

# Building an ecological-developmental model for adolescent HIV prevention: Program participation and family connectedness

Jennifer Sarah Tiffany, PhD, Guillermo Prado, PhD, John J. Eckenrode, PhD,  
Sara V. Birnel, Yael Bat-Chava, PhD and Amanda Purington, MPS

**Background:** This poster reports on the initial steps in the process of building an ecological-developmental model for adolescent HIV prevention. The study was carried out by the Complementary Strengths Research Project community-based research partnership. The research partnership formed during 2005 to study how social connectedness and HIV risk reduction practices by youth are related to and influenced by program strategies that promote strong youth engagement, voice and participation.

**Methods:** 331 culturally and ethnically diverse 13-17 year old adolescents took part in a longitudinal study completed during 2009. Recruitment was held at eight after-school program sites. Parents and guardians provided signed parental consent, with waivers obtained for some youth. Youth completed on-line baseline questionnaires and on-line follow-up questionnaires six and twelve months later. 43% of the participants reported having had sex at least once prior to the baseline survey; their average age at first sex was 13.8 years. 91% of participants returned for follow-up surveys. The findings reported here are drawn from the baseline data.

**TABLE 1 - Demographics of 331 13-17 year old participants enrolled at baseline**

	Male	Female	Transgender
African-American/Black, not Hispanic/Latino	15%	28%	
Hispanic/Latino only and/or Hispanic/Latino and more than one race/ethnicity	10%	15%	1%
African-American/Black and Hispanic/Latino	5%	7%	
Other, not Hispanic/Latino	2%	5%	
More than one race/ethnicity, not Hispanic/Latino	3%	6%	
Hispanic/Latino and White	1.5%	1.5%	
Unknown	1%		

**Measures:** Our frame of reference suggests that families, schools, and community-based programs serving youth are important ecological-developmental contexts that can influence HIV risk reduction practices by youth. One of our main aims is to see whether (and how) highly engaged program participation influences social connectedness and HIV risk reduction among 13-17 year olds. We developed a short (21 item) and reliable (Cronbach's Alpha = 0.89) scale that measures key characteristics of program participation (voice/choice/influence on decision-making, climate, connectedness with staff, and activities by the program that involve young people's schools, communities, and families). Summary scales measuring family connectedness (8 items; Cronbach's alpha 0.90) and school connectedness (6 items; Cronbach's alpha 0.71) were also derived. Outcome measures assessed access to services, sexual risk reduction, and non-use of alcohol, drugs and tobacco. We also developed a more comprehensive summary scale measuring adolescent sexual health and HIV risk reduction practices. The scale includes measures of access (knowing HIV status, health care visit within past year), protective practices (e.g., consistent condom use, delayed sexual debut), and avoidance of extremely risky practices such as sharing sharps and engaging in transactional sex (exchange of sex for money, drugs, or a place to stay).

**TABLE 2: Correlations controlling for age, gender, ethnicity and race**

	Adolescent Sexual Health and HIV Risk Reduction	Program Participation	Family Connectedness	School Connectedness
Adolescent Sexual Health and HIV Risk Reduction		.188**	.194**	.096
Program Participation			.304**	.159*
Family Connectedness				.305**
School Connectedness				

\* p<0.05 \*\*p<0.01

## OBJECTIVES

Relationships (e.g., parent-child connectedness) and social environments play a central role in promoting adolescent sexual health and HIV/STI risk reduction. Many risk reduction interventions take place in community-based youth programs which serve as support systems for adolescents. Most program impact measures focus on intrapersonal factors (knowledge, attitudes/intentions, beliefs, and behaviors) rather than on potentially protective eco-developmental effects (e.g., increases in family connectedness). Further, community-based programs are less frequently studied than schools, though they may be eco-developmentally important contexts. Our study examines the relationships among program participation, family and school connectedness, sexual health and experience, and HIV/STI risk reduction practices.

**TABLE 3: Significance of program participation, family connectedness, and school connectedness scales in binary logistic regressions with adolescent sexual health/HIV risk reduction scale items as dependent variable, controlling for gender, age, ethnicity (Hispanic), and race (African-American/Black).**

Adolescent Sexual Health and HIV Risk Reduction Scale Item	Significance of Correlation with Program Participation Scale	Significance of Correlation with Family Connectedness Scale	Significance of Correlation with School Connectedness Scale
Did not share sharps during past 3 months	**	NS	NS
No transactional sex during past 3 months	**	NS	NS
Know HIV status	**	NS	NS
Health care visit within past year	X	NS	NS
Never had sex	* NEGATIVE	**	NS
Age at first sex older than 14 (or no sex)	NS	**	NS
Consistent condom use past 3 months (or no sex)	NS	X	NS
One or no sexual partners past 3 months	NS	*	* NEGATIVE
No drug or alcohol use with sex during past 3 months	NS	NS	NS
Not pregnant during past year (self or partner)	NS	NS	NS

\* p<0.05 \*\*p<0.01 X = 0.05-0.07 NS = Not significant

**Data analysis:** We estimated binary logistic regression models in which each of the ten constructs included in the Adolescent Sexual Health and HIV Risk Reduction Scale was examined in relation to program participation, family connectedness and school connectedness, controlling for gender, age, ethnicity and race. See Table 3. We then estimated linear regression models with the summary risk reduction scale as the outcome, also controlling for gender, age, ethnicity, and race. Our first linear regression model includes only family connectedness as a predictor, the second model adds school connectedness, and the third model adds program participation. See Table 4.

**TABLE 4: Linear Regression (Dependent Variable: Adolescent Sexual Health and HIV Risk Reduction Scale; Predictors: Family Connectedness Scale, School Connectedness Scale, Program Participation Scale; Controls: Gender, Age, Ethnicity, Race)**

	Model 1	Model 2	Model 3
Family Connectedness	.18 (.0001)	.17 (.002)	.13 (.017)
School Connectedness		.04 (NS)	.03 (NS)
Program Participation			.13 (.015)
Gender (Female)	.26 (.0001)	.25 (.000)	.25 (.0001)
Age	-.13 (.017)	-.13 (.016)	-.14 (.008)
Ethnicity (Hispanic)	-.19 (.001)	-.20 (.001)	-.21 (.0001)
Race (Black or African-American)	-.20 (.001)	-.20 (.001)	-.22 (.0001)
Adjusted R-squared	.16	.16	.17
Coefficient (Significance)			

**Results and discussion:** As shown in Table 3, youth with higher levels of program engagement and participation are more likely to know their HIV status and to refrain from very high risk practices such as transactional sex and sharing sharps although they were more likely to be sexually experienced. Youth with higher levels of family connectedness were more likely to delay their sexual debut and to have fewer partners, and were somewhat more likely to use condoms consistently. Youth with higher levels of school connectedness reported higher numbers of sexual partners within the past three months. School connectedness did not demonstrate any positive relationships with the sexual health outcome measures. The linear regression models demonstrated significant impacts of family connectedness and program participation on adolescent sexual health and HIV risk reduction practices. School connectedness was not significant in any of the linear regression models estimated.

**Conclusions:** One objective of our exploratory study was to develop a program participation measure that would contribute to the development of increasingly nuanced ecological-developmental models for HIV risk reduction and sexual health promotion among adolescents. Our program participation construct assesses young people's perceived influence/voice within program; sense of safety, respect and support within program; linkages between program and other significant life contexts. Our results demonstrate the important role community-based programs potentially play in the promotion of adolescent sexual health and HIV risk reduction and the importance of high degrees of participation in bringing this potential to fruition. Higher levels of program participation appear to have a stronger effect than family connectedness in relation to reductions in very high risk behaviors such as sharing sharps and transactional sex as well as in relation to accessing HIV-related testing. Family connectedness strongly influences youth to delay having sex and to practice sexual risk reduction. School connectedness, however, failed to play a significant role in the ecological-developmental models tested.

**Limitations and Next Steps:** This analysis drew upon cross-sectional, baseline data, making it impossible to discern whether strong program participation enhances family connectedness, or whether strong family connectedness may be a precursor for highly engaged program participation among youth. We anticipate addressing this as we analyze 6-month and 12-month follow-up data from the exploratory study. The lack of significance of school connectedness within these models demands further examination, potentially including improved measurement tools.

### Contact:

Jennifer Sarah Tiffany, PhD  
Family Life Development Center  
Cornell University, Beebe Hall  
Ithaca, NY 14853  
jst5@cornell.edu  
607.255.1942



Complementary Strengths is a community-based participatory research (CBPR) partnership comprised of the NYC Department of Youth and Community Development, the NYS Department of Health AIDS Institute Adolescent HIV Prevention Services Unit, Cornell University's Family Life Development Center, and eight community agencies providing after-school programs to adolescents: The Hetrick Martin Institute, Lutheran Family Health Care/Project Reach Youth, Citizens Advice Bureau, Bronx AIDS Services, Mosholu Montefiore Community Center, The Educational Alliance, The Children's Aid Society/Frederick Douglass Community Center, and Legal Outreach, Inc.

The project described in this poster was supported by Award Number R21NR009764 from the National Institute of Nursing Research. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Nursing Research or the National Institutes of Health.