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Adolescent Dual Method Use: Relevant Attitudes, Normative Beliefs and Self-Efficacy

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Abstract

Purpose—To encourage dual contraceptive method use -- protection from both STD and pregnancy -- health behavior change efforts must target powerful risk and protective factors that are amenable to change. This study examines longitudinal relationships between adolescents' contraceptive-related cognitions and dual method use.

Methods—Data are from 1,123 sexually active 7–11th grade participants in the National Longitudinal Study of Adolescent Health, Waves 1 and 2 (W1, W2). A series of nested path models examined relationships between participants' contraceptive use level at most recent intercourse (zero, one, two methods) and contraceptive-related cognitions. Parallel analyses were completed with four grade/gender groups.

Results—Dual method use at most recent intercourse ranged from 14.3% to 25.0%. Path models suggested that contraceptive use patterns and contraceptive-related cognitions were moderately stable over time. Cross-sectionally, contraceptive use level was associated with parent approval of birth control (older youth, younger girls), birth control attitudes (older youth, younger boys), perceived pregnancy consequences (older youth), perceived STD risk (older girls), perceived benefits of sex (younger girls), and contraceptive self-efficacy (older youth). W1 father approval of birth control (younger girls), mother disapproval of sex (older girls), and birth control attitudes (older boys) predicted W2 contraceptive use levels. W1 contraceptive use levels predicted several W2 cognitions among older youth.

Conclusions—Sexually active adolescents' perceptions of parent expectations about sex and contraception have important links to dual method use. Adolescents' attitudes about practical, social and moral implications of using birth control are also linked to their use of dual contraceptive methods.

Keywords

Adolescents; Dual method use; Contraceptive attitudes and beliefs; Path models

There is growing interest in promoting dual method contraceptive use as a means of preventing both pregnancy and sexually transmitted diseases (STD). This goal is particularly worthy among sexually active adolescents, a group that experiences relatively high pregnancy and STD rates. While pregnancy rates among 15–19 year olds showed sustained declines during the 1990s, current rates remain among the highest in the industrialized world [1,2]. U.S.

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adolescents also have among the highest STD rates in the industrialized world [3]. In the U.S., almost half of the 19 million new STD cases annually occur among 15–24 year olds [4]. HIV is the seventh leading cause of death among 20–24 year olds [5], and at least half of all newly infected persons in the U.S. are younger than 25 years [6].

Discrepant trends in teen pregnancy versus STD rates strongly suggest that sexually experienced adolescents, not unlike their adult counterparts, do not consistently protect themselves from both STD and pregnancy. While teenagers' condom use increased during the 1990s, oral contraceptive use decreased during that period [7,8]. Indeed, an inverse association between condom use and hormonal use among adolescents is well documented [9–11]. In short, the use of dual methods is uncommon. Using data from the National Longitudinal Study of Adolescent Health, Ford and colleagues [12] estimated that dual method use occurred in one-quarter of U.S. adolescents' sexual relationships. Likewise, Santelli and colleagues [7], with data from the 2001 Youth Risk Behavior Survey, estimated that 7.4% of sexually active 15–17 year old girls used condoms plus a hormonal method at last intercourse. However, National Survey of Family Growth findings suggest an increase in dual method use among sexually active youth. In 2002, 20% of sexually active 15–19 year old females and 24% of males reported dual method use at last intercourse, while in 1995, only 8.4% of females and 16.5% of males reported dual method use at last sex [8]. Even with these increases, the proportion of adolescents using dual protection lags behind the proportion of youth at risk for pregnancy and STD.

To be more effective in promoting dual method use among sexually active adolescents, we must understand antecedents of dual method use. To impact dual method use, our health behavior change efforts must target risk and protective factors determined to be most powerful *and* amenable to change through intervention. While clinic and community-based interventions are not well suited to address overarching socio-cultural antecedents of unprotected intercourse (e.g., poverty), these efforts can effectively shape attitudes, beliefs and skills associated with adolescent health behaviors [13] including dual method use.

The Theory of Triadic Influence (TTI) guided the current study [14]. TTI asserts that causes of health-related behaviors fall into three categories: socio-cultural factors that affect an individual's *attitudes* towards a behavior and related outcomes, social contexts including others' behaviors and attitudes that affect an individual's *social normative beliefs*, and intrapersonal factors that affect an individual's *self-efficacy* to engage in a behavior. According to TTI, adolescents' attitudes, social normative beliefs, and self-efficacy specific to contraceptive use, sex, pregnancy and STD will directly influence their dual method use. TTI also suggests that adolescents' contraceptive use behaviors will impact subsequent contraceptive-related attitudes, beliefs and self-efficacy [14,15].

Relatively few studies have examined proximal predictors of dual method use. Research suggests that relevant attitudes may include youths' condom use beliefs [16,17], perceived risks of pregnancy and STD [11,18,19] and level of motivation to avoid pregnancy and STD [19,20]. Relevant social normative influences may include parent communication about sexual risk [20,21] and perceived partner support for condom use [16,22]. Condom negotiation self-efficacy and skills to refuse sex without condoms have also been identified as important correlates of dual method use [17,19].

To date, very few studies have used prospective designs to identify cognitive predictors of adolescent dual method use. No known studies have examined whether dual method use shapes subsequent cognitions. Most studies of dual method use have utilized data from clinic-based samples. Guided by TTI and findings from existing cross-sectional research, this study examined longitudinal and reciprocal relationships between contraceptive-related cognitions and dual method use among a nationwide sample of youth. We identified cognitive correlates

and predictors of contraceptive use levels among younger and older adolescent girls and boys. In addition, we explored whether adolescents' dual method use shapes subsequent contraceptive-related cognitions.

Analyses addressed three research questions. First, how stable over time are indicators of teens' dual method use, along with their attitudes, social normative beliefs, and self-efficacy related to contraceptive use? Second, which of these contraceptive-related cognitions demonstrate cross-sectional associations with teens' contraceptive use levels? Third, what longitudinal relationships exist between teens' contraceptive-related cognitions and their contraceptive use levels?

Methods

Data Source

Data are from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health) [23]. Approximately 90,000 7–12th graders at 134 junior and senior high schools completed Add Health in-school surveys, and a random sub-sample of 12,105 completed additional in-home surveys during the 1994–95 school year (Wave 1); 9 to 18 months later, participants in 7–11th grades at Wave 1 provided in-home data for Wave 2.

In-home surveys included questions about sexual and contraceptive behaviors, attitudes and beliefs about sex and contraception, as well as other health behaviors and personal characteristics. Only participants 15 years of age and older were asked to respond to questions related to sexual attitudes. For sensitive portions of the survey, adolescents listened to questions through earphones and entered their responses into a laptop computer, reducing the potential for interviewer or parent effects on their responses [24].

Analytic Sample

The sample for this study consisted of 1123 7–11th grade students who completed W1 and W2 in-home surveys, reported having vaginal intercourse in the 12 months before the W1 survey, reported having vaginal intercourse between W1 and W2, and provided data on contraceptive use at most recent intercourse at W1 and W2. This analysis of existing data was approved by the University of Minnesota IRB.

Comparing our study sample with the cross-section of sexually experienced 7–11th graders who completed only the W1 Add Health survey, the two groups were quite similar in terms of age, racial/ethnic background, family structure and welfare status. A significantly greater proportion of our sample was female. Compared to those with only W1 data, our study sample was more likely to report W1 attitudes supporting contraceptive use (i.e., significantly higher levels of parent approval of birth control, more favorable attitudes towards birth control, greater perceived risk of STD/HIV). While our study sample was less likely to report consistent non-use of contraception, the two groups reported similar contraceptive use levels at most recent intercourse. Thus, our sample was at somewhat lower risk for not using contraception than the larger group of sexually experienced 7–11th graders completing the W1 Add Health survey.

Measures

Level of contraceptive use at most recent sexual intercourse was derived from the question: "What method of birth control did you or your partner use the last time you had sexual intercourse?" Responses included condoms, withdrawal, rhythm, ring, vaginal sponge, contraceptive film, foam, diaphragm, IUD, birth control pills, Norplant, Depo-Provera, and other methods. Participants were asked to select all methods that applied to their most recent vaginal intercourse. For this study, participants were placed into three groups reflecting level

of contraceptive use at most recent intercourse: (1) no method use, (2) single method use, and (3) dual method use. Responses indicating condom use *and* use of another effective birth control method (i.e., hormonal methods, sponge, film, foam, diaphragm, IUD) were classified as “dual method use.” Preliminary analyses comparing means of these three groups on various beliefs related to birth control and pregnancy indicated that this three-category variable functioned linearly and could be treated as a quasi-continuous measure.

We included four **attitudinal** measures in this study. *Perceived Benefits of Sex*, a 3-item scale ($\alpha=0.59$), measured the degree to which participants believed that having sex would provide physical pleasure, make them feel more attractive and less lonely. *Attitudes about Birth Control*, a 7-item scale ($\alpha=0.82$), measured attitudes related to expense and hassle of using birth control, interference with sexual enjoyment, moral concerns, and perceived difficulty getting a partner to use. *Perceived Risk of STD/HIV*, a 3-item scale ($\alpha=0.75$), measured perceived likelihood of contracting a STD, HIV or AIDS. *Pregnancy Consequences*, a 7-item scale ($\alpha=0.74$), measured perceived negative consequences of pregnancy including embarrassment and growing up too fast.

Four measures of **social normative beliefs** were examined. *Mother disapproval of sex* and *father disapproval of sex* were single items measuring perceptions of each parent’s level of disapproval of participants having sex at this time. *Mother approval of birth control* and *father approval of birth control* were also single items measuring perceptions of each parent’s level of approval of participants using birth control at this time.

One measure of **birth control self-efficacy**, a 3-item scale ($\alpha=0.63$), assessed participants’ self-confidence to use birth control, to have birth control available, and to refuse sex without birth control.

Data Analyses

Developmental theory [25] and previous research [9,26–27] suggest that the importance of relationships between adolescents’ cognitions and their sexual behaviors may vary by age and gender. Thus, we divided the study sample into four grade/gender groups, and completed parallel analyses for 7–9th grade girls, 7–9th grade boys, 10–11th grade girls, and 10–11th grade boys.

We used path analysis to investigate study research questions. Path analysis, an extension of multiple regression, allows examination of complex relations among variables rather than having several independent variables predict one dependent variable; and permits comparison of different models to determine which one best fits the data [28]. To examine hypothesized relationships between participants’ contraceptive use levels and their contraceptive-related cognitions, we used a series of nested path models. An identical series of nested models was developed for each contraceptive-related cognition. In our series of model comparisons, the most parsimonious model included paths accounting for the stability of variables over time (Figure 1 solid lines). A second model added cross-sectional relationships to the first model (Figure 1 dashed lines), to test whether contraceptive use levels and contraceptive-related cognitions were significantly associated at either point in time. A third model added relationships between W1 contraceptive use and a W2 cognition to Model 2 (Figure 1 dashed – dotted lines), to test whether contraceptive use levels predicted subsequent cognitions. A fourth model incorporated relationships between a W1 cognition and W2 contraceptive use into Model 2 (Figure 1 dotted lines), to examine whether contraceptive-related cognitions predicted subsequent contraceptive use levels. Chi-square tests of model differences indicated whether the more complex of two models being compared provided a significantly better fit to the data [29]. Path analyses were completed using Amos 4.0 [30].

Results

Participant Characteristics

As noted in Table 1, the study sample consisted of 1,123 adolescents (59% female). Close to two thirds (65.4%) were white, 20.6% were black, 10.6% Hispanic, and 3.3% of other races or ethnicities. Eleven percent reported that a parent or parent's partner received public assistance in the past year. Slightly under half (42.5%) lived with two biologic parents. At W1, participants' average length of time since first intercourse was 20 months. More than two-thirds (69.3%) reported using contraception with first intercourse. Close to one-third (30.7%) reported having two or more sexual partners in the previous 18 months.

Contraceptive Use, Most Recent Intercourse

At W1, 17.8% of this sample reported using condoms plus another effective birth control method at most recent intercourse (Table 2). W1 dual method use was highest among 10–11th grade girls (20.3%) and lowest among 7–9th grade boys (14.3%). At W2, 20.6% of the sample reported using condoms plus another contraceptive method at most recent sex. W2 dual method use was highest among 7–9th grade girls (25.0%) and lowest among 10–11th grade boys (15.8%).

Longitudinal Stability of Measures

Examining stability of indicators from W1 to W2 (Table 3), level of contraceptive use at most recent sex was the most stable among 10–11th grade girls and the least stable among 7–9th grade boys. Most social normative belief measures exhibited significant stability over time, with the exceptions of 7–9th grade girls' perceptions of father disapproval of sex and 7–9th grade boys' perceptions of father approval of birth control. All grade/gender groups demonstrated similar levels of stability over time in attitudes about sex, birth control, STD and pregnancy and in birth control self-efficacy.

Cross-Sectional Associations

In path models accounting for longitudinal stability of measures, several cognitions had significant cross-sectional relationships with teens' contraceptive use levels (Table 4). For 7–9th grade girls, greater perceived benefits of sex was associated with lower contraceptive use levels at W2. For 10–11th grade girls, greater perceived STD/HIV risk was associated with lower contraceptive use levels at W1.

In regard to protective effects, perceived parent approval of birth control was associated with higher contraceptive use levels for three groups. Mothers' approval was a significant protective factor among older and younger girls; fathers' approval was a significant protective factor among younger girls and older boys. Having attitudes that supported birth control was associated with higher contraceptive use levels among older girls, younger and older boys. Perceived pregnancy consequences was associated with higher contraceptive use levels among 10–11th graders -- at W1 for boys and at W2 for girls. High birth control self-efficacy was associated with higher contraceptive use levels among 10–11th grade boys and girls.

Predictive Relationships

In path models accounting for longitudinal stability of measures and cross-sectional associations, several W1 cognitions predicted W2 contraceptive use levels (Table 5). Greater father approval of birth control predicted higher W2 contraceptive use levels among 7–9th grade girls. In contrast, greater mother disapproval of sex predicted lower W2 contraceptive use levels among 10–11th grade girls. Having attitudes supporting birth control predicted higher

W2 contraceptive use levels among 10–11th grade boys. None of the W1 cognitions in this study predicted W2 contraceptive use levels among 7–9th grade boys.

A final group of best-fitting path models accounting for the longitudinal stability of measures and cross-sectional associations illuminated the predictive power of W1 contraceptive use levels on W2 cognitions among older youth. Among 10–11th grade girls, higher W1 contraceptive use levels predicted higher W2 birth control self-efficacy ($\beta=0.10$; $p=0.01$). Among 10–11th grade boys, higher W1 contraceptive use levels predicted greater mother approval of birth control ($\beta= -0.13$; $p=0.015$) and attitudes supporting birth control ($\beta= 0.11$; $p=0.02$) at W2.

Discussion

The current study, utilizing two waves of data from a nationwide sample of 7–11th grade students, extends empirical understanding of adolescents' dual method contraceptive use in several ways. Our findings suggest that sexually experienced adolescents' contraceptive use levels and their contraceptive-related cognitions are moderately stable over 12–18 months' time. Level of contraceptive use at most recent intercourse appears to be more stable over time among older teens than among younger teens.

Our study highlights cross-sectional associations between adolescents' contraceptive-related cognitions and their levels of contraceptive use, and suggests that specific contraceptive-related cognitions may influence sexually experienced adolescents' contraceptive use levels 12–18 months later. In terms of relevant attitudes, similar to previous studies linking youths' condom use attitudes and dual method use [16,17], we found cross-sectional associations between adolescents' attitudes about practical, social and moral implications of using birth control and contraceptive use levels in all groups except 7–9th grade girls. In longitudinal models, attitudes supporting birth control predicted higher contraceptive use levels 12–18 months later *only* among 10–11th grade boys.

Our study is among the first to document that young (7–9th grade) sexually active girls who view sex as a means for providing pleasure, increasing attractiveness, and combating loneliness are at the same time least likely to use dual methods. However, perceived benefits of sex failed to predict contraceptive use levels 12–18 months later among youth in this study.

Previous research indicates that perceived risks of pregnancy and STD and motivation to avoid these outcomes are linked with adolescents' dual method use [11,18–20]. In our study, greater perceived pregnancy consequences were associated with higher contraceptive use levels only among older teens. That contraceptive use levels were not associated with perceived pregnancy consequences in younger teens may reflect differences in cognitive development, with younger teens less likely to link current behaviors with potential future consequences [31]. Higher perceived STD/HIV risk was associated with *lower* levels of contraceptive use *only* among 10–11th grade girls, suggesting that older adolescent girls who are not using dual methods may make realistic assessments of their STD/HIV risk [32]. The association of higher perceived STD/HIV risk and less protective contraceptive use also suggests the importance of understanding the sexual relationships within which older girls' contraceptive use occurs. Neither perceived pregnancy consequences nor STD/HIV risk predicted contraceptive use levels 12–18 months later among youth in this study.

Previous research documents associations between communication with parents about sexual risk and adolescent girls' dual method use [20,21]. Similarly, we found perceived parent approval of birth control to be associated with higher contraceptive use levels among sexually experienced adolescent girls and 10–11th grade boys. In addition, perceived parent expectations

related to sex and contraception predicted girls' contraceptive use levels 12–18 months later. Perceived father approval of birth control predicted higher contraceptive use levels among 7–9th grade girls, while perceived mother disapproval of sex predicted lower contraceptive use levels among 10–11th grade girls. Together, these findings suggest that parents' expectations related to sex and contraception may be important in understanding adolescents' dual method contraceptive use.

Previous research identifies self-efficacy to negotiate condom use as an important correlate of dual method use [19]. In our study, high birth control self-efficacy was associated with higher contraceptive use levels only among older teens. The association between contraceptive use levels and self-efficacy to have and use birth control may be especially relevant for older adolescents, at a time in which condom use is likely to be a second method versus a primary method of contraception [33–35]. Birth control self-efficacy did not predict contraceptive use levels 12–18 months later among youth in this study.

While the influence of behavior on subsequent attitudes has been long-studied in social psychology, this analysis demonstrates that contraceptive use behaviors shape subsequent attitudes, normative beliefs and self-efficacy among older sexually experienced adolescents. Among older boys, higher contraceptive use levels at baseline predicted attitudes supporting birth control, and higher mother approval of birth control 12–18 months later. Among older girls, higher contraceptive use levels predicted greater birth control self-efficacy 12–18 months later. Among younger teens, baseline contraceptive use levels had minimal influence on contraceptive-related cognitions 12–18 months later.

Our analysis has several limitations. First, our contraceptive use measures are limited to methods reportedly used at most recent intercourse, a subset of overall contraceptive use. Given the importance of consistent contraceptive use in preventing pregnancy and STD, future research should identify longitudinal predictors of consistent dual method use. Second, our findings are based on adolescents' self-report, raising concern that female contraceptive use may be under-reported among boys, who may not be aware of their partners' hormonal use. Thus, we used a conservative estimate of dual method use among adolescent boys. However, because we are interested in young people's decisions to use a second method given their belief that one method is being used, the relevant measure is whether adolescents thought that no method, one method or two contraceptive methods were being used. Third, using a 12–18 month follow-up point, we may have missed important relationships between contraceptive-related cognitions and dual method use that operate over shorter time periods, or within the context of specific relationships. Future research should explore predictive relationships between contraceptive-related cognitions and dual method use over the course of specific relationships. Fourth, representing Perceived Benefits of Sex and Birth Control Self Efficacy as 3-item scales with marginal internal consistency estimates may attenuate true associations between these constructs and dual method use [36]. Finally, our analysis did not include indicators of contraceptive use norms of sexual partners or friends, potentially important influences on adolescents' dual method use. Future research should explore relationships between attributes of adolescents' social environments, their contraceptive-related cognitions and their dual method use.

While further research will illuminate salient social and cognitive influences on adolescents' dual method use, several recommendations for adolescent health care practice emerge from this study. Because adolescents' use of dual methods varies over time, clinicians must repeatedly and explicitly counsel sexually active teens about the importance of using condoms and hormonal contraception as means of preventing both STD and pregnancy. Among older adolescents, providing positive reinforcement for dual method use may strengthen subsequent

cognitions supporting contraceptive use. At a given point in time, adolescents' dual method use may be associated with perceived parent approval of birth control as well as their own attitudes about practical, social and moral implications of using birth control. Older adolescents' dual method use may also be associated with perceived pregnancy consequences and self-efficacy to have and use birth control. Assessing these types of cognitions may provide fruitful leads for developmentally appropriate, effective one-on-one counseling about dual method use. With older sexually active adolescent boys, addressing attitudes about practical, social and moral implications of using birth control may be an effective means for promoting long-term dual method use. With sexually active adolescent girls, employing strategies that help parents convey support for their adolescents' responsible sexual behavior and contraceptive use may promote long-term dual method use.

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Figure 1.
Nested Path Models

Table 1

Selected characteristics of a sample of 7–11th graders (N=1123) who participated in Wave 1 and Wave 2 in-home surveys of the National Longitudinal Study of Adolescent Health

Characteristic	%
Gender	
Female	59.3%
Male	40.7%
Age⁺	
15	19.0%
16	35.3%
17	37.9%
18	7.8%
Race/ethnicity	
Non-Hispanic White	65.5%
Black	20.6%
Hispanic/Latino	10.6%
Other	3.3%
Family Structure⁺	
2 biologic parents	42.5%
Other 2 parent arrangements	12.5%
Single parent	37.3%
Other	7.7%
Family receives public assistance⁺	
Yes	10.6%
No	54.9%
Not reported	34.5%
Length of time since first intercourse⁺	
0–12 months	42.3%
13–24 months	25.2%
25–36 months	14.9%
> 36 months	17.6%
Barrier or hormonal use, first intercourse⁺	
Yes	69.3%
No	30.7%
Vaginal intercourse partners, past 18 mo⁺	
1	69.3%
2	19.7%
3	8.4%
4 or more	2.7%

⁺ Measured at Wave 1

Table 2
Number of contraceptive methods used at most recent intercourse

	# Methods, Wave 1			# Methods, Wave 2		
	0	1	2	0	1	2
Overall Sample (N=1123)	31.3%	50.9%	17.8%	26.3%	53.1%	20.6%
7 th -9 th Grade Girls (n=108)	36.1%	48.1%	15.7%	27.8%	47.2%	25.0%
10 th -11 th Grade Girls (n=558)	34.2%	45.5%	20.3%	25.6%	51.6%	22.8%
7 th -9 th Grade Boys (n=91)	33.0%	52.7%	14.3%	30.8%	48.4%	20.9%
10 th -11 th Grade Boys (n=366)	24.9%	59.6%	15.6%	26.0%	58.2%	15.8%

Table 3
Stability of study measures between W1 and W2, according to participant grade/gender group

Measure	W1–W2 autocorrelation.			
	7–9 th Grade Girls (n=108)	10–11 th Grade Girls (n=558)	7–9 th Grade Boys (n=91)	10–11 th Grade Boys (n=366)
Contraceptive Use Levels	0.16 (NS)	0.33 ****	0.12 (NS)	0.25 ****
<i>Social Normative Beliefs</i>				
Mother Disapproval of Sex	0.31 ***	0.56 ****	0.63 ****	0.45 ****
Father Disapproval of Sex	0.14 (NS)	0.41 ****	0.48 ****	0.36 ****
Mother Approval of Birth Control	0.23 *	0.46 ****	0.21 +	0.21 ****
Father Approval of Birth Control	0.26 +	0.43 ****	0.24 (NS)	0.31 ****
<i>Attitudes</i>				
Perceived Benefits of Sex	0.44 ****	0.38 ****	0.51 ****	0.34 ****
Attitudes About Birth Control	0.42 ****	0.47 ****	0.40 ****	0.44 ****
Perceived Risk of STD/HIV	0.50 ****	0.49 ****	0.36 ****	0.52 ****
Pregnancy Consequences	0.56 ****	0.59 ****	0.49 ****	0.58 ****
<i>Self-Efficacy</i>				
Birth Control Self-Efficacy	0.35 ****	0.32 ****	0.41 ****	0.33 ****

NS=non-significant relationship,

+ p<0.10,

* p<0.05,

** p<0.01,

*** p<0.005,

**** p<0.001

Table 4

Level of contraceptive use: Significant cross-sectional relationships

Measure	Cross-sectional correlations with contraceptive use level [^]							
	7-9 th Grade Girls (n=108)		10-11 th Grade Girls (n=558)		7-9 th Grade Boys (n=91)		10-11 th Grade Boys (n=366)	
	W1	W2	W1	W2	W1	W2	W1	W2
Social Normative Beliefs								
Mother Disapproval of Sex	NS	NS	NS	NS	NS	NS	NS	NS
Father Disapproval of Sex	NS	NS	NS	NS	NS	NS	NS	NS
Mother Approval of Birth Control	NS	0.23 *	NS	0.14 ***	NS	NS	NS	NS
Father Approval of Birth Control	NS	0.27 *	NS	NS	NS	NS	0.14 *	NS
Attitudes								
Perceived Benefits of Sex	NS	-0.27 **	NS	NS	NS	NS	NS	NS
Attitudes About Birth Control	NS	NS	0.26 ****	0.21 ****	0.30 **	0.29 **	0.24 ****	0.14 **
Perceived Risk of STD/HIV	NS	NS	-0.10 **	NS	NS	NS	NS	NS
Pregnancy Consequences	NS	NS	NS	0.11 *	NS	NS	0.16 **	NS
Self-Efficacy								
Birth Control Self-Efficacy	NS	NS	0.21 ****	0.19 ****	NS	NS	0.22 ****	0.24 ****

[^] Estimates are from path models controlling for autocorrelations over time. NS=non-significant relationship,

* p<0.05,

** p<0.01,

*** p<0.005,

**** p<0.001

Table 5

Level of contraceptive use: Significant longitudinal relationships

Measure	W1 cognitive predictors of W2 contraceptive use level [^]		
	7-9 th Grade Girls (n=108)	10-11 th Grade Girls (n=558)	7-9 th Grade Boys (n=91) / 10-11 th Grade Boys (n=366)
<i>Social Normative Beliefs</i>			
Mother Disapproval of Sex	NS	$\beta = -0.10^{**}$	NS
Father Disapproval of Sex	NS	NS	NS
Mother Approval of Birth Control	NS	NS	NS
Father Approval of Birth Control	$\beta = 0.29^*$	NS	NS
<i>Attitudes</i>			
Perceived Benefits of Sex	NS	NS	NS
Attitudes About Birth Control	NS	NS	NS
Perceived Risk of STD/HIV	NS	NS	$\beta = -0.11^*$
Pregnancy Consequences	NS	NS	NS
<i>Self-Efficacy</i>			
Birth Control Self-Efficacy	NS	NS	NS

[^] Estimates are from best-fitting path models controlling for autocorrelations over time and cross-sectional associations.

* $p < 0.05$,

** $p < 0.01$