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Positive and Negative Aspects of Relationship Quality and Unprotected Sex among Young Women

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Abstract

The aim of this study was to examine both positive and negative aspects of relationship quality in relation to condom use. Sexually active young women aged 14–18 years ($n=111$; 34% non-white) were recruited from community clinics and schools in the Midwest USA and provided data via an online survey. The number of unprotected sex acts in the past month with the most recent male partner was regressed on relationship quality with that partner, adjusting for demographics and other characteristics. Negative relationship quality was associated with a greater number of unprotected sex acts among women reporting a low level of positive relationship quality and among women taking hormonal/IUD contraception. Positive relationship quality was associated with unprotected sex among women who reported multiple partners in the past month. Both positive and negative aspects of relationship quality may confer risk for unprotected sex. This risk appears modified by patterns of contraceptive use and other sexual behaviours. Health professionals may be more effective in promoting condom use if they ask questions about both positive and negative aspects of young people's relationship quality and tailor their conversations based on the responses received.

Keywords

relationship quality; emotional abuse; condom use; young women, USA

Introduction

Roughly half of incident sexually transmitted infections (STIs) in the United States are among youth (Weinstock, Berman & Cates, 2004), highlighting the importance of consistent condom use. Only 60% of sexually active young people in grades 9–12 report using a condom during their last sexual intercourse (CDC, 2012). Of young people aged 15–19 years who do use condoms, nearly 1/5 of women and 14% of men report using them inconsistently (Martinez, Copen, & Abma, 2011). Relationship quality with a sexual partner has been linked to the likelihood that adolescents and young adults will consistently use a condom with that partner. Both positive and negative aspects of relationship quality are

associated with lower levels of condom use (Alleyne, Coleman-Cowger, Crown, Gibbons, & Vines, 2011; Brady, Tschann, Ellen, & Flores, 2009; Katz, Fortenberry, Zimet, Blythe, & Orr, 2000; Manning, Flanigan, Giordano, & Longmore, 2009; Pulerwitz, Amaro, De Jong, Gortmaker, & Rudd, 2002; Raiford, DiClemente, & Wingood, 2009; Sayegh, Fortenberry, Shew, & Orr, 2006; Silverman, Raj, & Clements, 2004; Teitelman, Ratcliffe, Morales-Aleman, & Sullivan, 2008; Wingood, DiClemente, McCree, Harrington, & Davies, 2001; Woodrome, Zimet, Orr, & Fortenberry, 2006). This suggests that different relationship characteristics may influence young people's motivation to use condoms or their ability to negotiate condom use with partners.

Separate conceptual frameworks have been developed to understand mechanisms by which positive and negative aspects of relationship quality may influence condom use among adults. These frameworks are relevant to young people because patterns of interaction and condom use with partners may have their origins in youth. Furthermore, empirical data collected from samples of young people support frameworks that were developed to explain patterns of condom use among adults. Harvey and colleagues (2006) integrated different theories of health behaviour change to propose a framework in which commitment between partners, a positive relationship characteristic, impacts on intentions to use condoms through different pathways. In support of the framework, a study of ethnically diverse women aged 18–25 years demonstrated that commitment was linked with lower intention to use condoms through lower perceived vulnerability to STIs and less favourable attitudes toward condom use (Harvey et al., 2006). Weaker paths linked commitment to *greater* intention to use condoms through greater condom use decision-making and more favourable norms for partners to use condoms. The latter finding suggests that positive relationship quality need not always lead to condom non-use. In ethnically diverse samples of young people, different facets of positive relationship quality have been associated with self-reported unprotected sex acts. These facets include greater overall trust in one's partner (Brady et al., 2009); a composite of different aspects of positive relationship quality (intimate self-disclosure, time spent together, passionate love, relationship importance; Manning et al., 2009); and overall positive relationship quality (e.g., *my partner is very important to me; I enjoy spending time with my partner*; Sayegh et al., 2006). In the latter study, positive relationship quality was associated with lower levels of condom use at enrollment, but did not predict changes in condom use over a 27-month period. The authors suggested that positive relationship quality can set patterns of condom use early in a relationship.

Frameworks also exist to explain why negative aspects of relationship quality are associated with unprotected sex. Over 35 years ago, Kelley and Thibaut (1978) reviewed the literature establishing that women have traditionally been more psychologically, economically, and socially dependent than men in the context of heterosexual relationships. The theory of Gender and Power, described by Connell (1987), further highlighted inequities in sexual division of labour, power, and emotional attachment. Several scholars have discussed the implications of gender-based inequities for women's control over their sexuality and contraception (e.g., Buffardi, Thomas, Holmes, & Manhart, 2008; Connell, 1987; Tschann, Adler, Millstein, Gurvey, & Ellen, 2002; Wingood & DiClemente, 1998). Wingood and DiClemente (1998) suggested that women's dependence on men leads to an imbalance of power, which can lead women to have low self-efficacy for negotiation of condom use.

Similarly, Buffardi and colleagues (2008) proposed a framework that includes relationship abuse as an ecosocial factor that undermines condom use through increased dependence and reduced access to support networks, as well as desensitisation to risk.

In support of frameworks that highlight gender-based inequities or abuse, different facets of negative relationship quality have been linked with less consistent condom use in ethnically diverse samples of adults and young people. In studies of adults, these facets include lack of power (Pulerwitz et al., 2002); perception of a partner's resistance to condom use (Wingood & DiClemente, 1998); low assertiveness in negotiating condom use (Wingood & DiClemente, 1998); and experience of verbal or physical abuse from a partner when asking to use a condom (Wingood & DiClemente, 1998). These findings extend to studies of young people. Facets of negative relationship quality linked with less consistent condom use include a composite of negative characteristics (controlling behaviour, conflict, partner mistrust, perceived partner inferiority, jealousy; Manning et al., 2009); physical abuse from dating partners (Alleyne et al., 2011; Silverman et al., 2004; Wingood et al., 2001); overall exposure to dating violence (e.g., physical, verbal, or emotional abuse; Teitelman et al., 2008); and fear of physical, verbal, or emotional abuse if one were to attempt condom use (Raiford et al., 2009). Young people who experience physical abuse from their dating partners are also more likely to be diagnosed with an STI (Decker, Silverman, & Raj, 2005; Wingood et al., 2001) in comparison to non-abused youth. Thus, a variety of aspects of negative relationship quality may undermine condom use and place young people at risk for contraction of STIs.

Positive and negative relationship quality characteristics are not mutually exclusive or at opposite ends of a continuum. It is conceivable that young people may become involved in relationships that are high in both positive and negative relationship quality, low in both indices of quality, or high in one index and low in the other. Despite this possibility, most empirical research to date has focused on either positive or negative relationship quality in relation to condom use. In an exception, Manning and colleagues (2009) created composites of positive and negative relationship quality and found that they were independently associated with less consistent condom use among youth. Manning and colleagues did not test for an interaction between positive and negative relationship quality. In other words, they did not examine whether one aspect of relationship quality (e.g., positive characteristics) moderated the effect of the other (e.g., negative characteristics) on condom use. This question is of both conceptual and practical importance. For example, negative characteristics of a relationship (e.g., emotional abuse) may be associated with condom use in different ways or to different degrees, depending on whether positive characteristics are present in the relationship.

With the exception of gender (Alleyne et al., 2011; Brady et al., 2009; Katz et al., 2000; Manning et al., 2009), and race/ethnicity (Alleyne et al., 2011), past research has not examined how demographic characteristics and other conceptually important covariates (e.g., hormonal/IUD contraception, monogamy, multiple partners) may moderate associations between positive or negative aspects of relationship quality and unprotected sex. Manning and colleagues (2009) found that conflict was associated with less consistent condom use among females, with no association among males. They tested for, but did not

find interactions between gender and different components of positive relationship quality. Similarly, Brady and colleagues (2009) observed no interaction between gender and trust with respect to number of unprotected sex acts. However, in a predominantly African American sample of young people aged 13–24 years who were being treated for an STI, positive relationship quality was associated with less consistent condom use among men, with no association among women (Katz et al., 2000). Alleyne and colleagues (2011) observed no interaction between dating violence and gender with respect to consistency of condoms use; associations between dating violence and inconsistent condom use were observed among White, but not African American or Latino youth. These findings suggest that specific subgroups of young people may be more vulnerable to inconsistent condom use as a function of negative or positive relationship quality.

Messages encouraging consistent condom use may have the greatest likelihood of changing behaviour if these messages are tailored to fit the quality of relationship a young person is experiencing. The present study examines whether positive and negative aspects of relationship quality interact in their association with unprotected sex among young women aged 14–18 years and their male partners. In addition, demographics, hormonal/IUD contraceptive use, monogamy, and multiple partners within the past month are examined as potential moderators of associations between different aspects of relationship quality and unprotected sex. Based on theory and previous literature, it was hypothesised that both higher positive relationship quality and higher negative relationship quality would be associated with a higher number of unprotected sex acts. No hypotheses with respect to interactions were posed due to limited work in this area.

Methods

Procedure

The University of Minnesota Institutional Review Board approved this research. A federal certificate of confidentiality was obtained.

Data were collected prior to a feasibility and pilot study of *TeensTalkHealth*, an interactive sexual health website designed to promote condom use and healthy relationships. With assistance from three community clinics and three schools, flyers describing the study were distributed to and collected from 1266 young people between January and October, 2011. Young people were asked to provide non-identifying demographic information (age, biological sex, race/ethnicity), indicate whether they were interested in the study, and (if interested) provide contact information. On 682 flyers, young people indicated interest and provided contact information. Research staff fully screened 438 potential study participants over the telephone. Eligibility criteria included being aged 14–18 years, inclusive; having engaged in vaginal or anal sex at least once in the past three months; and using the Internet at least twice a week for at least two hours total (due to the web-based modality of the intervention). Exclusion criteria included graduating from high school prior to spring 2011 and being pregnant at the time of the screening. After screening, 313 (71%) of 438 young people were eligible to participate. Of this number, 157 (50%) were enrolled in-person. Young people aged 18 years provided consent, while those aged 14–17 years provided assent and parents/legal guardians provided consent. During enrollment, young people selected a

non-identifying username and password that they could use to logon to the website to complete monthly surveys and, if they were assigned to the intervention condition, to access intervention content. After enrollment, 147 completed the baseline survey from which data is analysed in the present study; 132 participants (90%) were female.

For the present study, data from female participants who reported having had vaginal or anal sex in the past month ($n=113$) were analysed. Women who reported that their most recent partner was female ($n=2$) were excluded from analyses, due to the nature of how vaginal sex ('penis in vagina') and anal sex ('penis in butt') were defined. This limited the sample to 111 young women.

Measures

Unprotected Sex Acts—This risk composite was calculated by multiplying the number of times a participant reported she had vaginal sex with her most recent partner in the past month (a count) by how often she reported using condoms when having vaginal sex with that partner (a frequency). Frequency of condom use for vaginal sex was coded using a 5-point scale: 1 (never), 0.75 (less than half of the time), 0.5 (about half of the time), 0.25 (more than half of the time), 0 (always). This coding was chosen to indicate the approximate proportion of unprotected sex acts. A similar risk composite was created for anal sex. The vaginal and anal unprotected sex products were summed to create a final risk composite, which estimates number of unprotected sex acts during the past month.

Relationship Quality—Both positive and negative aspects of relationship quality were examined. Positive relationship quality has been defined in different ways in the literature, but uniformly features positive interpersonal constructs such as love, closeness, commitment, intimacy, and trust. In the present study, positive relationship quality was assessed through 5 items developed by Fortenberry and colleagues to evaluate positive emotional and affiliative aspects of a relationship (e.g., 'I have a strong emotional relationship with Partner 1'; 'I enjoy spending time with Partner 1'; $\alpha=.89$) (Katz et al., 2000; Sayegh et al., 2006). Items were rated on a 4-point scale with values of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree); a composite was formed by averaging across items.

Negative relationship quality has been defined in different ways in the literature, but uniformly features negative interpersonal constructs such as inequitable power, mistrust, conflict, and partner abuse. In the present study, negative relationship quality was assessed through 7 items from Wolfe and colleagues' Verbal and Emotional Abuse subscale of the Conflict in Adolescent Dating Relationships Inventory (e.g., 'Does Partner 1 insult you with put-downs?'; 'Does Partner 1 threaten to end the relationship?'; $\alpha=.78$) (Wolfe, Wekerle, Reitzel-Jaffe, & Lefebvre, 1998). Items were rated on a 4-point scale with values of 1 (never), 2 (once in a while), 3 (sometimes), and 4 (often); a composite was formed by averaging across items.

Hormonal/IUD Use—Hormonal contraceptive use or intrauterine device (IUD) use with the most recent partner was treated as a dichotomous variable (1=use of either; 0=non-use).

Participants who reported emergency contraceptive use in the absence of hormonal/IUD use received a value of 0.

Monogamous Relationship—Participants were asked, “Which of these best describes your current relationship?” A response of “going out *only* with each other” was classified as monogamy and assigned a value of 1. The following responses were assigned a value of 0: no relationship, acquaintances, friends, going out and we both see other people, going out and I see other people (my partner only sees me), going out and my partner sees other people (I only see my partner).

Multiple Partners—Sexual behaviour during the past month with up to three partners was assessed. Women who reported second or third partners were assigned a value of 1. The remaining participants were assigned a value of 0. Of note, having multiple sexual partners during the past month does not necessarily signify non-monogamy, as it is possible for young people to frame multiple short-term relationships as still “going out *only* with each other” (i.e., serial monogamy).

Analytic Plan—SPSS version 22 for Windows was used to conduct analyses. Preliminary analyses examined distributions of and correlations between variables. Generalised Linear Model (GLM) regressions were conducted with a log link and selected gamma distribution. Gamma regression, a member of the family of Generalised Linear Models (Nelder & Wedderburn, 1972), is a generalisation of ordinary linear regression that allows for response variables to have distributions other than normal, and for the mean response to equal some transformation of the linear predictor. The gamma distribution better matched the distribution of unprotected sex acts than the normal distribution; therefore, we applied a log-linear gamma regression model. Prior to regression analyses, a small constant (0.05) was added to the outcome variable, unprotected sex acts, as the logarithm of zero is not defined. Sandwich variance estimation (i.e., robust covariance matrix) was used in calculating confidence intervals and *p*-values. Main effects of positive and negative relationship quality and covariates were examined in a fully adjusted model. Potential moderation of associations between relationship quality and unprotected sex acts were examined for all covariates, including age in years, race/ethnicity (1=non-white; 0= white), hormonal/IUD use, monogamous relationship, and multiple partners. The potential interaction between positive and negative relationship quality was also examined. *P*-values less than .05 are considered significant.

In addition to the formation of continuous relationship quality variables, the composite values of positive relationship quality and negative relationship quality were dichotomised to allow for analysis of potential threshold effects. Dichotomisation was based on the distribution of each relationship quality variable among the analytic sample, with the aim of being as close to each median as possible. In the absence of a significant association between a continuous relationship quality variable and unprotected sex, a significant association between the corresponding dichotomous relationship quality variable and unprotected sex would provide support for a potential threshold effect. In other words, relationship quality would not be associated with unprotected sex in a linear, dose-response fashion. Instead, a specific level of relationship quality (i.e., high positive relationship

quality or high negative relationship quality) would appear sufficient to influence the behaviour of unprotected sex.

Results

The mean age of young women in the analytic sample was 17.6 (SD=1.1) years. Participants provided open-ended responses to questions assessing race and ethnicity that were coded as follows: White (66%), More than one race (15%), Asian, Asian American or Pacific Islander (7%), Black/African American or African (7%), Hispanic (4%), Native American/American Indian (1%). Thus, one-third of young women reported a non-white race/ethnicity. Seventy-seven percent of participants reported hormonal or IUD contraception use with their partner; 62% reported going out *only* with each other (i.e., monogamy); 18% reported one or more additional partners in the past month.

Table 1 contains the means and standard deviations for positive and negative relationship quality variables, as well as the minimum, 25th percentile, median, 75th percentile, and maximum values for each variable. Mean (3.6) and median (3.8) perceptions of positive relationship quality were high on the 4-point scale, while mean (1.5) and median (1.3) perceptions of negative relationship quality were low. Rather than creating dichotomous relationship quality groups by partitioning at the median for both positive and negative relationship quality variables, groups were created with the aim of being as close to the median as possible, while also clustering women together when they seemed similar with respect to their pattern of responses. Distributions for each variable showed a cluster of young women at the three highest values for positive relationship quality and the three lowest values for negative relationship quality. Relationship quality values for other women trailed away from these clusters into the tails of each distribution. To be coded into the high positive relationship quality group, women's composite value had to be 3.6 or greater. After dichotomisation, 71% of women were categorised into the high positive relationship quality group. To be categorised into the high negative relationship quality group, women's composite value need only be 1.3. After dichotomisation, 45% of women were categorised into the high negative relationship quality group.

A cross tabulation showed that membership to positive and negative relationship quality groups were not associated with one another (Chi-Square=.45, n.s.). Table 2 shows that 45 young women (40.5%) were in relationships characterised by high levels of positive relationship quality and low levels of negative relationship quality (HP/LN); 34 women (30.6%) were in relationships characterised by high levels of both positive and negative relationship quality (HP/HN); 16 women (14.4%) were in relationships characterised by low levels of positive relationship quality and high levels of negative relationship quality (LP/HN); 16 women (14.4%) were in relationships characterised by low levels of both positive and negative relationship quality (LP/LN). Membership to the four overall relationship quality groups did not vary by age, race/ethnicity, hormonal/IUD contraception, or having multiple partners. However, group membership did vary by monogamy (interaction term $B = -2.37$, 95% CI = $-4.30, -0.44$). The HP/LN relationship quality group was more likely to contain young women in monogamous relationships in comparison to the LP/LN group

(positive relationship quality $B=3.13$, 95% CI=1.64, 4.62). The HP/HN relationship quality group was no different from the LP/HN group with respect to monogamy.

All women reported engaging in vaginal sex at least once in the past month; 8% reported engaging in anal sex. Table 1 contains the mean and standard deviation for calculated number of unprotected sex acts in the past month, as well as the minimum, 25th percentile, median, 75th percentile, and maximum. The calculated variable estimating the number of unprotected sex acts in the past month was positively skewed, ranging from 0 to 45. Over 25% of participants had a value of zero; the median value was 2. This distribution justified the decision to conduct regressions with a log link and selected gamma distribution.

Table 3 contains bivariate (unadjusted) correlations between study variables. Report of hormonal/IUD contraception and a monogamous relationship were associated with a higher number of unprotected sex acts. Older women, those women using hormonal/IUD contraception, and those women categorised to the high positive relationship quality group were more likely to report a monogamous relationship. Women who reported multiple partners in the past month were less likely to report a monogamous relationship.

Main Effects of Study Variables on Number of Unprotected Sex Acts

Continuous relationship quality variables were not associated with unprotected sex acts in regression analyses. For this reason, results reported below are from regression analyses that utilised dichotomous relationship quality variables. In the fully adjusted linear regression model, white race/ethnicity, being in a monogamous relationship, having multiple partners in the past month, and having high negative relationship quality were independently associated with higher numbers of unprotected sex acts (see Table 4).

Interaction Tests

Three interactions were found to be significant. Positive and negative relationship quality interacted in their association with unprotected sex (see Table 4). As shown in Figure 1, negative relationship quality was associated with a higher number of unprotected sex acts among both young women who reported a low level of positive relationship quality ($B=1.73$, 95% CI=0.60, 2.86) and those who reported a high level of positive relationship quality ($B=0.51$, 95% CI=0.02, 1.01). However, this association was more pronounced among young women who reported a low level of positive relationship quality. The LP/LN relationship quality group engaged in the lowest numbers of unprotected sex acts relative to all other groups. In contrast, the LP/HN relationship quality group engaged in the highest numbers of unprotected sex acts. Relative to these two groups, young women whose relationships were high in positive characteristics (HP/LN and HP/HN groups) engaged in a moderate number of unprotected sex acts.

Use of hormonal/IUD contraception and negative relationship quality interacted in their association with unprotected sex (see Table 4). As shown in Figure 2, negative relationship quality was associated with a higher number of unprotected sex acts among women who reported using hormonal/IUD contraception ($B=1.32$, 95% CI=0.60, 2.03). Among women who were not using hormonal/IUD contraception, level of unprotected sex was relatively

low regardless of whether the relationship was low or high in negative relationship quality ($B = -0.91$, 95% CI = $-2.49, 0.68$).

Positive relationship quality with one's partner and number of additional partners in the past month interacted in their association with unprotected sex (see Table 4). As shown in Figure 3, positive relationship quality with one's partner was associated with a higher number of unprotected sex acts with that partner among women who reported one or more additional partners in the past month ($B = 1.72$, 95% CI = $0.36, 3.07$). Among women who reported no additional partners, level of unprotected sex with one's partner was relatively low regardless of whether the relationship was low or high in positive relationship quality ($B = -0.07$, 95% CI = $-0.93, 0.80$).

Bayesian Information Criterion (BIC) values (see Table 4) suggested that no one linear regression model was better fitting than others (Kass & Raftery, 1995).

Discussion

Findings from the present study are consistent with conceptual frameworks and empirical work that link either positive or negative aspects of relationship quality with unprotected sex. The measure of positive relationship quality utilised in the present study assessed emotional characteristics (e.g., perceived strength of the relationship) and affiliative characteristics (e.g., time spent together). The measure of negative relationship quality used in the present study assessed emotional and verbal forms of abuse. The observed interaction between positive and negative relationship quality highlights the need for an integrated framework that can be used to better understand potential determinants of unprotected sex among couples with different combinations of positive and negative relationship quality. Such a framework may in turn be used to guide conversations that health professionals have with young people.

Negative relationship quality was associated with a higher number of unprotected sex acts among young women whose relationships were low or high in positive relationship quality. However, the association between negative relationship quality and unprotected sex was more pronounced among women with low levels of positive relationship quality. This is because women with low levels of positive relationship quality comprised the "extremes" in the study sample with respect to mean numbers of unprotected sex acts. Young women in relationships characterised by low positive and low negative relationship quality engaged in the lowest numbers of unprotected sex acts. It is possible that women in this group did not know their partners very well, and that they would shift to a higher sexual risk group if the relationship progressed and relationship quality changed over time. Health professionals can proactively highlight the benefits of condom use (e.g., pregnancy and STI prevention) across all types of relationships and make the case that relationship quality should be independent of a couple's decision to use condoms. This approach may prevent young people from developing the belief that condom use is incompatible with commitment, trust, and intimacy, which has been observed across several studies of young people (Bauman & Berman, 2005; Brady et al., 2009; Gebhardt, Kuyper, & Greunsvan, 2003; Kirkman, Rosenthal, & Smith, 1998; Marston & King, 2006).

Young women in relationships characterised by low positive and high negative relationship quality engaged in the highest numbers of unprotected sex acts relative to other groups. These women may have experienced gender and power inequities in their relationships, as well as an unhealthy dependency or desensitisation to risk (Connell, 1987; Buffardi et al., 2008; Tschann et al., 2002; Wingood & DiClemente, 1998). Highlighting the benefits of condom use may be insufficient for young women whose relationships are overwhelmingly negative. Ideally, health professionals would aim to enhance young women's self-worth and self-sufficiency, which may in turn decrease feelings of dependence, increase comfort with the idea of being non-partnered until a person worthy of one's affections is met, and increase comfort with negotiation of condom use.

Young women whose relationships were high in positive characteristics engaged in a moderate number of unprotected sex acts relative to other groups, although the association between negative relationship quality and unprotected sex acts was still present. Women in relationships characterised by high positive and high negative relationship quality may feel a sense of intimacy with and commitment to their partner (Harvey et al., 2006), while also experiencing an unhealthy dependency or desensitisation to risk (Connell, 1987; Buffardi et al., 2008; Tschann et al., 2002; Wingood & DiClemente, 1998). Women may accept or tolerate emotionally abusive comments from their partners because these comments are mixed with positive experiences. Over time, this may undermine self-efficacy for setting boundaries, including negotiation of condom use. Health professionals could gently challenge the idea that a positive comment from a partner makes up for a negative comment, or that women deserve the emotionally abusive comments they receive from an otherwise "loving" partner. Health professionals could also aid women in understanding that unprotected sex should not be a test of their commitment to a partner, and that such testing – if present in the relationship – may be a sign of an unhealthy relationship.

Young women in relationships characterised by high positive and low negative relationship quality engaged in a lower number of unprotected sex acts in comparison to women in relationships characterised by high negative relationship quality. Nonetheless, unprotected sex acts among these women were elevated. This finding is consistent with previous research suggesting that condom use – particularly for prevention of STIs – is viewed by many young people as incompatible with commitment, trust, and intimacy (Bauman & Berman, 2005; Brady et al., 2009; Gebhardt et al., 2003; Kirkman et al., 1998; Marston & King, 2006). Emphasising the importance of condoms to prevent STIs may be inadequate, as women in relationships characterised by high levels of trust may not feel vulnerable to contracting an STI (Harvey et al., 2006). Young women and male partners may respond to the idea that condoms provide enhanced pregnancy prevention, thereby allowing one to relax and enjoy sex more. Health professionals should also tactfully challenge the idea that sex without condoms contributes to intimacy, trust, and commitment in relationships.

Interestingly, the interaction between positive and negative relationship quality was observed only when these variables were examined as dichotomous predictors of unprotected sex in regression equations, as opposed to continuous predictors. We interpret this to be consistent with a threshold effect. Less than strong agreement across the majority of items assessing positive relationship quality may have indicated that young women had reservations or

doubts about the quality of their relationships. Responses of “once in a while” to a few items reflecting negative relationship quality may be sufficient to indicate the presence of meaningful negative relationship characteristics. It is possible that infrequent instances of emotional abuse have a lasting negative impact. It is also possible that women may have underreported instances of emotional abuse – “once in a while” may have represented events that occurred more often.

Of note, negative relationship quality was not associated with unprotected sex among young women who were not using hormonal/IUD contraception. The desire to prevent pregnancy through condom use appeared to override an otherwise powerful risk factor for unprotected sex – negative relationship quality. Among young women who were using hormonal/IUD contraception, negative relationship quality was strongly associated with unprotected sex during the past month; 9 acts were estimated among women with a high level of negative relationship quality. This finding highlights the greater concern that many young people have for prevention of pregnancy than STIs (Gebhardt et al., 2003). Indeed, O’Leary (2011) has posited that dual-method messages (hormonal contraceptive use to prevent pregnancy, condom use to prevent STIs) have undermined STI/HIV prevention among youth. The present study suggests that this may be particularly true among young women who are using a hormonal or IUD method of contraception and who are in relationships characterised by high levels of negative relationship quality. These women may have low self-efficacy for negotiating condom because they do not want to risk incurring their partner’s displeasure (Alleyne et al., 2011; Raiford et al., 2009; Silverman et al., 2004; Teitelman et al., 2008; Wingood & DiClemente, 1998; Wingood et al., 2001) and because they or their partners reject the idea that condoms are necessary for enhanced protection against unintended pregnancy.

Also of note, positive relationship quality with one’s partner and number of additional partners in the past month interacted in their association with unprotected sex. Positive relationship quality with one’s partner was associated with a higher number of unprotected acts with that partner only among women who reported one or more additional partners in the past month. Research conducted in the United States suggests that adolescence is a developmental period during which it can be normative for relationships to be short-lived, for successive relationships to occur within brief time periods, and for individuals to engage in extra-dyadic sexual behaviour, particularly when the status of a relationship with respect to monogamy has not been discussed or established (Brady et al., 2009; Kelley, Borawski, Flocke, & Keen, 2003; Lenoir, Adler, Borzekowski, Tschann, & Ellen, 2006). Young people who report multiple partners may benefit from conversations that begin by acknowledging that strong emotions towards and affiliation with a partner can sometimes “override” safe sexual decision-making. Understanding what young people hope to gain from unprotected sex in the context of a positive relationship could aid in further refining messages. Depending on young people’s goals, health professionals could tactfully challenge the idea that sex without condoms contributes to intimacy, trust, and commitment in relationships or assist in identifying ways that sex can be exciting and pleasurable in the context of condom use.

Limitations of the present study should be considered along with novel contributions to the literature. The study's cross-sectional design limits inferences about causality. Although it is reasonable to expect that relationship quality influences patterns of condom use rather than the reverse, other factors may lead to associations between relationship quality and unprotected sex. This study adjusted for a number of potential confounders to ameliorate this concern. However, not all potential confounders were assessed (e.g., relationship length, age difference between a respondent and her partner). Findings should be replicated in samples that are larger and include sufficient numbers of male youth. Additional research is needed to determine whether mechanisms explaining risk are indeed different among young people whose relationships are defined by different combinations of positive and negative relationship quality and who engage in different patterns of contraceptive use and other sexual behaviours.

Conclusions

Both positive and negative aspects of relationship quality may confer risk for unprotected sex. This risk appears to be modified by patterns of contraceptive use and other sexual behaviours. Further research is needed to confirm observed interactions involving positive and negative aspects of relationship quality and to test possible mechanisms explaining unprotected sex among young people whose relationships have different combinations of positive and negative relationship quality. Health professionals may be more effective in promoting condom use if they ask questions about both positive and negative aspects of young people's relationship quality and tailor their conversations based on the responses received.

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References

- Alleyne, Binta, Coleman-Cowger, Victoria H., Crown, Laurel, Gibbons, Maya A., Vines, Linda Nicole. The effects of dating violence, substance use and risky sexual behavior among a diverse sample of Illinois youth. *Journal of Adolescence*. 2011; 34(1):11–18. [PubMed: 20452662]
- Bauman, Laurie J., Berman, Rebecca. Adolescent Relationships and Condom Use: Trust, Love and Commitment. *AIDS and Behavior*. 2005; 9(2):211–222. [PubMed: 15933840]
- Brady, Sonya S., Tschann, Jeanne M., Ellen, Jonathan M., Flores, Elena. Infidelity, Trust, and Condom Use among Latino Youth in Dating Relationships. *Sexually transmitted diseases*. 2009; 36(4):227–231. [PubMed: 19265741]
- Buffardi, Anne L., Thomas, Kathy K., Holmes, King K., Manhart, Lisa E. Moving Upstream: Ecosocial and Psychosocial Correlates of Sexually Transmitted Infections Among Young Adults in the United States. *American Journal of Public Health*. 2008; 98(6):1128–1136. [PubMed: 18445794]
- Connell, RW. *Gender and Power: Society, the Person, and Sexual Politics*. Stanford: Stanford University Press; 1987.

- Decker MR, Silverman JG, Raj A. Dating violence and sexually transmitted disease/HIV testing and diagnosis among adolescent females. *Pediatrics*. 2005; 116(2):e272–e276. [PubMed: 16061580]
- Eaton, Danice K., Kann, Laura, Kinchen, Steve, Shanklin, Shari, Flint, Katherine H., Hawkins, Joseph, et al. Morbidity and mortality weekly report. Surveillance summaries (Washington, D.C. : 2002). 2011; 61(4):1–162.
- Gebhardt WA, Kuyper L, Greunsven G. Need for intimacy in relationships and motives for sex as determinants of adolescent condom use. *Journal of Adolescent Health*. 2003; 33(3):154–164. [PubMed: 12944005]
- Harvey SM, Beckman LJ, Gerend MA, Bird ST, Posner S, Huszti HC, Galavotti C. A conceptual model of women's condom use intentions: Integrating intrapersonal and relationship factors. *AIDS Care*. 2006; 18(7):698–709. [PubMed: 16971278]
- Kass, Robert E., Raftery, Adrian E. Bayes Factors. *Journal of the American Statistical Association*. 1995; 90(430):773–795.
- Katz, Barry P., Fortenberry, J Dennis, Zimet, Gregory D., Blythe, Margaret J., Orr, Donald P. Partner-specific relationship characteristics and condom use among young people with sexually transmitted diseases. *The Journal of Sex Research*. 2000; 37(1):69–75.
- Kelley SS, Borawski EA, Flocke SA, Keen KJ. The role of sequential and concurrent sexual relationships in the risk of sexually transmitted diseases among adolescents. *Journal of Adolescent Health*. 2003; 32(4):296–305. [PubMed: 12667734]
- Kirkman M, Rosenthal D, Smith AMA. Adolescent sex and the romantic narrative: Why some young heterosexuals use condoms to prevent pregnancy but not disease. *Psychology, Health & Medicine*. 1998; 3(4):355–370.
- Lenoir CD, Adler NE, Borzekowski DL, Tschann JM, Ellen JM. What you don't know can hurt you: perceptions of sex-partner concurrency and partner-reported behavior. *Journal of Adolescent Health*. 2006; 38(3):179–185. [PubMed: 16488813]
- Manning WD, Flanigan CM, Giordano PC, Longmore MA. Relationship dynamics and consistency of condom use among adolescents. *Perspectives on Sexual and Reproductive Health*. 2009; 41(3):181–190. [PubMed: 19740237]
- Marston C, King E. Factors that shape young people's sexual behaviour: a systematic review. *Lancet*. 2006; 368(9547):1581–1586. [PubMed: 17084758]
- Martinez G, Copen CE, Abma JC. Teenagers in the United States: sexual activity, contraceptive use, and childbearing, 2006–2010 national survey of family growth. *Vital Health Statistics*. 2011; 23(31):1–35.
- Nelder JA, Wedderburn RWM. Generalized Linear Models. *Journal of the Royal Statistical Society. Series A (General)*. 1972; 135(3):370–384.
- O'Leary A. Are dual-method messages undermining STI/HIV prevention? *Infectious Diseases in Obstetrics and Gynecology*. 2011; 2011:691210. [PubMed: 22144850]
- Pulerwitz J, Amaro H, De Jong W, Gortmaker SL, Rudd R. Relationship power, condom use and HIV risk among women in the USA. *AIDS Care*. 2002; 14(6):789–800. [PubMed: 12511212]
- Raiford JL, Diclemente RJ, Wingood GM. Effects of fear of abuse and possible STI acquisition on the sexual behavior of young African American women. *American Journal of Public Health*. 2009; 99(6):1067–1071. [PubMed: 19372531]
- Sayegh MA, Fortenberry JD, Shew M, Orr DP. The developmental association of relationship quality, hormonal contraceptive choice and condom non-use among adolescent women. *Journal of Adolescent Health*. 2006; 39(3):388–395. [PubMed: 16919801]
- Silverman JG, Raj A, Clements K. Dating violence and associated sexual risk and pregnancy among adolescent girls in the United States. *Pediatrics*. 2004; 114(2):e220–e225. [PubMed: 15286260]
- Teitelman AM, Ratcliffe SJ, Morales-Aleman MM, Sullivan CM. Sexual relationship power, intimate partner violence, and condom use among minority urban girls. *Journal of Interpersonal Violence*. 2008; 23(12):1694–1712. [PubMed: 18349344]
- Thibaut, Harold H Kelley, Thibaut, John W. *Interpersonal relations: A theory of interdependence*. New York: Wiley & Sons Inc.; 1978.

- Tschann JM, Adler NE, Millstein SG, Gurvey JE, Ellen JM. Relative power between sexual partners and condom use among adolescents. *Journal of Adolescent Health*. 2002; 31(1):17–25. [PubMed: 12090961]
- Weinstock H, Berman S, Cates W Jr. Sexually transmitted diseases among American youth: incidence and prevalence estimates, 2000. *Perspectives on Sexual Reproductive Health*. 2004; 36(1):6–10. [PubMed: 14982671]
- Wingood GM, DiClemente RJ. Partner influences and gender-related factors associated with noncondom use among young adult African American women. *American Journal of Community Psychology*. 1998; 26(1):29–51.
- Wingood GM, DiClemente RJ, McCree DH, Harrington K, Davies SL. Dating violence and the sexual health of black adolescent females. *Pediatrics*. 2001; 107(5):E72. [PubMed: 11331722]
- Wolfe DA, Wekerle C, Reitzel-Jaffe D, Lefebvre L. Factors associated with abusive relationships among maltreated and nonmaltreated youth. *Development and Psychopathology*. 1998; 10(1):61–85. [PubMed: 9524808]
- Woodrome SE, Zimet GD, Orr DP, Fortenberry JD. Dyadic alcohol use and relationship quality as predictors of condom non-use among adolescent females. *Journal of Adolescent Health*. 2006; 38(3):305–306. [PubMed: 16488834]

Figure 1.

Association between negative relationship quality and unprotected sex, within groups of young women reporting high or low levels of positive relationship quality.¹

¹ The interaction ($p < .05$) was plotted using the B coefficients from regression models in which age was fixed at 17; other dichotomous covariates not involved in the interaction (race/ethnicity, hormonal/IUD contraception, monogamous relationship, multiple partners) were fixed at a value of .5.

Figure 2.

Association between negative relationship quality and unprotected sex, within groups of young women using or not using hormonal or IUD contraception.²

² The interaction ($p < .05$) was plotted using the B coefficients from regression models in which age was fixed at 17; other dichotomous covariates not involved in the interaction (race/ethnicity, monogamous relationship, multiple partners, positive relationship quality group) were fixed at a value of .5.

Figure 3.

Association between positive relationship quality and unprotected sex with the same partner, within groups of young women with and without additional partners in the past month.³

³ The interaction ($p < .05$) was plotted using the B coefficients from regression models in which age was fixed at 17; other dichotomous covariates not involved in the interaction (race/ethnicity, hormonal/IUD contraception, monogamous relationship, negative relationship quality group) were fixed at a value of .5.

Table 1

Distributions of continuous relationship quality variables and unprotected sex acts.

	Mean	SD	Minimum	25th	Median	75th	Maximum
Positive Relationship Quality	3.6	0.6	1.0	3.4	3.8	4.0	4.0
Negative Relationship Quality	1.5	0.5	1.0	1.1	1.3	1.7	4.0
Unprotected Sex Acts	4.9	7.0	0	0	2.0	7.0	45.0

Table 2

Classification of young women into relationship quality groups

		Positive Relationship Quality	
		Low	High
Negative Relationship Quality	Low	n=16 (14.4%)	n=45 (40.5%)
	High	n=16 (14.4%)	n=34 (30.6%)

Table 3

Correlations between study variables.^a

	1.	2.	3.	4.	5.	6.	7.
1. Age (years)							
2. Non-White Race/Ethnicity	.08						
3. Hormonal/IUD Contraception	.08	-.15					
4. Monogamous Relationship	.25 **	-.08	.34 ***				
5. Multiple Partners	-.16	.07	-.13	-.47 ***			
6. Positive Relationship Quality ^b	-.02	-.01	.16	.41 ***	-.17		
7. Negative Relationship Quality ^b	-.10	-.09	-.01	-.11	.09	-.06	
8. Unprotected Sex Acts ^c	.13	-.08	.21 *	.20 *	.00	.06	.18

* p<0.05

** p<0.01

*** p<0.001

^aPhi coefficients are shown for associations between two dichotomous variables; point-biserial correlations are shown for associations between one dichotomous and one continuous variable.^bThis variable is dichotomised for correlations and subsequent regression analyses.^cThis continuous variable is the calculated number of unprotected sex acts during the past month.

Table 4Gamma GLM regression of unprotected sex acts on relationship quality variables and covariates.^a

	Main Effects Model B (95% CI)	Pos. × Neg. Rel. Qual. B (95% CI)	Hormonal/IUD Contr. × Neg. Rel. Qual. B (95% CI)	Multiple Partners × Pos. Rel. Quality B (95% CI)
Age (years)	.23 (−.07, .54)	.21 (−.08, .50)	.39 (.11, .67) **	.25 (−.05, .55)
Non-White Race/Ethnicity	−.67 (−1.23, −.12) *	−.64 (−1.12, −.16) *	−.65 (−1.16, −.13) *	−.63 (−1.17, −.09) *
Hormonal/IUD Contraception	.57 (−.25, 1.38)	.44 (−.37, 1.25)	−.28 (−1.44, .89)	.57 (−.24, 1.39)
Monogamous Relationship	1.05 (.28, 1.83) **	.82 (.12, 1.53) *	1.30 (.50, 2.08) **	1.13 (.38, 1.88) **
Multiple Partners	.90 (.19, 1.61) *	.97 (.22, 1.73) *	1.49 (.60, 2.39) **	−.11 (−1.24, 1.02)
Positive Relationship Quality	.26 (−.47, .98)	1.14 (.20, 2.09) *	.32 (−.32, .97)	−.12 (−.93, .70)
Negative Relationship Quality	.98 (.49, 1.47) ***	2.00 (.91, 3.10) ***	−.57 (−1.85, .70)	.81 (.32, 1.31) **
Positive Relationship Quality × Negative Relationship Quality		−1.47 (−2.72, −.23) *		
Hormonal/IUD Contraception × Negative Relationship Quality			2.08 (.44, 3.72) *	
Multiple Partners × Positive Relationship Quality				1.62 (.37, 2.87) *
Model Goodness of Fit (BIC) ^b	514.53	514.25	512.17	514.98

*
p<0.05**
p<0.01***
p<0.001^aThe beta coefficient is unstandardised. Only one interaction term was entered into a model at a time. Of 11 interaction tests, 3 were significant (significant interactions are shown in the table).^bBayesian Information Criterion (BIC) values are a criterion for model selection among a finite set of models. Lower BIC values imply fewer explanatory variables, better fit, or both. When comparing different models, differences in BIC of 0–2 are viewed as negligible.