British Journal of Social Psychology (1995), 34, 9–21 *Printed in Great Britain*

Anticipated affective reactions and prevention of AIDS

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Controlling the AIDs epidemic may depend largely upon health education aimed at adolescents. A number of approaches have been applied to human immunodeficiency virus (HIV) preventive behaviour in adolescents, including the health belief model (Becker, 1974), protection motivation theory (Rogers, 1983), and the theory of planned behaviour (Ajzen, 1985, 1991). Since sexual behaviour is heavily influenced by emotions, a possible shortcoming of these models is that little attention is given to affective processes. In this study we investigated the role of anticipated, post-behavioural, affective reactions to (un)safe sexual behaviours in the context of the theory of planned behaviour (TPB). The results showed that anticipated affective reactions such as worry and regret predicted behavioural expectations over and above the components of the TPB. The implications for our understanding of adolescent sexual behaviour and for campaigns aimed at the reduction of risky sexual practices will be discussed.

The spread of the human immunodeficiency virus (HIV) has become a major public health problem in many countries. An estimated 13 million people have been infected worldwide and this number is expected to rise to 30 to 40 million by the end of this century (World Health Organization, 1993). Estimates suggest that nearly all who are infected will eventually become ill with AIDS and die from its consequences (Lui, Darrow & Rutherford, 1988). Since there is no cure for AIDS nor a vaccine against HIV, the scale of the AIDS epidemic in the years to come depends largely on the prevalence of risky practices such as unprotected sex and needle sharing. Certain sexual practices have been identified as posing a very high risk of HIV transmission (Coates & Schechter, 1988). Therefore, promoting changes in behaviour among sexually active individuals might be an effective way to limit the AIDS epidemic. However, sexual behaviour is usually difficult to change because it is rooted in life-style and identity (Bauman & Siegel, 1987), and may occasionally even have similar characteristics to addictive behaviours (Pincu, 1989). Adolescent sexual behaviour is generally not (yet) habituated, and therefore health education programmes that focus on this particular group might help to control the AIDS epidemic.

The success of AIDS prevention campaigns is for the most part dependent on an understanding of the psychological factors that influence risky sexual behaviour. Generally, interventions to reduce the risk of AIDS aimed at adolescents have been based on infor-

*Requests for reprints.

mal conceptualizations, designed without elicitation research, and directed primarily at providing information about AIDS (Fisher & Fisher, 1992). Although it is necessary for people to have information in order to take protective measures, such information is usually not sufficient (Fishbein, 1976; Ross & Rosser, 1989). In fact, whether people tend to behave in a safe way or not has repeatedly been found to be unrelated to their knowledge about AIDS and HIV (e.g. Baldwin & Baldwin, 1988; Goodman & Cohall, 1989; Richard & van de Pligt, 1991). Intervention strategies based on empirically validated theories are more promising, and recently several models of health behaviour have been tested with respect to adolescent sexual behaviour.

The health belief model (HBM; Becker, 1974) is perhaps the most widely used psychological theory of health-related behaviours. This theory has proved useful in predicting preventive behaviours in a wide range of health settings (Janz & Becker, 1984). The basic model postulates four determinants of health behaviours: perceived susceptibility (i.e. one's subjective perception of the risk of contracting an illness), perceived severity (i.e. feelings concerning the seriousness of contracting an illness), perceived benefits (i.e. effectiveness of the recommended health action), and perceived barriers (i.e. the potential negative aspects of the health action). The model was recently tested with respect to HIV preventive behaviours among Scottish teenagers (Abraham, Sheeran, Spears & Abrams, 1992). Their findings indicated that, although the explanatory value of the HBM seemed to increase with age, the model was a poor predictor of preventive intentions. It was also concluded that the HBM was of limited use with respect to the HIV preventive behaviours of adolescents after several studies using elements of the model were reviewed (Brown, DiClemente & Reynolds, 1991).

Thus, it appears that factors not included in the HBM could be important in the context of HIV-related actions. One of these could be perceived self-efficacy, which refers to people's beliefs that they can exert control over their motivation and behaviour and over their social environment (Bandura, 1992). Several studies have indicated the importance of self-efficacy in health-related behaviours (Bandura, 1991; O'Leary, 1985), and more importantly, in the HIV preventive behaviours of adolescents (O'Leary, Goodhart, Jemmott & Boccher-Lattimore, 1992; Richard & van der Pligt, 1991; Rosenthal, Moore & Flynn, 1991; Schaalma, Kok & Peters, 1993). Rogers' protection motivation theory (PMT; Rogers, 1983) is similar to the HBM, and incorporates the factors severity, susceptibility and effectiveness of the recommended health action (i.e. response-efficacy). The PMT also includes the concept of self-efficacy, and should therefore be a better predictor of adolescent sexual behaviour than the HBM. This seems to be the case, since a recent test of the PMT with respect to adolescent sexual behaviour (Abraham, Sheeran, Abrams & Spears, 1993) yielded qualified support for the theory. Perceived self-efficacy was found to be an important predictor of anticipated condom use.

The HBM and the PMT both make use of the constructs perceived severity, perceived susceptibility and response-efficacy (or perceived benefits). Questions have been raised concerning the role of these variables with respect to HIV preventive behaviours. Perceived severity has often been found to be unrelated to health behaviour (Wurtele & Maddux, 1987) and this also appears to be the case for the sexual behaviour of adolescents (Abraham *et al.*, 1992, 1993). Although perceived susceptibility has been found to be directly related to preventive behaviours in a variety of health settings (Janz & Becker, 1984), there seems to be no reliable empirical evidence that perceived vulnerability to HIV infection motivates HIV preventive actions (Gerrard, Gibbons & Warner, 1993; see also van der Pligt, Otten, Richard & van der Velde, 1993). Finally, response-efficacy also seems to be unrelated to the HIV preventive behaviours of adolescents (Abraham *et al.*, 1992, 1993; Richard & van der Pligt, 1991), probably due to the ceiling effects of the proposed effectiveness of HIV preventive behaviours.

Ajzen's theory of planned behaviour (TPB: Ajzen, 1985, 1991) can also be used to describe and predict adolescent sexual behaviour. This theory includes a factor similar to Bandura's concept of perceived self-efficacy, but does not include any of the constructs mentioned above that were found to be unrelated to HIV preventive behaviours. The TPB asserts that a person is motivated to perform a particular behaviour to the extent that he or she has a positive evaluation of the behaviour (i.e. attitude towards the behaviour), perceives social pressure to perform the behaviour (i.e. subjective norm), and expects to have control over performing the behaviour (i.e. perceived behavioural control). In contrast to the HBM and the PMT, the TPB was not developed as a theory of health behaviour, but as a general model of social behaviour. However, the model has successfully been used to explain a variety of health behaviours (see Ajzen, 1991). The TPB was also used in a recent study of the HIV preventive behaviours of Dutch teenagers (Schaalma *et al.*, 1993). The findings indicated that the three components of the TPB explained 49 per cent of the variance in intended condom use. Thus, in comparison to the HBM and the PMT, the TPB seems to be more predictive of adolescent HIV preventive behaviours. This conclusion parallels the findings of a direct comparative test of the HBM, the PMT and the TPB which showed that the intended condom use of heterosexuals was best explained by the TPB (Bakker, Buunk & Siero, 1993).

The TPB is based on the assumption that people make rational decisions based on the systematic use of information available to them (Ajzen & Fishbein, 1980). However, research findings indicate that sexual behaviour is heavily influenced by emotions, which might interfere with rational decision making (Fisher, 1984; Gerrard *et al.*, 1993). Therefore, a possible shortcoming of the TPB in the domain of sexual behaviour is its relative exclusion of affective processes (cf. Ajzen, 1989, 1991). The present study investigates the role of affective processes with respect to adolescent sexual behaviour in the context of the TPB. More specifically, we focus on the role of affective states that might be experienced *after* unsafe sex has taken place. If a person has had sexual intercourse with a casual partner without using a condom, he or she might worry about the possibility of being infected with HIV, and therefore regret having taken the wrong course of action. Although this unpleasant affective state will perhaps motivate the person to take protective measures in the future, it cannot undo a possible infection with HIV. However, to the extent that people *anticipate* such negative feelings before undertaking an action, they will be more cautious (Janis & Mann, 1977). We believe that the anticipated affective reaction to unsafe sexual behaviour could be a powerful motivator to take protective measures. Thus, the purpose of the present study is to investigate whether anticipated, post-behavioural, affective reactions influence sexual behaviour over and above the components of the TPB. This will be independently tested with respect to two HIV preventive behaviours—that is, refraining from sexual intercourse and condom use.

Method

Subjects

Subjects were approached via their schools. Of the 138 schools contacted, 66 agreed to participate. Each school selected 12–15 subjects varying in age and gender, which gave a total of 822 adolescents between 15 and 19 years of age. This sample is representative for the general population of Dutch adolescents in terms of educational level, type of school, region (urbanization) and gender. One exception to representativeness is age; we deliberately included a larger proportion of subjects aged 17, 18 and 19 years. This was a planned departure from representativeness as we wished to get a fair number of adolescents with sexual experience in the sample. Of the 822 subjects, 118 were 15 years of age, 138 were 16, 173 were 17, 196 were 18, and 193 were 19 (four subjects did not indicate their age).

Two subjects were eliminated from the sample because of an unacceptable number of missing values. Sixteen subjects who stated that they were homosexual were also removed from the sample since most questions referred to heterosexual intercourse. Of the remaining 804 subjects, 220 indicated that they had a steady sexual relationship and never had sexual intercourse with anyone but their present partner. As we were interested in casual sexual intercourse, these subjects were excluded from the analyses. The final sample consisted of 584 subjects (304 males and 280 females). The subjects who were excluded from the analyses did not differ from the final sample in terms of educational level, type of school and region. There was, however, a significant gender difference between these groups ($\chi^2(1) = 5.25, p < .03$). Female subjects indicated more often than male subjects that they had a steady sexual relationship and never had sexual intercourse with anyone but their present partner. It should be noted, however, that this did not impair the sample's representativeness for the general population of Dutch adolescents; in the final sample the proportions of female and male subjects approach the national proportions.

Procedure

The study was designed as part of a larger investigation into adolescent HIV preventive behaviours and other AIDS-related issues. The questionnaires used in this field study focused on issues such as the relative importance of AIDS compared to other issues, the role of the media and other sources of information, past sexual behaviour, knowledge about AIDS and transmission of AIDS, and coping styles with regard to AIDS-related issues. However, only relevant measures will be discussed here. Subjects were interviewed individually by a AIDS-trained interviewer. The interviews were carried out by a market research company with experience in AIDS-related research. For reasons of privacy, subjects were also asked to fill out a brief questionnaire dealing with aspects of their sexual behaviour. The interviews took place during school hours and took about 50 minutes.

Subjects were asked to state their expectations with respect to a number of behavioural alternatives. These expectations were given for a few hypothetical situations in which the sexual partner might be infected with HIV. The difference in expectation between the alternative of interest and relevant other alternatives was the dependent variable of the study. In this manner we did not predict whether subjects would or would not behave in a specific way, but whether they were likely to perform a specific action compared to alternative actions. In other words, we predicted preference judgements or choice. Inclusion of behavioural alternatives has been found to improve the prediction of behaviour (Fishbein, Middlestadt & Chung, 1989; Sheppard, Hartwick & Warshaw, 1988). A method for computing the difference score between intentions towards the target behaviour and intentions towards the alternative behaviours is given by Petty & Cacioppo (1981, p. 199):

$$I = I_{\text{target}} - [\Sigma I_{\text{alternatives}}/P]$$

where I is the intention and P is the number of alternative behaviours. This method was used in the present study.

It should also be noted that although the TPB focuses on behavioural *intentions*, our dependent variable was a measure of behavioural *expectations*. There is evidence to suggest, however, that behavioural expectations are better predictors of behaviour than behavioural intentions (Sheppard *et al.*, 1988; Warshaw & Davis, 1985*a*). Moreover, especially when behaviours are under limited volitional control, behavioural expectations may be more accurate in predicting behaviour (Ajzen, 1985; Morojele & Stephenson, 1992).

Measures

Behavioural expectations. Subjects were asked to give behavioural expectations with respect to the following situations:

- Suppose the following weekend you meet a nice boy/girl and both of you want to make love. (The Dutch word used was *vrijen*. This term refers to cuddling and kissing, but also to sexual intercourse.)
- Suppose next summer on holiday you meet someone and both of you would like to make love.
- Suppose you are on a date with a person in your school. After a great evening both of you want to make love.

For each of these situations subjects were asked to give the likelihood of the following three behavioural alternatives:

1. Making love without having sexual intercourse. (BE1)
2. Having sexual intercourse and use a condom. (BE2)
3. Having sexual intercourse without using a condom. (BE3)

All expectations were given on a seven-point scale with end-points 'very likely'(7) and 'very unlikely'(1).

The first two alternatives are most protective against HIV. We wanted to predict whether subjects would decide not to engage in sexual intercourse, which is reflected by the expectation of alternative (1) minus the expectations of the other alternatives. And we wanted to predict whether subjects would use a condom on occasions when they would have sexual intercourse. The latter is reflected by the difference in expectation between alternatives (2) and (3).

Independent predictions will be made of the expectation to refrain from sexual intercourse, and to use condoms:

Refraining from intercourse (RI): BERI = BE1 − (BE2 + BE3)/2

Condom use (CU): BECU = BE2 − BE3

We used LISREL to analyse the date. This computer program offers the possibility of estimating the relations between latent constructs. A precondition is that the constructs are represented by multiple indicators. The above three situations were used as multiple indicators of behavioural expectations.

Anticipated affective reactions. Subjects were asked to evaluate the feelings they would have after:

1. Having made love without having sexual intercourse. (AAR1)
2. Having had sexual intercourse using a condom. (AAR2)
3. Having had sexual intercourse without using a condom. (AAR3)

These alternatives were combined in similar fashion to the behavioural expectations:

Refraining from intercourse: AARRI = AAR1 − (AAR2 + AAR3)/2

Condom use: AARCU = AAR2 − AAR3

Anticipated feelings were assessed on three seven-point scales: *worried–not worried, regret–no regret, tense–relaxed.* These three scales were used as multiple indicators of anticipated affective reactions.

Subjective norms. These were operationalized as normative beliefs multiplied by the motivation to comply. Subjects were asked to indicate how important others (parents, best friends and individually selected others) would find it if they:

1. Made love without having sexual intercourse.
2. Had sexual intercourse.
3. Used a condom if they would have sexual intercourse.
4. Used another contraceptive if they would have sexual intercourse.

Scores ranged from 1 (disagree entirely) to 7 (agree entirely). Motivation to comply was assessed by asking how much the subjects adhere to the opinions of others about behaviours 1 to 4, with scores ranging from 1 (not at all) to 7 (very much).

Subjects would feel most pressure to refrain from sexual intercourse if important others would not object to them making love without having sexual intercourse, and would object to them having sexual intercourse. Therefore the final subjective norm score for refraining from sexual intercourse was computed as (1. multiplied by the motivation to comply) minus (2. multiplied by the motivation to comply). Correspondingly, subjects would feel most pressure to use condoms if important others would not object to them using condoms and would object to the use of other contraceptives. Therefore the final subjective norm score for condom use was computed as (3. multiplied by the motivation to comply) minus (4. multiplied by the motivation to comply).

Scores for parents and remaining others were used as two separate indicators for subjective norms.

Self-efficacy[1]. Effective self-protective behaviour is dependent on a sense of personal power over sexual situations (Bandura, 1992). These situations refer to social pressure from an unwilling partner, but also to situational constraints. Therefore, in order to get a measure of self-efficacy with respect to condom use, subjects were asked to indicate for eight situations whether they would have intercourse and *not* use a condom. Examples of those situations are: 'You say you want to use a condom and the other person gets angry' and 'You don't carry a condom and first have to buy some'. Scores ranged from 1 (very likely) to 7 (very unlikely). Cronbach's α for this measure is .79. The items were matched on content and combined in two indicators of four situations each.

For refraining from sexual intercourse, we used four situations dealing with social pressure to have involuntary sexual intercourse. Subjects were asked: 'If you would like to make love with a person, but you do not want to have sexual intercourse, how likely is it that you will have sexual intercourse anyhow if . . .'. An example of a situation is 'you know that the other would find you really stupid if you would object to having sexual intercourse'. Scores ranged from 1 (very likely) to 7 (very unlikely). Cronbach's α for the four situations is .68. The items were combined in two indicators of two situations each.

Attitudes. Attitudes towards condom use were measured by asking the level of agreement with 12 possible consequences of using condoms, e.g. 'condoms protect against the AIDS virus' and 'putting on a condom is an annoying interruption'. Scores ranged from 1 (disagree completely) to 7 (agree completely). Cronbach's α for this measure is .63. Evaluation of the consequences was not carried out separately since all consequences were clearly positive or negative. The items were matched on content and combined in two indicators of six consequences each (after recoding the negative consequences).

Attitudes towards refraining from sexual intercourse were measured by asking subjects to evaluate the behavioural alternative: 'Making love with a person, without having sexual intercourse' on four semantic differential scales: *like–dislike, easy–difficult, safe–unsafe, mature–immature*. These four semantic differential scales were used as multiple indicators.

Analyses

The LISREL VII program (Jöreskog & Sörbom, 1988) was used to test the goodness-of-fit of the models and to estimate the models' parameters. As mentioned above, we had multiple indicators for all latent constructs. Therefore the LISREL VII program enabled us to estimate structural regression parameters without the influence of measurement error.

Among the many available methods of estimation for model parameters and overall fit, the Maximum Likelihood (ML) method is most commonly used (Breckler, 1990). A major advantage of this method is the possibility of using the χ^2 goodness-of-fit index to test the overall fit of the models. A disadvantage, however, is that this method is based on the assumption that the observed variables have a multi-normal distribution. Parameter estimates are robust against departures from normality (Browne & Shapiro, 1988), but this does not apply to standard errors and the χ^2 measure (Jöreskog & Sörbom, 1988). An alternative to the maximum likelihood method is the Weighted Least Squares (WLS) method, which is asymptotically distribution-free

[1] Self-efficacy is compatible with, and might be used synonymously with, the construct perceived behavioural control (see Ajzen, 1991, p. 184).

(see Browne, 1984). When large samples are available, this method can be used to compute asymptotically correct chi squares and standard errors in the case of continuous variables which depart from normality. As this is the case in the present study, the WLS method was applied, using the PRELIS computer program (version 1.7, Jöreskog & Sörbom, 1988)[2].

The χ^2 test can be used to assess the overall fit of the proposed model to the data. The χ^2 statistic indicates the adequacy of the proposed model in terms of its ability to recreate the observed covariance matrix. The larger the difference between the recreated and the observed covariance matrix, the larger the χ^2. If the χ^2 is large relative to its associated degrees of freedom, the model should be rejected. Thus, a significant χ^2 indicates inadequate fit of the model to the data. However, the power of the χ^2 test increases with sample size, and therefore any model will be rejected if the sample gets sufficiently large. Therefore, in addition to the asymptotically correct χ^2 statistic, the adjusted goodness-of-fit index (AGFI, Jöreskog & Sörbom, 1988), the normed fit index (NFI; Bentler & Bonett, 1980), and the incremental fit index (IFI, Bollen, 1989) will be reported. These indices are less sensitive to sample size (see Bollen, 1990). The AGFI and NFI have a maximum value of 1, which indicates perfect fit of the model to the data. Although the IFI may exceed 1, it will be about 1 for a valid model (Bollen, 1990).

LISREL provides estimates of a model's parameters. These parameters are estimated under the assumption that the model is correct. Therefore, if the overall fit indices indicate an adequate fit of the model to the data, the model's parameters can be evaluated. To determine whether a particular parameter is necessary for the proposed model to adequately fit the data, two inference procedures can be used. First, LISREL provides standard errors for all parameters. A standard error is an estimate of the precision of the parameter. The ratio between the parameter estimate and its standard error is a t value. If $t \geq 2$, the parameter can be assumed to differ from zero. Second, the difference of χ^2 test can be used to compare the fit between the proposed model and the model in which the critical parameter is forced to equal zero (see Long, 1983). If this test yields a significant χ^2, this means that the proposed model's ability to recreate the observed covariance matrix decreases significantly if the critical parameter is forced to equal zero. In the present research t values will be used to test the significance of the parameters. Under certain conditions a t test is less accurate than the difference of the χ^2 test (see Neale, Heath, Hewitt, Eaves & Fulker, 1989). For this reason, *both* tests will be used to test whether anticipated affective reactions add to the prediction of sexual behaviour over and above the components of the TPB.

Results

Figures 1 and 2 summarize the models of refraining from sexual intercourse and condom use, respectively. The large circles refer to the latent factors, the small circles to the residual variance that is not accounted for by the common factor, and the rectangles refer to the measured variables. The two-way arrows indicate that there might be a correlation between the constructs without an assumed causal relationship. The one-way arrows from the large circles to the rectangles refer to factor loadings, and the one-way arrows between the large circles refer to regression coefficients. Since all parameters are presented in standardized metric, the regression parameters should be interpreted as β-weights, the remaining parameters as correlation coefficients. β-weights are accompanied by zero-order correlation coefficients in brackets.

Overall, the models of refraining from sexual intercourse and condom use had adequate fit ($\chi^2(67) = 76.77$, $p < .19$, AGFI = .959, NFI = .980, IFI = .997 and $\chi^2(44) = 47.03$, $p < .35$, AGFI = .959, NFI = .990, IFI = .999, respectively). The regression coefficient from behavioural expectations to subjective norms in the model of refraining from sexual intercourse, and the regression coefficient from behavioural expectations to attitudes in the model of condom use approach significance ($p < .10$); the remaining

[2] The weight and covariance matrices are available on request from the first author.

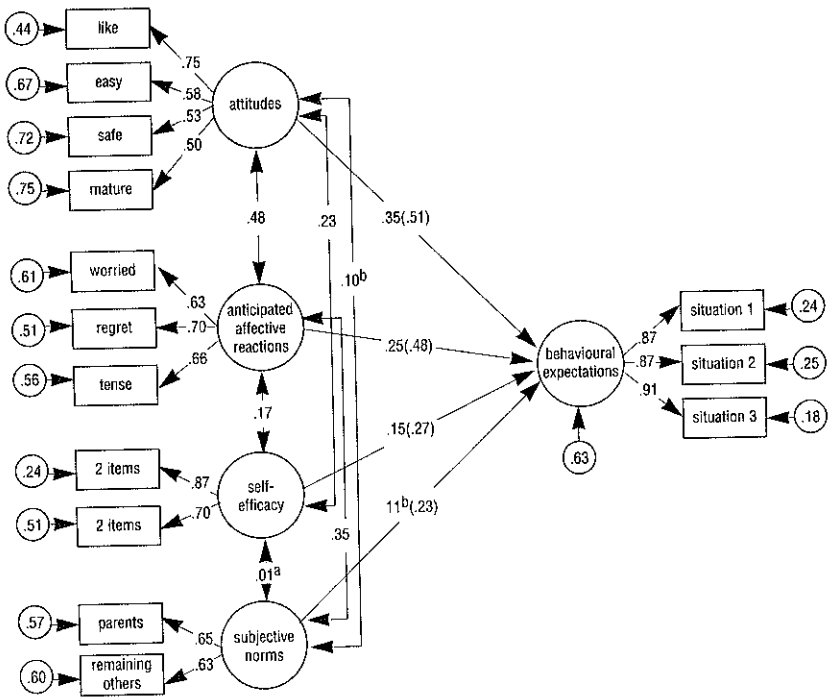

Figure 1. The model of refraining from sexual intercourse. Parameter estimates are standardized; all parameters are significant at $p < .01$ except [a] n.s. and [b] $p < .10$.

regression coefficients are significant at $p < .01$[3]. More importantly, in both models anticipated affective reactions predict a significant proportion of variance in behavioural expectations, over and above the components of the TPB. The difference of χ^2 test yielded $\chi^2(1) = 10.05$, $p < .002$ and $\chi^2(1) = 10.93$, $p < .002$ for the models of refraining from sexual intercourse and condom use, respectively. The four independent factors explain 37 per cent of the variance in expectations to refrain from casual sexual intercourse, and 28 per cent of the variance in expectations to use a condom when having sex with a casual partner. It should be noted that attitudes seem to be the most important predictors and subjective norms seem to be the least important predictors of expectations to refrain from casual sexual intercourse. In contrast, in the model of condom use subjective norms contribute relatively more and attitudes contribute relatively little to the prediction of behavioural expectations.

The TPB postulates that human behaviour is caused by beliefs relevant to the behaviour, and distinguishes three conceptually distinct types of beliefs: behavioural

[3] As noted, we used the WLS method to estimate parameters and overall fit. We also conducted a LISREL analysis using the more commonly employed ML method. This analysis yielded essentially the same results. The only difference was that with this method of estimation the regression coefficient of behavioural expectations on attitudes towards condom use was significant at $p < .05$.

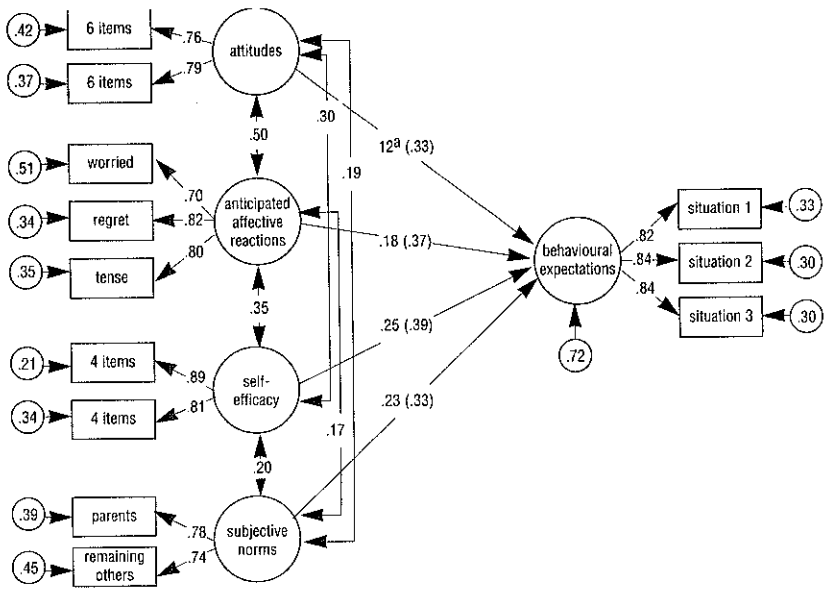

Figure 2. The model of condom use in casual encounters. Parameter estimates are standardized; all parameters are significant at $p < .01$ except [a] $p < .10$.

beliefs which cause attitudes, normative beliefs which cause subjective norms, and control beliefs which cause perceptions of behavioural control. Behavioural beliefs link the behaviour to a certain consequence or attribute of the behaviour. It could be argued that, since anticipated affective reactions reflect the affective consequences of a behaviour, anticipated affective reactions are part of individual attitudes, and therefore should not be distinguished from attitudes. This possibility can easily be tested, by comparing the fit of the models in which anticipated affective reactions and attitudes are reflected by a single latent construct (with five indicators) with the models in Figs 1 and 2. Since the former models are *nested* in the latter models, we can compare fit by means of the difference of χ^2 test. If anticipated affective reactions and attitudes are essentially equivalent, the overall fit of the proposed alternative models should not differ significantly from the overall fit of the models in Figs 1 and 2. This is not so, however. The difference of χ^2 test yielded $\chi^2(4) = 69.92$, $p < .001$ for the model of condom use. Thus, with respect to both refraining from sexual intercourse and condom use, the possibility that anticipated affective reactions are similar to attitudes is statistically rejected.

Discussion and conclusions

It appears that in the domain of sexual behaviour the predictive ability of the TPB can be increased if anticipated affective reactions are incorporated into the model. It seems, therefore, that the effectiveness of AIDS prevention campaigns aimed at adolescent sex-

ual behaviour could be enhanced if these campaigns would address affective issues. In particular, such campaigns might try to increase the likelihood that people will anticipate the affective consequences of unsafe sexual behaviour. That is, AIDS prevention campaigns should increase the awareness that unsafe sexual behaviour can lead to negative feelings, whereas safe sexual behaviour is likely to result in positive feelings. Indeed, this was one of the aims of the British campaign, 'The choice is up to you'. Part of this campaign was an advertisement with a photograph of a young man and woman in bed. The woman (who looked into the camera) showed some signs of distress. To the left of the photograph two scenarios were described. In the first scenario the reader allegedly had had sex the night before, but did not use a condom. This was followed by a question about how the reader would feel this morning. Perhaps a little worried? Next some general facts about AIDS transmission were given. This was followed by the second scenario, in which the reader allegedly had had sex the night before, and used a condom. Again the question was asked how the reader would feel this morning, and positive feelings were suggested. This campaign clearly aimed to increase the salience of negative feelings that could be experienced after unsafe sex, and of positive feelings that could be experienced after safe sex. Recently, we carried out two experiments that made use of a similar strategy (Richard, van der Pligt & de Vries, 1994*a*). The results showed that the strategy was effective in changing expectations to use condoms in future casual sexual encounters. Moreover, in a follow-up study five months later, a reliable effect of the experimental manipulation on reported condom use in casual sexual relationships was found. These findings provide empirical support for a strategy such as that used in the British campaign.

It is perhaps interesting to contrast the above strategy with that of fear appeals to produce behavioural change. Fear arousal was the key element of early AIDS prevention campaigns in the UK (gravestones, terrifying voices, etc.). One of the possible drawbacks of fear appeals is that high levels of fear may lead to denial, which would reduce the likelihood of behavioural change. Several models assume a curvilinear relationship between fear arousal and behavioural change (Janis, 1967; McGuire, 1969). This is based on the assumption that anxiety can set off defensive reactions such as failure to pay attention to the message, rejection of the communication, or defensive avoidance of anxiety-arousing thoughts. In contrast, the approach we would like to recommend increases the *awareness* that risk-taking sexual behaviour will result in negative feelings (worry, regret, etc.), and at the same time makes salient that these negative feelings will be avoided if protective measures are taken.

It should be mentioned that there is a possible limitation to the present findings. We distinguished between safe and risky behavioural alternatives, and predicted subjects' preferences between relevant alternatives. The subtraction method that we used to determine subjects' preferences was also applied to their anticipated affective reactions. However, this subtraction method did not exactly match those that were used for the other predictor variables. Thus, the dependent variables share more method variance with anticipated affective reactions than with the other predictor variables. This may have artificially enhanced the predictive power of anticipated affective reactions. Recently, we carried out a study that also addressed this alternative explanation (Richard, van der Pligt & de Vries, 1994*b*). This study replicated the findings of the present study, and therefore method variance does not seem to be a sufficient explanation for our finding that anticipated affective reactions predict sexual and contraceptive behaviours over and above the components of the TPB.

Apart from the strategy of increasing the awareness that unsafe sexual behaviour can lead to negative feelings, our findings also suggest other possibilities of influencing adolescent sexual behaviour. Attitudes, subjective norms and self-efficacy may all be targets of intervention strategies, since these variables significantly contributed to the prediction of safe versus less safe sexual behaviour. It should be noted, however, that whereas attitudes were the prime predictors in the model of refraining from sexual intercourse, they contributed only marginally to the prediction of condom use. Subjective norms, on the other hand, were of major importance for the prediction of condom use, but not for the prediction of refraining from sexual intercourse. Thus, whether adolescents refrain from sexual intercourse appears to be under attitudinal influence, but their condom use in casual encounters appears to be primarily under normative influence. This points at the role that important others, in particular parents, can have in influencing HIV preventive actions. It seems that if parents advise their children to refrain from sexual intercourse, this will be less effective than if they stress the importance of condom use. AIDS prevention campaigns should therefore also focus on parents (see also Schaalma *et al.*, 1993).

Finally, our study clearly indicates that HIV preventive behaviour is dependent on perceptions of self-efficacy. This finding is in line with other studies that indicated the importance of self-efficacy in the HIV preventive behaviours of adolescents (O'Leary *et al.*, 1992; Rosenthal *et al.*, 1991; Schaalma *et al.*, 1993). Adolescents are more likely to refrain from sexual intercourse or to use condoms in casual sexual encounters if they believe themselves capable of managing sexual situations. For instance, they must believe that they can resist the social pressure from an unwilling partner and that they can overcome situational constraints such as the non-availability of a condom. Of course this belief in one's efficacy to exercise personal control is dependent on certain skills such as assertiveness. Therefore, changing adolescent sexual behaviour via the mechanism of self-efficacy may involve intensive training (cf. Gilchrist & Schinke, 1983). However, simply providing videotaped models designed to build self-assurance, as well as to convey strategies on how to deal effectively with coercion for risky practices, may also be highly effective (Bandura, 1992). Moreover, social modelling could easily combine efforts to enhance self-efficacy with an attempt to increase the salience of negative feelings that may be experienced after unsafe sex, and positive feelings that may be experienced after safe sex. Our findings suggest that this combined approach may be a highly effective method for influencing the HIV preventive behaviours of adolescents.

Acknowledgement

This research was supported by grant no. 89056 of the Ministry of Welfare, Health and Cultural Affairs (WVC).

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