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Original article

Family and friend closeness to adolescent sexual partners in relationship to condom use

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Abstract

Purpose: The role of closeness of sexual partners to family and friends (i.e., how well the participant's family and friends knew their primary sexual partner) to a variety of relationship and sexual behavior measures was explored.

Methods: A sample of 151 adolescent females (aged 14–17 years) was assessed. Areas assessed include family and friend closeness, relationship intimacy, length of sexual relationship, and condom use.

Results: Bivariate correlations indicated that the integration of the sexual partner into the family and friend networks was related to greater relationship intimacy. Lowered condom use was related to a number of measures, including increased relationship intimacy and increased family closeness. A path analysis was conducted to assess for direct and indirect effects of family closeness, friend closeness, relationship length, and relationship intimacy on condom use. Social network closeness in family and friend networks was implicated in lowered condom use through higher relationship intimacy within adolescent dyads.

Conclusions: Social network theory is useful in understanding adolescent health-related behavior. In particular, the integration of adolescent sexual partners into both family and friend networks is related to the expression of adolescent sexual behavior.

Keywords: Adolescent; Relationship intimacy; Sexual; Network

In the present study we examined the role of two sources of social influence—family and friends—on adolescent condom use, using social network theory as a point of departure. Social network theory is a promising way to explore the function of adolescent relationships on behavior. Traditional social network research has explored the link between basic social relations (i.e., family or friend group members) and the attitudes and behaviors of an individual [1]. For instance, the association between individual levels of social support from both family and friend networks was found to be related to various indices of positive adolescent adjustment [2]. Additionally, increased cigarette smoking has been related to isolation within social networks [3], and urban adolescent females who were highly connected (labeled closeness centrality in this study) to their peers were more like to be sexually experienced than peers who were less connected [4].

In this article we discuss the importance of using a social network perspective in understanding adolescent health behavior and discuss manners in which both family and friend social networks play a role in romantic relationships during adolescence. We will then clarify the manners in which extended social networks could play a role in how sexual behaviors are expressed in adolescence (through both "control" and "influence" mechanisms). Lastly, we will spend

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time discussing the importance of developing intimacy or relationship closeness during adolescence and how this concept is an important mediator in how social networks affect individual sexual behavior.

Among the social networks in which adolescents participate, family and friends are the most proximal to sexual behavior [5,6]. For instance, parental attitudes, parent-adolescent communication about sex, and sibling influences are associated with sexual behaviors and contraceptive choices [7,8]. Additionally, parents are aware of and monitor (to varying degrees) their child's interactions with friends and potential partners [9]. The degree to which parents become familiar with a partner may serve as an indicator not only of parental involvement and control but of relationship duration and stability, and a signal of relative acceptance by the family. Chaperoned school events, athletic events, provision of transportation, shared holidays, meals, and even informal "drop-in" visits are examples of opportunities for family members to become acquainted with partners. Popular literature and song chronicles the humorous and tragic influences of family on partner selection. In that same vein, the social connectedness of romantic partners among adolescents was assessed using the National Longitudinal Study of Adolescent Health (Add-Health; [10]). The majority of adolescents in a romantic relationship reported that their partners had met their parents, they had identified themselves as a couple to family and friends, and had gone out together in groups [11]. This study thus gives an important social context to adolescent romantic relationships, but does not address the relative "strength" of the connections.

The study of friend influence on the sexual decision-making of adolescents has been assessed for some time [12]. It has been shown that perceptions of friend sexual norms and behaviors clearly predict sexual behavior for adolescents [13–17]. However, the social psychological mechanisms by which friends influence an adolescent's sexual behavior have not been elucidated. One way to assess the influence of friends on individual sexual behavior is through social network phenomena. For instance, current data suggest that romantic relationships function as extensions of adolescent friend groups [18]. Additionally, romantic partnerships exist within the context of the increasing support of friendships during adolescence [19,20]. It may be that the amount of integration of romantic partners within a friend network is related to differing views of sexuality and engagement in varying levels of sexual risk behavior. Clearly, the importance of friends in the initiation and maintenance of important health behaviors has been shown within the research literature [21,22]. Hence, acceptance by or integration into the friend group may be an important mechanism that affects how sexual behavior is displayed within the relationship, even as romantic relationships become more relatively exclusive [23]. For instance, the friend group may serve as a source of information about potential partners (e.g., by reputation). Reputation may be an important aspect of partner choice and behaviors within partnerships.

In sum, adolescents' romantic relationships bring the involved partners into contact with family and friend networks. Those contacts with family and friend networks could be associated with the relative intensity of the adolescent relationships. When contacts between network members increase in frequency and intensity, there are more opportunities to influence how the relationship progresses. For example, two ways in which social networks exert social influence over behaviors and attitudes include social control and flow of pertinent information [24]. Social control of adolescent sexual behavior can occur through the specific individuals in a romantic relationship (i.e., two adolescents) as well as those who are more distant in a given network (i.e., parents and peers). Social control can include the pragmatic choices that an individual makes within a relationship (such as the time of a date) as well as the control that friends have over a relationship (such as encouraging a friend group member to date someone from a popular group of friends).

The second manner in which social influence is exerted over adolescent sexual behavior includes the flow of information. For instance, an adolescent might receive information from both family and friend members regarding the most appropriate time for coitus to occur within a relationship. This information can be passed on explicitly or in more subtle ways. Flow of information can happen through behavioral contagion [25] when a behavior is imitated even though the behavior was not originally intended to be imitated by that individual [26]. Rodgers and Rowe [27] have demonstrated such behavioral influences as important elements of adolescent sexual behavior. However, relational and social network characteristics were not assessed in those analyses. Within this study, we will explore the role of social influence through both family and friend networks.

The development and expression of sexuality is an integral aspect of the adolescent time period. Moreover, romantic and sexual relationships are a common experience of this developmental period. These initial experiences provide an important basis for subsequent relationships. Additionally, most sexual behaviors occur in the context of a social bond between two participants. As such, romantic relationships are the most salient social interaction in which sexual behaviors occur. Interpersonal relationship factors have previously been implicated in sexual behaviors and contraceptive choices [28,29]. For instance, unprotected intercourse between adolescents often takes place in a relationship considered to be "close" or "intimate" [30]. Adolescents reporting higher levels of emotional comfort and trust with a sexual partner are less likely to use a condom with that partner [28]. Similarly, condom use declines over time in adolescent sexual relationships as comfort and trust increase [31]. As a result, the overall interpersonal and social context plays a role in how adolescent sexual behavior is expressed.

In the current study, we included condom use as the outcome of interest. This was based on the rationale that behaviors within a relationship could be differentially influenced by family and friend social networks. For example, condom use tends to decline within adolescent relationships, likely as a reflection of increased trust, commitment, and assumption of monogamy [31]. Integration into the social network could serve as important social confirmation of this degree of intimacy. Although condom use is typically a private behavior associated with sex, consequences of nonuse such as pregnancy or sexually transmitted disease may be matters of public knowledge. A priori, greater social network closeness would be expected to be associated with lower levels of condom use, especially if the relationship was perceived to be relatively close and accepted by family and friends.

The primary goal of this research was to identify social network influences on condom use behaviors of adolescent women. To assess the role of friend and family networks, bivariate correlations between behavioral and attitudinal measures related to adolescent sexual behavior and relationships will be conducted. Then a path analysis will be conducted to consider the role of family and friend closeness as well as relationship intimacy on condom use. Other variables of interest were not chosen to be included in the path analysis given the relatively small number of participants.

Methods

Subjects

This study is a portion of a larger investigation of adolescent sexuality and sexual behavior. Participants were 151 adolescent females recruited from urban adolescent health clinics in a large Midwestern city. The institution's Institutional Review Board approved all procedures. Inclusion criteria included ages 14–17 years and female gender. The mean age of recruited adolescents was 16 years. The majority of adolescents identified themselves as African-American (84%), with lower rates of white (14%) and Hispanic (2%) participants. Participants received $20.00 as compensation for time and inconvenience.

Measures

Relationship characteristics. Length of relationship was calculated by asking the participant when they initially had sex with their primary partner (calculated in months). Time in months since initial coitus was used as a measure of relationship length in this study because the focus is on sexual partnerships, rather than romantic partnerships.

Relationship intimacy was assessed with a 5-item scale (α = .92). Items that assess relationship intimacy include "We have a strong emotional relationship." and "We enjoy spending time together." A 4-point Likert scale was used (1 = strongly disagree; 4 = strongly agree). This scale addresses issues similar to "intimacy" constructs identified in other research related to relationship quality [32]. Prior research shows that the scale is associated with several relationship variables such as condom use and notification of sexual partners about potential sexually transmitted infection [28,31].

Sexual partner identification. In a structured interview, the participants were asked to identify a primary sexual partner. Participants were read the following text to identify their sexual partners. "Now we'd like to know about your sex partners. Think about the people you have had sex with in the past 2 months. When I say sex, I mean any of the kinds of sexual contact mentioned a few minutes ago (description of contact from holding hands to coitus), even if you have not had sexual intercourse. If there is someone you haven't had sex with in a while but is still important to you, you can list him also." The participants were asked to identify up to five partners. For the current study, only the primary sexual partner was used in the following analyses.

Social network closeness. Social network closeness was assessed by asking participants how well their friends (up to seven identified friends) and family members (6 members; mother, father, grandmother, sister, brother, cousin) knew the primary sexual partner (1 = don't know each other at all, 2 = know each other some, 3 = know each other very well). Social network closeness was calculated by dividing the total possible connections (number varied depending on number of friends/family members identified by participant) by total connections per participant (varied between .00 = no connections to sexual partner to 1.00 = all network members know partner very well). This measure reflects the social network analysis concept of "density," defined as "... the extent to which all possible relations are actually present" ([33], p. 32).

For example, a participant who identifies three friendships has a possible denominator of 9. If each friend identifies knowing the sexual partner "some" the resulting nominator is 6. Hence, the friend network closeness for this participant is .66. Two separate measures of closeness are then calculated, one for friends and one for families. The term "friend/partner closeness" will be used to refer to the network measure of how close the sexual partner was to the participant's friends. "Family/partner closeness" will be used to refer to degree of closeness between the sexual partner and the participant's family.

Coitus and condom use. Participants were asked to estimate the number of sexual encounters over the past 2 months with the sexual partner ("In the past 2 months, how many times did you have sex with your partner?"). Condom use was calculated by asking the participant how often they used a condom in the past 2 months based on the number of coital events ("How many of these times did you use a condom with your partner?"). Thereafter, a variable was

Table 1
Means, standard deviations, and correlations among variables (N = 151, except for condom use, n = 108)

Variables	Mean (Standard deviation)	1	2	3	4	5
Friend/Partner Closeness	.66 (.34)		.37**	.28**	.05	−.12
Family/Partner Closeness	.51 (.29)			.39**	.03	−.26**
Relationship Intimacy	18.9 (3.9)				.23**	−.28**
Relationship Length	7.1 (12.0)					−.36**
Condom use, %	0.64 (.43)					

*Correlation significant at the 0.05 level; **Correlation significant at the 0.01 level.

created based on the proportion of condom-protected coital events to total number of coital events in the past 2 months (range from .00 with no condom use to 1.00 with a condom used at every coital event).

Statistical Analyses

The results are presented in two sections. First, the relationship characteristics of the sample are described and bivariate correlations between the social network, attitudinal and behavioral measures are presented. Second, the path analysis is presented that assesses associations of friend/partner closeness, family/partner closeness, relationship intimacy, and relationship length with condom use. The path analysis was conducted using an asymptotic covariance matrix generated by LISREL 8.5 [34] because matrices calculated from polychoric correlations, in comparison with Pearson correlations, are more consistent estimators of sample parameters with ordinal level measures [35]. However, reported correlations within the text and Table 1 are Pearson correlations. A measurement model was generated using the weighted least squares estimation procedure for the single-item measures (family/partner and friend/partner closeness, condom use, relationship length) and the latent variable (relationship intimacy). A weighted least squares estimation method was used because the number of subjects was relatively small [34,36]. Model fit was assessed through three measures. The first was the likelihood ratio chi-square measure of fit, which should be small and nonsignificant [35]. The second was a ratio of chi-square to degrees of freedom, which is a rough estimate of fit. Last, the Root Mean Square Error of Approximation (RMSEA) is a measure of discrepancy between the model and degrees of freedom. Values of 0.05 or below represent close fit to the original data set [37].

Results

On average, participants identified three friends (mean = 2.6, SD = 1.5) and five family members (mean = 4.5; SD = 1.7). When calculated, the friend/partner closeness mean was .66 (SD = .33) and the family/partner closeness mean was .52 (SD = .29). The average number of months since first coitus with the primary partner was 7 months (range 1–48 months; mean = 7.1; SD = 12.0).

Average number of coital events with their primary sexual partner during the past 2 months was eight (mean = 7.7, SD = 14.3) with a mean of 60% of coital events being protected with a condom.

The primary sex partner's closeness to family and to friends were significantly correlated ($r = .37$, $p < .001$). Relationship intimacy was significantly correlated with family/partner closeness ($r = .39$, $p < .001$), friend/partner closeness ($r = .28$, $p < .001$) and condom use ($r = -.28$, $p < .001$). Friend/partner closeness was uncorrelated with condom use but family/partner closeness was significantly correlated ($r = -.26$, $p < .001$). See Table 1 for a review of means and Pearson product-moment correlations for the independent measures.

The path analysis was conducted to assess for direct and indirect effects between the variables. The participant total for the path analysis was 108 because adolescent females who have never had coitus were excluded (18 participants, 12% of sample) and adolescents who had not engaged in coitus in the last 2 months, although they may have engaged in other sexual behaviors with their partners, were similarly excluded (25 participants, 17% of the sample). Thereafter, a covariance matrix was created with the measures of friend/partner closeness, family/partner closeness, and condom use, as well as the five items assessing relationship intimacy. LISREL 8.5 [34] was the path analysis program that was used in the following analyses. The five items assessing relationship intimacy were found to load significantly on the created latent variable of relationship intimacy. In sum, the measurement model was a good fit for the data (chi-square = 12.98, df = 13, $p = .44$, RMSEA = 0.00). The chi-square likelihood ratio of fit is small and nonsignificant, the ratio of chi-square to degrees of freedom is roughly equal, and the RMSEA is well below 0.05.

The model tested for direct effects of friend/partner, family/partner closeness and relationship length on condom use as well as indirect effects of friend/partner, family/partner closeness and relationship length on condom use through relationship intimacy (see Figure 1 for pictorial display of model and standardized path coefficients). The model fit the data well (chi-square = 26.84, df = 28, $p = .53$, RMSEA = 0.000). Longer relationship length was directly related to higher family/partner closeness, higher

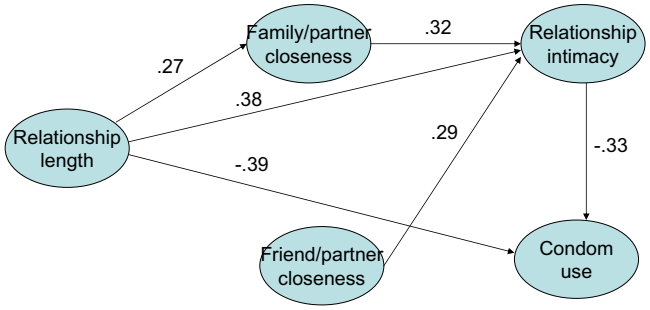

Fig. 1. Family and friend closeness on condom use. Chi-square = 26.84, df = 28, p value = .53, RMSEA = .000.

relationship intimacy, and lowered condom use. Increased family/partner and friend/partner closeness were related to higher relationship intimacy. Lastly, the role of relationship intimacy on condom use was noted to be significant. Hence, the indirect effect of family/partner and friend/partner closeness on condom use through relationship intimacy was significant.

Discussion

These analyses show that aspects of adolescent women's sexual behavior—condom use—are directly influenced by the duration of a specific sexual relationship. Relationship duration is also directly associated to the relationship intimacy measure. Social network closeness–both friend and family–with the primary sex partner were also associated with relationship intimacy. Relationship intimacy was negatively associated with condom use.

The complex associations of condom use to relationship characteristics and social network variables suggest interesting explanations. These findings are consistent with other data showing that adolescent condom use declines with time, especially in primary or "established" relationships [28,31]. Rather than conceiving of lowered condom use as a "risk" behavior in the context of a relationship, lowered condom use could equally be conceived as a "trust" behavior. The indirect associations of social network measures—via relationship intimacy—support the hypothesis that social networks may influence adolescent sexual behaviors by a process of social control. The association of these social network measures to relationship intimacy thus represents a degree of acceptance by key members of the adolescent's family and friends [24]. Of course, this does not suggest direct knowledge of the sexual aspect of a couple's relationship by either friends or family members. Interestingly, relationship length was directly associated with family/partner closeness but not friend/partner closeness (see Figure 1). It may be that friend/partner closeness is more relevant during the early phases of adolescent sexual relationships. In the relatively long-lived relationships represented in the current study, connections to the adolescent's family are represented by the higher levels of relationship intimacy.

Limitations

The results of this investigation should be interpreted with a number of caveats in mind. First, this sample was composed of adolescent females from an urban environment. The experience of this sample may well be fundamentally different for those in other settings. Additionally, this study did not employ measures taken from the sexual partners. Rather, information regarding the sexual partner was collected from the participant. This data collection may have produced self-report errors. With that said, we do have a good picture regarding the participant's view of their relationship and network closeness of the partner. The current study is focused on the primary sexual partner. However, many participants reported other partners in the past 2 months. In fact, 60% of the sample had two or more sexual partners in the last 2 months. The number of sexual partnerships will obviously influence risk of adverse health outcomes, such as sexually transmitted infections. Given the obvious importance of sexual relationships to disease acquisition and other relationship oriented factors (i.e., dating violence, rape), future studies should include assessments of multiple sexual relationships. Lastly, much of the literature cited within the introduction is from the field of developmental psychology, which has focused primarily on romantic relationships during adolescence rather than sexual relationships, which has been the focus of research in the public health field. There may well be distinct differences between these two groupings of adolescent relationships. Our assumption is that the groups overlap, with the majority of sexual relationships in adolescents also being romantic partners.

Our results suggest a number of directions for future research. The utility and importance of assessing social networks is highlighted. Measures of network closeness are a novel approach and were useful in providing a broader picture of adolescent sexuality. Future research should continue to explore the developmental character of family/partner and friend/partner closeness and specific relationships to development of sexual behavior within the dyad. Additionally, data collection from a number of participants (sexual partner, friends, and family) would be useful to explore their perceptions and how their perception/influence modifies certain sexual behaviors and attitudes. Lastly, further exploration on definitional issues related to romantic and/or sexual partnerships with adolescent populations are merited.

This research study is novel in the focus on a number of different domains during adolescence (i.e., social networks, relationship factors, sexual behaviors, and sexual attitudes). The results highlight the importance of taking a broad, contextual view of the adolescent development as it applies to sexual behavior.

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References

[1] Marsden PV, Friedkin NE. Network studies of social influence. In: Wasserman S, Galaskiewicz J, eds. Advances in Social Network Analysis. Thousand Oaks, CA: Sage, 1994:3–25.

[2] Cauce AM, Mason C, Gonzales N, et al. Social support during adolescence: methodological and theoretical considerations. In: Nestmann F, Hurrelman K, eds. Social Networks and Social Support in Childhood and Adolescence. New York: Walter de Gruyter, 1994: 90–108.

[3] Ennett ST, Bauman KE. Peer group and adolescent cigarette smoking: a social network analysis. J Health Soc Behav 1993;34:226–36.

[4] Ellen JM, Dolcini MM, Bir ND, et al. Social network centrality and sexual experience among a household sample of urban African American adolescents. Connect 2001;24:76–81.

[5] Connolly J, Goldberg A. Romantic relationships in adolescence: the role of friends and peers in their emergence and development. In: Furman W, Brown BB, Fiering C, eds. The Development of Romantic Relationships in Adolescence. Cambridge, UK: Cambridge University Press, 1999:266–90.

[6] Gray MR, Steinberg L. Adolescent romance and the parent-child relationship: a contextual perspective. In: Furman W, Brown BB, Fiering C, eds. The Development of Romantic Relationships in Adolescence. Cambridge, UK: Cambridge University Press, 1999:235–65.

[7] Jaccard J, Dodge T, Dittus P. Maternal discussions about pregnancy and adolescents, attitudes toward pregnancy. J Adolesc Health 2003; 33:84–7.

[8] Metzler CW, Noell JW, Biglan A, et al. The social context for risky sexual behavior among adolescents. J Behav Med 1994;17:419–38.

[9] Huebner AJ, Howell LW. Examining the relationship between adolescent sexual risk-taking and perceptions of monitoring, communication, and parenting styles. J Adolesc Health 2003;33:71–8.

[10] Bearman PS, Jones J, Udry JR. The national longitudinal study of adolescent health: research design. Available from: http://www.cpc.unc.edu/projects/addhealth/design.html 1997. Accessed April 13, 2003.

[11] Carver K, Joyner K, Udry JR. National estimates of adolescent romantic relationships. In: Florsheim P, ed. Adolescent Romantic Relations and Sexual Behavior: Theory, Research, and Practical Implications. Mahwah, NJ: Lawrence Erlbaum, 2003:23–56.

[12] Hofferth SL, Hayes CE Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing. Washington DC: National Academy of Science, 1987.

[13] DiClemente RJ. Adolescents and AIDS: current research, prevention strategies and public policy. In: Temoshok L, Baum A, eds. Psychological Aspects of AIDS and HIV Disease. Hillsdale, NJ: Lawrence Erlbaum, 1990;52–64.

[14] DiClemente RJ. Predictors of HIV-preventive sexual behavior in a high-risk adolescent population: the influence of perceived peer norms and sexual communication on incarcerated adolescent adolescents' consistent use of condoms. J Adolesc Health 1991;12:383–90.

[15] Holtzman D, Robinson R. Parent and peer communication effects on AIDS-related behavior among U.S. high school students. Fam Plann Perspect 1995;27:235–40, 268.

[16] Romer D, Black M, Ricardo I, et al. Social influences on the sexual behavior of youth at risk for HIV exposure. Am J Public Health 1994;84:977–85.

[17] Whitaker L, Millstein SG. Parent-adolescent discussions about sex and condoms: impact on peer influences of sexual risk behavior. J Adolesc Res 2000;15:251–73.

[18] Brown BB. "You're going out with who?" Peer group influences on adolescent romantic relationshipsIn: Furman W, Brown BB, Feiring C, eds. The Development of Romantic Relationships in Adolescence. Cambridge, UK: Cambridge University Press, 1999;291–329.

[19] Buhrmester D, Furman W. The development of companionship and intimacy. Child Dev 1997;58:1101–13.

[20] Connolly J, Goldberg A. Romantic relationships in adolescence: the role of friends and peers in their emergence and development. In: Furman W, Brown BB, Fiering C, eds. The Development of Romantic Relationships in Adolescence. Cambridge, UK: Cambridge University Press, 1999;266–90.

[21] Curran PJ, Stice E, Chassin L. The relation between adolescent alcohol use and peer alcohol use: a longitudinal random coefficients model. J Consult Clin Psychol 1997;65:130–40.

[22] Hundleby JD, Mercer GW. Family and friends as social environments and their relationship to young adolescents' use of alcohol, tobacco, and marijuana. J Marriage Fam 1987;49:151–64.

[23] Connolly JA, Johnson AM. Adolescents' romantic relationships and the structure and quality of their close interpersonal ties. Pers Relatsh 1996;4:1–14.

[24] Youm Y, Laumann EO. Social network effects on the transmission of sexually transmitted diseases. Sex Transm Dis 2002;29:689–97.

[25] Lippitt R, Polansky NA, Rosen S. The dynamics of power: a field study of social influence in groups of children. Hum Relatsh 1952; 5:37–64.

[26] Polansky NA. On the dynamics of behavioral contagion. Group 1952;14:3–8.

[27] Rodgers JL, Rowe DC. Social contagion and adolescent sexual behavior: a developmental EMOSA model. Psychol Assess 1993;100: 479–510.

[28] Katz BP, Fortenberry JD, Zimet GD, et al. Partner-specific relationship characteristics and condom use among young people with sexually transmitted diseases. J Sex Res 2000;37:69–75.

[29] Misovich SJ, Fisher JD, Fisher WA. Close relationships and elevated HIV risk behavior: evidence and possible underlying psychological processes. Rev Gen Psychol 1997;1:72–107.

[30] Keller ML. Why don't young adults protect themselves against sexual transmission of HIV? Possible answers to a complex question. AIDS Educ Prev 1993;5:220–33.

[31] Fortenberry JD, Tu W, Hareziak J, et al. Condom use as a function of time in new and established adolescent sexual relationships. Am J Public Health 2002;92:211–3.

[32] Hassebrauck M, Fehr B. Dimensions of relationship quality. Pers Relatsh 2002;9:253–70.

[33] Scott J. Social Network Analysis: A Handbook. Newbury Park, CA: Sage, 1991.

[34] Joreskog KG, Sorbom D. LISREL 8.5: Structural equation modeling with SIMPLIS command language. Hillsdale, NJ: Lawrence Erlbaum, 2001.

[35] Bollen KA. Structural Equations with Latent Variables. New York, NY: Wiley, 1989.

[36] Byrne BM. Structural Equation Modeling with LISREL, PRELIS and SIMPLIS. Mahwah, NJ: Lawrence Erlbaum, 1998.

[37] Browne MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, eds. Testing Structural Equation Models. Newbury Park, CA: Sage, 1993;136–62.