

Published in final edited form as:

J Adolesc. 2011 June ; 34(3): 589–592. doi:10.1016/j.adolescence.2010.03.002.

Parsing the heterogeneity of adolescent girls' sexual behavior: Relationships to individual and interpersonal factors

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Introduction

Recent reports of a reversal of the decreasing trend in sexual risk behaviors among adolescents (Hamilton, Martin & Ventura, 2007) highlight the need for continuous monitoring of normative and atypical adolescent sexual practices, as well as associated risk factors that can be used as potential targets for intervention. Problem Behavior Theory (Jessor & Jessor, 1977) provides a conceptual framework for understanding socially concerning adolescent behaviors, such as risky sexual activity. A central tenet of the theory is that problem behaviors (e.g. disruptive behavior, substance use, sexual risk-taking) cluster due to similarities in their personal and social functions. Consistent with this theory, a range of individual (e.g. substance use, depression, early pubertal maturation), and interpersonal factors (e.g. affiliation with deviant peers, assertiveness skills) have been linked to aspects of sexual risk-taking (Bachanas et al., 2002; Lehrer, Shrier, Gortmaker & Buka, 2006). However, operationalizations of sexually risky behaviors have varied widely across studies; often represented by a single construct such as 'early' initiation of sexual intercourse, or contraction of an STD. This approach fails to capture the broad spectrum of adolescent pre-sexual and sexual behaviors, which contributes to inconsistent findings, and imprecision in intervention efforts. The present study addresses this gap by examining the shared and unique individual and interpersonal risk characteristics associated with empirically derived clusters of pre-sexual and sexual behaviors in an urban sample of adolescent girls.

Method

The current study uses data from the Pittsburgh Girls Study (PGS) (see Hipwell et al., 2002), a longitudinal study of the development of conduct disorder, depression and substance use in 2,451 girls followed annually from early childhood. The most recent available data from the oldest cohort of girls (N=546) at age 15.8 years (SD=0.37) were used. By caregiver report,

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60% of the girls were of minority race (91% African American, 8% multiracial) and 40% were Caucasian. In addition, 32.8% of households received public assistance and 48.4% of families were headed by a single parent.

Approval for all study procedures was obtained from the University of Pittsburgh Institutional Review Board. Written informed consent from the caregiver and verbal assent from the girl were obtained prior to conducting individual interviews in the home.

Girls' sexual experiences were assessed using nine self-reported past year (yes/no) items of pre-sexual and sexual behaviors adapted from the Adolescent Sexual Activity Index (ASAI, Hansen, Paskett & Carter, 1999), and 'yes'/'no' reports of inconsistent contraceptive use; oral sex; more than one sexual partner; and prior pregnancy and/or sexually transmitted infection in the past year. Individual risk factors comprised girls' report of current alcohol, tobacco and/or marijuana use assessed by the Nicotine, Alcohol and Drug Use scale (adapted from Pandina, Labouvie & White, 1984), and severity of conduct problems (the sum of conduct and oppositional-defiant disorder behaviors), impulsivity and depression using the Adolescent Symptom Inventory-4 (Gadow & Sprafkin, 1997). Interpersonal risk factors included girls' report of low assertiveness using the Social Skills Rating Scale (Gresham & Elliott, 1990), susceptibility to peer pressure using four items from the Extreme Peer Orientation scale (Fuligni & Eccles, 1993), and number of peers engaging in deviant behaviors (e.g. stealing, aggression) using the Peer Delinquency Scale (Loeber et al., 1998). Finally, rate of pubertal maturation (slow, average and fast) was determined using growth curve trajectory analyses of the girls' annual reports on the Pubertal Development Scale (Petersen, Crockett, Richards & Boxer, 1988) between ages 8 to 14 years.

Latent class analysis (LCA) with MPlus 5.2 (Muthén & Muthén, 2008) was used to identify the most common clusters of pre-sexual and sexual behaviors. Multinomial logistic regression analysis was conducted to describe the nature of the clusters by examining differences in known correlates of risky sexual behavior.

Results

Examination of one to five LCA class solutions revealed that a three-class solution provided the best model fit (Low BIC=4,178; High Entropy = .90). Classes reflected a low probability of pre-sexual behaviors ('Low'); a high probability of pre-sexual behavior ('Moderate'); and a high probability of sexual behavior and/or sexual risk-taking ('High') (Figure 1).

Multinomial regression showed that current substance use distinguished between all three classes in a dose-response relationship (Table 1). Thus, substance-using girls had significantly increased odds of being in the High relative to the Moderate group and in the Moderate relative to the Low group. Higher levels of depressed mood also increased the odds of inclusion in the High relative to the Moderate group. In contrast, Moderate group girls appeared more susceptible to peer pressure. In addition, older girls, and girls living in single parent families, were disproportionately represented in the High compared with the Moderate group.

Importantly, girls classified in the High group were similar to Moderate group girls on a number of key variables. Thus, there were no differences in the severity of disruptive behavior problems, or impulsivity, levels of assertiveness, deviant peer affiliation, or rate of pubertal maturation. The results also showed that race and household poverty were unrelated to pre-sexual/sexual group membership.

Four variables distinguished between the pre-sexual groups. The likelihood of being in the Moderate compared with the Low group was higher among girls reporting substance use,

more deviant peers, and average to fast rates of pubertal maturation. In addition, the odds of membership in the Low, compared with the Moderate, pre-sexual group were higher among unassertive girls.

Discussion

The current study extends prior research by modeling the spectrum of pre-sexual and sexual experiences in adolescent girls, and demonstrating that derived clusters differ in characteristically distinct ways. The LCA showed that sexually active girls engaged in a broad range of behaviors that variously included some sexual-risk taking. This provides support for the argument that adolescents' sexual experiences and practices should be conceptualized dimensionally, rather than dichotomously (Miller et al., 1997; Whitaker, Miller & Clark, 2000). The results also challenge a common assumption that girls who engage in sexual risk-taking behaviors are a distinct group requiring targeted sexual health and HIV prevention programs. Our results suggest that such programs should be available to any girls engaging in sexual intercourse by age 15.

The likelihood of using substances increased in a dose-response manner across the Low and Moderate pre-sexual behavior groups and the sexually active girls. Although there is much evidence for the co-occurrence of substance use and risky sex (e.g. Hair, Park, Ling & Moore, 2009), the current results suggest that there is also differential risk among girls who have not yet initiated sexual intercourse. The influence and involvement of deviant peers in this relationship clearly warrants further investigation.

Girls engaging in sexual behaviors reported higher levels of depression than girls reporting pre-sexual behavior, as has been demonstrated previously (e.g. Lehrer et al., 2006) although the direction of this effect is unclear. In important other respects however, the Moderate and High groups showed similar individual and interpersonal characteristics. Thus, girls reporting a high probability of pre-sexual behaviors could not be distinguished from girls engaging in sexual and/or sexually risky behavior on severity of conduct problems, impulsivity, and number of deviant peers. In this sample therefore sexual activity and risk behaviors were not exclusively linked to deviant behavior problems (with the exception of substance use). In contrast, the results highlight substance use and depression as specific targets for intervention to reduce and prevent sexual health risks among mid-adolescent girls. In addition, longitudinal follow-up will determine whether greater susceptibility to peer pressure is an important clinical marker of future HIV or unintended pregnancy risk among girls who have not yet initiated intercourse.

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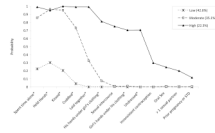


Figure 1.
Typologies of pre-sexual and sexual behavior among girls at age 15.
Note: Items marked with an asterisk indicate pre-sexual behaviors.

Multinomial logistic regression predicting the contrasts among sexual behavior groups from the covariates, behavior and interpersonal problems

Table 1

	Moderate vs. Low				High vs. Low				High vs. Moderate			
	B	Adjusted OR	95% CI	B	Adjusted OR	95% CI	B	Adjusted OR	95% CI	B	Adjusted OR	95% CI
Girls' age	.40	1.49	.84-2.66	1.36**	3.90	1.75-8.71	.96*	2.62	1.19-5.73			
Minority race	-.51	.60	.34-1.01	-.33	0.72	.37-1.38	.18	1.20	.65-2.20			
Household poverty	-.02	.98	.60-1.60	.21	1.23	.68-2.24	.23	1.26	.70-2.26			
Single parenthood	-.43	.65	.41-1.04	.41	1.50	.82-2.73	.84**	2.31	1.30-4.11			
Substance use	.68**	1.98	1.22-3.21	1.79***	6.01	3.33-10.83	1.11***	3.04	1.72-5.36			
Conduct problems	.05	1.05	.99-1.12	.11**	1.11	1.04-1.20	.06	1.06	.99-1.13			
Impulsivity	.002	1.00	.86-1.17	-.12	0.88	.73-1.07	-.13	.88	.74-1.06			
Depressed mood	-.02	.98	.93-1.03	.07*	1.07	1.01-1.14	.09**	1.10	1.03-1.16			
Unassertive	-.08*	.93	.86-.99	-.05	0.96	.87-1.05	.03	1.03	.94-1.13			
Peer susceptibility	.14	1.15	.70-1.90	-.46	0.63	.33-1.21	-.60*	.55	.30-.99			
Deviant peers	.11*	1.12	1.02-1.22	.21***	1.23	1.10-1.37	.09	1.10	.99-1.22			
Puberty: Fast dev	.69*	1.99	1.05-3.77	1.11**	3.03	1.31-6.99	.42	1.52	.68-3.42			
Average dev	.58*	1.78	1.04-1.90	.65	1.92	.90-4.08	.07	1.08	.52-2.25			

Note. Adjusted OR = adjusted odds ratio, or the odds ratio adjusted for the effects of other predictors in the regression model. 95% CI = 95% confidence intervals around the odds ratios.

* p<.05,

** p<.01,

*** p<.001.