



Published in final edited form as:

*Health Psychol.* 2011 May ; 30(3): 310–319. doi:10.1037/a0022871.

## Condom use among young women: Modeling the Theory of Gender and Power

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### Abstract

**Objective**—This study sought to articulate pathways between constructs from the Theory of Gender and Power (TGP) and their associations with sexual behavior.

**Design**—The data were collected pre-intervention during a randomized controlled HIV prevention trial. Participants were 701 sexually active, unmarried African-American females, aged 14–20, who were not pregnant, and were recruited from three health clinics in a southeastern U.S. city. Structural equation modeling was used for the analyses.

**Main Outcome Measure**—Self-reported condom use.

**Results**—Theoretical associations yielded a well-fitting structural model across initial and cross-validation samples. A significant amount of variance was explained for the variables of condom use ( $R^2=.31, .18$ ), partner communication ( $R^2=.30, .26$ ), substance use during sex ( $R^2=.32, .51$ ), and negative personal affect ( $R^2=.36, .48$ ). Partner communication (.35, .38) was the strongest predictor of condom use, negative personal affect (–.41, –.37) was the strongest predictor of partner communication, and physical risk (.54, .54) was the strongest predictor of negative personal affect.

**Conclusion**—This model provides evidence to support both direct and indirect associations between social and behavioral risk factors and condom use. Associations between TGP constructs and condom use can facilitate future development and analyses of interventions based on this theory.

### Keywords

African American; Adolescent; Condoms; SEM

### Introduction

Adolescents who are sexually active are at higher risk for sexually transmitted infections (STIs) compared to adults (Weinstock, Berman, & Cates, 2000), and African American adolescents and young adults are overrepresented in rates of STI and HIV incidence compared to other categories of race, ethnicity and age (CDC, 2007, 2009). Wingood and DiClemente (2000) have outlined how multiple social and structural factors have powerful repercussions for women in their application of Connell's (1987) sociological theory of gender and power (TGP) to HIV risk. Given that the HIV-tailored TGP is the only HIV specific theory that is focused exclusively on women (Noar, 2007) and that the theory

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identifies being an ethnic minority and being younger than 18 as specific risk factors that increase vulnerability to HIV, it provides a unique framework for understanding HIV risk among African American young women through accounting for potentially distinct challenges to protective behaviors relevant to this population.

The TGP partitions myriad influences into three domains of HIV risk for women: the Sexual Division of Labor (SDL), the Structure of Affective Attachments and Social Norms (SAASN) and the Sexual Division of Power (SDP) (Wingood & DiClemente, 2000). However, a smaller set of potentially more proximal influences have not been formally articulated as central to explaining risk behavior (Noar, 2007). Additionally, the potential for the less proximal factors to impact risk behavior indirectly has not been formally tested in the context of the entire theory. This study sought to test a comprehensive model of direct and indirect effects of constructs defined by the TGP on condom use among African American young women to provide insight into how to measure the constructs and extend its utility through illuminating pathways and potential mediators as targets for intervention development.

### **The TGP: Three Domains of Acquired Risks and Risk Factors**

The application of the TGP to HIV defined the SDL, the SAASN, and the SDP as domains of risk and then further delineated the constructs as acquired risks and risk factors within those domains (Wingood & DiClemente, 2000). Previous research has related social and economic constraints to sexual behavior (Brewster, Billy, & Grady, 1993), and the TGP calls these factors “acquired risks” and classifies them by domain. These acquired risks increase the importance of assessing “risk factors” which are those psychosocial constructs that are associated with engaging in risk-taking behaviors (Wingood & DiClemente, 2000).

Acquired risks generated by the SDL (economic risks) encompass economic inequities such as low socioeconomic status and lack of a high school education which have been associated with lower rates of contraception at first intercourse among adolescents (Singh, Darroch, Frost, & The Study Team, 2001). Risk factors within the SDL that relate to HIV risk behavior are considered as socioeconomic and consist of being a minority or being under the age of 18 (Wingood & DiClemente, 2000) and the relevance of these are borne out by the HIV and STI statistics described earlier (CDC, 2007, 2009).

Acquired risks produced by the SAASN (social risks) demarcate social inequities that enforce gender roles. Risks in this domain that have been found to be prohibitive of condom use among African American young women include having older sex partners (DiClemente et al., 2002) and less frequent communication about sex-related topics with parents (Crosby et al., 2002). Although not included in the TGP, peer norms not supportive of condom use have also been associated with unprotected sex (Crosby et al., 2003). Personal risk factors described as part of the SAASN associated with HIV risk among African American young women include knowledge of HIV prevention (Bachanas et al., 2002) and a history of psychological distress (DiClemente, Wingood, Crosby, Sionean, Brown, et al., 2001). Self esteem might also be important to consider in this domain based on associations with risk behavior among adolescents (Fisher, Schneider, Pegler, & Napolitano, 1991).

Acquired risks created by the SDP (physical risks) delimit social risks that are characterized by power imbalances. Interpersonal violence and partner disapproval of practicing safe sex have been associated with reduced condom use among African American young women (Sales, Salazar, et al, 2008). Behavioral risk factors that have been associated with risky sexual behavior or unprotected sex in this population include substance use (Bachanas, et al., 2002), poor assertive communication skills (DiClemente et al., 1996), infrequent sexual communication (Crosby, DiClemente, Wingood, Cobb, et al., 2002), lower self efficacy to

avoid HIV (Wingood & DiClemente, 1998a), and limited perceived control over condom use (Wingood & DiClemente, 1998a). The three domains of the TGP are theorized to operate in concert with one another to increase the risk of HIV among females (Wingood & DiClemente, 2000).

### **The Conceptual Model: Relationships Among Acquired Risks and Risk Factors**

The hypothesized model for the TGP used in this study is described in Figure 1. The economic risk of socioeconomic status has been found to be associated with the affective personal risks of depression (Schraedley, Gotlib, & Hayward, 1999) and self-esteem (Sterk, Klein, & Elifson, 2004). Parental communication about sex has also demonstrated significant association with self-esteem (Salazar et al., 2005). Multiple studies of adolescents have demonstrated a positive association between the physical risks of child sexual abuse, forced intercourse or physical abuse and the personal risk factors of depression (Howard & Wang, 2005; Schraedley, et al., 1999) and self-esteem (Beadnell, Baker, Morrison, & Knox, 2000).

Acquired social and physical risks have also been shown to influence behavioral risk factors among youth. Frequency of parental communication about sex has been found to be associated with partner communication (Crosby, DiClemente, Wingood, Cobb, et al., 2002) and self-efficacy for communication about sex with a partner (DiIorio, Dudley, Lehr, & Soet, 2000). Experiencing violence has been shown to be negatively associated with condom use negotiation (Beadnell, et al., 2000; Wingood & DiClemente, 1998b). Substance use before sex (Howard & Wang, 2005) and substance use more generally (Silverman, Raj, Mucci, & Hathaway, 2001) have also been correlated with experiencing sexual trauma among adolescents.

Personal risk factors may impact behavioral risk factors. Depression has been associated with lower self-efficacy to negotiate condom use with a new partner (DiClemente, Wingood, Crosby, Sionean, Brown, et al., 2001) and self-esteem has demonstrated significant association with partner communication (Salazar, et al., 2005). A study which found that higher knowledge of HIV risk was paradoxically associated with inconsistent condom use also found that the same young women possessed less confidence in using condoms (Morrison-Beedy, Carey, & Aronowitz, 2003), implying that these associations are interrelated.

### **The Present Study**

An advantage to designing interventions based on frameworks such as the TGP is that the theoretical constructs provide psychological and behavioral targets to improve the likelihood of behavioral change. Interventions aimed at changing behaviors (e.g. condom use) often do so by enhancing theoretical mediators of the behavior (e. g. condom use negotiation) (MacKinnon, 1994). Additionally, analysis of theoretical constructs that may be antecedents to important mediators of behavioral change can illuminate whether background variables indicate diversity in the target population and aid in the refinement of intervention strategies (Rakowski, 1999).

Developing statistical models in the social sciences can lead to conclusions that are dependent upon validation in other samples. A practice that allows researchers to develop a model through exploratory methods in one sample and test the best fitting model as a legitimate hypothesis in another is that of cross validation (Cliff, 1983). When two samples are not available, a single sample may be randomly split into a calibration and validation sample. In structural equation modeling (SEM), hypotheses regarding measurement of

constructs and associations between constructs can be confirmed in this manner (Cudeck & Browne, 1983).

This study tested how acquired economic, social and physical risks and personal and behavioral risk factors predicted condom use among African American young women. The study goals were to randomly split a sample of African American young women into calibration and validation samples and (1) test a measurement model of observed variables and latent constructs described by the TGP, (2) test a structural equation model of the latent variables, and (3) validate the model through multi-group analysis with equality constraints using SEM.

## Methods

### Procedure

This study was a secondary analysis of data collected at baseline from a randomized controlled trial. From June 2005 to June 2007 African American adolescent females were recruited from three clinics in downtown Atlanta, Georgia, providing sexual health services to predominantly inner-city adolescents. Eligibility criteria included self-identifying as African American, aged 14–20 years of age, and reporting vaginal intercourse in the past 60 days. Adolescents, who were married, currently pregnant, or attempting to become pregnant, were excluded from the study. Adolescents returned to the clinic to complete informed consent procedures, baseline assessments, and be randomized to trial conditions. Written informed consent was obtained from all adolescents with parental consent waived for those younger than 18 due to the confidential nature of clinic services. Of the eligible adolescents, 94% (N=701) enrolled in the study, completed baseline assessments using Audio Computer Assisted Self Interview (A-CASI) and were randomized to study conditions. Participants were compensated \$75 for travel and childcare to attend intervention sessions and complete assessments. The Emory University Institutional Review Board approved all study protocols.

### Sample

The age range of the sample was 14–20 years (M=17.6 years, SD = 1.72), 35% had graduated high school or gotten a GED; 59% lived with their mother or both parents; 36% were employed; 80% reported having a boyfriend, 63% reported at least one type of abuse; 23% reported substance use during sex and 56% reported condom use more than 50% of the time.

### Measures

**Sexual Division of Labor**—Three constructs within the SDL were used to measure acquired risk in this domain. *Assistance Received* was measured using the question “In the past 12 months, did you or anyone you live with receive any money or services from any of the following?” and a list was provided that included sources such as welfare and food stamps. The variable was dichotomized such that 0 = no aid received and 1 = any aid received. *Employment* was measured using the questions “Do you have a job for which you are paid?” with 0 corresponding to “Yes” and 1 corresponding to “No”. *Education* was measured using the question “What is the last grade you completed in school?” Responses were collapsed such that high school or greater = 0 and less than high school = 1. The three items were summed to create an index representing acquired risk stemming from the sexual division of labor, with greater levels indicating greater acquired risk (Calibration  $\alpha=.44$ , Validation  $\alpha=.55$ ). *Age* was measured using the respondent's age at baseline.

**Structure of Affective Attachments and Social Norms—***Older partners* was measured using the question “In general how old are the people you have sex with, are they...” (<5 yrs - >5 yrs). Higher levels indicated older partners. *Frequency of parental sexual communication* was measured using a validated five item scale (Sales, Milhausen, et al., 2008). Higher scores indicated greater frequency of parental communication (Calibration  $\alpha=.92$ , Validation  $\alpha=.91$ ). *Peer norms* was measured using seven items from the perceived peer norms scale with questions such as “How many of your friends think that it's okay to have vaginal or anal sex without a condom”. Higher levels indicated higher perceptions of unsafe sexual norms among peers (Calibration  $\alpha=.76$ , Validation  $\alpha=.76$ ). *Conservative religious beliefs* was measured using a newly developed three item scale that included questions such as “Because of my religious beliefs I feel bad when I use condoms during sex”. Items were summed to indicate higher levels of conservative religious beliefs (Calibration  $\alpha=.68$ , Validation  $\alpha=.71$ ).

*Self esteem* was measured using the Rosenberg Self Esteem scale (Rosenberg, 1965). Items were coded such that higher levels indicated lower self-esteem (Calibration  $\alpha=.86$ , Validation  $\alpha=.86$ ). *STD Knowledge* was measured using the STD Knowledge scale (Sikkema et al., 2000). Higher scores indicated greater knowledge (Calibration  $\alpha=.76$ , Validation  $\alpha=.70$ ). *Depression* was measured using the eight-item brief version of the Center for Epidemiologic Studies (CES-D) depression symptomatology (Melchior, Huba, Brown, & Reback, 1993). Higher scores indicated greater levels of depression (Calibration  $\alpha=.90$ , Validation  $\alpha=.91$ ).

**Sexual Division of Power—***Coerced sex* was measured using the questions “Has anyone ever forced you to have vaginal sex when you didn't want to?” and “Has anyone ever forced you to have anal sex when you didn't want to?” Only two young women had experienced forced anal sex in addition to forced vaginal sex and responses were collapsed. *Physical abuse* was measured using the question “Have you ever been physically abused? (hit, punched, kicked, slapped, etc.)” *Emotional abuse* was measured using the question “Have you ever been emotionally abused? (threatened, called names, etc.)” *Fear of condom negotiation* was measured by a seven item scale (DiClemente, Wingood, Crosby, Sionean, Brown, et al., 2001). Higher scores indicated greater fear of condom negotiation (Calibration  $\alpha=.80$ , Validation  $\alpha=.83$ ). *Use of substances during sex* was measured using three items that asked if the participant had ever used marijuana, alcohol or ecstasy and/or GHB to enhance sexual pleasure. Selection of these substances was based on prevalence. Responses included four levels ranging from (0) “Never” to (3) “Often (5 or more times)”. Alcohol and marijuana were the most frequently used substances. Other substances were markedly less common. *Refusal Self-Efficacy* was measured using the seven item refusal self-efficacy scale (Ebreo, Feist-Price, Siewe, & Zimmerman, 2002). Higher levels indicated higher levels of refusal self efficacy (Calibration  $\alpha=.87$ , Validation  $\alpha=.87$ ). *Frequency of partner communication about sex* was measured using three items from the validated Partner Communication Scale (Milhausen et al., 2007). Higher levels indicated greater partner communication about sex (Calibration  $\alpha=.85$ , Validation  $\alpha=.87$ ). *Partner communication self efficacy* was measured using a three item scale with questions that began with the stem “How hard is it for you to ...” A sample item was “Ask if he would use a condom?” Item responses were 4-point Likert scales anchored by “Very hard” to “Very easy”. Higher levels indicated higher self-efficacy. (Calibration  $\alpha=.78$ , Validation  $\alpha=.84$ ).

**Behavioral Outcomes—**Outcome variables included whether the participant used a condom at last sex and the number of times the participant engaged in unprotected vaginal sex during the last six months. Anal sex was uncommon in the sample (14%) and was excluded from the outcome variable. Oral sex was more common (55%) but was also excluded because the act is thought to involve less risk than either vaginal or anal sex. It has



been argued that unprotected vaginal sex acts (UVS) or a measure that “weights” condom use by number of sex acts is superior to proportion of condom use (Crosby, DiClemente, Holtgrave, & Wingood, 2002). As UVS presented distributional problems, it was instead used to derive the most appropriate proportional split. Analysis of the association of potential proportional options with UVS showed that the <50%/ 50% split resulted in a nonparametric correlation of  $-.62$  which was higher than that of consistent condom use ( $-.51$ ) and any condom use (.16) and therefore was selected as the second indicator of condom use.

### Data Analysis

The models were tested using SEM. The sample was randomly split into two groups ( $n=300$ ,  $n=400$ ) to employ a cross-validation strategy (Byrne, 2006). Using this method, a calibration sample was used to test a measurement model, a hypothesized predictive model and conduct post-hoc analyses to attain a well-fitting model (Cudeck & Browne, 1983). The best-fitting model was applied to the validation sample. The sample size allowed for a well-specified complex model to be tested (Jackson, 2001).

### Model Development

Prior to analysis, variable distributions were evaluated and outliers reviewed. Bivariate statistics were used to assess the suitability of observed variables as indicators. For the domain of the sexual division of labor, a composite scale (Liang, Lawrence, Bennet, & Whitelaw, 1990) was used to represent acquired risk as an observed independent variable by summing its proposed indicators. Taking into account the suitability of variable distributions and associations with the outcome variables and other independent variables, fear of condom negotiation and refusal self efficacy were removed from the model. For other scales such as partner communication and conservative religious beliefs, theoretical considerations, item to total correlations in reliability analysis and hypothesized associations were used to select subscales that were best suited to capture the theoretical construct. Finally, if measured indicators of latent variables representing the acquired risks and risk factors were not associated with one another, the latent variable was separated into multiple factors to capture TGP constructs with single indicators. This was the case for peers, older partners, parents and religious values. Additionally, after deeming substance use during sex its own latent construct, it was indicated by the individual items described in the measurement section.

Using confirmatory factor analysis (CFA) procedures (Byrne, 2006) in Mplus Version 5.0 (Muthen & Muthen, 2007), the latent variables were analyzed as correlated factors. For latent variables with single indicators, the reliabilities for the observed indicators described in the measures were computed and the residual variances of the observed variable were fixed (Brown, 2006). All ordinal and categorical variables were indicated as such within Mplus and models were estimated using a weighted least squares estimator (WLSMV) that adjusts the chi-square for non-normality (Muthen & Muthen, 1998–2007). The measurement model was assessed for fit using the Comparative Fit Index (CFI) (Bentler, 1990) and the RMSEA (Steiger, 1990). A CFI that is very close to .95 or greater and an RMSEA that is very close to .06 or less are considered to be indicative of good fit (Hu & Bentler, 1999). Following the confirmation of a valid measurement model, a structural model based on the one described in Figure 1 was tested. The structural paths between latent factors included in the model were those that aligned with the theoretical associations indicated by the literature in Figure 1 that also demonstrated corresponding significant bivariate associations in the measurement model for the calibration sample displayed in the bottom half of the correlation matrix in Table 1. Adjustments to the model were made based on the significance of path coefficients and theoretical justifications.

## Model Validation

Observed variables for the validation sample were computed based on the observed variables in the calibration sample. The data were merged with the calibration sample and tested for multi-group invariance using Mplus (Muthen & Muthen, 2007). Following this, the model was tested with the data from both groups with model parameters constrained to be equal across groups. The significance of releasing a constraint was estimated using a chi-square difference test.

## Results

### Model Development

Descriptive statistics were analyzed for outliers and the final model was run with and without cases identified as outliers. Although the removal of outliers produced no changes to the interpretation, an extreme outlier based on UVS was removed. There was minimal missing data (N=13) for the economic index variable and all cases were retained in the analysis. The measurement model and structural models demonstrated good model fit (CFI=.94 and RMSEA=.05). However, it was noted that the latent variable of knowledge did not demonstrate a hypothesized association at the level of  $p < .10$  and it was dropped from the model in the interest of parsimony. The final model afforded slightly better fit statistics (CFI = .95, RMSEA = .05).

### Model Validation

As in the calibration sample, missing data were minimal in the validation sample; a single case was missing one of the indicators of condom use and 17 cases were missing the economic index variable. The measurement model fit statistics were very similar to those of the calibration sample (CFI = .94, RMSEA=.05). Due to a non-positive definite matrix, the indicators of the latent variable condom use were fixed to be equal, and the variance of condom use was fixed to one. This more restrictive and parsimonious model allowed for successful estimation with the validation sample and the constraint was retained in subsequent models across both samples. In the structural model for the validation sample, the fit deteriorated slightly (CFI=.93, RMSEA=.05) but was considered good enough to use for multiple group testing.

The multiple group model with equality constraints across groups demonstrated a good fit for the data (CFI=.95, RMSEA=.04). Based on the modification indices for the multiple group model and the latent variable correlations, the equality constraint across samples for the path from physical exposure to condom use was removed. This resulted in a significant improvement to the model based on the chi-square ( $\chi^2$  difference test = 10.65,  $df=1$ ,  $p=001$ ; CFI=.96, RMSEA=.04). The final multi-group model is displayed in Figure 2. The direct, indirect, and total effects are displayed in Table 2.

## Discussion

The purpose of this study was to test a predictive model of condom use based on the TGP. A number of novel associations were found. Acquired risk from the SDP and the SDL revealed numerous paths to condom use and its proximal predictors. The effect of economic risk on condom use through negative affect demonstrated a trend toward significance while its indirect effect on partner communication through negative affect was significant. These findings help explicate how socioeconomic factors, often included as control variables, may indirectly influence condom use. Physical risk was found to indirectly impact condom use and communication through negative personal affect. The inclusion of personal affect as a mediator between violence and communication in the hypothesized chain of effects

represents a departure from a previous study (Sales, Salazar, et al., 2008) and may be important to consider in future intervention research. For example, it may be that some adolescents who have experienced violence need specialized treatment addressing the impact to their mental health (e.g. depression, post-traumatic stress disorder) prior to receiving skills training for condom negotiation.

Acquired risks and risk factors from the SAASN also demonstrated new pathways of risk. Social risk, represented by older partners and parental communication about sex, indirectly predicted condom use through partner communication. In a prior analysis, older partners have been associated with risk behaviors in models that did not control for partner communication related constructs (DiClemente, et al., 2002), indicating the potential for this indirect association. Older partners also demonstrated an association with the behavioral risk of substance abuse during sex. Parental communication was indirectly predictive of condom use through partner communication. Frequency of parental communication has been included as a covariate of partner communication in tests of associations between communication and condom use because of its potential as a confounder (Crosby, DiClemente, Wingood, Cobb, et al., 2002) implying it is possible for one variable to mediate the other. Finally, conservative religious beliefs were also indirectly associated with both condom use and partner communication via negative personal affect. Although greater religiosity has been found to be associated with increased odds of partner communication and demonstrated a trend toward increased odds of condom use (McCree, Wingood, DiClemente, Davies, & Harrington, 2003), this study tested the distinctly different construct of conservative religious beliefs that may impede condom use. Its impact was mediated through negative personal affect, suggesting that these beliefs may be associated with guilt about practicing safe sex.

Many of the findings also confirmed the results of previous studies. For example, the model was consistent with previous research on the association between parental communication about sex and communication with a partner about sex (Crosby, DiClemente, Wingood, Cobb, et al., 2002). Negative personal affect also indirectly predicted condom use through partner communication. These findings are consistent with previous associations between depression and self-efficacy for condom use negotiation (DiClemente, Wingood, Crosby, Sionean, Brown, et al., 2001) and self esteem and partner communication (Salazar, et al., 2005).

Although nearly all of the direct effects hypothesized in Figure 1 held across samples, there were some paths that did not demonstrate significant associations. The direct path from physical exposure to behavioral risk was only evident in one sample. In both samples, it also failed to demonstrate an indirect association with condom use through communication that was included in the hypothesized model and has been demonstrated in a previous study (Sales, Salazar, et al., 2008). However, this may have been because the indirect effect of physical risk on condom use and partner communication was mediated by negative personal affect. Additionally, measures of physical risk that address relationship to the perpetrator may yield different results.

Substance use during sex did not achieve expected results. It was posited as representing behavioral risk and failed to demonstrate associations with condom use. A previous study that examined the participants' intoxication as well as the intoxication of the partners found that both types of intoxication were associated with UVS while controlling for partner communication self efficacy, but the intoxication measures were time sensitive (in the past 60 days) (Crosby et al., 2008). Therefore, a time sensitive measure of the use of alcohol or drugs during sex may have been a better conceptualization of the construct. Additionally, the qualifier of "to enhance sexual pleasure in each of these questions may have resulted in the



under-reporting of substance use during sex. However, the associations of physical risk, peer norms and older partners with substance use during sex are still of note as it is considered to be a risk behavior.

This study also revealed a number of important findings about the measurement of TGP constructs. The latent variable of partner communication was indicated by two 3- item subscales specific to condom use: partner condom communication self efficacy and frequency of partner communication about condoms. These were subsets of existing scales that have been used in a number of other studies (DiClemente, Wingood, Crosby, Cobb, et al., 2001; Milhausen, et al., 2007; Sales, Salazar, et al., 2008). The reliability for these items was high and each was associated with both measures of condom use in both samples, suggesting that researchers interested in condom use outcomes may be able to utilize these shorter scales.

Negative personal affect was directly associated with partner communication as well as an indirect predictor of condom use, but this latent construct had only two indicators. Body image has been found to be associated with both self-esteem and depression in previous research as well as with sexual risk behaviors (Wingood, DiClemente, Harrington, & Davies, 2002). Ethnic identity has also been found to co-vary with self-esteem as part of the latent construct of self-concept (Salazar et al., 2004). It is unknown as to whether it would fit as an indicator of overall affect. Additional research exploring whether body image or ethnic pride would be acceptable indicators of personal affect may be needed to strengthen this latent construct.

This study also found that dimensions of social exposure described by the TGP cannot be captured with a single latent variable. The literature indicates that parental communication about sex may be one of multiple indicators of parental influence on sexual risk behaviors in adolescence. For example, parental monitoring and family support have also been found to be predictive of condom use behaviors (Crosby, DiClemente, Wingood, & Harrington, 2002; DiClemente, Wingood, Crosby, Sionean, Cobb, et al., 2001) and family influence may warrant its own latent construct within the domain of affective attachments and social norms.

The results of this study also provide implications for tailoring interventions. For example, economic risk emerged as an indirect predictor of communication. Although the young women in this study were all African American and between the ages of 14 and 20, this distal predictor provides evidence that heterogeneity exists in important ways that can affect psychosocial mediators that have been targets of HIV/STI risk reduction interventions (DiClemente et al., 2004). Adolescents who come from families who are economically disadvantaged may have different or increased needs for various intervention components. Additionally, HIV prevention interventions specifically for adolescents who have experienced victimization may also need to be enhanced to address this important population.

## Limitations

SEM, though powerful, is not without limitations. A well-fitting, validated structural model does not mean that alternative models do not exist. The nature of secondary data analysis precludes the addition of instruments that measure additional or alternative constructs indicated by the TGP, and as a result the conceptualization of the theory is incomplete. The measures of economic and physical risk may have been less than adequate as evidenced by low reliability in the former and a lack of consistent association with the outcome in the latter and additional research is needed to enhance these measurements among adolescents. Also, coerced sex excluded oral sex. Additionally, the outcome variable focused on vaginal

sex, and the model may be different for other sex acts. Economic risk as conceptualized by the TGP is particularly difficult to measure among young women as it is actually indicated by the young women's families in many cases. More appropriate indicators may be whether the young woman is supporting her own children or whether she engages in sexual relationships to shield her from community violence in a disadvantaged neighborhood. The size of the sample also limited the number of indicators of the TGP that could be included, requiring the selection of only the most salient constructs to test the theoretical relationships between the domains of the TGP. Additionally, the data is cross-sectional, and therefore causal inferences cannot be drawn based on the model. Finally, the nonrandom selection of young women seeking services at health clinics means that generalizations must be made with caution.

This study also has a number of strengths. The cross validation strategy revealed that all but one of the paths tested in the calibration sample held in the validation sample, increasing the likelihood that these findings could be replicated. Many of the measures for this study were designed based on the TGP and created an opportunity to test associations among a number of theory constructs. Previously unexplored indirect effects for economic, social and physical risks were identified. A new measure of conservative religious beliefs that is more in line with the TGP description of religious influence was introduced and demonstrated hypothesized associations. Consistent with extant literature (Noar, Carlyle, & Cole, 2006), communication about condom use was a direct predictor of condom use. Additionally, partner communication and negative affect emerged as important mediators of constructs within other domains of the TGP. As interventions guided by the TGP (Wingood & DiClemente, 2006) are disseminated (Lyles et al., 2007), this model may help to further sharpen theory measures and the findings related to associations between theory constructs may prove to be a helpful evolution for the TGP with respect to future evaluations of effectiveness.

## Acknowledgments

The project described was supported by Grant Number F31MH082635 and 5 R01 MH070537 from the National Institute Of Mental Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute Of Mental Health or the National Institutes of Health.

The authors would like to thank Claire Sterk for her comments on a previous draft the manuscript.

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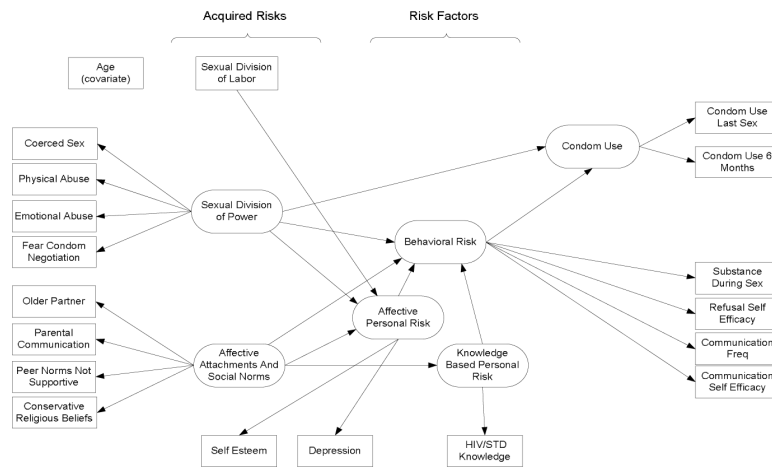
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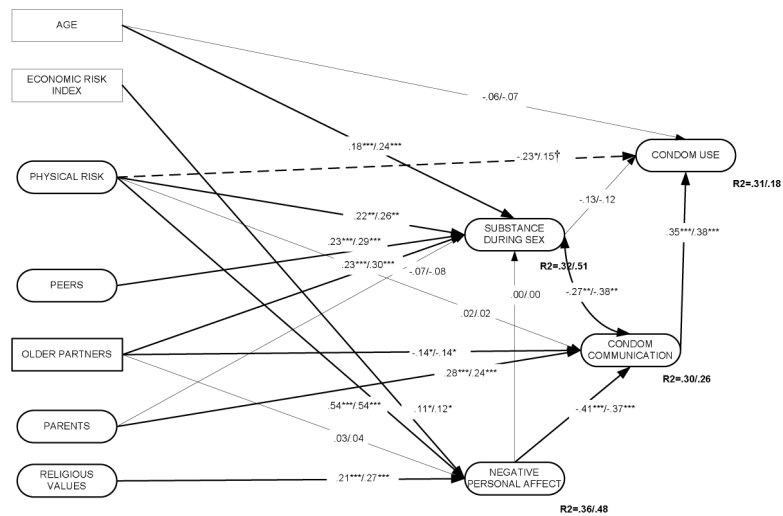
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**Figure 1. Conceptual model for the Theory of Gender and Power**

Note: The Sexual Division of Labor is a composite scale describing SES that includes the variables any receipt of government aid, lack of employment, and less than a high school education. Age was tested as a potential control variable between predictors and the outcome. Ovals represent latent constructs and rectangles represent directly observed variables.



**Figure 2. Multi-Group Structural Equation Model (Standardized Coefficients) for the Theory of Gender and Power**

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Note: Bold arrows denote statistically significant paths and the broken arrows denote a path not constrained to be equal across samples. For all other paths, inequality across samples is due to differential variability for the factor by sample. Ovals represent latent constructs and rectangles represent directly observed variables for which the error has been set to 0.

Table 1

Latent Variable Correlations (Based on Independent Measurement Models)

	1	2	3	4	5	6	7	8	9	10	11
1. Communication		-.53***	-.32***	.17*	-.21*	-.24**	-.19*	.24**	-.36***	-.08	.44***
2. Substance During Sex	-.34**		.24**	-.20*	.49***	.44***	.42***	-.16 <sup>†</sup>	.25**	.39***	-.13
3. Negative Affect	-.72***	.23*		.07	.58***	.16*	.20**	-.14*	.36***	.02	-.04
4. Economic Exposure	.00	-.10	.20***		.04	-.14*	-.11*	.25***	-.12*	-.53***	.01
5. Physical Risk	-.36**	.35***	.62***	.04		.37***	.30***	-.22***	.31***	.09	-.08
6. Peer Norms	-.15	.43***	.09	-.15*	.35***		.12*	-.14*	.23***	.22***	-.09
7. Older Partner	-.36***	.39***	.22**	-.03	.31***	.20***		-.09 <sup>†</sup>	.09	.06	-.13*
8. Parental Communication	.32***	-.30***	-.10	.24***	-.15*	-.18**	-.15**		-.07	-.21***	.12 <sup>†</sup>
9. Conservative Religion	-.09	-.05	.27**	.06	-.07	-.13	.03	-.08		.03	.06
10. Age	-.07	.28***	-.09	-.56***	.04	.20***	.09 <sup>†</sup>	-.22***	-.01		-.11
11. Condom Use	.63***	-.42***	-.34**	.04	-.37***	-.24*	-.15*	.27**	.09	-.17*	

Note: Calibration sample is under the diagonal, validation sample is over the diagonal

<sup>†</sup> p < .10,

\* p &lt; .05,

\*\* p &lt; .01,

\*\*\* p &lt; .001

**Table 2**  
 Direct and Indirect Effects of Structural Equation Model (Calibration and Validation Samples)

<i>Outcome/Independent</i>	<i>Communication<sup>a</sup></i>	<i>Substance Use<sup>a</sup></i>	<i>Negative Affect<sup>a</sup></i>	<i>Direct Effect</i>	<i>Total Effect</i>
<i>Condom Use</i>					
Age	-.03	-.03		-.06	-.08 <sup>†</sup>
Partner Communication				.35 <sup>***</sup>	.38 <sup>***</sup>
Substance Use During Sex				-.13	-.12
Negative Personal Affect	-.14 <sup>**</sup>	.00		-.14 <sup>**</sup>	-.14 <sup>**</sup>
Economic Risk			-.02 <sup>†</sup>	-.02 <sup>†</sup>	-.02 <sup>†</sup>
Physical Risk	.01	-.03	-.08 <sup>**</sup>	.15 <sup>†</sup>	.05
Peer Norms		-.03		-.03	-.03
Older Partners	-.05 <sup>*</sup>	-.03	-.01	-.08 <sup>**</sup>	-.10 <sup>**</sup>
Parental Communication	.10 <sup>**</sup>	.01		.11 <sup>**</sup>	.10 <sup>**</sup>
Religious Beliefs <sup>b</sup>			-.03 <sup>**</sup>	-.03 <sup>*</sup>	-.04 <sup>*</sup>
<i>Partner Communication</i>					
Negative Personal Affect				-.41 <sup>***</sup>	-.37 <sup>***</sup>
Economic Risk			-.05 <sup>*</sup>	-.05 <sup>*</sup>	-.05 <sup>*</sup>
Physical Risk			-.22 <sup>***</sup>	.02	-.20 <sup>**</sup>
Older Partners			-.01	-.14 <sup>*</sup>	-.16 <sup>**</sup>
Parental Communication				.28 <sup>***</sup>	.28 <sup>***</sup>
Religious Beliefs <sup>b</sup>			-.08 <sup>**</sup>	-.08 <sup>**</sup>	-.10 <sup>**</sup>
<i>Substance During Sex</i>					
Age				.18 <sup>***</sup>	.18 <sup>***</sup>
Negative Personal Affect				.00	.00
Economic Risk		.00		.00	.00
Physical Risk		.00		.22 <sup>**</sup>	.22 <sup>**</sup>
Peer Norms				.23 <sup>**</sup>	.23 <sup>**</sup>
Older Partners		.00		.23 <sup>***</sup>	.23 <sup>***</sup>

Outcome/Independent	Communication <sup>a</sup>	Substance Use <sup>a</sup>	Negative Affect <sup>a</sup>	Direct Effect	Total Effect
Parental Communication				-.07	-.07
Religious Beliefs <sup>b</sup>		.00	.00	-.08	-.08

<sup>†</sup> p < .10,

\* p < .05,

\*\* p < .01,

\*\*\* p < .001;

<sup>a</sup> Refers to mediator of indirect effect;

<sup>b</sup> Conservative Religious Beliefs