HIV-protection through condom use: Testing the theory of planned behaviour in a community sample of heterosexual men in a high-income country

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Abstract

Given the increasing importance of heterosexual HIV-transmission in Europe and Switzerland, the present study tested the theory of planned behaviour (TPB) in a prospective study on the HIV-protection behaviour in a community sample of heterosexual men. The study focused on condom use in sexual encounters with new partners. Participants were 982 Swiss men between the ages of 25 and 65 who were surveyed using standardised questionnaires in two computer-assisted telephone interviews that took place in autumn 2002 and spring 2003. The TPB was able to predict condom use in sexual encounters with new and casual partners. In accordance with the theory, condom use was predicted by intention. Perceived behavioural control and attitude were significant predictors of intention, whereas subjective norm was not. Thus, in line with other studies, the present study highlighted the somewhat limited explanatory power of the theory. Further theoretical and empirical work is needed to develop extensions to the theory.

Keywords: Socio-cognitive models, theory of planned behaviour, HIV-protection behaviour, HIV/AIDS, heterosexual men

Introduction

Social research continues to be called upon to identify causes and conditions of HIV-risk and -protection behaviour. By developing explanatory models, the social scientists are able to outline the proximal determinants of such behaviour

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Researchers have used relatively homogenous samples, which were easy to contact such as university students (Bucher, 1993; Fisher et al., 1993; Terry, Galligan, & Convay, 1993) or adolescents and young adults (Piles, Schmidt, Nickel, & Berger, 1993; Reinecke, Schmidt, & Aizen, 1996; Sutton, McVey, & Glanz, 1999). In Switzerland, the theory of planned behaviour has only been tested on a sample of university students (Bucher, 1993).

There are few tests of the theory of planned behaviour on HIV-protection behaviour among community samples of heterosexual men and women. The same point applies to prevention in high-income countries: Research has focused on target groups such as men who have sex with men, intravenous drug users, and sex workers and has tended to ignore the majority of the heterosexual population. In particular, heterosexual men can be seen as the “forgotten group” of HIV-prevention (Ezner, Gardos, Seal, & Ehrhardt, 1999) even though UNAIDS in 2000 and 2001 realized the campaign “Men make a difference”. The statistics clearly show the significance of heterosexual intercourse as a mode of HIV transmission. It has been the most common mode of HIV transmission in Western Europe since 1999 and in Switzerland since 1996 (BAG, 2003; EuroHIV, 2003; UNAIDS, 2005). Heterosexual transmission currently accounts for approximately 50% of the newly diagnosed HIV infections.

Objectives

The present study sought to test whether the theory of planned behaviour provides a suitable explanatory model for the HIV-protection behaviour of heterosexual men between the ages of 25 and 65 living in the German-speaking part of Switzerland. The protection behaviour under investigation was condom use in the context of a first or casual sexual encounter.

The reason for focusing on one particular protection behaviour in a specific situation is due to methodological requirements: Aizen postulates in his earlier works that intention and perceived behavioural control “must be assessed in relation to the particular behavior of interest, and the specified context must be the same as that in which the behavior occurs” (Aizen, 1991, p. 185). In later publications he states that the “principle of compatibility” requires “that all other constructs (attitude, subjective norm, perceived behavioral control, and intention) conform with the behavior which is to occur” (Aizen, 2002).

Thus, it is essential that the TPB variables are specified with regard to one protection strategy in a specific situation. Under this condition, observing different protection behaviours in one study would require a highly differentiated assessment of various specific measures in the same data assessment. This would make data collection exceedingly complex, lengthy and demanding. Therefore, we decided to focus on one protection behaviour in a specific context, i.e. condom use in first or casual sexual encounters. In terms of HIV-infection, such an encounter is a crucial moment, insofar as two people are engaged in an action that holds the risk of HIV infection, while condom use is an adequate protection behaviour.

and thereby inform the development of theory-based and evidence-based interventions (Michie & Abraham, 2004; Hornung & Vollrath, 1993). Until now, two theoretical strands have dominated social research on HIV prevention. The first strand consists of relationship-oriented concepts. These mainly focus on the situational aspects of a sexual encounter as well as on couple intercution. The second strand consists of socio-cognitive explanatory models, such as protection motivation theory (Rogers, 1975), the health-belief model (Rosenstock, 1974), the theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behaviour (Ajzen, 1985; Ajzen & Fishbein, 1980; Ajzen & Madden, 1986). This strand is dominated by studies based on the theory of reasoned action and its extension, the theory of planned behaviour (TPB).

The TPB posits that intention to carry out a certain behaviour is the most important predictor of engaging in the respective behaviour. Intention, in turn, may be determined by an individual’s attitudes towards the behaviour, subjective norm and perceptions of behavioural control (PBC) with respect to the act in question (Ajzen, 1991, 2002; Ajzen & Madden, 1986). The TPB further postulates that there may be a direct effect of PBC on behaviour (Ajzen, 1995). This is the case when volitional control over the behaviour in question is weak and when perceived behavioural control matches actual control (Ajzen, 1991).

The TPB has been tested in numerous studies on various forms of HIV-protection behaviour and, given the results of recent meta-analyses, it is considered to have sufficient predictive validity. Based on the data from 96 studies, Albarracin, Blair, Fishbein and Muellerelle (2001) showed that condom use was related to intention (weighted mean r = 0.45), and intention was correlated with attitudes (r = 0.58), subjective norm (r = 0.39) and perceived behavioural control (r = 0.45). The latter variable was also correlated with condom use (r = 0.25). Overall, behaviour was predicted by intention (β = 0.51) and attitudes, subjective norm and perceived behavioural control were predictive of intention (β = 0.47, β = 0.21 and β = 0.20, respectively). The path coefficient from perceived behavioural control to condom use was not significant (Albarracin et al., 2000). In their narrative review of 20 studies, Bennett and Bozicelos (2000) reported intention-behaviour correlations ranging between r = 0.16 and 0.52; attitude-intention correlations varying between r = 0.27 and 0.61 and subjective norm-intention correlations ranging between r = 0.25 and 0.61. Significant correlations were also reported between perceived behavioural control and both intention and behaviour, although not in all of the reviewed studies (Albarracin et al., 2001; Bennett & Bozicelos, 2000).

However, in all empirical tests of the theory of planned behaviour to date, researchers either used samples of persons with high promiscuity (i.e. persons with a higher probability for a first and casual sexual encounter) or random samples of different persons showing particularly risky behaviour (Albarracin et al., 2001; Montanaro, Kazprzyk, & Fishbein, 1996). Researchers have also tested the theory of planned behaviour in samples of men having sex with men (Fisher, W. A., Fisher, J. D., & Rye, 1995; White, Terry, & Hogg, 1994) or in samples of intravenous drug users (Corby, Jannier, & Wolitzki, 1996).
According to the TPB, we hypothesised that (a) attitude, subjective norm and perceived behavioural control would be related to the intention to use condoms in the next first or casual sexual encounter; (b) intention would be predictive of condom use.

Method

Procedure
We designed this project as a prospective study. The first wave of interviews took place between October and December 2002. The second wave of interviews followed after an interval of 6 months. We used a standardised questionnaire and collected the data using computer-assisted telephone interviews (CATI).

In measuring the variables from the theory of planned behaviour we used scales that had proved effective in other studies and had been documented in the relevant literature. We had to adapt some of them to the specific behaviour and context of interest. In a pretest, we tested if the questionnaire was comprehensible and clear, if there were any programming errors in the CATI, how long the interview would take and which coverage rate could be reached. Furthermore, we tested the reliability of the scales.

We targeted German-speaking men by choosing telephone numbers from the most up-to-date electronic telephone directory available at that time by means of a random algorithm. In Switzerland, approximately 98% of all private households have a telephone line (LINK, 2000). Thus, the conditions for conducting a CATI survey were excellent. A question, which also needs to be addressed at this point is whether it is appropriate to do a survey by telephone, given the sensitive nature of the data to be collected. Extensive experiences in the US and the UK show, however, that this method has yielded especially good results with the collection of data on sexual behaviour (Ittenbroek & Robertson, 1996a, 1996b). The ZUMA Institute in Germany has used this method for sensitive issues, such as "adultery" and has found telephone surveys to be suitable in this context (Pors, 1998). In Switzerland, Brühl, Werner, Abel and Müller (2001) have provided evidence for the suitability of telephone interviews in a survey on first and casual sexual encounters, HIV/AIDS and the risk or protection behaviour practiced by respondents.

Since warm contacting usually yields higher coverage rates, we informed all the households beforehand in writing about the imminent telephone call. The telephone interviewers were specially trained for this survey. For the first wave, the interview staff consisted of 25 interviewers between the ages of 25 and 62. Of these, 16 were women and 7 men. On average, the interviews lasted 30 minutes each and included questions to measure attitude, subjective norm, perceived behavioural control and intention. We surveyed a total of 1071 men. Only 18 decided to break off the telephone interview.

The interview staff for the second wave comprised a total of 28 employees, 19 women and 9 men aged between 21 and 68. The interviews lasted, on average, for 17 minutes. The main purpose of the second interview was to investigate the actual protection behaviour (action). In the second wave, it was possible to interview 92% (N=982) of the men who had been questioned before. This time, only one man broke off the interview.

We examined all scales, to test whether for interviewer effects. However, we found no significant effects.

Sample

We only included those respondents in the analysis who stated that they had had a first or casual sexual encounter during the 6 months between the first and the second interview. Among the 982 men surveyed in total, 81 (8.2%) said that they had had a first or casual sexual encounter during this period. Of those who reported at least one casual or first encounter 33.3% were married at the time of their sexual encounter and 9.9% were in a steady relationship. A total of 43.2% of these men, therefore, had had sex with a secondary partner and had "been cheating", as it is popularly known. The remaining 56.8% were single at the time of the encounter. The average age of the men was 45 years; the group of 25- to 34-year-olds made up 18.5% and the group of 55- to 65-year-olds 11.1% and were thus slightly underrepresented compared to the other age groups. Of the 81 men 44.4% had completed vocational training, 17.3% were graduates. Only 4.9% had only finished obligatory education (8-9 years of school) and 92.6% were working full-time or part-time, of which the majority was employed (82.7%). With 22.7%, the largest proportion of the men were working as technicians and associate professionals, i.e. as teachers, social workers, physiotherapists etc., whereas 20% had a manual job. 18.7% were legislators, senior officials and managers and 16% were professionals, i.e. lawyers, medical doctors, higher education teaching professionals, engineers, analysts and programmers. The average personal net income of the 81 men was between CHF 6500 and CHF 7500 a month (approximately EUR 4100-4700); 25% only had a monthly net income of less than the Swiss average income of CHF 5500 (approximately EUR 3500).

Measures

Our operationalisation of the theory of planned behaviour followed the recommendations of Aizen (1991). We measured the predictor variables attitude and subjective norm indirectly: Attitude towards condom use is determined by the person's evaluation of the outcomes associated with the condom use and by the strength of these associations. By multiplying belief strength and outcome evaluation, and summing the resulting products, we obtained an estimate of the attitude toward condom use, an estimate based on the person's salient beliefs about condom use (Aizen, 1988).

The scale for measuring belief strength consisted of 15 items, all with different statements concerning the possible outcomes of condom use: "How strongly do you believe that - as a result of using a condom - you will be protected against
sexually transmitted diseases?”, “... sex will be less romantic...”, “...you will feel less manly?” etc. The response scale ranged from 0 to 10, whereby 0 signified “I don’t believe this at all” and 10 “I am completely sure of this”.5

The scale to measure the outcome evaluation consisted of another 15 items. “How much do you care about protecting yourself against sexually transmitted diseases?”, “... sex being romantic?”, “... feeling manly?” etc. Again, the response scale ranged from 0 to 10, whereby 0 meant “not at all” and 10 “extremely”.

The measure of subjective norm was obtained by summing up the product of salient normative beliefs regarding condom use in a first or casual sexual encounter and the motivation to comply with those expectations. In order to measure these two dimensions, the respondents had to imagine three persons with whom they felt able to discuss personal matters. In order to measure the men’s normative beliefs, the following question was used: “How strongly do you believe that person 1-3 expects you to use a condom when you have sex with a woman for the first time?” In response, the respondents were again asked to give a number between 0 and 10, whereby 0 meant “does not expect me to use a condom” and 10 “absolutely expects me to use a condom”.

To measure their motivation to comply, the respondents were always asked the same question: “And to what degree are you usually ready to fulfills the expectations of person 1-3?” This response scale also ranged from 0 to 10 (“not at all ready”/“generally ready”/“absolutely ready”). Finally, a fourth item asked the following question: “How do you generally assess society's expectations that you have to use a condom when having sex with a woman for the first time?” and “To what degree are you usually ready to fulfill society's expectations?”

The internal reliabilities of all of the four scales were found to be satisfactory. The scale for measuring the belief strength reached a reliability coefficient of α = 0.78. The scale for measuring the outcome evaluation also showed good internal consistency, having a reliability coefficient of α = 0.73. The two scales of normative beliefs and motivation to comply also had acceptable levels of internal reliability (α = 0.68 and α = 0.72, respectively).

Two items were used to measure perceived behavioural control: “How likely is it that you will be able to use a condom correctly when you are having sex with a woman with whom you have never been intimate before?” At the same time, it was explained to the respondents how to interpret “correctly”, i.e. to be able to open the condom packet, roll it down, and use it at the correct moment. Item 2 was “How difficult is it for you to use a condom when you are having sex with a woman for the first time?” For both questions, the respondents again had to give a number between 0 and 10. The two items correlated (r = 0.40, p < 0.01) and were combined to provide a measure of PBC.

We introduced the section to measure intention with the following question: “On a scale of 0 to 10, how likely do you think it is that in the next six months you will have sex with a woman with whom you have never been intimate before?” This was followed by “And how likely do you think it is that you will use a condom?” 6 months later in the second set of interviews, we established, whether a condom had actually been used. The men were asked if they had had any first or casual sexual encounter in the last 6 months and whether they had used a condom during this first or casual sexual encounter: “What happened the last time you had sex with a woman with whom you had never been intimate before: Did you use a condom?”

Analytic Strategy

We tested the theory of planned behaviour in three steps. In line with previous studies (Bennett & Bozinovska, 2000), in step one, we conducted a bivariate correlation to establish the relationship between the variables “intention” and “condom use”. In step two, we used a standard multiple regression analysis to determine which TPB variables were predictive of intention and the proportion of variance in intention they accounted for. In step three, we conducted a hierarchical logistic regression analysis in order to check that the predictor variables of intention had no effect on action when the effect of intention was controlled for. This step allowed us “to establish that the hypothesized mediating process is the sufficient mediating process” (Judl & Kenny, 1981).

Results

Descriptives

In total, 79.0% (n = 64) of the respondents used a condom in the last sexual encounter with a new or casual partner, 21.0% (n = 17) did not. Looking at the means of the predictors, attitudes towards condom use were generally positive (see Table 1). 72.7% had a positive or a very positive attitude towards condom use (values 51-100). The mean of the subjective norm was 52.80. 46.2% of the respondents were not willing to comply with the normative beliefs of relevant others (values 0-50). However, the respondents had a high degree of perceived behavioural control (M = 8.75, SD = 1.51). 93.8% of the respondents were sure that they could use a condom without any difficulties in the situation of a first or casual sexual encounter with a new partner (values 6-10). The respondents also held strong intentions to use a condom (M = 8.84, SD = 2.30). 88.8% expected that they would use a condom in the next sexual encounter with

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude about condom use</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0-100</td>
<td>61.92</td>
<td>14.40</td>
</tr>
<tr>
<td>Subjective norm</td>
<td></td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0-100</td>
<td>61.92</td>
<td>14.40</td>
</tr>
<tr>
<td>Perceived behavioural control</td>
<td>0.25**</td>
<td>0.05</td>
<td>0.05</td>
<td>0-10</td>
<td>8.75</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td></td>
<td>0.47**</td>
<td>0.50**</td>
<td>0-10</td>
<td>8.84</td>
<td>2.30</td>
<td></td>
</tr>
<tr>
<td>Behaviour</td>
<td>0.05</td>
<td>0.11</td>
<td>0.10</td>
<td>0.23*</td>
<td>01</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: *p < 0.05, **p < 0.01
a new partner (values 6–10). Due to a skewed distribution of errors, we took the logarithm of intention for testing the model.

Testing the theory of planned behaviour

In the first step, using a correlation analysis, we identified a significant relationship between intention and condom use ($r = 0.23$, $p < 0.05$). The stronger the intention to use a condom during his next first or casual sexual encounter, the greater the likelihood that this would happen (see Table I).

In the second step we identified significant relationships between the predictor variables and intention. Perceived behavioural control was found to be the best predictor of intention to use a condom, with a standardised multiple regression coefficient of $\beta = 0.41$ ($p < 0.001$) (see Table II). Perceived control explained 16% of the variance in intention. Another significant predictor variable, with a standardised multiple regression coefficient of $\beta = 0.25$ ($p < 0.05$) was “attitude”. However, it only explained 6% of the variance of intention and was therefore a weaker predictor. The effect of subjective norm on intention was non-significant.

Therefore, whether men decide to use a condom during their next first or casual sexual encounter, first and foremost depends on their conviction that they will be able to use a condom correctly and without experiencing any difficulties during a first or casual sexual encounter. A positive attitude towards condom use is secondary in influencing a man’s intention.

In the third step of the analysis, the hierarchical logistic regression found no direct effects on behaviour for any of the three predictor variables (i.e., attitude, subjective norm and perceived behavioural control), when controlling for intention (see Table III). So the meditational hypothesis of the theory of planned behaviour was found to be valid. The explanatory power of the model was 36%.

Regarding the relationship status of the respondents, quite a large proportion of the sample were involved in a steady partnership at the time of their last sexual encounter. This may have a direct impact on one of the predictors and therefore have implications for the prediction of condom use behaviour. Men having a first or casual sexual encounter while being involved in a steady relationship may show differences in social norms. There is a certain probability that they are influenced in their salient normative beliefs as much as in their motivation to comply by knowing — in a explicit or implicit manner — that their

Table II. Standard multiple regression model predicting intention.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.11</td>
<td>0.05</td>
<td>0.25*</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.02</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Perceived control</td>
<td>1.79</td>
<td>0.40</td>
<td>0.41***</td>
</tr>
</tbody>
</table>

Note: $R^2 = 0.33$ ($N = 78$, $p < 0.001$), *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table III. Hierarchical logistic regression model predicting condom use.

<table>
<thead>
<tr>
<th>Step 1</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>$B$</td>
<td>$SE$</td>
<td>Odds ratio</td>
<td>Wald statistic</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.00</td>
<td>0.03</td>
<td>1.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.00</td>
<td>0.02</td>
<td>1.010</td>
<td>0.696</td>
</tr>
<tr>
<td>Perceived control</td>
<td>0.01</td>
<td>0.02</td>
<td>1.010</td>
<td>0.696</td>
</tr>
</tbody>
</table>

Note: Step 1: $N = 75$, pseudo $- R^2 = 0.03$, $p > 0.05$. Step 2: $N = 75$, pseudo $- R^2 = 0.07$, $p < 0.05$.

Table IV. Means, standard deviations, and one-way analyses of variance (ANOVA) for effects of relationship status on attitude, subjective norm, perceived behavioural control and intention ($N = 81$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Single men</th>
<th>Married men and men in steady partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>35.23 Brett 12.92</td>
<td>55.26 Brett 15.72</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>48.03 Brett 24.08</td>
<td>58.06 Brett 16.60</td>
</tr>
<tr>
<td>Perceived control</td>
<td>8.65 Brett 1.55</td>
<td>8.58 Brett 1.46</td>
</tr>
<tr>
<td>Intention</td>
<td>8.41 Brett 2.79</td>
<td>9.4 Brett 1.24</td>
</tr>
</tbody>
</table>

Note: *$p < 0.05$.

steady partner as well as other normative referents would expect them to use a condom in such a situation. We therefore conducted an additional series of analyses.

An analysis of variance (ANOVA) yielded significant differences between men with a secondary partner and men with a primary partner, with regard to subjective norm. As Table IV shows, men who were married or involved in a steady partnership while having the last sexual encounter in question, had a stronger belief that normative referents would expect them to use a condom in this situation than men who were single. However, when we re-tested the regression analyses controlling for relationship status, the results remained unchanged with no effects for relationship status and no increases in the amounts of variance explained.

Discussion

The present study showed that the theory of planned behaviour provides a suitable explanatory model for the condom use behaviour of Swiss men between the
ages of 25 and 65. A significant relationship of $r_s = 0.23$ ($p < 0.05$) was found between intention and condom use. Men who intended to use a condom during their next first or casual sexual encounter with a new partner were more likely to do so.

Our bivariate correlation between intention and condom use can be compared to the strength of the intention-behaviour relationship reported in other studies with regard to condom use. A meta-analysis on the intention-behaviour relationship by Sheeran and Orbell (1998), which used 26 prospective tests of the TTP with regard to condom use showed that the simple-weighted average correlation between intention and condom use was $r = 0.44$. A similar result was reported by Albarracin et al. (2001), i.e. $r = 0.45$.

A considerably stronger relationship between intention and behaviour, i.e. $r = 0.59$, was found by Fisher et al. (1995) using students as respondents. It must however be taken into consideration that the interval between the first and the second interviews was only 2 months. It has been shown that the strength of the connection between intention and behaviour decreases as the period between measuring intention and behaviour increases (Bennett & Bozonelos, 2000; Sheeran & Orbell, 1998). Because of the 6-month interval between the two interviews, our study is situated at the upper end of the scale for two reasons: On the one hand, 6 months is the maximum period after which it is still possible to assume that the recall has not been biased. On the other hand, it has been shown that with the exception of one study that was conducted with adolescents between the ages 14 and 24 and allowed 12 months to pass between the first and second interviews (Reinecke et al., 1996), all prospective tests set a much shorter observation period of between 1 and 3 months. For studies that allowed more than 3 months to elapse between intention and behaviour interviews, Sheeran and Orbell (1998) found an average intention-behaviour correlation of only $r = 0.33$. In the aforementioned study by Reinecke et al. (1996) over a 12-month period, the correlation between intention and condom use was $r = 0.22$.

Furthermore, it must be taken into consideration that our model examined first or casual sexual encounter with a new partner. As Galligan and Terry (1993), Morrison (1993) and Morrison, Rogers Gillmore and Baker (1995) have shown, the intention-condom use relationship for steady partners is much stronger than for casual sexual partners. Sheeran and Orbell (1998) identified an average correlation between intention and condom use with a steady partner of $r = 0.45$, while the average correlation between intention and condom use with casual partner was $r = 0.21$.

In addition, it must be noted that a significant proportion of the respondents did not expect a first or casual sexual encounter to occur in the following 6 months. On a scale from 0 to 10, 26% estimated the probability at the time of the prospective intention interview to be 0. A further 41% estimated the probability to be a value between 1 and 5. Thus, 67% of the respondents expressed their intention at a moment when they considered it unlikely or extremely unlikely that the situation in question would actually become reality. This is why we must be aware that intention may be realised and modified either during or shortly before the encounter in question. Indeed it is a condition for accurate behavioural prediction that intention (as much as perceived behavioural control) must remain stable in the interval between the assessment and the observation of the respective behaviour. In this design we know nothing about the intention shortly before the action in question.

In view of the 6-month observation period, the restriction of condom use to sexual encounters with a new partner and the large number of respondents who thought a first or casual sexual encounter improbable, the intention-behaviour relationship of $r_s = 0.23$ determined by our study is in line with the range of correlations reported in previous studies.

The second step of analysis revealed significant relationships between the predictor variables and intention. Intention was primarily determined by perceived behavioural control, while attitude was secondary. Men with a high degree of perceived behavioural control and a positive attitude towards condom use were more likely to develop an intention to use a condom during their next first or casual sexual encounter than those who had low perceived behavioural control and a negative attitude. Subjective norm had no effect on intention.

However, this does not mean that the theory should necessarily be modified in this direction. On the one hand, the lack of relationship between subjective norm and intention may be due to measurement issues. The reliability coefficient for subjective norm was, with $\alpha = 0.65$, low. On the other hand, however, the result is in line with empirical findings of other applications of the theory of planned behaviour. In earlier applications of the TBP to other behaviours it may be found that "attitudes and perceived behavioural control are sufficient to account for intentions" (Ajzen, 1991). Similar results have been reported in other European studies on condom use. Some studies show that subjective norm has an effect on intention among women, but not among men (Bucher, 1995; Pies et al., 1993). A possible reason could be that subjective norm in men is lower than subjective norm in women. This is very similar to our own findings. Only 19.2% of the respondents had high subjective norm values (75–100), 46.2% had a low or a very low subjective norm value (0–50). Among the men in question, therefore, the strength of subjective norm was relatively weak. Against the background of the above mentioned studies (Bucher, 1995; Pies et al., 1993), this result suggests that a gender specific formulation of the model may be needed. On the other hand, men involved in a steady partnership while having the last sexual encounter with a new partner displayed higher values in subjective norm. This may indicate that further research on the relationship between subjective norm and intention should include measures of partnership status in order to determine whether partnership status moderates this relationship rather than gender or personality traits that have been identified in previous studies, including the group identification (Johnston & White, 2003; Terry & Hogg, 1996), collective self-identity (Trafnov & Finlay, 1996) and fear of negative evaluation from others (Latimer & Martin Ginis, 2005).
Considering methodological factors, an operationalisation of the theory of planned behaviour consistent with Ajzen's recommendations has proved to be valid, despite the fact that the study had a number of limitations due to measurement issues. "Condom use" is a dichotomous variable that reduces the analytic strategy to non-parametric methods or categorical data analysis procedures. We focused on the last sexual encounter with a new partner in the last six months and not on every sexual encounter in this period. Looking at a behaviour on only a single occasion might be too restrictive (Ajzen, 2002). Future research might consider every first and sexual encounter in the last six months and ask respondents how often they used a condom. However, we have to keep in mind, that first and sexual encounters do not occur as frequently as other observable behaviours. In our sample 36 out of 81 men (44.4%) reported only one such encounter in the observed time period.

The measurement of perceived behavioural control also had some limitations. This predictor variable was measured with just two items, that were fairly general. Future research could take into consideration more specific behavioural control barriers, such as being aroused or in love, when measuring perceived behavioural control (Ajzen, 2002).

Nevertheless, the finding that behaviour is not predicted by perceived behavioural control but by intention alone is within the scope of the theoretical framework of planned behaviour that posits, that in any given application, only one of the two predictors of behaviour may be needed to explain the behaviour to occur (Ajzen, 1991). Our data may give reason to the assumption that condom use is a behaviour over which the man in our sample think that he can complete volitional control. Indeed we have to take into account that this perception of control could be biased by social desirability effect, caused by the Swiss Stop-AIDS-Campaign, which has been promoting condom use and condom skills since 1987. Furthermore we must consider that perceived control does not necessarily match actual control.

This test of the theory of planned behaviour has revealed - and here the results of other studies on other populations and in various countries agree (see the studies by Bennett & Bozioenlos, 2000 or Albarracin et al., 2001) - that the explanatory power of the model is somewhat limited and yields an insufficient explanation of the variance in condom use. Ajzen appears to be aware of this, noting that: "The theory of planned behaviour is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account" (Ajzen 1991: p. 199). There is also justified criticism that it is an individualistic approach built on purely cognitive variables and based on the assumption that condom use is a rational choice by an individual faced with the danger of HIV infection. In reaction to these criticisms one of the next steps would be the development of an extended theory of planned behaviour. This extension should however be done without transforming the theory of planned behaviour into an overly complex multifactorial model. What kind of predictor is needed? The individualistic approach of the theory of planned behaviour demands a predictor concerning social and situational dimensions, without being holistic. It is questionable if a combination of socio-cognitive variables and macro-sociological variables is appropriate (Bengel, 1993). Each of the socio-cognitive concepts forming an integral part of the theory of planned behaviour denotes subjective perceptions of social reality. By analogy, the model should not therefore include, for example, the objective position, but rather a variable capturing the individual internalisation of social structure and culture. A possible solution could be the concept of Bourdieu's habitus, which describes how incorporated social structures, generated in an individual's socialisation process, guides a person's action. As a result, individuals who share the same social conditions develop a system of dispositions which generates similar modes of practice (Bourdieu, 1974, 1997). This suggestion awaits further research.

Notes

[1] The situation in question is the first sexual encounter with a person, with whom the man has not been intimate before. This can turn out to be the first intercourse of a longer relationship or to be a casual sexual encounter.

[2] This is a translation of the original German formulation.

[3] As rating technique, we used an unipolar 11-point-scale ranging from 0 to 10. This type of scale is often called a "number production scale". As a rule, the rating scale usually employed in attitude research constitutes a variety of the Likert scale, with verbally labelled response categories ranging from "not at all" to "completely", and with either an even or an uneven number of possible responses. In order to be able to treat such an ordinal scale as a numerical scale, it is best to offer response scales with a greater number of categories. On the other hand, a number of (e.g., seven) verbal categories might make it difficult for respondents to understand the content of the categories and the differences between them. Such a gradation is therefore not very useful. At the same time, various studies have shown that it is the number of response categories or scale points that has the strongest influence on the quality of the data (Akwes & Kossack, 1994; Andrews, 1984; Edlund, 1988; Rodgers, Andrews, & Herzog, 1992). Thus, the rule is: the more categories, the higher the validity and reliability of the scales and the fewer the random errors. Number production scales are to be preferred to verbally labelled response categories (Andrews, 1984). Number production scales have the added advantage of saving time during the interview, since the interviewer only has to read out the end figures of the scale over the telephone. Moreover, with CATI number production scales are easy to handle (House & Nickolls II, 1985). Furthermore, number production scales prevent response-order effects, such as primacy or recency effects (Scheepsbeek, 2003).

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HIV-protection through condom use


