are some shortcomings considering this research. The dependent variable is a behavior and is measured with a questionnaire in this research. Measuring behavior with a questionnaire is a form of self-evaluation and this could lead to overestimation. A follow-up study is therefore recommended to test the effects reported in this research. Furthermore, the data of this study were not representative for all South-African adolescents. Although this study was an exploratory study that aimed to examine the various variables and not to generalize the findings, enhancing the generalizability of the findings is ideal in future studies. Recruiting adolescents from different types of schools and areas in similar communities will be needed to validate and improve the generalizability of the findings of this study in the future. Also, the quantitative design of this study limited the depth of our understandings about the phenomena. Some additional qualitative questions should be added to the future quantitative study to raise the value of study findings.

Concluding, this research was to approach the issue of HIV from both a psychological and an educational viewpoint. It is the first to measure self-efficacy and self-determination in this context, and therefore contributes to findings considering 15-18 year old South-African adolescents at risk of getting infected by HIV/AIDS. Hopefully, successful efforts can be

made to find fruitful ways of educating target groups like these and to prevent or correct risky sexual behavior.

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