

Applicability of the theory of planned behavior to intended and self-reported condom use in a rural Ethiopian population

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Abstract

Objective: to assess the applicability of the theory of planned behavior, TPB, in predicting intended and self-reported condom use and to examine the effect of previous condom use, PCE, among young adults in rural Ethiopia. *Method:* Completion of a TPB interview involving 802 participants (mean age 20.7 yr, 74.7 % women) and self-reported condom use at three months follow up involving 743 participants (mean age 20.7 yr, 76.4% women). *Results:* The TPB and PCE explained 55% and 2.4% of the variance in intended condom use. Subjective norms discriminated strongly between subjects with and without PCE. The TPB and PCE accounted for 10% and 11% of the variance in condom use. *Conclusion:* The TPB provided a fairly accurate description of the process underlying intention but was less sufficient to account for self-reported condom use. Ethiopian youth decided for condom use if they anticipated predominantly positive consequences associated with performance and social support, whereas perceived barriers seemed to have less impact. Once they had started to use condom, they were more likely to continue to do so in the future.

Key words: theory of planned behavior, condom use, Ethiopia, young adults

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Ethiopia belongs to the poor region of Sub-Saharan Africa, facing the highest rate of HIV infections in the world (World Bank, 2000). In urban areas, the epidemic has started to level off at a high prevalence rate, whereas the prevalence rates are coming up in rural parts of the country (Ministry of Health, 2002). It is evident that the spread of AIDS into rural communities might be attributed to a high prevalence of extramarital unprotected sexual intercourse (Shabbir & Larson, 1995; Central Statistical Authority, 2000). Existing data reveal falling age at sexual debut, increasing sexual involvement and high morbidity and mortality from abortion and HIV/AIDS in young Ethiopians (Taffa **et al.**, 2002). Current prevalence estimates of contraceptive use are extremely low by Sub Saharan African standards (Eshetu **et al.**, 1997; Fitaw **et al.**, 2003; Tadesse **et al.**, 1996, Taffa, 1998; Taffa **et al.**, 2002). Educational efforts to encourage regular condom use could contribute to the prevention of the HIV/AIDS epidemic and other sexually transmitted diseases more effectively than reducing the number of sexual partners (Eaton **et al.**, 2003).

The theory of planned behavior, TPB (Ajzen, 1991) and its precursor, the theory of reasoned action, TRA (Ajzen & Fishbein, 1980) constitute promising frameworks for understanding and predicting social behaviors. Recognizing that the TRA applies strictly to volitional behaviors, Ajzen and Madden (1986) proposed the TPB in order to account for non-volitional behaviors (Fig 1). The TPB includes perceived behavioral control on a level with attitude and subjective norm as predictors of behavioral intention (Ajzen, 1991). The TPB implies that the three predictors influence subsequent behavior indirectly through behavioral intention and further that perceived behavioral control affects behavior directly when the behavior in question is not under complete volitional control by the individual. The TPB posits that behavioral intention is a function of attitude, reflecting a favorable or unfavorable evaluation of the particular behavior, subjective norm, referring to the perceived social pressure to perform the behavior. Perceived behavioral control reflects the ease or difficulty associated with performance and is closely related to the notion of self-efficacy (Bandura, 1986). Attitudes, subjective norms and perceived behavioral control are underpinned by behavioral, normative and control beliefs, respectively.

Insert Figure 1 about here

The TRA and the TPB have been applied successfully to a range of behavioral domains (Ajzen, 1991; Godin & Kok, 1996; Conner & Armitage, 1998; Armitage & Conner, 2001) including HIV preventive behaviors (Terry **et al.**, 1993; Sheeran **et al.**, 1999; Albarracin **et al.**, 2001; Sheeran & Taylor, 1999; Sheeran & Orbell, 1998). With respect to intended and self-reported condom use, numerous studies have been conducted in industrialized societies (Albarracin **et al.**, 2001). Contrary, there are comparatively few studies of non-occidental origin (Wilson **et al.**, 1991; Rise & Lugoe, 1999; Wilson **et al.**, 1992; Fekadu & Kraft, 2001; Bandawe & Foster, 1996; Bosompra, 2001). Very few studies from Sub-Saharan African countries have been included into the recent meta analytical reviews (Albarracin **et al.**, 2001; Sheeran & Taylor, 1999). The TPB studies conducted in Africa have been focused towards condom use intentions and have assessed behavior retrospectively rather than prospectively. Thus, longitudinal studies are needed to test the efficiency of this model in predicting HIV/AIDS preventive behaviors. The applicability of socio-cognitive models to the African context should be systematically addressed, considering the need for theory-based studies in the planning and implementation of effective HIV/AIDS educational programs (Hardeman **et al.**, 2002; Fishbein & Ajzen, 2002).

Meta-analytical reviews of condom use in the context of TRA and TPB have indicated that intentions correlate more strongly with future condom use than perceived behavioral control (weighted mean correlations $r=.45$ versus $r=.25$) and that intentions are more predictable from attitudes (weighted mean correlation $r=.50$) than from subjective norms ($r=.39$) and perceived behavioral control ($r=.45$) (Albarracín *et al.*, 2001). Generally the addition of the perceived behavioral control has improved the performance of the TRA model also in relation to intended condom use (Sheeran & Taylor, 1999). However, some studies have failed to show this effect (Wilson *et al.*, 1992; Sutton, 1998). Two studies of African origin reported that the effect of subjective norms exceeded that of attitudes in predicting intended condom use (Bosompra, 2001; Rise & Lugoe, 1999). Studies conducted in Zimbabwe failed to identify any significant association between social influences and intention to use condom (Wilson *et al.*, 1992). Bearing in mind that some of the largest variations in sexual related behaviors are attributable to cultural differences, it is assumed that condom use is a different behavior for people living in various socio-cultural contexts (Ajzen, 1991). In Ethiopia there are many culturally rooted taboos about sexuality and sex education is practically non-existent in the school system (Eshetu *et al.*, 1997). Abstinence before marriage is the accepted norm, but polygamous marriage and extramarital sexual intercourse are commonly practiced (Berhane, 2000).

The TPB, it has been criticized for a number of reasons (Norman & Conner, 1996). One is the sufficiency issue in terms of the role of past experience with the target behavior (Sutton, 1994). According to the assumption underlying socio-cognitive models, effects of external variables (e.g. past behavior) on intention and subsequent behavior should be mediated by the TPB variables (Ajzen, 1991). However, a number of western studies have shown that there is a residual effect of varying degree of past behavior when the TPB components have been taken into account (Reinecke *et al.*, 1996; Rhodes & Courneya, 2003; Yzer *et al.*, 2003). Thus, equivocal information exists as to whether the TPB provides a sufficient explanation of intended- and self-reported condom use. This study extends analyses of the role of past behavior within the TPB into the context of condom use among rural Ethiopian youth.

Focusing young people (15-24 yr) from a rural South Ethiopian population, the aim of the present study was to assess the applicability of the TPB in predicting intended and self-reported condom use when having sexual intercourse with a regular or casual partner. In addition, the following questions were addressed; 1) Does previous experience with condom use add to the prediction of intended and self-reported condom use beyond the TPB? 2) Does youth, more and less experienced with condom use differ across the TPB components?

Materials and Methods

Study area

This study was conducted in rural Butajira, Meskan and Mareko District, Southern Ethiopia within an organized demographic surveillance site initiated and administered by the Department of Community Health at the Addis Ababa University. The surveillance site of Butajira Rural Health Program (BRHP) which has been operational since 1986 has been described in detail elsewhere (Byass *et al.*, 2003).

Study participants and procedure

The study population included youth (15-24 yr) residing in the BRHP study site and estimated to be 10,475 individuals in 2004. The BRHP database as of June 2004 was used to draw a proportionate stratified random sample including 4399 individuals. The response rate was 85.0% (n=3743). A two stage prospective study based on the TPB was conducted among the sexually active participants (802/3743, 21.4%) who completed personal interviews in household settings from July to September 2004 (first phase). The structured interview schedule employed was prepared in English and translated into Amharic (the Ethiopian national language) and then back translated into English by a language expert. Ethical clearance was obtained from the concerned authorities. A follow-up study (phase 2) was conducted 90 days after the completion of the main TPB interview involving 743 participants who provided information about condom use. Informed consent was obtained separately from the participants of the follow up study.

Variables and measurement

Intention to use condom was measured by three items, e.g. "I intend to use condom when having sexual intercourse with my partner (casual or regular) in the future". Response scale was in the range, (1) very likely to (5) very unlikely. Principal component analysis (PCA) suggests that the three items considering intentions can be described as one dimension. A sum score was constructed by adding the responses of the three items.

Attitudes towards using condom was constructed from four statements, each completed on a five-point Likert scale ranging from (1) strongly agree to (5) strongly disagree. E.g. "For me using condom when----- is beneficial". PCA suggested that the four items can be described as one dimension. A sum score was constructed after negatively worded statements had been reversibly scored. The higher the score on the attitude scale the less favorable the attitude.

Subjective norm was constructed from two statements. E.g. "People who are important to me think that, I should use condom when-----". Responses were indicated on five-point Likert scale ranging from (1) completely true to (5) completely false. A sum score of the two items were used to construct an additive scale for subjective norms.

Descriptive norm was assessed by one single item, "People who are important to me use themselves condom when----". The response scale ranged from (1) completely true to (5) completely false.

Perceived behavioral control - participants responded to six statements assessed on a scale ranging from (1) completely certain to (5) completely uncertain. E.g. "For me to use condoms when having sexual intercourse with my partner is difficult because I feel it is embarrassing to use condoms". PCA suggests that the six items considering intentions can be described as one dimension. A sum score was constructed from the six statements.

Past experience with condom use- two statements (statistically significantly associated at $p=0.001$) were added. "Have you ever used condom" and "have you used condom when having sex with a casual partner"?. Response categories (1) yes always, (2) yes but not always, and (3) No. The two items were added and dichotomized for the purpose of analyses into (1) experienced with condom use and (2) not experienced with condom use.

Self reported use of condom was assessed using two items. E.g. "How often have you used condom when having sexual intercourse with partner during the previous three months?".

Scale: (1) all the time to (5) never. The two items were strongly correlated (Pearson's $r = .86$) and were added into a sum-score.

Socio-demographic variables used in the analysis, their coding and the number of subjects according to categories are depicted in Table 1.

Results

The first phase of the study included 802 sexually active subjects, mean age 20.7 yr ($sd=2.4$), of which 599 (74.7%) were women. The mean age at first intercourse was 17.1 yr ($sd=2.1$) and 84.8% of the participants reported no experience with condom use. After three months, 743 participants completed interviews yielding a loss to follow-up of 7.4%. The mean age of the follow-up participants was 20.7yr ($sd=2.3$) and the majority were women (76.4%). No systematic difference was observed between first and second phase participants with respect to the TPB components and past behavior.

Insert Table 1 about here

As shown in Table 2, respondents had on average weak intentions to use condom. They showed slightly unfavorable attitudes, perceived less normative pressure and felt a moderately strong control associated with that behavior. Previous experience with condom use and the TPB components were all statistically significantly associated with intended condom use. Age was statistically significantly associated with previous- and subsequent condom use ($r=.11$, $p<0.001$). Education associated significantly with all variables except age ($p<0.001$) (not included in Table 2). A MANOVA with the TPB components and previous condom use experience as dependent variables and gender as fixed factor revealed a statistically significant overall multivariate effect (Wilk's Lambda= .675, $p<0.001$). Compared to women, men had more favorable attitudes, perceived stronger normative influence, perceived more control, had stronger intentions and had more previous condom use experience ($p<0.001$). The effect sizes in terms of eta squared ranged from 0.127 (past condom use experience) to 0.256 (subjective norms).

Insert Table 2 about here

Table 3 shows the results from the multiple linear regression analysis testing the TPB against previous condom use. The TPB components were entered in the first step accounting for 55% ($\Delta R^2=.55$, $F\text{-change}= 235.5$ [4,782], $p<0.001$) of the explainable variance. Adding past behavior to the equation, increased the explained variance by $\Delta R^2=.024$, $F\text{-change}= 42.7$ [1,781], $p<0.001$). Adding age, gender and education in the final step explained no additional variance ($p=.982$). At the zero-order level (Table 2) previous experience explained 24% of the variance in intention. This proportion dropped to 2.2% when controlling for internal TPB variables and descriptive norms suggesting that past behavior had predominantly an indirect effect on intention.

Insert Table 3 about here

To examine *how* the effect of previous condom use was mediated by the TPB, a MANOVA with the TPB sum-scores of attitudes, subjective norms, perceived control and descriptive norms as dependents and previous condom use as fixed factor was conducted, whilst controlling for gender (Wilk's Lambda= 0.909, $p<0.001$). As shown in Table 4, compared

with non-experienced participants, the experienced ones had statistically significantly more favorable attitudes, stronger norms and perceived more control (i.e. less barriers) associated with condom use. The effect sizes, ES (squared eta), indicating the magnitude of the mean differences between the two groups ranged from ES=.023 (perceived barriers) to ES=.076 (subjective norms).

Insert Table 4 about here

Results from multiple linear regression analysis with **reported** condom use are presented in Table 5. Entering intention, perceived control and past behavior accounted for $\Delta R^2 = .10$, F-change= 39.0, [1,725], $p < 0.001$ and $\Delta R^2 = .12$, F-change= 107.3 [1,724], $p < 0.001$, respectively. Adding age, gender and education in the final step added $\Delta R^2 = .01$, F-change 3.102, [3,721], $p < 0.05$. At the zero order level, previous condom use explained 13% of the variance in condom use dropping to 9% in the multivariate analysis.

Insert Table 5 about here

Discussion

A minority (16%) of the sexually active participants confirmed previous condom use. **Males** reported use of condom most frequently, suggesting that the male partner largely controls sexual activity in Africa (Taffa **et al.**, 2002). According to previous studies in this area, the overall contraceptive use is low compared with the national average and even lower than the figure for rural Ethiopia generally (Fitaw **et al.**, 2003). The prevalence assessed in this study was probably underestimated due to the Ethiopian cultural taboo of premarital sexual engagement. Studies from other sub Saharan African countries have shown that people tend to reserve condoms for casual partners and that introduction into steady relationships calls into question the assumption of mutual monogamy (Eaton & Flisher, 2003). However, polygamous marriage is common in the area and also culturally accepted as is the inclination towards having extramarital sexual intercourse (Berhane, 2000).

This study contributes to the literature by assessing the applicability of the TPB using a prospective approach and by exploring the cognitive determinants of intended condom use in rural Ethiopian youth. Attitudes, subjective norms, descriptive norms and perceived control accounted for 55% of the variance in intention. According to previous sub Saharan African studies (Rise & Lugoe, 1999; Fekadu & Kraft, 2001) the explained variances in intended condom use based on TRA and TPB variables have ranged from 25% to 48%. The present result compares favorably with recent meta analytical reviews concerning the predictive validity of the TPB upon intended condom use (Armitage & Conner, 1998, Sheeran & Taylor, 1999). The TPB was also found to predict self-reported condom use at 3 months follow-up accounting for 10% of the explainable variance. This is a fit below the optimal figure of 27% reported previously although there is considerable heterogeneity in the proportion of variance explained by TPB across behaviors (Godin & Kok, 1996). One might speculate whether intentions predict condom use as well as other behaviors, since this is less of an individual behavior but one that requires the co-operations of a partner.

Past condom use contributed only marginally to the explained variance in intention and was in magnitude clearly below the effect of attitudes and subjective norms. This is consistent with the results reported by Lugoe and Rise (1999). The result suggests that the TPB provides a fairly accurate description of the process underlying condom use intentions in rural Ethiopian

youth. The influence of previous experience was mediated through the proximal TPB variables, which corresponds to the theory's assumption about the role of external variables (Ajzen, 1991). The most profound difference between experienced and non-experienced youth occurred with the social component, indicating that previous condom use is mediated by the strength with which subjective and descriptive norms are held and less so by attitudes and perceived control. The TPB model appeared less sufficient to account for self-reported condom use. Conner and Armitage (1998) revealed an average effect of 13 % explained variance of past behavior upon later behavior. Ajzen (1991) suggests that the direct effect of previous behavior might reflect a neglect of key cognitive variables. This might be a valid argument in this study since previous experience with condom use turned out to be the strongest determinant of self reported condom use.

Consistent gender variations across the strengths of attitudes have been reported in a previous study from Ethiopia (Taffa *et al.*, 2002) suggesting that gender power differences are deeply rooted within social functions in Ethiopia. In a society of male dominance, the perceived capacity for action in females becomes a factor of gender interaction in addition to personal motivation (Eaton & Flisher, 2003).

In sum, both men and women decided for condom use with sexual partners if they anticipated predominantly positive consequences associated with performance and social support, whereas perceived barriers seemed to have less impact. Once young people have started to use condom, they are more likely to continue to do so in the future. The TPB seems to provide a fairly accurate description of the intention formation. It appeared less sufficient to account for self-reported condom use. Interventions aimed at producing favorable condom use intention might not be enough to achieve behavioral change. Different interventions should be provided for youth who have and do not have experience with condom use. For the former group who intends to use condom, efforts should be made to help them maintain and carry out their intentions for instance by providing skill training in condom use-and negotiation. For the latter group, interventions should attempt to create positive intentions through targeting attitudinal and normative beliefs. There should be a shift in focus from an individual to a community level approach to include sexual partners and broader social networks as one way of enhancing peer acceptance of condom use. An analysis of the TPB belief structure may extend the applicability of the model to designing HIV/AIDS prevention among rural Ethiopians.

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Figure text

Fig 1. The theory of planned behavior, TPB.

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Table 1 Frequency distribution of socio-demographic characteristics and their categories (n=802)

Variables	Categories (code)	% (n)
<i>Gender</i>		
	Male (1)	25.8 (203)
	Female (2)	74.2 (584)
<i>Age</i>		
	15-19 yr (1)	28.5 (224)
	20-24 yr (2)	71.5 (563)
<i>Education</i>		
	Illiterate (1)	51.7 (407)
	Primary (2)	48.3 (380)

The total number in the different categories do not add to 802 due to missing responses

Table 2. Mean scores (SD), and Pearson's correlation coefficients for inter-scale associations and Cronbach's alpha (on the diagonal) for intention (INT), attitudes (ATT), subjective norms (SN), perceived controls (PBC), descriptive norm (DN), past condom experience (PCE) and subsequent condom use (SB).

Variable	1	2	3	4	5	6	7	8
1. INT	-.98							
2. ATT	.66**	-.84						
3. SN	.64**	.58**	-					
4. PBC	-.52**	-.71**	-.56**	.88-				
5. DN	.49**	.42**	.62**	-.37**	-			
6. PCE	.49**	.42**	.50**	-.49**	.46**	-		
7. SB	.22**	.13**	.21**	-.17**		.36**	-	-
8. Gender	.40**	.39**	.50**	-.42**	.41**	.35**	.25**	-
Mean	12.1	13.1	7.4	19.3	3.6	4.7	3.9	
SD	4.0	4.9	2.3	6.6	1.1	0.7	0.6	
Range	3-15	4-20	2-10	6-30	1-5	2-5	1-5	

** p<0.001

Table 3. Intention to use condom regressed on TPB components and past condom use experience, PCE, in terms of standardized regression coefficients, β , R and adjusted R^2 (the model controlled for age, gender, education).

Step	Variables in the equation	R	adjR ²	ATT _{β}	SN _{β}	PBC _{β}	DN _{β}	PCE _{β}
1	ATT+SN+DN+PBC	.74	.55	.40**	.32**	-.03	.11**	
2.	ATT+SN+DN+PBC+PCE	.76	.57	.39**	.28**	-.02	.08*	.17**

** p<0.001, * p<0.05

Table 4 Mean scores, F statistics and effect size (ES) for attitudes (ATT), subjective norms (SN), perceived behavioral controls (PBC), descriptive norms (DN) and perceived barriers in experienced (PCE+) and non experienced (PCE-) youth

Constructs	PCE (+)	PCE (-)	FE S					
ATT				10.3	12.4	21.278**	.026	
SN				5.5	7.1	64.399**	.076	
DN				2.8	3.5	49.927	.060	
PBC				23.0	23.3	18.373**	.023	
Perceived barriers								
Embarrassed				3.7	3.0	17.559**	.022	
High costs				3.9	3.5	9.692*	.012	

				Shy to discuss with partner	3.7	3.2	11.886*	.015
				Partner refuse	3.7	2.9	34.527**	.042
				Not readily available to buy	4.0	3.7	5.014*	.006
				Drunk/drugs before intercourse	3.9	3.8	0.069ns	.000

**p<0.001, *p<0.05

Table 5 Self -reported use of condom regressed upon intention (INT), perceived control (PBC), past condom experience (PCE) and socio-demographic variables, SES, (age, gender, education) in terms of standardized regression coefficients, R and adjusted R² (n=728)

Step	Variables in the equation	R	Adj R ²	INT	PBC	PCE
1	INT+PBC	.31	.10	.26**	-.09*	
2	INT+PBC+PCE	.46	.21	.11**	-.06	.37**
3	INT+PBC+PCE+SES ^a	.47	.22	.10**	-.03	.34**

** <0.001, *p<0.05

^a age statistically significantly associated at p<0.05