INTERNATIONAL ARTICLE

# Condom Use Self-efficacy: Effect on Intended and Actual Condom Use in Adolescents

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*Purpose:* To investigate aspects of adolescents' condom use self-efficacy that affect their intended and actual condom use.

*Methods:* Four hundred twenty-four male and female sexually experienced and inexperienced adolescents with a mean age of 17.0 years filled out a questionnaire concerning condom use self-efficacy and intended and actual condom use. Specific condom use self-efficacy scales were constructed from 37 items on the basis of a principal component analysis. The effect of self-efficacy, both as a global measure and in terms of specific scales, on condom use intention and consistency was assessed using multiple hierarchic regression analyses.

*Results:* Six specific self-efficacy scales were constructed: Technical Skills, Image Confidence, Emotion Control, Purchase, Assertiveness, and Sexual Control. In sexually inexperienced adolescents, global self-efficacy explained 48%, the six self-efficacy scales 30%, and both together 51% of the variance in intention, after statistical control for gender, age, and education level. In the sexually experienced sample, this was 40%, 50%, and 57% for intention, and 23%, 29%, and 33% for consistency of condom use. Significant predictors of intention in the final model were gender, age, global self-efficacy and purchasing skills in the inexperienced sample, and global self-efficacy, emotion control, assertiveness, image confidence, and sexual control in the experienced sample, whereas gender, age, global self-efficacy, emotion control, assertiveness, and purchase predicted consistency of condom use in the experienced sample.

*Conclusions:* Condom use self-efficacy is a multidimensional construct. Intended and actual condom use in adolescents are best predicted by self-efficacy measures that include both global and relevant specific aspects of condom use. © *Society for Adolescent Medicine, 2001*

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Condom use self-efficacy is one of the most important predictors of intended and actual condom use, where self-efficacy is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance" (1). Accordingly, measures of self-efficacy for condom use should be tailored to the behaviors required for its use.

Despite the clear definition of the self-efficacy construct and the large number of publications on this subject (a Medline and Psyclit search produced about 200 articles with the terms "self-efficacy and condom"), until now no consensus has been reached about its conceptualization and measurement in the domain of condom use. In itself, this heterogeneity should not cause worry. The construction of generalized self-efficacy scales was attempted in the early 1980s (2–4), but by now the idea that self-efficacy measures should be tailored to the subject of research has generally been accepted.

However, generality or specificity is a major dimension of self-efficacy with implications for its predictive and explanatory value (5,6). In this re-

spect, Maibach and Murphy (6) stressed that self-efficacy measures should be based upon "a conceptual analysis of the domain of functioning to determine the competencies involved in the behavior and the barriers and challenges one will have to manage" and adjusted to the specific population under study. Thus, for example, the measurement of early adolescents' self-efficacy concerning condom use with a new sex partner will necessarily differ from adults' condom use self-efficacy with multiple sex partners. Yet, the literature shows that most condom use self-efficacy measures are of acceptable reliability and good predictors of intended and reported condom use, whether they are operationalized as global statements or as specific ones covering a range of situational and interpersonal contexts. If both global and specific measures are able to explain condom use equally well, there might be no need for specific measures, at least not in predictive research.

Explanatory research, in contrast to predictive research, aims at explaining phenomena of interest (7). A critical aspect of the conceptualization of condom use self-efficacy is that it should contribute to the understanding of condom use in the population under study, in this case adolescents. The expanding literature on the subject (8–14), however, has not always reached or tried to reach this. All studies do support the assumption that condom use self-efficacy is related to both intended and past condom use. Most studies have adopted technical skills, purchasing and carrying condoms, and proposing and convincing a partner to use a condom as relevant aspects of condom use self-efficacy. These studies found that males are better at technical and purchasing skills, whereas females score higher on communication skills (6,10,11), but whether these perceived skills are also relevant for condom use remains unclear. Less frequently addressed are the issues of condom use under the influence of intoxicants and the matter of control over sexual feelings, although these were primary factors in Brien et al.'s (9) analysis and Brafford and Beck's Condom Use Self-Efficacy scale (8). Furthermore, the effect of control over emotions (such as feelings of confusion, uncertainty, or simply being in love) on condom use has not been explored, although several sources suggest that this does affect condom use. For example, Bandura (15) asserted that perceived self-efficacy is also concerned with people's beliefs that they can exert control over their emotional states, and the Theory of Planned Behavior (16) accounts for the possibility that emotions and compulsions can lower one's action control. Also, developmental studies on adolescent sexuality demonstrate that adolescents' sexual encounters have more to do with the expression of love and emotional commitment, physical attraction, excitement, and sometimes curiosity than with technical and verbal performance (17–19).

Against this background of clear indications of the multidimensionality of condom use self-efficacy, it is remarkable that few studies have tried to uncover those dimensions that help to predict and understand condom use. In addition, empirical findings by Brien et al. and Joffe and Radius (9,10) suggest that the effect of condom use self-efficacy on condom use varies as a function of sexual experience. Theoretical justification of this possibility can be found in the idea that beliefs underlying the measurement of determinants of behavior(al intentions) should be salient to the participants (20,21). It may be that sexually inexperienced adolescents' intention to use condoms is constituted from a general sense of efficacy, or in terms of the most obvious barriers for condom use, such as buying condoms (10) and technical skills. Sexually experienced adolescents, in contrast, can be assumed to be more aware of the power of communication, emotion, and sexual aspects in intimate relationships that affect condom use.

Altogether, we thought a comprehensive study was needed that addressed these issues simultaneously. Answers to these questions should be helpful in constructing more economical and valid measurements of condom use self-efficacy, in differentiating educational messages for sexually active and/or inactive adolescents, and in designing intervention strategies that effectively prepare adolescents for condom use. The present study was therefore designed to assess the relative importance of condom use self-efficacy and its dimensions for predicting and understanding condom use in an unselected sample of adolescents. The first goal was directed at understanding the multidimensional construct of condom use self-efficacy itself; the second goal was to assess to what extent these self-efficacy measures can be used to predict and explain condom use. Finally, because of the assumed differences between sexually inexperienced and experienced adolescents, the analyses were stratified by sexual experience.

## Methods

### Research Questions

The first study goal of uncovering the multidimensional structure of condom use self-efficacy is an-

swered by a principal component analysis in which all self-efficacy items are treated on an equal footing. The second goal entails responses to three questions. First, does a global condom use self-efficacy measure explain condom use equally well as a self-efficacy measure that covers several aspects of condom use, after controlling for person characteristics? Second, is the variance in condom use best explained by a global or a specific self-efficacy measure, or by both together? Third, which aspects of condom use self-efficacy affect adolescents' condom use? These questions are answered by regression analyses, in which the dependent variable (intended or reported condom use) is predicted by the independent variables (self-efficacy and person variables). Finally, to address the differences between sexually inexperienced and experienced participants, intended condom use was chosen as the main dependent or criterion variable (10,22). It can be argued that precisely in this domain the intention–behavior link can be weak, but strong associations between intentions and actual behavior can be found if the measure of intention corresponds in its level of generality to the target behavior, and when action, target, situational context, and time are specified (20,23). Therefore, intention was targeted to using condoms with a new partner at the first sexual encounter. However, to minimize the risk of socially desirable answers on one simple intention question, raise the probability of realistic answers, and improve the reliability of the measure, the participants were also questioned on their motivation to use condoms and their condom use expectation in the depicted situation. As a control of the validity of the findings with this combined intention measure the data were also analyzed with consistency of condom use as the dependent variable in the sexually experienced sample. Both a global self-efficacy measure and a specific one with a wide variety of condom use self-efficacy items were used as predictor variables, as well as the personal variables of gender, age, and education level.

### Procedure

After receiving approval from the institutional review boards, the anonymous survey questionnaire designed by the authors was administered to high school students. The survey was filled out during a 1-h course. Participation was not required and students had the opportunity to refuse cooperation.

### Participants

A total of 428 Flemish high school students (Grades 11 and 12) with a mean age of 17.0 years (standard deviation [SD] = 1.1) from three secondary schools participated in the study between April and November 1993. As this is a convenience sample, it is not to be representative of the population of adolescents in Flanders. No one refused cooperation, but four participants filled out the questionnaire inadequately and were left out of the analyses. The final sample consisted of 166 boys and 258 girls from a technical ($n$ = 253) or a general education ($n$ = 171) school. There were 90 technical and 76 general education males, and 81 technical and 177 general education females, with mean ages 17.5 (SD = 1.2) of 17.1 (SD = 0.9), 17.5 (SD = 1.1), and 16.5 (SD = 0.8) years, respectively.

### Measures

Most of the items were answered on a 9-point scale. Deviant answering modes will be mentioned explicitly.

*Personal characteristics.* Participants were questioned about their age, gender, and experience with sexual intercourse (yes or no). Sexually experienced participants also reported the number of steady and nonsteady sexual partners, their experience with condom use, and consistency of condom use.

*Self-efficacy.* The Global Condom Use Self-efficacy measure consisted of three general statements about the perceived ability to use condoms in the future with a new partner: "I think I would succeed in using a condom when I have sex with a new partner," "I would find it difficult to use a condom when having sex with a new partner," and "I am not sure I could use a condom when I have sex with a new partner." Its reliability, expressed as the Cronbach alpha measure for the standardized values, was $\alpha$ = .79. Specific Condom Use Self-efficacy was covered by 37 items about skills necessary for condom use, such as technical skills, purchasing and carrying condoms, communication skills, and control over emotions and sexual arousal. Items from other questionnaires were used (8,13,24) and, especially with respect to control over emotions and sexual arousal, items were constructed, such as "Even if I were very much in love, I would think of using a condom when I have sex with my partner for the first time."

*Intended condom use.* Intention to use a condom with a new partner in the future was assessed by summing the scores of three items ($\alpha = .88$): "Would you prefer to . . . ," "Do you intend to . . . ," and "Do you think you actually will use a condom when you have sex with a new partner?"

*Consistency of condom use.* Sexually experienced participants were asked whether they had never, had not most of the time, had most of the time, or had always used condoms.

## Statistical Analyses

The raw data were transformed into *a priori* scales in such a way that a low (high) score represented a low (high) level of self-efficacy, intention, or consistency of condom use. The data analyses were conducted with SAS 6.08 for Windows (Cary, NC: SAS Institute, Inc.) unless otherwise mentioned.

To test the first hypothesis, a principal component analysis with orthogonal rotation of the components was performed on the 37 specific self-efficacy items. On the basis of this component structure, six Specific Self-efficacy scales were constructed that were used in the further analyses.

Testing the second hypothesis involved two four-step hierarchic multiple regression analyses stratified by sexual experience with intention as a dependent variable. The models were also tested with consistency of condom use as a dependent variable in the sample of sexually experienced respondents. Normality of the residuals of the regression models was checked. Nonnormal variables were transformed following Stevens and Tabachnick and Fidell (25,26); negatively skewed variables were reflected and then transformed. In the first step (Model 1), gender, education level, and age were entered. Then (Model 2a), global condom use self-efficacy was added to the previous model. As such, the relationship between global self-efficacy and intention/consistency was tested with the effects of the person variables statistically eliminated. The same analysis was performed with the six specific self-efficacy scales (Model 2b). Whether both analyses are equally good at explaining intended and actual condom use was tested with a formula proposed by Tabachnick and Fidell (26, pp.158–9), in which predicted scores from both models are correlated and transformed into a *z* score. Finally, we tested whether a model containing both global and specific self-efficacy measures predicts condom use intention and consistency better than either of the previous models (Model 3).

## Results

### Descriptive Data

Of the 424 participants, 255 (60%) were sexually inexperienced, 165 (39%) had already engaged in sexual intercourse, and four (1%) did not answer the questions about their sexual experience. More students from technical schools (69%) than from general education schools (19%) were sexually experienced ($\chi^2$ [1] = 106.812, $p = .000$; $n = 420$), but no gender difference was found ($n = 420$, $\chi^2$ [1] = 1.398, $p = .237$).

One hundred sixty-three of the 165 sexually experienced participants provided more details. Less than half of them (45%) had only one sexual partner, 19% engaged in successive monogamous sexual relationships, and 36% were having sex with steady and nonsteady partners or with nonsteady partners only. Despite this, only one in four (25%) reported using condoms consistently; 59% reported using them inconsistently (34% most of the time and 25% most of the time not), and 17% reported never having used a condom. There were less consistent condom users among females (18%) than among males (33%), and more girls (67%) than boys (49%) were inconsistent condom users ($\chi^2$ [2] = 5.977, $p = .050$; $n = 163$). Technical and general education students did not differ in this respect ($\chi^2$ [2] = 1.940, $p = .379$). In summary, more technical education students had more sexual relations than general education students, but once these adolescents had engaged in sexual intercourse, their behavior with regard to the consistency of condom use was the same.

### Components of Condom Use Self-efficacy

*Principal component analysis.* A principal component analysis with orthogonal rotation on the 37 specific self-efficacy items yielded a final communality estimate of 20.71, meaning that the solution explained 55.98% of the variance in the items. Eight components with an eigenvalue higher than 1 emerged. Of the 37 items, six loaded higher than 0.40 on more than one component.

The largest component, technical skills (six items with a component loading > 0.40), explained 9.66% of the total variance. The second component explained 9.33% of the total variance and was interpreted as image confidence. The six items loading on this component were associated with the negative impression the partner might have and with the uncertainty about the partner's reaction when proposing condom use. The third component explained

7.79% of the total variance. This component, emotion control (six items), expressed the extent to which strong emotions might interfere with condom use with a new partner. The fourth component, purchase condoms (six items), indicated the perceived capability to buy and carry condoms, which is a material condition for using them. It explained 7.29% of the total variance. The fifth component, which explained 6.99% of the total variance, contained classic items about communicative skills, as well as items from the component image confidence. Because it indicated in how far one sticks to his or her decision to use a condom despite relational or environmental difficulties, it was labeled "assertiveness" (seven items). The sixth component explained 5.82% of the total variance. Because it had a typical sexual meaning with items about the perceived control over sexual feelings, it was named "sexual control" (five items). The seventh component (four items) explained 5.02% of the total variance. With items about the discussibility of condom use in noncommittal situations, it expressed a general feeling of self-assurance with respect to condom use. The smallest component explained <5% of the total (4.08%) variance. Because the two items of this component described situations in which one has to cope with difficulties or failure, it was named "unconcern about failure." This component solution was used as a basis for the construction of self-efficacy scales.

*Construction of condom use self-efficacy scales.* The self-efficacy scales were constructed in line with the procedure described by Mahoney et al. (27). First, items were assigned to scales if their component loading was higher than 0.40. Then, reliability of the scales was maximized by deleting those items that reduced Cronbach α. If fewer than three items were assigned to a scale or if α was smaller than .60, that component was eliminated. This resulted in six scales that match the meaning of the first six components of the principal component analysis: technical skills (α = .84), image confidence (α = .82), emotion control (α = .77), purchase (α = .78), assertiveness (α = .76), and sexual control (α = .65). The scores on these scales were obtained by summing the scores on the relevant items. The correlations between them ranged from .09 to .69, which indicates that the amount of shared variance ranged from 1% to 48%. The highest overlap was found among both the scales "image confidence" "emotional control," and "assertiveness" (48% shared variance); and "technical skills" and "purchase" (30% shared variance). Of the 37 items, three (Items 9, 22, and 28) were assigned

to two scales, and eight did not meet the criteria for inclusion. Table 1 lists the components, items, and their factor loading.

## Aspects of Condom Use Self-efficacy That Explain Condom Use Intention and Consistency

Owing to nonnormality, intention was reflected and log transformed and global self-efficacy, image confidence, emotion control, assertiveness, and sexual control were reflected and square root transformed (25,26). This implies that low (high) scores on these variables indicate high (low) perceived ability or intention, whereas low (high) scores on technical skills, purchase, and consistency of condom use indicate low (high) perceived ability or consistency. The residuals of the regression models were acceptable after this transformation.

The results of the hierarchic regression analyses with intention as an outcome variable are presented in Table 2 for the sexually inexperienced, and in Table 3 for the sexually experienced; those concerning consistency of condom use are in Table 4. All multiple regression models were significant ($p < .05$). The correlations between the self-efficacy measures and condom use intention and consistency are in Table 5.

In the sexually inexperienced sample ($n = 255$) (Table 2), the first regression analysis (Model 1) showed that gender, education level, and age explained only 5% of the variance in intention. Males had lower levels of intention than females, and condom use intention increased with age. Adding global self-efficacy (Model 2a) raised the explained variance to 53%, indicating that global self-efficacy was strongly correlated with intention, whereas the effects of gender and age remained. Model 2b explains 35% of the variance in intention demonstrating the additional explanatory value of specific self-efficacy scales beyond the person variables. Of the significant self-efficacy scales, "emotion control," "assertiveness," and "sexual control" are positively related with intention. Purchase was negatively related (remember that this variable was not reflected, so a positive coefficient means negatively related), meaning that inexperienced adolescents with lower (higher) perceived purchasing skills intended more (less) to use condoms. Technical skill was positively associated but not significant, whereas image confidence did not predict intention. Comparison of the explanatory value of Models 2a and 2b resulted in a z score of 3.73 ($p < .001$), indicating that Model 2a explained intended condom use better than Model

**Table 1.** Specific Condom Use Self-efficacy Scales

| Item | Factor Loading (Std. Variables) |
|---|---|
| Technical skills | |
| 17. I feel confident that I am able to use a condom correctly. | 0.71 |
| 33. I would be capable of using a condom efficiently. | 0.69 |
| 30. I think I would be able to remove a condom easily. | 0.66 |
| 13. Putting on a condom would make me feel uncomfortable. | 0.58 |
| 6. I think I am able to put on a condom quickly. | 0.54 |
| 28. I dare to get condoms out of a condom machine in a pub or dance without any problem. | 0.51 |
| Image confidence | |
| 26. I would not dare to propose condom use to a new partner because this might suggest my partner has an STD. | 0.74 |
| 29. I would not dare to propose condom use to a new partner because this might suggest I have an STD. | 0.70 |
| 21. I would not dare to propose condom use because this might suggest I have slept with several partners. | 0.60 |
| 9. I think I could propose condom use without causing my partner feel as if he or she were ill. | 0.51 |
| 8. If I were to propose condom use, I would be afraid to be rejected. | 0.47 |
| 18. I would not dare to propose condom use to a new partner because this might suggest homosexual experiences. | 0.47 |
| Emotion control | |
| 22. None of us has got a condom, so we would have to buy one. In that case I think I would have sex without a condom. | 0.62 |
| 12. If I would have sex unexpectedly I would forget to use a condom. | 0.61 |
| 15. If I would be drunk a little, I would not be able to stop making love to put on a condom first. | 0.56 |
| 5. Even if I would be very much in love, I would think of using a condom when I have sex with my partner for the first time. | 0.50 |
| 24. If I would have sex with my partner for the first time, I would hardly be able to wait until the condom has been put on. | 0.41 |
| Purchase | |
| 25. I can get condoms whenever I want without difficulty. | 0.61 |
| 3. I wouldn't mind buying condoms in a department store. | 0.59 |
| 1. I would feel uncomfortable if I'd carry condoms with me. | 0.55 |
| 35. I find purchasing condoms at a pharmacist embarrassing. | 0.53 |
| 28. I dare to get condoms out of a condom machine in a pub or dance without any problem. | 0.48 |
| Assertiveness | |
| 23. I feel able to convince my partner to use a condom when we have sex together. | 0.60 |
| 14. If my partner wouldn't want to use a condom, I could easily convince him/her of its necessity. | 0.53 |
| 10. I would not propose using a condom if I didn't know how my partner feels about condom use. | 0.50 |
| 22. None of us has got a condom, so we would have to buy one. In that case I think I would have sex without a condom. | 0.50 |
| 9. I think I could propose condom use without causing my partner feel as if he or she were ill. | 0.46 |
| 31. I see myself as capable of buying condoms at a duty pharmacist during the evening. | 0.44 |
| Sexual control | |
| 20. I feel able to use a condom together with my partner without breaking the mood. | 0.55 |
| 11. I think I could use a condom without lessening sexual excitement. | 0.42 |
| 7. If my partner would carry a condom I would certainly manage to use one. | 0.38 |
| 4. I feel I am able to integrate putting on a condom into the foreplay. | 0.35 |

Items not included: 2. I feel able to discuss condom use with every possible future partner; 16. I would be afraid to tear the condom by my clumsiness; 19. I would rely on my/my partner's ability to maintain an erection while using a condom; 27. After I get a condom out of its pack with some difficulty, it is broken. In that case I would simply take a second one; 32. I would feel at ease to discuss condom use with a possible sexual partner, even before we ever had sexual relations; 34. If our attempt to use a condom failed, I would feel uncomfortable trying it again; 36. I am able to propose condom use to a new partner; 37. If my partner would insist on sex with a condom, my chance of having sex without a condom against my will is great.
Std = standardized.

2b. Finally, Model 3 explained 56% of the variance in intention, which was significantly better than Models 2a and 2b. When the global and specific self-efficacy measures were combined, global self-efficacy remained the strongest predictor and negated the significance of emotion control, assertiveness, and sexual control, whereas purchase remained the only significant specific self-efficacy scale.

As in the inexperienced sample, the first regression analysis of the sexually experienced group ($n = 163$) (Model 1) explained 5% of the variance in intention (Table 3). There was no gender difference,

**Table 2.** Hierarchical Regression Models of Condom Use Intention of Sexually Inexperienced Sample ($n = 255$)

| Variable | Model 1 β | Model 2a β | Model 2b β | Model 3 β |
|---|---|---|---|---|
| Dependent variable | | | | |
| Intention | | | | |
| Independent variables | | | | |
| Gender | 0.20* | 0.13** | 0.09 | 0.11* |
| Educational level | −0.04 | −0.03 | −0.01 | −0.02 |
| Age | −0.17* | −0.13** | −0.12* | −0.13** |
| Global self-efficacy | | 0.69** | | 0.60** |
| Technical skills | | | −0.15 | −0.11 |
| Image confidence | | | −0.00 | −0.07 |
| Emotion control | | | 0.30** | 0.11 |
| Purchase | | | 0.16* | 0.16** |
| Assertiveness | | | 0.21** | 0.12 |
| Sexual control | | | 0.15* | 0.05 |
| Model F | $F(3, 251) = 7.77^{**}$ | $F(4, 250) = 70.30^{**}$ | $F(9, 245) = 14.81^{**}$ | $F(10, 244) = 31.51^{**}$ |
| $R^2$ of model | 0.05 | 0.53 | 0.35 | 0.56 |
| $R^2$ change | | 0.48 | 0.30 | $R^2$ chg. Model 2a = 0.03 |
| | | | | $R^2$ chg. Model 2b = 0.21 |
| F change | | F chg.(1, 250) = 28.42** | F chg.(6, 245) = 19.12** | F chg. Model 2a(6, 244) = 3.17** |
| | | | | F chg. Model 2b(1, 244) = 117.33** |

\* $p \le .05$; \*\* $p \le .01$.
 $z$ score difference in predictive value between Model 2a and Model 2b = 3.73 ($p < .001$). Model 3 is an extension of both Model 2a and Model 2b. Therefore, the $R^2$ change of Model 3 is mentioned in the fourth column for each model separately.

but in contrast to the inexperienced sample, condom use intention decreased with age. Model 2a explained 45% of the variance, of which 40% was by global self-efficacy; Model 2b explained 55% of the variance in intention. Emotion control, sexual control, and assertiveness were positively, and image confidence negatively related to intention, meaning that adolescents who felt less (more) confident about their image had higher (lower) condom use intentions. Although Model 2b seemed to explain intention better than Model 2a, the $z$ score of −1.65 indicated no significant difference, owing to the

**Table 3.** Hierarchical Regression Models of Condom Use Intention of Sexually Experienced Sample ($n = 165$)

| Variable | Model 1 β | Model 2a β | Model 2b β | Model 3 β |
|---|---|---|---|---|
| Dependent variable | | | | |
| Intention | | | | |
| Independent variables | | | | |
| Gender | 0.03 | 0.04 | 0.07 | 0.05 |
| Education level | −0.08 | −0.03 | 0.03 | 0.02 |
| Age | 0.18* | 0.12* | 0.03 | 0.04 |
| Global self-efficacy | | 0.64** | | 0.35** |
| Technical skills | | | 0.05 | 0.03 |
| Image confidence | | | −0.16* | −0.17** |
| Emotion control | | | 0.52** | 0.33** |
| Purchase | | | −0.07 | −0.01 |
| Assertiveness | | | 0.18* | 0.22** |
| Sexual control | | | 0.24** | 0.15* |
| Model F | $F(3, 161) = 2.74^{*}$ | $F(4, 160) = 32.73^{**}$ | $F(9, 155) = 21.03^{**}$ | $F(10, 154) = 25.28^{**}$ |
| $R^2$ of model | 0.05 | 0.45 | 0.55 | 0.62 |
| $R^2$ chg. | | 0.40 | 0.50 | $R^2$ chg. Model 2a = 0.17 |
| | | | | $R^2$ chg. Model 2b = 0.07 |
| F change | | F chg.(1, 160) = 118.09** | F chg.(6, 155) = 28.79** | F chg. Model 2a.(6, 154) = 11.44** |
| | | | | F chg. Model 2b.(1, 154) = 28.68** |

\* $p \le .05$; \*\* $p \le .01$.
 $z$ score difference in predictive value between Model 2a and Model 2b = −1.65 (not significant). Model 3 is an extension of both Model 2a and Model 2b. Therefore, the $R^2$ change of Model 3 is mentioned in the fourth column for each model separately.

**Table 4.** Hierarchical Regresssion Models of Condom Use Consistency of Sexually Experienced Sample ($n = 163$)

| Variable | Model 1 β | Model 2a β | Model 2b β | Model 3 β |
|---|---|---|---|---|
| Dependent variable | | | | |
|   Consistency | | | | |
| Independent variables | | | | |
|   Gender | 0.18** | 0.18** | 0.18 | 0.19** |
|   Education level | 0.06 | 0.03 | −0.01 | −0.00 |
|   Age | −0.22*** | −0.18** | −0.13* | −0.13* |
|   Global self-efficacy | | −0.40*** | — | −0.25*** |
|   Technical skills | | | 0.10 | 0.11 |
|   Image confidence | | | 0.08 | 0.08 |
|   Emotion control | | | −0.33*** | −0.20* |
|   Purchase | | | −0.12 | −0.17* |
|   Assertiveness | | | −0.19* | −0.21* |
|   Sexual control | | | −0.02 | 0.05 |
| Model $F$ | $F(3, 159) = 4.07$*** | $F(4, 158) = 11.80$*** | $F(9, 153) = 7.03$** | $F(10, 152) = 7.44$*** |
| $R^2$ of model | 0.07 | 0.23 | 0.29 | 0.33 |
| $R^2$ chg. | | 0.16 | 0.06 | $R^2$ chg. Model 2a = 0.17 |
| | | | | $R^2$ chg. Model 2b = 0.07 |
| $F$ change | | $F$ chg.(1, 158) = 32.41*** | $F$ chg.(6, 153) = 8.02*** | $F$ chg. Model 2a.(6, 152) = 3.73*** |
| | | | | $F$ chg. Model 2b.(1, 152) = 8.18*** |

    * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$.
    $z$ score difference in predictive value between Model 2a and Model 2b = −1.13 (not significant). Model 3 is an extension of both Model 2a and Model 2b. Therefore, the $R^2$ change of Model 3 is mentioned in the fourth column for each model separately.

smaller sample size (when the sample size would have been equal to the previous one, the difference would have been significant). Finally, the combined model (Model 3) explained 62% of the variance in intention, which was significantly better than both Model 2a and Model 2b. The most important predictors of intention in Model 3 were global self-efficacy and emotion control. In contrast to the inexperienced sample, the previously significant specific scales remained: emotion control, followed by assertiveness, image confidence, and sexual control.

For analyses with consistency of condom use as a dependent variable in the sexually experienced sample (Table 4), a more liberal α level of .10 was used because of the small sample sizes, but probabilities between .05 and .10 are mentioned. Model 1 explained 7% of the variance in consistency, with males and younger adolescents using condoms more consistently than females and older adolescents. In Model 2a, which explained 23% of the variance, global self-efficacy was positively related to consistency, and the effects of gender and age remained.

**Table 5.** Pearson Correlations of Global Self-efficacy and Specific Self-efficacy Scales With Intention of Sexually Inexperienced Sample ($n = 255$) and With Intention ($n = 165$) and Consistency of Condom Use ($n = 163$) of Sexually Experienced Sample

| | Consistency Condom Use | Intention | Global Self-efficacy | Technical Skills | Image Confidence | Emotion Control | Purchase | Assertiveness | Sexual Control |
|---|---|---|---|---|---|---|---|---|---|
| Intention | −.51** | | .78** | −.19** | .34** | .52** | −.17 | .48** | .38** |
| Global self-efficacy | −.42** | .65** | | −.28** | .44** | .56** | −.28** | .54** | .45** |
| Technical skills | .24** | −.21** | −.24** | | −.28** | −.14 | .67** | −.30** | −.48** |
| Image confidence | −.13 | .21** | .29** | −.26** | | .47** | −.34** | .63** | .34** |
| Emotion control | −.47** | .69** | .59** | −.31** | .40** | | −.20** | .66** | .41** |
| Purchase | .04 | −.08 | −.17* | .60** | −.27** | −.09 | | −.37** | −.38** |
| Assertiveness | −.40** | .56** | .42** | −.35** | .57** | .70** | −.29** | | .44** |
| Sexual control | −.30** | .51** | .46** | −.24** | .24** | .50** | −.00 | .41** | |

    * $p \leq .05$; ** $p \leq .01$.
    Owing to nonnormality, intention was reflected and log transformed and global self-efficacy, image confidence, emotion control, assertivenss, and sexual control were reflected and square root transformed. This implies that low (high) scores on these variables indicate high (low) perceived ability or intention, whereas low (high) scores on technical skills, purchase, and consistency of condom use indicate low (high) perceived ability or consistency.

Model 2b explained 29% of the variance, and significant contributors were gender, age ($p = .09$), emotion control, and assertiveness ($p = .09$). Finally, 33% of the variance was explained by Model 3. Gender and age ($p = .09$) were significant. Higher levels of global self-efficacy, emotion control ($p = .07$), and assertiveness ($p = .05$), and lower levels of purchase ($p = .06$) were associated with more consistent condom use. Model 3 explained more variance than both Model 2a and Model 2b, but the $z$ score of $-1.13$ suggests that the predictive value of the latter two should be considered equal.

## Discussion

### Condom Use Self-efficacy as a Multidimensional Construct

With regard to the first hypothesis, this study clearly demonstrated the multidimensionality of condom use self-efficacy. The principal component analysis resulted in a refinement of two hypothesized components: communication skills and emotional control.

Communication skills involve both emotional and operational aspects. Image confidence, the perceived ability to deal with eventual negative impressions caused by proposing condom use, has to do with emotional motives to be accepted by the partner. This should be distinguished from assertiveness or the decisiveness and perceived verbal skills needed for the target instrumental behavior of convincing someone to have safe sex. Thus far, these findings replicate Brien et al.'s (7) factors: partner's disapproval and assertive. Moreover, these aspects behave differently in relation to condom use: More assertiveness and less image confidence tend to associate with higher condom use intention and consistency.

Second, instead of one component, emotional control, the components emotion control and sexual control emerged, which were strikingly captured under the heading "intoxicants" by Brien et al. (7). Emotion control summarizes the influence of being in love, having sex unexpectedly, the emotions associated with becoming sexually experienced, and drinking alcohol. When one is involved in strong emotions, an instrumental behavior such as using condoms might not come into one's mind. When it does, adolescents might feel reluctant to bring up the subject because condom use has no place in the concepts of love or going out of one's mind. Flowers et al. (17) expressed this idea with the terms "romantic rationality" versus "health rationality." Perceived sexual control, on the other hand, refers to the immediate satisfaction of a sexual need or giving in to immediate physical attraction. It does not refer to control over sexual behavior as such, but to control over condom use in the face of the strictly sexual aspects of it, such as breaking sexual excitement. Illustrative in the context of the distinction between emotion control and sexual control is that Traeen and Kvalem (19) found that initial sexual intercourse in adolescents is both emotionally and sexually motivated.

### Aspects of Condom Use Self-efficacy That Explain Condom Use Intention

The second goal of this study was to examine which condom use self-efficacy measure best predicts and explains condom use intention and consistency in sexually inexperienced and experienced adolescents.

Global self-efficacy highly increased the explained variance in intention and consistency, by now a common finding in this domain. This effect was also demonstrated with specific self-efficacy scales. The predictive value of both measures emerged in both sexually inexperienced and experienced adolescents, after controlling for the main effects of gender, age, and education level. Our present results show that combining a global self-efficacy measure and specific measures resulted in the best prediction of intention and consistency of condom use in both sexually experienced and inexperienced adolescents. This suggests that the most valid self-efficacy measure contains both global and specific measures, and that this measure can be generalized to all adolescents regardless of the sample's sexual experience.

For the purpose of designing more effective intervention strategies to promote condom use, a more thorough understanding of condom use self-efficacy in relation to intended and actual condom use is needed. Global self-efficacy is the strongest predictor in the final model in all analyses. However, in line with the expectations, the model with the global self-efficacy measure was superior to the model with specific measures in predicting intention in the inexperienced sample, whereas the specific self-efficacy scales were superior to the global measure in the experienced sample. Thus, our results suggest that condom use intentions in the inexperienced sample rely more on general efficacy cognitions and those of the experienced sample on perceived skills: The impact of global self-efficacy on intention remained in the final model of the inexperienced sample but decreased in the experienced one. A closer look at

Models 2b and 3 of the inexperienced sample reveals that emotion control, assertiveness, and sexual control affected intention when no global self-efficacy statements were included, but their effect was partially absorbed into the effect of global self-efficacy in the final model. In the experienced sample, the significant components continued to contribute to intention independently from the global self-efficacy measure. The lower impact of global self-efficacy and the independent effects of specific self-efficacy scales, those of "emotion control" and "assertiveness" in particular, were also confirmed in the analysis of condom use consistency in the experienced sample.

With respect to the impact of specific aspects of condom use self-efficacy, we found that adolescents with a stronger sense of emotion control—control over the emotional conflicts that can hinder condom use—and higher levels of assertiveness—the decisiveness and verbal skills needed for imposing condom use—are more inclined to use condoms and use condoms more consistently. These results justify current investments in teaching assertiveness and communication skills as an acquired immunodeficiency virus–preventive strategy. Nevertheless, as emotional competence probably affects all interpersonal aspects of condom use, we strongly argue in favor of more research and educational efforts into enhancing this competence in adolescents. Furthermore, adolescents' ideas about the controllability of sexual feelings affect their intention to use condoms with a new partner, but sexual control does not independently contribute to consistency of condom use in past or current relationships. Although it is a difficult subject to communicate, health educators should also pay attention to the role of sexual feelings associated with new intimate relationships. Less confidence about one's image (image confidence) is related to higher condom use intention but not to consistency of condom use in the sexually experienced sample. The findings with respect to sexual control and image confidence suggest that the impact of these cognitions is strongest in preparatory and initial stages of sexual relationships, and declines as the relationship progresses. Also, feeling less comfortable with buying and carrying condoms (purchase) is associated with higher condom use intention in the sexually inexperienced sample and with higher condom use consistency in the sexually experienced one. Thus, the data concerning image confidence and purchase suggest that some reserve could be more health protective than verbal overconfidence. Finally, perceived technical skills could not be shown to influence condom use significantly, which

illustrates that the biggest component is not necessarily the one that best explains condom use.

Finally, the last model explains 56% and 62% of the variance in condom use intentions, whereas the study variables explain much less of the variance in condom use (33%). Given that the only determinant included in these models was self-efficacy, the amount of variance explained is to be considered relatively high. The results of the final models of intention and condom use behavior of the sexually experienced sample are similar, so that it can be concluded that global self-efficacy, emotion control, and assertiveness are important predictors of condom use intention and behavior. However, the question of how the discrepancy between the explained variance of intention and behavior could be reduced remains. One area for special attention concerns the conceptualization of the intention measure. Although the intention measure in this study concerned a specific situation in some undefined point in the future, it was still measured at a global level comparable to the global self-efficacy measure. Alternative measures to be tested are measures that include specific implementation intentions or action plans, that specify a short or longer time period in which condom use is considered, or that cover a variety of situational and relational contexts. Furthermore, including other cognitive determinants (such as social norms and attitudes), relational and situational characteristics variables (such as steady or nonsteady relationships and contraception used), and fine-tuning the intention and behavior measure in a prospective study would certainly make the gap between the explained variance in intentions and behavior smaller.

### Limitations

Our findings suggest that some aspects of condom use self-efficacy are involved in both intentions and behavior, but some questions remain unanswered, such as how the validity of intention measures can be enhanced and how a global sense of condom use self-efficacy is constructed from specific condom use self-efficacy. Also, some methodologic limitations of this study must be mentioned. Because a convenience sample was used, generalizing the findings to the overall adolescent population should be done cautiously, especially with respect to unexplained findings, such as our finding that low purchasing skills and image confidence seem to be associated with higher condom use intentions and behavior. Also, the results should be replicated and validated

in a prospective study with a larger sample of sexually experienced adolescents.

## Conclusions

Our study replicates previous studies showing that condom use self-efficacy is a multidimensional construct. With respect to the conceptualization and measurement of condom use self-efficacy, it appears warranted to use both global and specific self-efficacy items to predict and explain condom use intention and consistency. Intentions of sexually inexperienced adolescents appear to be more influenced by general efficacy feelings and those of sexually experienced youths by specific aspects of condom use self-efficacy. However, the self-efficacy measure with both global and specific statements is the most valid for both sexually experienced and inexperienced adolescents. The results of this study also suggest that the aspects of condom use self-efficacy that affect intention are also implied in condom use behavior. The efforts of human immunodeficiency virus (HIV)-preventive interventions invested in assertiveness and communication skills are supported. Our findings suggest however that research and education in emotional competence might prove more effective in preventing HIV infection.

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