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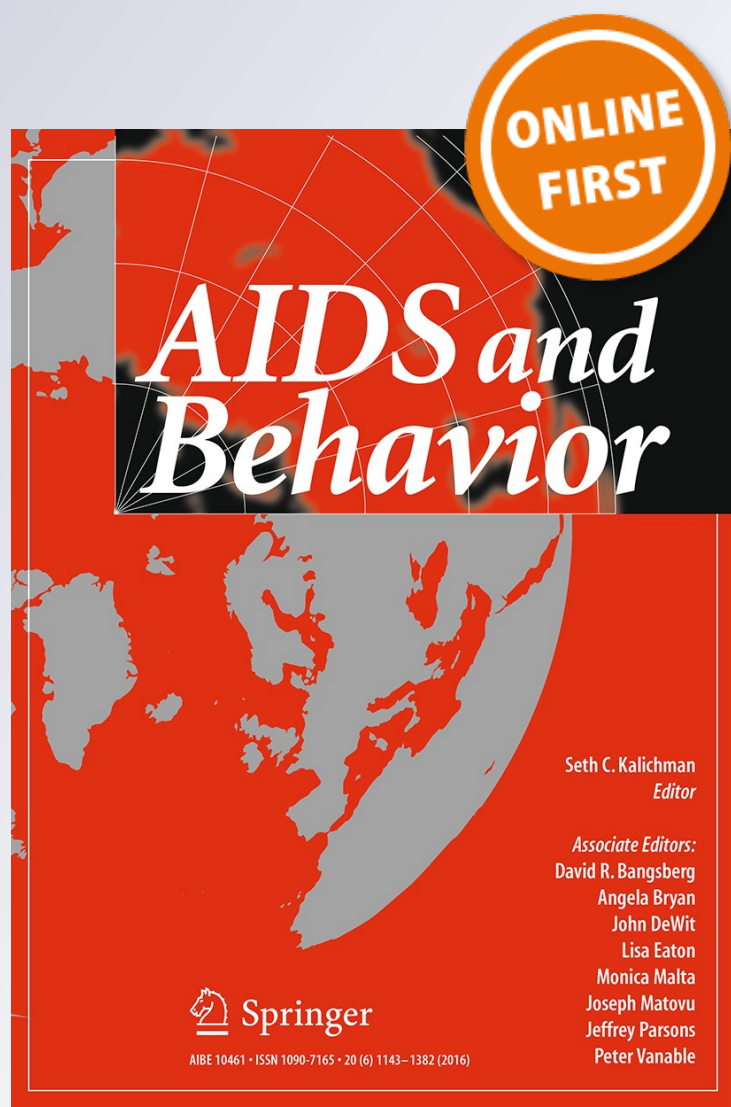
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**AIDS and Behavior**

ISSN 1090-7165

AIDS Behav

DOI 10.1007/s10461-016-1430-x



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# Structural Equation Modeling Test of an Integrated Model of Spanish Youth's Condom Use

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**Abstract** Heterosexual transmission represents 26 % of newly diagnosed infection in Spanish youth. Behavioral change models have emphasized the influence of multiple variables to predict condom use behavior. The aim of this study is to examine how those variables are organized and which theory explains the condom use behavior better. A sample of 424 young heterosexuals ( $M_{age} = 20.62$ ;  $SD = 2.16$ ) filled out a battery of self-report questionnaires for assessing AIDS-related variables, personality traits and clinical variables (general, sexuality-related and health-related). A structural model was specified that included perceived pleasure and condom use self-efficacy as predictive variables. Depression and sexual compulsivity indirectly influence behavior. The final model accounted for 65.9 % of the variance in behavior. These results highlight the importance of cognitive and emotional variables as predictors of behavior (ex. expectations of pleasure and self-efficacy beliefs). This is important information for designing effective psychological interventions.

**Resumen** La transmisión heterosexual representa el 26 % de los nuevos diagnósticos de VIH en los jóvenes españoles. Los modelos de cambio de comportamiento han enfatizado la influencia de múltiples variables para predecir el uso del preservativo. El objetivo del presente estudio es

examinar cómo se organizan estas variables y qué teoría explica mejor esta conducta. Una muestra de 424 jóvenes heterosexuales ( $x_{edad} = 20.62$ ;  $SD = 2.16$ ) completó una batería de cuestionarios sobre Sida, rasgos de personalidad y variables clínicas (generales, sexuales y de salud). Los resultados obtenidos utilizando modelos de ecuaciones estructurales apoyan una relación directa entre uso del preservativo y autoeficacia y placer percibido. Las variables depresión y compulsividad sexual influyen indirectamente sobre la conducta. El modelo explica el 65.9 % de la varianza. Estos resultados destacan la importancia de las variables cognitivas y emocionales como predictoras del comportamiento. Esta información es importante para el diseño de intervenciones psicológicas eficaces.

**Keywords** HIV prevention model · Behavioral change · Heterosexual youth · Condom use · Predictive factors

**Palabras clave** Modelo de prevención del VIH · Cambio de comportamiento · Jóvenes heterosexuales · Uso del preservativo · Factores predictores

## Introduction

Epidemiological reports observe a progressive *sexualization* of the AIDS epidemic in Spain. Almost 79.9 % of new HIV diagnoses in 2014 originate in sexual transmission. Young people under 34 years old account for nearly half of new HIV diagnoses (47.4 %). Heterosexual transmission represents 26 % of newly diagnosed infection by this route. This percentage represents a 15.9 % of new diagnoses in men and 81.7 % in women [1].

The unprotected sex put at risk for HIV infection, other sexually transmitted infections (STIs) and unwanted

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pregnancy [2–5]. Furthermore, safe sexual behavior (for example, abstinence, consistent condom use or mutual monogamy with an HIV-negative partner) is the only way to prevent sexual transmission of HIV and STIs. The researchers continue to analyze the factors that predict risk of sexual behaviors. Different theoretical models of behavior have been applied in the analysis of determinants of condom use in heterosexual relationships. The most commonly used have been: the Health Belief Model (HBM) [6], the Theory of Planned Behavior (TPB), developed from the Theory of Reasoned Action [7, 8], the Social Cognitive Theory (SCT), updated version of the Social Learning Theory [9], or the Transtheoretical Model (TTM) [10]. These paradigms focus on different factors in attempting to explain the behavior, but all of them share a cognitive-social orientation.

From HBM, key elements to adopt preventive behaviors for HIV infection are that people perceive AIDS as a serious disease, perceive themselves at risk, know prevention mechanisms, are motivated to implement them and have the necessary resources to carry out protective behaviors [11]. Different studies have shown how the components of HBM are good predictors of behaviors related to HIV infection in youth. The high perception of vulnerability is related to delaying first sex and fewer sexual partners and also condom use [12]; the perceived benefits has been linked to condom use [13] and perceived barriers to unprotected sex [14].

On the other hand, the TPB has predicted 33 and 43 % of the intention to use condoms in young people [15–17], the intention to refuse sex with a new partner [18] or the intention to use contraception [19]. In a meta-analysis by Albarracín, Johnson, Fishbein and Muellerleile, a total of 96 studies using the TPB as a basic model to explain the condom use were examined [20]. The study shows that the behavior was related to behavioral intention (.45); behavioral intention was related to attitudes (.58) and the subjective norm (.39); attitudes were associated with behavioral beliefs (.56); norms were associated with normative beliefs (.46); and perception of control was associated with the behavioral intention (.45) and condom use (.25). In the implementation model it has been observed that the intention to use condoms predicts significantly its use during sex; the perception of control and attitudes are the best predictors preventive behavior; the subjective norm has more influence on the formation of intent to action on specific groups, such as adolescents [21–23].

The SCT proposes a model of human behavior integrated within a cultural context. Therefore, the behavior is the result of interaction between an auto-system, which allows to measure the control on own thoughts, feelings, motivations and actions, and external influences. This model promotes self-protective factors, enhance self-

efficacy, and provide information to reinforce the benefits of healthy behaviors. Many of the preventive interventions in young people have taken this theoretical model [24, 25]. It has also been used to explain the sexual risk behavior and promote condom use [26–28].

Finally, TTM is based on the premise that changes in behavior occur incrementally and through a predictable sequence of stages. In this regard, DiClemente and Prockaska observed that subjects who are placed in the pre-contemplation stage of change do not yet see themselves as having a problem, they are not thinking seriously about changing and tend to defend their current problem behavior [10]. It is in the contemplation stage when people are more aware of the personal consequences of their problem behavior and they spend time thinking about it. People value the pros and cons of modifying their behavior, so there is a greater emotional and cognitive implication to use condoms [29].

These models have a well-articulated set of theoretical constructs, which have facilitated the psychological interventions design to prevent HIV infection. But, in the first decade of the HIV epidemic, they have not achieved the necessary behavioral changes for primary prevention in young people. Efforts to increase the effectiveness of preventive interventions require a thorough understanding of the social, contextual and interpersonal determinants of risk behaviors for HIV infection [30]. The behavioral change models have emphasized the influence of specific factors as the level of information about HIV, attitudes towards condoms or beliefs related vulnerability to AIDS. But also the influence of other personality dimensions, clinical (for example, fear of negative evaluation, depression, self-esteem or worrying about health) or health-related factors (for example, health locus of control or value in health care) [31–33]. Abundant empirical literature suggests that there is some consensus on what variables are most important to explain the condom use behavior. But much less about how those variables are causally organized to predict behavior or what theory might be better than the other at explaining behavior. The reviewed studies have explained between 50 and 66 % of the variance of behavioral intention or condom use. They are mainly used by the TPB as a framework, although some of them have incorporated other variables as the dynamics of the relationship [22, 34–39].

The theoretical development of behavioral determinants of condom use has not been stopped. The search for approaches and scientific models that explain the behavior of condom use both individually and collectively continues. Therefore the main aims of this study are: to examine the influence of the variables included in the main theoretical models (HBM, TPB, SCT and TTM) and other dispositional variables in condom use among young

people's heterosexual relationships, and test a structural equation model for predicting condom use behavior.

## Methods

### Participants

A sample of 424 young heterosexual people were evaluated (60.4 % were women and 39.6 % were men). All participants had tertiary-level studies and a mean age of 20.62 years old ( $SD = 2.16$ ).

Given that the only safe behavior to prevent HIV infection entails the systematic use of the condom and that the remainder of response options would imply a certain amount of risk, it was decided to form two dichotomous groups with a equivalent distribution by sex and the mean age:

- The no-risk group (NRG), made up of participants who reported that 'always' used condoms: 39.3 %, 60.8 % were women and 39.2 % were men ( $M_{age} = 20.38$ ;  $SD = 2.09$ ).
- The risk group (RG), made up of participants who reported not to systematically used condoms: 60.7 %, 59.3 % were women and 40.7 % were men ( $M_{age} = 20.91$ ;  $SD = 2.19$ ).

### Measures

#### AIDS-Related Variables

- *AIDS Prevention Questionnaire (CPS)* This instrument was made up of 65 items that attempt to gather up the various components considered to be relevant in various HIV prevention models: HIV/AIDS knowledge, perceived susceptibility, perceived severity, fear of HIV infection, perceived condom use benefits and barriers, condom use self-efficacy, behavioral intention and behavior. The internal consistency and test-retest reliability of the data were acceptable, obtaining a Cronbach's Alpha value of .70 [40].

#### Personality Traits

- *Revised NEO Personality Inventory (NEO-PI-R)* The questionnaire is structured on the five dimensions of the Five-Factor Model (Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness). The version used for this study is the Spanish adaptation. The questionnaire contains 240 items that are answered on a five-point Likert scale ranging from strongly agree (1) to strongly disagree (5) [41, 42].

#### Clinical Variables

- *Rosenberg Self-Esteem Scale (RSE)* It is a unidimensional instrument, made from a phenomenological conception of self, which measures the respect and acceptance of people to themselves. A 10-item scale whose items are answered using 4-point Likert scale format ranging from 1 (strongly agree) to 4 (strongly disagree). The Spanish version used has an internal consistency of .85 and .88 [43].
- *Beck Depression Inventory II (BDI-II)* It is a 21-item self-report instrument intended to assess the existence and severity of symptoms of depression as listed in the DSM. There is a four-point scale for each item ranging from 0 to 3, sorted from lowest to highest severity. It has a high coefficient alpha (.89) in the Spanish version used [44, 45].
- *Penn State Worry Questionnaire (PSWQ)* It is a 16-item measure of trait anxiety designed to assess the general tendency to experience the experience of worry. It is a 5-point scale ranging from 1 (not at all typical of me) to 5 (very typical of me). The experimental version used is an adaptation to the worry about health with a internal consistency of .90 [46, 47].
- *The Brief Fear of Negative Evaluation Scale (BFNE)* It is the measure most commonly used to determine the degree to which people experience apprehension at the prospect of being negatively evaluated. It contains 12-items to which respondents rate the degree to which each statement applies to them on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me). The Spanish version used has a internal consistency of .90 [48, 49].

#### Sexuality-Related Clinical Variables

- *Sexual Sensation Seeking Scale (SSSS)* The scale is an 11-item, Likert-type measurement that asks respondents to endorse the extent to which they agree with a series of statements related to personality disposition sensation seeking. The answers vary in a range from 1 (not at all like me) to 4 (very much like me). The version used for this study is the Spanish adaptation which has an internal consistency of .70 [50, 51].
- *Sexual Compulsivity Scale (SCS)* The scale is a 10-item, Likert-type measurement that asks respondents to endorse the extent to which they agree with a series of statements related to sexually compulsive behavior, sexual preoccupations, and sexually intrusive thoughts. The answers vary in a range from 1 (not at all like me) to 4 (very much like me). The version used for

this study is the Spanish adaptation which has an internal consistency of .84 [50, 52].

- *Sexual Pleasure/Affinity* The original version of the measure was composed of 7 items that assessed the perceived pleasure of sexual behaviors related to varying degrees of risk for HIV infection along a 5-point scale, ranging from 1 (Not at all pleasurable) to 5 (Extremely pleasurable). In the adaptation to heterosexual population, some items were added. Therefore, the scale was composed of 11 items [50].

#### Health-Related Clinical Variables

- *The Health Locus of Control Scale (HLC)* An instrument that measures generalized expectancies regarding locus of control related to health. It is a 11-item in a 6-point Likert format, ranging from 0 (strongly disagree) to 5 (strongly agree). The experimental version was used [53, 54].
- *Health Self-Care Scale (unpublished)* A 11-item which represent efforts to maintain self-care in different areas of health, (for example, physical exercise, check-ups, etc.). It is a numerical rating scale for self-reporting of self-care from 0 (I never care about it) to 10 (I always care about it). The overall alfa de Cronbach obtained, .686, indicates a good internal consistency of the questionnaire.

#### Procedure

The sample collection process was carried out in a period of about 2 years. The development of this study is conducted in the framework of a larger research project that aims to bring preventive HIV strategies adapted to the characteristics of the population to which they are addressed, so that more efficient and effective interventions are achieved for behavioral changes in young people.

Each year the Unit sets up informative tables and panels on campus on World AIDS Day. Interested persons were given the opportunity to participate in studies carried out by the Unit. The first step was to contact via email or phone the youth, who had given us their data, to inform them about the objectives and procedure of the present study. After signing the informed consent, they completed the questionnaires (approximately 90 min). In the present study we applied the guidelines of the Spanish data protection law known as *Ley Orgánica de Protección de Datos (LOPD)* and the Declaration of Helsinki, to guarantee the confidential nature and treatment of the data obtained and to protect the ethical principles for research involving human beings.

#### Analysis of Data

To select the criterion variable and to carry out the statistical analyses, biological risks of the practices evaluated were taken into account (oral sex, vaginal penetration and anal penetration), as well as their frequency. It was chosen as a dependent variable (DV) condom use in vaginal intercourse, due to its high frequency because it represents one of the highest risk sexual behaviors for HIV infection. A dichotomous variable from single-item AIDS Prevention Questionnaire is coded: How often have you used a condom in vaginal intercourse? So the dependent variable (DV) of study belonged or not to a risk group for HIV infection. The value 1 corresponds to the risk group (RG), that is, not use condoms consistently during sex (never, sometimes and quite often). While value 0 represents no-risk group (NRG), who themselves have used condoms consistently.

Following the differential study, a multivariate analysis was carried out using a multiple logistic regression analysis. Logistic regression was the chosen analytical method for two reasons: (a) The conditions of multivariate normality, homoscedasticity and linearity are not required, and (b) the model may incorporate independent variables of different types [55]. The Enter method, in which all variables in a block are entered in one step, was used in order to find the best predictors.

Then, structural equation modeling (SEM) was used. The statistical program used is the EQS 6.1 which enables robust analysis method assuming that a normal multivariate distribution is not followed. Maximum likelihood estimation of missing data was used and thus robust estimation of standard errors was conducted for tests of fit and significance of the paths. It is recommended that social research use the following absolute fit indices (Chi Square value, Root Mean Square Error of Approximation [RMSEA]) and incremental fit indices (Comparative Fit Index [CFI], the Non-normed Fit Index [NNFI]). A satisfactory model fit is indicated by a high NFI and NNFI > .95, and a low RMSEA < .07 [56, 57].

#### Results

At the moment of evaluation, 63.2 % (n = 268) of the sample were having sexual intercourse with a steady partner. Fifteen per cent (n = 40) of these young people reported being unfaithful to their partners with others and almost half of them did not use a condom (n = 17). While 22.4 % of youth report a single sex partner within their live, 13.7 % report two, 14.9 % report three, and 49 % report four or more (M = 4.59, SD = 4.93). The prevalence of consistent condom use in vaginal intercourse was

39.3 % and of no-consistent condom use was 60.7 %. When it asked about the intention to use condoms in future sexual intercourse, increased intention to use condoms always (64.4 %) and decreased intention to inconsistent-use (35.6 %).

**Preliminary Analysis**

A multiple regression logistic analysis with all the above variables was performed with the enter method. The value of R square Naglekerke indicates that the proposed model accounts for 46.4 % of the variance of the dependent variable. This equation generated ten explanatory variables which were age, depression (BDI's punctuation), sexual pleasure without condom (Sexual pleasure/affinity factor), and fear of HIV infection (CPS item) as risk factors. And Compliance (facet of Agreeableness), Competence (facet of Conscientiousness), sexual pleasure with a condom (Sexual pleasure/affinity factor), condom use self-efficacy (CPS factor), behavioral intention (CPS item), interference (SCS dimension) as protective factors. Hosmer–Lemeshow test did not obtain statistical significance ( $\chi^2 = 8.031$ ;  $p = .430$ ), indicating a goodness of fit of the model. In general, a good classification result is obtained with an average of 76.4 % of classifications being correct. The results are better with regard to sensibility, given that in the RG 82 % of subjects are correctly classified; the results are considerably worse in relation to specificity, as here there is a correct classification of 67.8 % of the participants that belonged to the NRG. The variables age and sexual pleasure without condom multiplied by 20 and 18 %, respectively, the risk of not using a condom during sex. Moreover, the personal interference reduced it by 73.5 % (see Table 1).

**Model-Building Analyses**

The fit of this model was adequate, NNFI = .954, CFI = .962, RMSEA = .024, 90 % confidence interval [.000, .037]. The model explained 65.9 % of the behavior variance. Path Diagram (see Fig. 1) shows that standardized weights vary from .15 to .80. All estimated parameters were significant, correlations varied between .30 and .57.

Perceived pleasure with a condom ( $B = .573$ ,  $p < .05$ ) and without condom ( $B = -.439$ ,  $p < .05$ ), and self-efficacy ( $B = .371$ ,  $p < .05$ ) were predictors of behavior in the model. There is an indirect effect of depression on behavior through self-efficacy ( $B = -.357$ ,  $p < .05$ ), also of sexual compulsivity on behavior through perceived pleasure without a condom ( $B = .298$ ,  $p < .05$ ).

**Discussion**

In an attempt to advance the search for a conceptual design integration to enable effective prevention campaigns and programs to prevent HIV among heterosexual youth, two issues were raised. What variables act as risk and protective factors in condom use? And, how are they organized? These questions guided our research design.

To answer the first question a regression analysis with all variables was performed. Most of the variables that predict the non-use of condoms were associated with emotional and affective factors except age, which is a socio-demographic variable. The older youth use fewer condoms consistently during sex. It seems logical to think that there is greater probability of steady relationships; therefore people could use other contraceptives methods that do not prevent STIs. Different studies in Spain suggest the existence of the phenomenon called monogamy not

**Table 1** Multiple regression logistic analysis

	$\beta$	S.E.	Wald	df	Sig	OR	IC 95 % for OR	
							Lower	Higher
Compliance	-.073	.031	5.533	1	.019	.930	.875	.988
Competence	-.063	.031	4.243	1	.039	.939	.884	.997
Depression	.076	.031	5.923	1	.015	1.079	1.015	1.148
Sexual pleasure without condom	.168	.061	7.551	1	.006	1.183	1.049	1.333
Sexual pleasure with condom	-.152	.056	7.230	1	.007	.859	.769	.960
Fear of HIV infection	.010	.004	5.072	1	.024	1.010	1.001	1.018
Behavioural intention	-.030	.007	19.516	1	.001	.970	.958	.983
Condom use self-efficacy	-.80	.036	4.926	1	.026	.923	.861	.991
Age	.188	.084	4.968	1	.026	1.206	1.023	1.423
Interference	-1.328	.492	7.298	1	.007	.265	.101	.695

protective [2–5]. They reported about negative beliefs that arise when using a condom with a steady partner (e.g., mistrustfulness, lack of love for the other person). On the other hand, the experience of fear of a HIV infection and depressive traits appear as risk factors. Authors confirmed the inverted U-shaped relationship between negative emotions and preventive behaviors [11, 58]. The experience of negative emotions may partially affect the processes of self-regulation and, thus, this can interfere with the ability to initiate sexual activity, to refuse unwanted sexual activity and to negotiate wanted sexual relationship [39, 59]. Similarly, because this is a correlational study, negative emotions can also occur as a result of having sexual risk behavior. The short-term benefit to get pleasure prevails over the long term cost of a possible disease. In the cost-benefit balance, these youth attach greater importance to achieve short-term benefit in the form of sexual pleasure than the possible negative future consequences their behavior may cause. Perhaps these people underestimate the risk; they are more susceptible to the reinforcing effects of pleasurable stimuli considered [60, 61].

The psychological characteristics that have appeared as protective factors are related to cognitive, motivational and behavioral variables. The SCS's interference dimension made significant contributions to understanding the decision of safer sexual behavior. As Carnes pointed out, sexual compulsives often have sexual feelings and cognitions of great intensity and frequency [62]. Interpersonal interference of compulsive behavior probably facilitates problem awareness and therefore the risk awareness. Social consequences of certain sexual behaviors motivate the consistent use of condom. Moreover, the expectation for physical sexual pleasure with condom was associated with practicing safe sex. Perhaps, safe sex practices are psychologically reinforced by one's perceived sexual pleasure. Self-efficacy beliefs not only affect how well individuals motivate themselves for use of condoms, it also affects the choices they make at important decisional points. According to Bandura, "if self-efficacy is lacking, people tend to behave ineffectually, even though they know what to do" [9]. Alike, as experience in condom use increases, the skills also increase, which will surely have an impact on improving self-efficacy expectations. Finally, the two facets which were related to safe sex outcome, compliance and competence, are included in the domain of Agreeableness and Conscientiousness. People with high interpersonal skills, with tendency to think before acting, that consider potential consequences, are less likely to participate in risky sexual behaviors [63–65]. On the other hand, the importance of condom use self-efficacy has been demonstrated in many studies [27].

Preliminary results suggest that there are two profiles of young people. If it is understood that the decision to use a

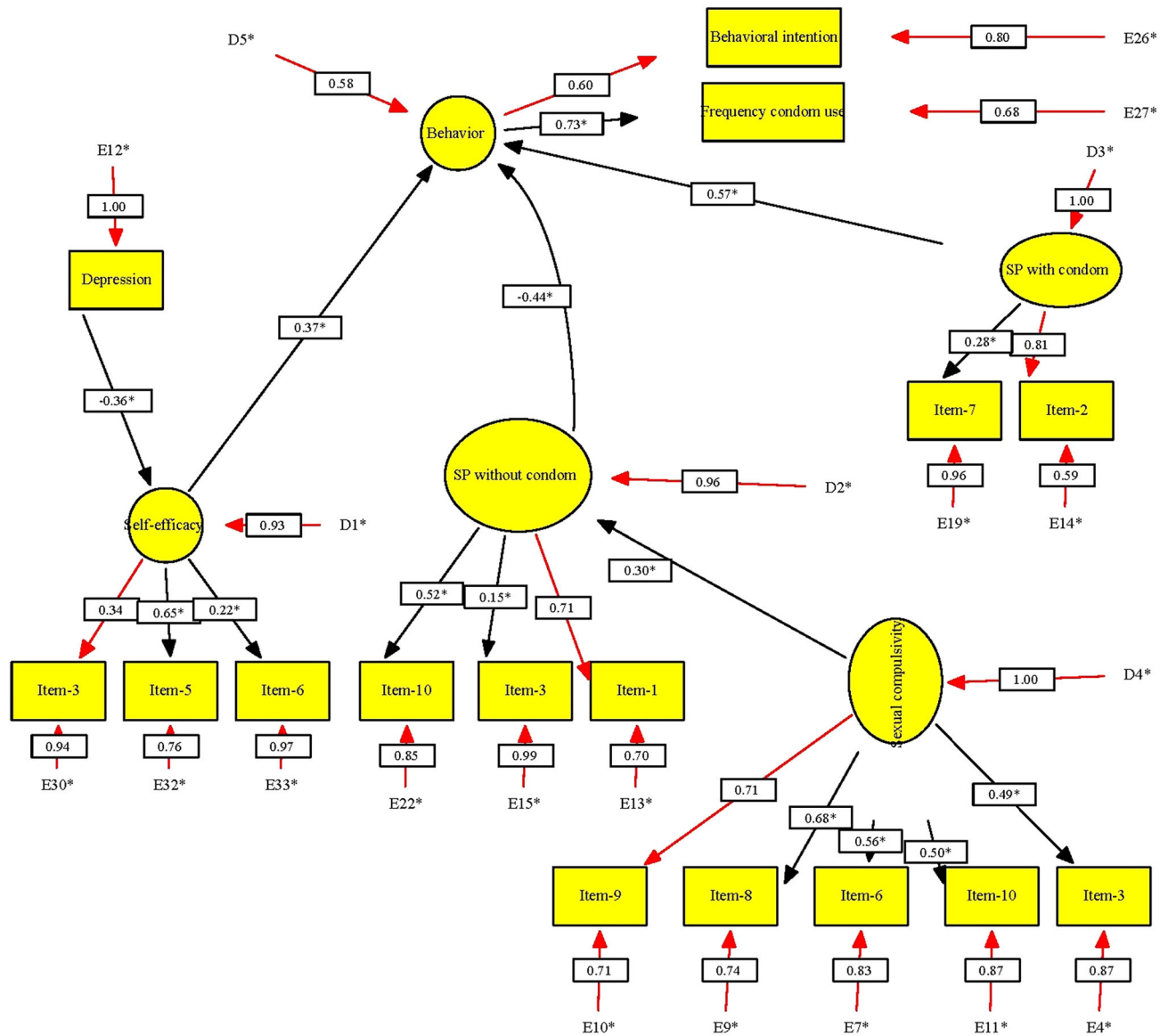
condom in a sexual relationship seems to be a type of psychosocial stress, it is possible to apply the model by Lazarus and Folkman. Transactional approach defines as person-environment transactions the stressful experiences. When youths are faced with a condom-use decision, they evaluate the significance and potential threat (primary appraisal). The secondary appraisals address what one can do about the situation. It seems that youth who consistently use a condom employ coping problem-focused strategies, and youth who do not consistently use a condom, employ coping emotion-focused strategies [66].

Our second question responds to how all these significant variables are organized in a explanatory model of youth's condom use. Behavior was composed by self-reported condom use and behavioral intention because they have appeared closely related [20, 21, 29, 36]. The behavior was directly predicted by perceived sexual pleasure and condom use self-efficacy. Depression and sexual compulsivity have an indirect influence on behavior.

Self-efficacy is the primary variable of SCT but also appears in other theoretical models (HBM, TPB as control beliefs, or TTM). Self-efficacy emphasizes the individual and reflects a person's level of confidence in his or her ability to control the environment. A person, whose cognitive self-evaluation or judgement of their capabilities is high, will tend to use a condom with greater confidence. Empirical evidence has demonstrated that people with high levels of condom use self-efficacy make successful decisions regarding sexual health, both ability to use condoms as ability to reject sexual risk behaviors [22, 23, 26–29, 67]. Self-efficacy is not a static characteristic, it can be altered by internal personal factors in the form of cognitive and affective events. So that, those who score higher on measures of self-efficacy show substantially fewer symptoms of depression. Self-efficacy acts as a buffer against negative feelings that is the effect of stressful life events on depressive symptoms is mediated through the impact of stressful life events on self-efficacy [68, 69].

The expectancies about sexual pleasure is a variable associated with the HBM, and subsequently to the TPB. Pleasure is the main element of human sexual motivation [70]. Condoms can interpose a mechanical barrier, limit physical contact, reduce tactile sensation, attenuate heat transduction, or affect other aspects of sexual functioning masculine and feminine [71]. Studies support the hypothesis that persons who believe condoms interfere with pleasure or reduce pleasure, or who rate condom-protected sex as less enjoyable or pleasurable than unprotected sex may be less likely to use condoms in practice, and conversely [72–75]. This double profile emphasizes the role of cognition or emotion as important factors in the decision process [5, 33, 76–78]. When making decisions, there exists an imaginary balance between a desire for immediate





**Fig. 1** Structural equation model with standardized parameter estimates. *Note:* The content of the items is provided: Behavior (Frequency condom use: How often have you used a condom in vaginal intercourse?); Behavioral Intention: How often do you intend to use a condom in vaginal intercourse?); Self-efficacy (*Item-3* If I have to suggest to a partner to use a condom, I have/should fear of rejection by him/her; *Item-5* I am sure I would remember to use condoms although I have used alcohol or other drugs; *Item-6* I feel/would feel uncomfortable when put on a condom or put it on my partner); Sexual Compulsivity (*Item-3* My desires to have sex have

disrupted my daily life; *Item-6* I find myself thinking about sex while at work; *Item-8* I have to struggle to control my sexual thoughts and behavior; *Item-9* I think about sex more than I would like to; *Item-10* It has been difficult for me to find sex partners who desire having sex as much as I want to); Sexual Pleasure without condom (*Item-1* Vaginal sex without condom; *Item-3* Receptive anal intercourse without condom; *Item-10* Receptive oral-genital sex without condom); Sexual Pleasure with condom (*Item-2* Vaginal sex with condom; *Item-7* Insertive oral-genital sex with condom)

gratification and delayed gratification. Impulsive people give into temptation and desire for immediate gratification, where the longer term consequences might be ignored or not evaluated. Non-impulsive people reflect the benefits of delayed gratification and ability to wait for these benefits, perhaps to avoid undesirable consequences [79].

**Limitations**

Some limitations need to be addressed. First, we have taken as criterion variable the condom use in vaginal intercourse. As indicated earlier, the reasons are that it is one of the riskier practices and at the same time it is one of the most

frequent practices enjoyed by young people. However, it would be important to analyze whether the same results are replicated in other sexual practices and risk situations, for example oral sex, anal intercourse, a steady partner, a casual partner and under the effect of drugs. Second, the results should be generalized with caution, due to the specific sociocultural characteristics of the participants (e.g., high level of education) and they were interested in AIDS-related research. Future studies should include more representative samples of youth to test the universality of the mechanisms found in this study. Finally, prediction is used in the context of a cross-sectional study that may not take into consideration changes over time.

### Implications and Contribution

Nevertheless, the innovative aspect of the current study lies in the evaluation of a comprehensive model for condom use in young heterosexuals. Findings contribute to the understanding of the role of each component and their possible integration into a unified explanatory framework. It has been shown that the behavior of condom use is mainly influenced by the appraisal of self-competence to use condoms and expectancies about sexual pleasure with/without condoms, also mentioning the distal role of depressive symptoms and sexual compulsivity. Therefore, two types of young people are intuited within the reflectivity-impulsivity continuum. The components of psychological interventions aimed at risk groups should focus on the work of beliefs about sexuality (love, romance, pleasure, etc.), positive attitudes towards condom use, focusing on the sensory and sensual aspects of themselves, self-regulation and management of risk decision making.

**Acknowledgments** This work was supported by *Universidad Jaume I-Fundación Bancaixa* (P1 1B2006-19) and by the Spanish Foundation for AIDS Research and Prevention known as *Fundación para la Investigación y la Prevención del Sida en España* (exp. 36639/07), the principal investigator of which is Rafael Ballester Arnal.

### Compliance with Ethical Standards

**Conflict of interest** The authors declare no competing interests.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

### References

1. Ministerio de Sanidad, Servicios Sociales e Igualdad. Plan Nacional sobre el Sida. Vigilancia Epidemiológica del VIH y sida en España. Madrid: Dirección General de Salud Pública, Calidad e Innovación. [http://www.mssi.gob.es/ciudadanos/enfLesiones/enfTransmisibles/sida/vigilancia/InformeVIH\\_SIDA\\_2015.pdf](http://www.mssi.gob.es/ciudadanos/enfLesiones/enfTransmisibles/sida/vigilancia/InformeVIH_SIDA_2015.pdf). Accessed Jan 2016.
2. Ballester R, Gil MD, Giménez C, Ruiz E. Actitudes y conductas sexuales de riesgo para la infección por VIH/Sida en jóvenes españoles. *Revista de Psicopatología y Psicología Clínica*. 2009;14(3):181–91.
3. Espada JP, Escribano S, Orgilés M, Morales A, Guillén-Riquelme A. Sexual risk behaviors increasing among adolescents over time: comparison of two cohorts in Spain. *AIDS Care*. 2015;27(6):783–8.
4. Lameiras M, Faílde JM, Bimbela JL, Alfaro N. Male condom usage in vaginal intercourse relations by spanish youngsters aged fourteenth to twenty fourth. *Diversitas*. 2008;4(2):401–15.
5. Prat J, Planes M, Gras ME, Sullman MJ. Stages of change and decisional balance for condom use with a romantic partner. *J Health Psychol*. 2012;17(8):1193–202.
6. Rosenstock IM. The health belief model and preventive health behavior. *Health Educ Monogr*. 1966;2(4):354–86.
7. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis*. 1991;50:179–211.
8. Fishbein M, Ajzen I. Belief, attitude, intention, and behavior: an introduction to theory and research. Reading: Addison-Wesley; 1975.
9. Bandura A. Social learning theory. Nueva York: General Learning Press; 1977.
10. DiClemente C, Prochaska J. Toward a comprehensive, transtheoretical model of change. In: Miller W, Heather N, editors. *Treating addictive behaviours*. New York: Plenum Press; 1998.
11. Zak-Place J, Stern M. Health belief factors and dispositional optimism as predictors of STD and HIV preventive behavior. *J Am Coll Health*. 2004;52(5):229–36.
12. Getachew G, Negussie D, Gezaheng T. Intention to use condom among students in Agena preparatory school, Guraghe Zone Ethiopia: with the application of health believe model. *Arch Public Health*. 2013;71(23):3–9.
13. Adekeye OA, Adeusi SO. Attribution patterns, attitude and knowledge of HIV/AIDS on sexual behavioural change among students of covenant university Ota, Nigeria. *IFE Psychologia: Int J*. 2011;19(1):255–69.
14. Mashegoane S, Moalusi KP, Peltzer K, Ngoepe MA. The prediction of condom use intention among South African university students. *Psychol Rep*. 2004;95(2):407–17.
15. Montanaro EA, Bryan AD. Comparing theory-based condom interventions: health belief model versus theory of planned behavior. *Health Psychol*. 2014;33(10):1251–60.
16. Protogerou C, Flisher AJ, Wild LG, Aaro LE. Predictors of condom use in South African university students: a prospective application of the theory of planned behavior. *J Appl Soc Psychol*. 2013;43(S1):E23–36.
17. Tyson M, Covey J, Rosenthal HES. Theory of planned behavior interventions for reducing heterosexual risk behaviors: a meta-analysis. *Health Psychol*. 2014;33(12):1454–67.
18. Fazekas A, Senn ChY, Ledgerwood DM. Predictors of intention to use condoms among university women: an application and extension of the theory of planned behavior. *Can J Behav Sci*. 2001;33(2):103–17.

19. Fekadu Z, Kraft P. Predicting intended contraception in a sample of Ethiopian female adolescents: the validity of the theory of planned behaviour. *J Psychol Health*. 2000;16(2):207–22.
20. Albarracín D, Johnson BT, Fishbein M, Muellerleile PA. Theories of reasoned action and planned behavior as models of condom use: a meta-analysis. *Psychol Bull*. 2001;127(1):142–61.
21. Hubach RD, Dodge B, Goncalves G, Malebranche D, Reece M, Van Der Pol B, et al. Gender matters: condom use and nonuse among behaviorally bisexual men. *Arch Sex Behav*. 2014;43(4):707–17.
22. Eggers SM, Aarø LE, Bos AE, Mathews C, de Vries H. Predicting condom use in South Africa: a test of two integrative models. *AIDS Behav*. 2014;14(1):135–45.
23. Senn ET, Scott-Sheldon LA, Carey PM. Relationship-specific condom attitudes predict condom use among STD clinic patients with both primary and non-primary partners. *AIDS Behav*. 2014;18(8):1420–7.
24. Ferrer RA, Fisher JD, Buck R, Amico KR. Pilot test of an emotional education intervention component for sexual risk reduction. *Health Psychol*. 2011;30(5):656–60.
25. Gurdin JB, Niego S, Park MJ, Mince J. Safer sex efficacy workshop: an adolescent STI/HIV/AIDS prevention program for college students. In: Card JJ, Benner TA, editors. *Model programs for adolescent sexual health: evidence-based HIV, STI and pregnancy prevention interventions*. Nueva York: Springer; 2008. p. 273–80.
26. Dilorio C, Dudley WN, Soet J, Watkins J, Maibach E. A social cognitive-based model for condom use among college students. *Nurs Res*. 2000;49(4):208–14.
27. Ballester R, Gil MD, Ruiz E, Giménez C. Autoeficacia en la prevención sexual del Sida: la influencia del género. *Anales de Psicología*. 2013;29(1):76–82.
28. Heeren GA, Jemmott JB III, Ngwane Z, Mandeya A, Tyler JC. A randomized controlled pilot study of an HIV risk-reduction intervention for sub-Saharan African university students. *AIDS Behav*. 2013;17(3):1105–15.
29. Tung WC, Cook DM, Lu M. Sexual behavior, stages of condom use, and self-efficacy among college students in Taiwan. *AIDS Care*. 2011;23(1):113–20.
30. Ballester-Arnal R, Gil-Llario MD, Giménez-García C, Kalichman SC. What works well in HIV prevention among Spanish young people? an analysis of differential effectiveness among six intervention techniques. *AIDS Behav*. 2014;19(7):1157–69.
31. Ballester-Arnal R, Ruiz-Palomino E, Gil-Llario MD. HIV testing among Spanish youth: analysis of the mediating role of the big five personality and other psychological factors. *AIDS Behav*. 2015;19(11):2001–11.
32. Ruiz-Palomino E, Ballester-Arnal E, Gil-Llario MD. Personality as a mediating variable in condom use among Spanish youth. *J Health Psychol*. 2015; doi:10.1177/1359105315605656.
33. George WH, Davis KC, Masters NT, Kajumulo KF, Stappenbeck CA, Norris J, et al. Partner pressure, victimization history, and alcohol: women's condom-decision abdication mediated by mood and anticipated negative partner reaction. *AIDS Behav*. 2016;20(Suppl. 1):134–46.
34. Xiao Z, Palmgreen P, Zimmerman R, Noar S. Adapting and applying a multiple domain model of condom use to Chinese college students. *AIDS Care*. 2010;22(3):332–8.
35. Harvey SM, Beckman LJ, Gerend MA, Bird ST, Posner S, Huszti HC, Galavotti C. A conceptual model of women's condom use intentions: integrating. *AIDS Care*. 2006;18(7):698–709.
36. Carvalho T, Alvarez MJ, Barz M, Schwarzer R. Preparatory behavior for condom use among heterosexual young men: a longitudinal mediation model. *Health Educ Behav*. 2015; 42(1):92–9.
37. Hogben M, Liddon N, Pierce A, Sawyer M, Papp JR, Black CM, Koumans EH. Incorporating adolescent females' perceptions of their partners' attitudes toward condoms into a model of female adolescent condom use. *Psychol Health Med*. 2006;11(4):449–60.
38. VanderDrift LE, Agnew CR, Harvey SM, Warren JT. Whose intentions predict? power over condom use within heterosexual dyads. *Health Psychol*. 2013;32(10):1038–46.
39. Tara K, MacDonald TK, McKenna C, Mouck LC. The person and the partner: individual differences moderate the relationship between partner feedback and condom use. *AIDS Behav*. 2016;20(Suppl. 1):185–96.
40. Ballester R, Gil MD, Giménez C. El Cuestionario de Prevención del Sida (CPS): Análisis de la fiabilidad y validez. In *Sida, un nuevo escenario: Proceedings of the X Congreso Nacional sobre el Sida de la Sociedad Española Interdisciplinaria de Sida*. San Sebastián; Seisida; 2007. p. 135.
41. Costa PT Jr, McCrae RR. The NEO personality inventory manual. Odessa: Psychological Assessment Resources; 1985.
42. Cordero A, Pamos A, Seisdedos N. NEO PI-R Manual. Adaptación Española. 3rd ed. Madrid: TEA Ediciones; 2008.
43. Martín-Albo J, Núñez JL, Navarro JG, Grijalvo F. The Rosenberg Self-Esteem Scale: translation and validation in university students. *Span J Psychol*. 2007;10(2):458–67.
44. Beck AT, Steer RA, Brown GK. *Manual for the Beck Depression Inventory-II*. San Antonio: The Psychological Corporation; 1996.
45. Sanz J, Navarro ME, Vázquez C. Adaptación española del Inventario para la Depresión de Beck II (BDI-II): propiedades psicométricas en estudiantes universitarios. *Análisis y Modificación de Conducta*. 2003;29(124):239–88.
46. Leary MR. A brief version of the Fear of Negative Evaluation Scale. *Pers Soc Psychol B*. 1983;9:371–5.
47. Castañeiras Gebrikian CE. *Avances en Psicopatología y Clínica de la Hipocondría* [Doctoral dissertation unpublished]. Valencia, Universidad de Valencia; 2001.
48. Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. *Behav Res Ther*. 1990;28(6):487–95.
49. Gallego MJ, Botella C, Quero S, Baños RM, García-Palacios A. Propiedades psicométricas de la Escala de Miedo a la Evaluación Negativa versión breve (BFNE) en muestra clínica. *Revista de Psicopatología y Psicología Clínica*. 2007;12(3):163–76.
50. Kalichman SC, Rompa D. Sexual sensation seeking and sexual compulsivity: reliability, validity and predicting HIV risk behavior. *J Pers Assess*. 1995;65(3):586–601.
51. Ballester R, Gil MD, Ruiz E, Giménez C, Gómez S. El cuestionario de Búsqueda de sensaciones sexuales: adaptación y validación en una muestra española. Poster session presented at VI Congreso Nacional de la Asociación Española de Psicología Clínica y Psicopatología. Huelva, Spain; 2008.
52. Ballester R, Gómez S, Gil MD, Salmerón P. Sexual Compulsivity Scale (SCS): adaptation and validation in Spanish population. *J Sex Marital Ther*. 2013;39(6):526–40.
53. Wallston KA, Wallston BS, DeVellis R. Development of the multidimensional health locus of control (MHLC) scales. *Health Educ Monogr*. 1978;6(2):160–70.
54. Lemos S, Fidalgo AM, Calvo P, Menéndez P. Salud mental de los adolescentes asturianos. *Psicothema*. 1992;4(1):21–48.
55. Hair JF, Anderson RE, Tatham RL, Black WC. *Multivariate data analysis*. 4th ed. Englewood Cliffs: Prentice Hall; 1995.
56. Bollen KA, Long JS. *Testing structural equation models*. Newbury Park: Sage; 1993.
57. Bowen NK, Guo S. *Structural equation modeling*. New York: Oxford University Press; 2012.
58. Crepaz N, Marks G. Are negative affective states associated with HIV sexual risk behaviors? a meta-analytic review. *Health Psychol*. 2001;20(4):291–9.
59. Alvy LM, McKirman DJ, Mansergh G, Koblin B, Colfax GN, Flores SA, et al. Depression is associated with sexual risk among

- men who have sex with men, but is mediated by cognitive escape and self-efficacy. *AIDS Behav.* 2011;15(6):1171–9.
60. Chico E. Búsqueda de sensaciones. *Psicothema.* 2000;12(2): 229–35.
61. Cooper ML, Wood PK, Orcutt HK, Albino AW. Personality and predisposition to engage in risky or problem behaviors during adolescence. *J Pers Soc Psychol.* 2003;84(2):390–410.
62. Carnes PJ. Cybersex, courtship, and escalating arousal: factors in addictive sexual desire. *Sex Addict Compuls.* 2001;8(1):45–78.
63. Ingledew DK, Ferguson E. Personality and riskier sexual behaviour: motivacional mediators. *Psychol Health.* 2007;22(3): 291–315.
64. Longman-Mills S, Carpenter K. Interpersonal competence and sex risk behaviours among Jamaican adolescents. *West Indian Med J.* 2013;62(5):423–6.
65. Miller JD, Lynam D, Zimmerman RS, Logan TK, Leukefeld C, Clayton R. The utility of the five factor model in understanding risky sexual behavior. *Pers Individ Differ.* 2004;36(7):1611–26.
66. Lazarus RS, Folkman S. *Estrés y procesos cognitivos.* Barcelona: Martínez Roca; 1984.
67. Nesoff ED, Dunkle K, Lang D. The impact of condom use negotiation self-efficacy and partnership patterns on consistent condom use among college-educated women. *Health Educ Behav.* 2015;. doi:[10.1177/1090198115596168](https://doi.org/10.1177/1090198115596168).
68. Caprara GV, Steca P, Cervone D, Artístico D. The contribution of self-efficacy beliefs to dispositional shyness: on social-cognitive systems and the development of personality dispositions. *J Pers.* 2003;71:943–70.
69. French SE, Holland KJ. Condom negotiation strategies as a mediator of the relationship between self-efficacy and condom use. *J Sex Res.* 2013;50(1):48–59.
70. Abramson PR, Pinkerton SD. *With pleasure: thoughts on the nature of human sexuality.* Nueva York: Oxford University Press; 2002.
71. Higgins JA, Fenell JL. Providing for women's pleasure in the next generation of condoms. *J Sex Med.* 2013;10(12):3151–3.
72. Higgins JA, Wang Y. The role of young adults' pleasure attitudes in shaping condom use. *Am J Public Health.* 2015;105(7): 1329–32.
73. Khan SI, Hudson-Rodd N, Siggers S, Bhuiyan MI, Bhuiya A. Safer sex or pleasurable sex? rethinking condom use in the AIDS era. *Sex Health.* 2004;1(4):217–25.
74. Norton TR, Bogart LM, Cecil H, Pinkerton SD. Primacy of affect over cognition in determining men's condom use behavior: a review. *J Appl Soc Psychol.* 2005;35(12):2493–534.
75. Pinkerton SD, Cecil H, Bogart LM, Abramson PR. The pleasures of sex: an empirical investigation. *Cogn Emot.* 2003;17(2): 341–53.
76. Gutnik LA, Yoskowitz NA, Hakimzada AF, Patel VL. Role of emotion in decision making: a neuroeconomic approach towards understanding sexual risk behavior. *J Biomed Inform.* 2006; 39(6):720–36.
77. Scott-Sheldon LAJ, Carey KB, Cunningham K, Johnson BT, Carey MP, The MASH Reserch Team. Alcohol use predicts sexual decision-making: a systematic review and meta-analysis of the experimental literature. *AIDS Behav.* 2016;20(Suppl. 1):19–39.
78. Prat F, Planes M, Gras ME, Sullman MJM. Perceived pros and cons of condom use as predictors of its consistent use with a heterosexual romantic partner among young adults. *Curr Psychol.* 2016;35:13–21.
79. Dariotis JK, Johnson MW. Sexual discounting among high-risk youth ages 18–24: implications for sexual and substance use risk behaviors. *Exp Clin Psychopharm.* 2015;23(1):49–58.