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Validation of a Parent-Adolescent Communication Scale for Use in STD/HIV Prevention Interventions

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This study reports on the validation of a scale to assess adolescent girls' frequency of sexual communication with their parents. The Parent-Adolescent Communication Scale (PACS) was administered to 522 African American female adolescents ranging in age from 14 to 18. The PACS demonstrated satisfactory internal consistency (across multiple administrations) and acceptable test-retest reliability over a 12-month follow-up period. Concurrently, scores on the PACS were correlated with frequency of sexual communication with partner, sexual communication self-efficacy (boyfriend), perceived parental knowledge, family support, depression, and condom use with steady male sex partners. Prospectively, baseline PACS scores were correlated with frequency of sexual communication with partner and condom use. The present investigation indicates that the PACS is a reliable and valid measure of frequency of sexual communication between female adolescents and their parents. Utility of the PACS for researchers and practitioners is discussed.

Keywords: *STD/HIV; sexual communication; parent-adolescent*

Despite recently reported declines in the percentage of high school students who are sexually active, the percentage of adolescents initiating intercourse at younger ages has increased (Kann et al., 2000; Meschke, Bartholomae, & Zentall, 2000), and the prevalence of sexual risk taking among adolescents in the United States remains high (Centers for Disease Control and Prevention [CDC], 2002a). Consequently, the incidence and prevalence of sexually transmitted diseases (STDs) among adolescents is exceptionally high (CDC, 2000), and about one half of all new HIV infections occur in individuals younger than the age of 25 (CDC, 2002b).

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The risk of adverse consequences associated with high-risk sexual behavior, such as STD/HIV infection, is not equally distributed among adolescents. Girls are at particularly high risk for contracting STDs because they are physiologically more vulnerable to both viral and nonviral sexual transmitted infections, including HIV (Aral, Hawkes, Biddlecom, & Padian, 2004; CDC, 2004; Walsh & Irwin, 2002). In addition to gender differences in STD prevalence rates, the risk of contracting STDs is substantially greater for African American adolescents, as is the risk for HIV infection (Eng & Butler, 1997; National Institutes of Health, 1997). A large-scale seroepidemiological study conducted among Job Corps applicants indicated that African American adolescent girls had a HIV prevalence significantly higher relative to same-age White or Hispanic adolescent girls (4.9 versus 0.7 and 0.6/1000; Valleroy, MacKellar, Karon, Janssen, & Hayman, 1998).

Identifying the determinants of STD/HIV-preventive behaviors in adolescents has become a public health priority. Reflective of the urgent nature of this public health crisis, the National Academy of Science has called for further research to understand factors associated with adolescents' acquisition of HIV-preventive behaviors (H. G. Miller, Turner, & Moses, 1990). One important determinant of adolescents' STD/HIV-protective behavior may be their communication with parents about issues pertaining to safer sex. Evidence indicates that parent-adolescent communication about sex may exert much more influence on adolescents' sexual behavior than previously believed (Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003) and has been characterized by some as one of the most critical influences on adolescents' sexual behavior (Dittus, Jaccard, & Gordon, 1999; Hutchinson, 2002, Pequegnat & Szapocznik, 2000).

Following from family process theory, which suggests that open communication patterns encourage adolescents to internalize the values and norms embedded in the parents' messages thereby influencing adolescents' sexual decision making (Whitaker & Miller, 2000), it is important to assess the frequency of parent-adolescent communication regarding pressing issues in adolescents' lives, especially topics related to sex and protective behaviors, as increased frequency of such communication suggests openness between parents and adolescents, promotes more direct discussions about sex, and encourages youths to seek information from parents about sexual health-related questions, all of which ultimately affect adolescents' sexual decision making. In addition, following from social learning theory (Bandura, 1986), frequency is an important criterion for the successful learning and internalization of parental messages as more frequent discussions provide the opportunity for repetition, which better facilitates learning. Furthermore, regarding the content of parent-adolescent sexual communication, empirical evidence indicates that both parents and adolescents believe the focus of their sexual communication should be issues relating to sexual safety (i.e., condom use, ways to protect against STDs, AIDS, and pregnancy) rather than more highly personal psychological and relationship-related topics (Rosenthal & Feldman, 1999). Thus, it is imperative to assess the frequency of parent-adolescent communication specifically regarding issues of sexual safety, as this is the domain both parties value as an important topic for communication.

Parent-adolescent sexual communication (defined for the purpose of this study as the frequency of any communication between adolescents and their parent(s) about topics related to sexual safety in general, and specifically, methods of protection against STDs, HIV, and pregnancy) has been associated with a number of STD/HIV-preventive or safer sex behaviors. Specifically, adolescents who frequently talk with their parents about sex are likely to adopt more conservative sexual attitudes, are less likely to be sexually

active, and show later onset of sexual initiating behaviors (DiIorio, Kelley, & Hockenberry-Eaton, 1999; Fisher, 1986; Guzman et al., 2003; Leland & Barth, 1993; Whitaker & Miller, 2000). Parent-adolescent sexual communication has been positively associated with more consistent condom use in adolescents (Holtzman & Rubinson, 1995; Hutchinson & Cooney, 1998; K. S. Miller, Levine, Whitaker, & Xu, 1998; Whitaker & Miller, 2000) and inversely related to number of sexual episodes, frequency of unprotected sexual intercourse, number of sexual partners, and likelihood of having at least one STD (Crosby, Wingood, DiClemente, & Rose, 2002; Fox & Inazu, 1980; Holtzman & Rubinson, 1995; Hutchinson et al., 2003). In addition, among sexually active adolescent girls, parent-adolescent sexual communication has been positively related to more responsible sexual attitudes and behaviors, as well as greater condom use self-efficacy and increased sexual communication with male partners (Hutchinson & Cooney, 1998; Hutchinson et al., 2003; Shoope & Davidson, 1994). Together, these findings strongly suggest that reducing STD/HIV risk behaviors could be facilitated by parental-adolescent communication about sex and sexual risk and protective factors.

Unfortunately, there is very little consistency in how parent-adolescent communication about sex is measured. In fact, more than a decade ago, Fisher (1993) noted the inconsistency of research findings pertaining to parent-child communication about sex-related issues and stressed the need for instrument development in this area. Yet, to the best of our knowledge, no valid or reliable measures have been developed. Thus, studies have measured adolescents' comfort with parent-adolescent sexual communication (Bennett & Dickenson, 1988; Guzman et al., 2003; Rozema, 1986), the specific content of parent-adolescent sexual communication (DiIorio et al., 1999), quality of sexual communication (Leland & Barth, 1993; Olson et al., 1982), and frequency of communication (Crosby et al., 2002; DiIorio et al., 1999; Fisher, 1986, 1987; Hutchinson et al., 2003). Of these, communication frequency studies show the most consistent links to safer sex behaviors in adolescents, especially adolescent girls (Crosby et al., 2002; DiIorio et al., 1999; Fisher, 1986, 1987; Hutchinson et al., 2003).

Most measurements of this construct have been idiosyncratic, with measures being adopted, adapted, or specifically developed for a particular study. To the best of our knowledge, no study has provided psychometric analyses characterizing the reliability and validity of a measure of parent-adolescent sexual communication. Therefore, given the central role of parent-adolescent sexual communication in STD/HIV-protective behaviors for adolescents, a measure that is reliable and valid would provide a critical resource for the field. Thus, the aim of this study was to evaluate the psychometric properties of a scale to measure the frequency of parent-adolescent sexual communication. Given their disproportionate risk of STD/HIV acquisition, we chose to conduct this study with a sample of African American adolescent girls.

METHOD

Item Development

The Parent-Adolescent Communication Scale (PACS) was developed by two of the authors (Wingood and DiClemente). A review of the empirical literature was conducted to ascertain domains pertinent to sexual communication. Five topics were frequently noted in the literature with regard to parent-adolescent sexual communication: pregnancy, STD, HIV/AIDS, condom use, and general information about sex. In addition,

five focus groups of African American adolescent girls ($N = 40$) were conducted to determine whether or not these topics were ever discussed with their parents. Health educators specializing in sexual health also evaluated the significance of these five topic areas to adolescent girls' sexual behavior. The results from the focus groups and from the health educator evaluations indicated that these five topic areas were applicable to adolescent girls and were relevant to sexual communication as well as to sexual health. Thus, 36 items were created. To assess face validity, the initial items were submitted to six health educators who had expertise in sexual health among African American girls. The health educators were asked to evaluate each item in terms of relevance. Fifteen adolescents who met the inclusion criteria (female, African American, 14-18 years of age) were recruited to complete the preliminary version of the measurement tool. Based on their suggestions, the items were revised to enhance reading comprehension. Items were also subjected to a computer analysis to determine their reading level. Item analysis was conducted, and items that seemed to assess the common underlying construct of parent-adolescent sexual communication (correlated at the .90 level or above) were retained, and items that decreased the Cronbach's alpha were deleted, leaving a 5-item scale.

Participants

The participants in the current validation study were part of a larger longitudinal evaluation study of an HIV prevention intervention for African American adolescent girls. Because the PACS was administered in the context of a larger longitudinal intervention study, the repeated administration of the scale occurred at atypically long intervals in order to adhere to data collection schedules appropriate for the intervention. Baseline data for the entire sample (i.e., both intervention and comparison groups) were used for internal consistency analyses, as well as concurrent and discriminant construct validity; however, comparison group data only were used for the test-retest reliability analyses and predictive validity. The study was conducted at the University of Alabama at Birmingham, and their Institutional Review Board (IRB) approved the study protocol prior to implementation. From December 1996 through April 1999, recruiters screened self-identified African American adolescent girls seeking services at four community health agencies. Eligibility criteria included being African American, female, 14 to 18 years of age, and being sexually active (reporting vaginal intercourse in the previous 6 months). Of the 1,130 adolescent girls screened, 53.9% ($n = 609$) met eligibility criteria. Participants had to provide written informed consent. Parental consent was waived by the IRB. Of the eligible adolescents, 86% ($n = 522$) agreed to participate in the study. Of these, 271 were in the control arm of the study at baseline, 243 were retained for the 6-month follow-up, and 241 completed the 12-month follow-up assessment.

Data Collection

Data collection occurred at baseline and at 6- and 12-month follow-up in order to adhere to the assessment schedule to evaluate the intervention. Data were collected from two sources, a self-administered survey and a private, personal interview. First, participants completed a self-administered questionnaire assessing sociodemographics and psychosocial mediators of HIV-preventive behaviors, including the PACS. Subsequently, a trained African American female interviewer administered an interview that assessed adolescents' sexual behaviors.

The PACS

The PACS is composed of five items that assess adolescents' self-reported frequency of communicating about sexually related topics with their parents. Specifically, adolescents were asked,

> In the past 6 months, how often have you and your parent(s) talked about the following things: (1) sex, (2) how to use condoms, (3) protecting yourself from sexually transmitted diseases (STDs), (4) protecting yourself from the AIDS virus, and (5) protecting yourself from becoming pregnant?

Each item required a response based on a 4-point Likert-type scale: 1 (*never*), 2 (*rarely*), 3 (*sometimes*), and 4 (*often*). All items were coded so that higher values indicated more frequent parent-adolescent communication.

Establishing the Validity of the PACS

Additional data were collected to determine construct validity of the PACS. Part of determining the construct validity of a measure is to assess concurrent, predictive, and discriminant validity. Evidence of concurrent validity is found when measures of constructs that theoretically or empirically should be related to each other are, in fact, observed to be related to each other at one point in time (Huck, 2000). The constructs selected were frequency of sexual communication with partner, sexual communication self-efficacy (boyfriend and new partner), family support, perceived parental knowledge, and depression, all of which have been empirically associated with parent-adolescent sexual communication in prior studies. We also selected measures of sexual behaviors that have been shown empirically to be related to parent-adolescent communication such as condom use at last sex, consistent condom use during the previous 30 days and during the previous 6 months, and frequency of vaginal intercourse in the past 30 days. It was hypothesized that PACS scores would be significantly correlated with these constructs and behavioral outcomes, providing evidence of concurrent construct validity. In predictive validity, one assesses the construct's ability to predict the future performance or behavior of something it should theoretically or empirically be able to predict (Huck, 2000). To assess predictive validity for the PACS, we tested the relationship between the PACS scores at baseline and measures previously demonstrated to be prospectively related to parent-adolescent sexual communication (i.e., condom use and sexual communication with partners) at both 6- and 12-month follow-up assessments. Convergent validity refers to the degree to which the measure of a construct is similar to (i.e., converges on) other measures that, theoretically or empirically, it should be similar to. In the absence of any validated measure(s) of parent-adolescent sexual communication, we were unable to directly compare the PACS with other measures demonstrated to assess parent-adolescent sexual communication and thus were not able to assess convergent validity. Discriminant validity refers to the degree to which the measure of the construct is not similar to (i.e., diverges from) other measures that theoretically it should not be similar to. For example, there is no theoretical or empirical basis for an association between parent-adolescent communication about sex and movie or television viewing. Thus, if correlations between the PACS and measures of frequency of viewing movies and television are indeed low, then this would be evidence for discriminant validity (Huck, 2000).

Measures

The following measures were used for the selected constructs and behaviors to establish concurrent and discriminant construct validity of the PACS.

Partner Communication Scale (PCS). The PCS is composed of five items that assess adolescents' frequency of communicating with a male sex partner (Milhausen et al., 2006a). Specifically, adolescents were asked,

> During the past 6 months, how many times have you and your sex partner discussed (1) how to prevent pregnancy, (2) how to use condoms, (3) how to prevent the AIDS virus, (4) how to prevent STDs, and (5) their male partner's sex history?

Each item required a response based on a 4-point Likert-type scale: 0 (*never*), 1 (*sometimes/1-3 times*), 2 (*often/4-6 times*), and 3 (*a lot/7 or more times*). All items were coded so that higher values indicated more frequent sexual communication. Cronbach's alpha for the scale was .80.

Sexual Communication Self-Efficacy (New Partner and Boyfriend). Sexual communication self-efficacy was assessed separately for both a new partner and for a boyfriend by a seven-item scale that used different stems (Milhausen et al., 2006b). Sample items included the following: "With a new partner (someone you are having sex with for the first time), how hard is it for you to ask how many sex partners he has had?" and "With a boyfriend or steady partner (that you have had sex with before), how hard is it for you to ask if he would use a condom?" Each item was answered with a 4-point Likert-type continuum, with responses ranging from 1 (*very hard)* to 4 (*very easy)*. Responses were coded so that higher scores indicated greater sexual communication self-efficacy. Cronbach's alpha for each administration of the scale was .79 (new partner) and .81 (boyfriend).

Family Support. Perceived family support was assessed with a four-item scale developed by Zimet, Dahlem, Zimet, and Farley (1988). The scale consisted of the following four statements: (1) My family really tries to help me, (2) I get the emotional help and support I need from my family, (3) I can talk about my problems with my family, and (4) My family is willing to help me make decisions. Adolescents indicated their level of agreement or disagreement with each statement on a 5-point Likert-type rating scale, with responses ranging from 1 (*strongly disagree)* to 5 (*strong agree)*. Responses were coded so that higher scores reflected higher levels of perceived family support by the adolescent. Cronbach's alpha for the scale was .84.

Perceived Parental Knowledge. Adolescents' perception of parental knowledge about their whereabouts was assessed by two items. Specifically, adolescents were asked (1) how often parents (or parental figures) knew where they were when they were not at home or at school and (2) how often their parents knew whom they were with when not at home or at school. Responses were provided on a 5-point Likert-type scale, with responses of 1 (*never or almost never)*, 2 (*rarely*), 3 (*sometimes*), 4 (*usually*), and 5 (*almost always)*. Adolescents who answered "almost always" or "usually" to both items were classified as adolescents with high perceived parental knowledge, and the remaining individuals were classified as adolescents with low perceived parental knowledge.

Depression. Depression was assessed with the eight-item, Center for Epidemiological Studies–Depression Scale (CES-D; Melchior, Huba, Brown, & Reback, 1993). The CES-D assesses presence of depressive symptoms in the past 7 days and has been shown to be a valid measure of depression in diverse populations, including African Americans. Sample items included the following: "During the past week I thought my life had been a failure," "During the past week my sleep was restless," and "During the past week I had crying spells." Each item was answered with a 5-point Likert-type scale with responses ranging from 0 (*less than 1 day*) to 4 (*5 to 7 days*). Responses were coded so that higher scores indicated higher levels of depressed mood. Cronbach's alpha for the scale was .82.

Condom Use. Three measures of condom use were selected. First, condom use during the last episode of vaginal sex with a steady partner was assessed. Condom use at last sex is an appropriate outcome measure because it is less susceptible to memory error (Catania, Gibson, Chitwood, & Coates, 1990). Participants were asked, "Did you use a condom the last time you had vaginal sex with your boyfriend or steady partner?" Response choices were *yes* or *no*. Second, condom use during the previous 30 days was assessed. This, too, is an adequate measure of condom use as it preserves the ratio nature of the data, as suggested by Crosby (1998), by calculating the number of times condoms were used divided by the number of times the participant had intercourse. The participants were asked, "How many times did you have vaginal sex with your boyfriend or steady partner in the last 30 days?" Following this question, participants were asked, "How many of these times did you use a condom?" Finally, condom use during the previous 6 months was assessed. Similar to condom use during the past 30 days, the ratio nature of the data was preserved by calculating the number of times condoms were used in the previous 6 months, divided by the number of times the participant had intercourse during that time period.

Frequency of Vaginal Sex in Past 30 Days (Steady Partner). Frequency of vaginal sex in the past 30 days with a boyfriend or steady partner was included as an outcome measure because previous research examining the relation between parent-adolescent communication and safer sexual behaviors has indicated an inverse relation between parent-adolescent sexual communication frequency and frequency of sexual intercourse (Hutchinson et al., 2003). Frequency of vaginal sex in the past 30 days was measured by a single item, "How many times did you have vaginal sex with your boyfriend or steady partner in the last 30 days?"

Frequency of Movie Viewing. An index of frequency of movie viewing was created by summing four items. The items shared the same item stem: "How many movies (in movie theaters or VCR tapes) have you seen in the past 3 months that were rated . . . ?" The participants were asked to write in the number of movies they had seen that were rated (a) PG, (b) PG-13, (c) R, and (d) X.

Number of Hours Spent Watching Television. An index of number of hours spent watching television was created by summing three items. The items shared the same item stem: "On average, about how many hours of television (not music videos) do you watch . . . ?" The participants were asked to write in the numbers of hours they watched television on (a) weekdays (Monday through Friday), (b) Saturdays, and (c) Sundays.

To assess predictive validity, the PACS scores at baseline were correlated with the following measures that were reassessed at the 6- and 12-month follow-up assessments: the Partner Communication Scale (i.e., frequency of safer sex related conversations with partner) and condom use in the intervening 6 months between assessments.

Data Analysis

The PACS was submitted to a Flesch-Kincaid computer analysis of its readability. Internal consistency was evaluated for the PACS by computing Cronbach's alpha for the scale using the entire sample at baseline, 6-month follow-up, and 12-month follow-up. Statistical analyses were conducted using SPSS 12.0.1. Test-retest reliability was assessed using the comparison sample by calculating Pearson correlations between scores at baseline and 6- and 12-month follow-up periods. At the 6- and 12-month follow-ups, 243 and 241 participants were in the control arm of the study, respectively. Concurrent and discriminant construct validity were assessed by calculating Pearson correlations between the PACS and other measures collected at the baseline assessment for the full sample, and predictive validity was assessed using the comparison sample by calculating Pearson correlations between the baseline scores of the PACS and selected measures that were reassessed at 6- and 12-month follow-up assessments.

RESULTS

Sample Characteristics

Participants ($N = 522$) were African American, female, single (never married), and had a mean age of 16 years ($SD = 1.2$). Most (81%) were enrolled in school full-time. The remaining participants were equally split between attending school part-time and not attending school. Three percent had not yet completed 8th grade, 17% had completed 8th grade, 28% had completed 9th grade, 24% had completed 10th grade, 24% had completed 11th grade, and 5% had completed 12th grade. The majority (83%) were currently in relationships.

Descriptive Statistics

Scores on the PACS ranged from 5 to 20, with a mean score of 14.20 ($SD = 4.79$). Scale scores were within the normal range for skewness (skewness statistic = −.58) and kurtosis (kurtosis statistic = −.85). All five items were highly, significantly intercorrelated (all interitem correlations significance levels were $p < .000$), with Pearson correlation coefficients ranging from .56 to .89. Table 1 displays the frequencies of each response for each of the five items comprising the PACS.

Psychometric Evaluation

Readability. The literacy level based on the Flesch-Kincaid assessment was 5.04, indicating that a person would need to have reached between fourth and fifth grade to understand the text. The Flesch Reading Ease score was 73 (scores range from 0 to 100, with higher scores indicating the text is easier to read).

Table 1. Frequency of Responses (in percentages) to the PACS Items ($N = 520$)

Item	Response			
	Never	Rarely	Sometimes	Often
In the past 6 months, how often have you and your parent(s) talked about the following things?				
Sex	21.6	19.2	32.4	26.8
How to use condoms	39.0	15.7	17.1	28.2
Protecting yourself from STDs	19.2	11.1	19.7	50.0
Protecting yourself from the AIDS virus	19.2	10.5	17.0	53.3
Protecting yourself from becoming pregnant	13.1	11.1	21.7	54.1

NOTE: PACS = Parent-Adolescent Communication Scale.

Internal Consistency of the PACS. Cronbach's alpha for the PACS was .88 at baseline ($N = 520$), .89 at the 6-month follow-up assessment ($N = 467$), and .90 at the 12-month follow-up assessment ($N = 447$).

Test-Retest Reliability. The intercorrelation between baseline and 6-month follow-up scores was significant ($r = .58$, $p < .001$) as was the intercorrelation between baseline and 12-month follow-up scores ($r = .53$, $p < .001$), indicating good reliability.

Concurrent Construct Validity. The PACS was correlated significantly with other measures in the predicted direction. Specifically, frequency of sexual communication with parent(s) was positively associated with frequency of sexual communication with partner, sexual communication self-efficacy (with new partner), family support, and perceived parental knowledge. In addition, the frequency of sexual communication with parent(s) was negatively associated with depression. Table 2 displays the correlation coefficients pertaining to these analyses.

The PACS was positively correlated with condom use during the previous 30 days with steady partners and condom use with steady partner during the previous 6 months. Also, the PACS was inversely correlated with frequency of vaginal intercourse with steady partner in the previous 30 days and positively correlated with condom use at last vaginal sex with steady partner.

Discriminant Construct Validity. The PACS was not significantly correlated with either the index of watching movies ($r = .005$, $p = .92$) or of watching television ($r = -.02$, $p = .71$), suggesting discriminant validity.

Predictive Construct Validity. At the 6-month follow-up interval, baseline PACS scores were positively associated with frequency of sexual communication with partner ($r = .29$, $p < .001$) and sexual communication self-efficacy with new partner ($r = .10$, $p = .015$). Also, as expected, the PACS was positively correlated with condom use during the intervening 6 months between baseline and the 6-month follow-up assessment with steady partners ($r = .13$, $p = .04$).

At the 12-month follow-up interval, baseline PACS scores were positively associated with frequency of sexual communication with partner ($r = .28$, $p < .001$) and condom

Table 2. Correlations Between the PACS, Selected Measures, and Safer Sex Behaviors at Baseline

Measure	Pearson Correlation (one-tailed)	*p*
Frequency of partner communication	.36	.001
Sexual communication self-efficacy (new partner)	.11	.005
Sexual communication self-efficacy (boyfriend)	.08	.03
Family support	.37	.001
Perceived parental knowledge	.11	.01
Depression	–.10	.01
Condom use last vaginal sex—steady partner	.08	.04
Condom use previous 30 days—steady partner	.14	.002
Condom use previous 6 months—steady partner	.12	.004
Frequency of vaginal intercourse previous 30 days—steady partner	–.08	.04

NOTE: PACS = Parent-Adolescent Communication Scale.

use during the intervening 6 months between the 6-month follow-up assessment and the 12-month follow-up assessment ($r = .15$, $p < .05$).

DISCUSSION

This study reports the psychometric evaluation of a scale to measure parent-adolescent sexual communication frequency. The PACS is a brief, self-administered scale comprising five items that is suitable for low-literate samples (requiring a fifth-grade reading level). We administered the scale to a sample of sexually active African American female adolescents. The results indicate that the PACS is a reliable measure as indicated by its satisfactory internal consistency across multiple assessment points and acceptable test-retest reliability. In addition, the PACS demonstrated construct validity by determining concurrent, predictive, and discriminant validity, indicating the PACS is also a valid measure of parent-adolescent communication about sex.

Concurrent validity of the PACS was determined by its significant correlations with scales measuring other constructs previously shown to be empirically related to parent-adolescent communication (e.g., frequency of sexual communication with partner, family support, etc.). Furthermore, the PACS was correlated with measures of sexual behaviors such as condom use. Previous studies have established a link between frequency of parent-adolescent sexual communication and condom use (Holtzman & Rubinson, 1995; Hutchinson & Cooney, 1998; Hutchinson et al., 2003; K. S. Miller et al., 1998; Whitaker & Miller, 2000). Our study found small, but statistically significant concurrent correlations between the PACS and condom use with steady partners at two time intervals (past 30 days and past 6 months). Furthermore, we found statistically significant prospective associations between the baseline PACS scores and condom use at the 6- and 12-month follow-up assessment, suggesting that the PACS has predictive utility.

Discriminant validity was found by demonstrating that the PACS was not significantly related to constructs that it should not be related to. We had no a priori reason to believe that the frequency of watching television or movies should be related to parent-adolescent communication, and in fact, there was no relationship.

Despite the apparent psychometric strengths of the PACS, this study has several limitations that must be addressed. First, only good test-retest reliability coefficients were found for the PACS ($r = .53$ between baseline and 6-month follow-up and $r = .58$ between baseline and 12-month follow-up). However, we would expect test-retest reliability to decay over time, and we consider the observed correlations to be satisfactory given the extended time periods between assessments. As data for this scale validation were collected as part of a larger HIV prevention intervention, data collection time points were established in order to best evaluate the intervention. Future research on the test-retest reliability of the PACS should include a shorter time period between administrations.

Also, two of the scales that the PACS is validated with have not yet been formally validated. However, both scales are in the process of being psychometrically assessed. Moreover, the PACS has only been used with a sexually active African American female sample. It is not certain how the measure will generalize to other racial/ethnically diverse populations or to young women who are not yet sexually active. Also, the scale comprises only five items. When considering the universe of items that theoretically should tap into this construct, there may be other aspects of parent-adolescent sexual communication that are relevant but were not included in the PACS. Next, we do not know whether reports of communication frequency refer to communication with mother or father independently or together, or the modality of communication (i.e., if the communication occurred via face-to-face interactions or in e-mails or text messaging). Finally, because the PACS is specifically designed to gain information on the frequency of parent-adolescent sexual communication from adolescents, it is inherently only gathering information about parent-adolescent communication from one source (the adolescent) and thus reflects only the adolescents' perception of the frequency of communication and does not reflect the parents' perception of communication.

Implications for Practitioners

Notwithstanding these concerns, the brief nature of the PACS may facilitate its use in a variety of research and practice settings. Specifically, after further research to establish thresholds or cutoff scores that determine risk, the PACS may be particularly useful as a screening instrument for STD/HIV intervention and prevention studies targeting high-risk adolescents. It would be feasible to administer and score the PACS quickly in order to identify adolescents who may be at especially high risk for acquiring STDs or HIV/AIDS based on their history of low parent-adolescent sexual communication. Potential participants' scores on the PACS could then be used to target and recruit adolescents most in need of intensive STD/HIV interventions.

Furthermore, emerging evidence suggests that family-level interventions may be effective at reducing adolescents' STD-associated risk behaviors (DiIorio et al., 2000; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Jemmott et al., 2000; Klein et al., 2003; Stanton et al., 2000). Family-level interventions typically promote increased communication between adolescents and parents about STD prevention. Given that family-level interventions are being implemented and that parent-adolescent communication is a primary outcome of these types of interventions, reliable and valid measures are needed to ensure that program outcomes are measured reliably and accurately so

that program effects can be determined. Thus, the PACS holds great utility as an evaluation tool in family intervention studies.

In summary, despite the limitations noted, the present study demonstrates the PACS to be a reliable and valid measure of frequency of parent-adolescent sexual communication for African American adolescent girls. Future studies using the PACS should include studies with more diverse samples in terms of race/ethnicity, gender, age, and sexual orientation to corroborate and extend its applicability.

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