

Abstinence Education Grantees Research Update

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INTRODUCTION

Implementing high-dosage programs and rigorous evaluation easily fills a forty-hour work week, leaving little time to keep up with literature in the field. However, reading recent literature is important and contributes to developing best practices for primary prevention strategies and methods for evaluation. The purpose of the research updates is to help solve this problem and provide program directors and evaluators with insights gathered from recent literature. These updates summarize the methods, statistical analysis, and results of each study; identify strengths and weaknesses; and emphasize practical application.

The theme of this research update is exploring how multiple risk behaviors manifest themselves with some adolescents. Youth who are involved with one risk factor, such as smoking, are often involved with other risky behaviors, such as early

onset of sexual activity, and/or exhibit depression. Abstinence education programs can address these risks through staff training and curriculum development.

This issue includes a study about depression and clusters of risk behaviors from the Youth Risk Behavior Survey and another study about subjective experience of age. The first article documents how risk behaviors tend to cluster together, and the outcomes of this study support the use of a school-wide social norming campaign. Abstinence education programs may want to adjust their current program information to emphasize social norms and/or they may want to add a social norming campaign. The second article reviewed focuses on the influence of subjective experience of age (SEA), or how old one feels relative to one's chronological age, and its relationship to dating, sex, and substance use.

Associations between Depressed Mood and Clusters of Health Risk Behaviors

Paxton, R.J.; Valois, R.F.; Watkins, K.W.; Huebner, E.S.; & Wazner, D.J. (2007). Associations between depressed mood and clusters of health risk behaviors. *American Journal of Health Behavior*, 31(3), p. 272-283.

Background

Previous studies have demonstrated an association between adolescent depression and suicide risk and sex and drug behavior (Hallfors, Waller, Ford, et al 2004). This study expands on this concept by including more variables of risk. Risk clusters used in this study include: 1) passengers of drinker or light substance abusers, 2) frequent alcohol abusers, 3) comprehensive extreme risk takers, 4) marijuana users, 5) comprehensive moderate risk takers, 6) moderately

violent aggressive alcohol users, 7) alcohol and sexual risk takers, 8) illicit substance users, 9) low level risk takers, and 10) substance abusers and sexual risk takers. It also demonstrates the use of an advanced statistical technique (cluster analysis), which measures how individuals participate in multiple risk behaviors simultaneously.

Purpose

The purpose of this study was to include variables in a cluster analysis not included in other studies. The new variables included were: carrying a weapon, physical fighting, riding with someone who had been drinking, and driving after drinking. Association between cluster membership and depressed mood were also examined among racial or ethnic groups, controlling for factors associated with elevated risk such as gender and age. Each of the risk measures includes a degree of severity on a scale from 0.00 (no risk or never) to 3.00 (highest measure of risk). See Table 1 for descriptions of degrees of risk.

Practical Application

This study found that a small number of high school students engage in the highest (extreme or moderate) levels of risk behaviors. Therefore, **most students** are not engaged in the highest levels of risk. Staff involved with school-based prevention education efforts can make informed decisions about programs that are responsive to actual rather than perceived levels of risk occurring in the local school.

When schools highlight local statistics demonstrating that **most students** are not taking these risks, it is a strategy known as “social norming.” Social norming has been found to be effective at reducing alcohol abuse (Cialdini, 2001; Perkins & Berkowitz, 1986). Social norming combined with abstinence education is a solid strategy appropriate for school-based programs.

Implications for Targeting Local Classroom Populations

If the school or school district has local data from the Youth Risk Behavior Survey (YRBS), abstinence programs occurring in the classrooms can modify curriculum to reflect the actual risks that are occurring. According to this study, the percentage of youth engaged in the extreme or moderate risk ranges from 6 to 20% depending on the behavior. This study found that only 8% of youth are engaged in extreme or moderate sexual risk behaviors.

Most youth—55%—have never had sex; 10% reported having only one to two lifetime partners, but were not sexually active at the time of the survey; and only 3% reported having three or more partners, but were not sexually active at the time of the survey. This study supports efforts that inform the messages we send to youth. By using these national statistics in a social norming campaign, the campaign could say that “68% of high school youth in the United States are currently not having sex.” Local programs can supplement this promising statistic with local statistics to highlight the positive choices youth are making at the local level as well.

It’s critical for programs to help youth who are abstinent stay abstinent. It may also be important to include skill building steps to successfully reestablish sexual boundaries because of the prevalence of “hooking up.” This practice may take several different forms, but it can be described as casual sex with an acquaintance or even a stranger. Some youth may tune out a message about abstinence if they have participated in hooking up. They think, “Well, since I’ve had sex once, I might as well keep having sex.” We know from the National Campaign

to Prevent Teen Pregnancy (2003) that most sexually active youth (66%) regret their sexual activity and wish they would have waited. Many youth who have initiated sex may be open to learning skills to help them successfully reestablish sexual boundaries. These skills include interpersonal skills (ability to interpret nonverbal and verbal messages and effectively communicate new sexual boundaries) and intrapersonal skills (understanding one’s own emotions and vulnerabilities). By promoting skills to reestablish sexual boundaries, youth will know they can always have a new start after experiencing a hookup and/or after having sex in a monogamous relationship.

Youths who participate in extreme or moderate levels of sexual risk will benefit most from small group or one-on-one sessions with a therapist or school counselor trained to address their needs, including the depression more often associated with this population. Public school teachers may not have the training to provide the counseling such youth need.

Implications for Targeting Schools

An abstinence education program should work closely with the leadership of the school district, using local statistics to develop a social norming campaign that can be implemented throughout the district. If the school does not participate in the YRBS survey, a program may work with it to conduct a survey and include questions from the YRBS on topics such as sexual activity rates. Programs may add additional questions that measure perceptions of marriage and goals of youth, including desire for healthy marriage. According to national surveys, a large majority (91%) of high school seniors say that having a good marriage and family life is important to them (Johnston, Bachman, O’Malley, Schulenberg, 2004). Local statistics about abstinence and marriage included in social norming campaigns complement classroom curriculum and instruction initiatives. Once the local statistics are compiled, posters, announcements, and other media campaigns can be distributed throughout the school, school district, and community at large.

Methods

The study utilized data from the 2003 national YRBS. This survey uses county size, school size, and classrooms in a cluster sampling design. The study oversampled African Americans and Hispanics to allow for subgroup analysis. This means that these groups were purposefully sampled with higher probability to ensure that samples from each group were large enough to be analyzed. The population of the study was 15,214 high school adolescents in the

ninth through twelfth grade. Of that population, 61% were white, 14.2% Hispanic, and 13.9% African American. The remaining 10.6% were collapsed into a category denoted Other, which consisted of Asian, American Indian, Alaska Native, Native Hawaiian or Other Pacific Islander, and Multiracial representation.

The dependent or outcome variable for this study was depressed mood. This variable was measured by the following item: “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some activities?”

Ten independent measures were created from 26 YRBS items. The YRBS items used in the study have resulted in adequate test-retest reliability in previous studies. These 10 health-risk behaviors are: *rode with someone who was drinking during past 30 days, drove after drinking during past 30 days, carried weapon during past 30 days, physical fights in past 12 months, cigarette use, alcohol use, binge drinking, marijuana use, illicit drugs use, and sexual risk.* The independent measures were scored from 0 to 3, where 0 represented total absence of the risk behavior and 3 represented the highest degree of it. Frequencies in the total sample for each level of sexual risk behavior are presented in Table 1.

Statistical Analysis

The 10 health-risk variables were used to identify “clusters” of individuals. These are sets of youths that had similar

patterns of risk behaviors. Logistic regression was then used to model the relationship between depressed mood and cluster membership, after controlling for the demographic variables age, race, and gender.

Results

Ten clusters were identified, which are described in Table 2. Nearly half of the students could be classified as engaging in either a low level of risk behavior or none at all. Five of the clusters were associated with high frequency of moderate to extreme sexual risk taking (clusters 3, 4, 5, 7, and 10 in Table 2). Only a small percentage of students had engaged in extreme levels of risk behaviors. This is a critical finding of this study.

All of the 10 risk clusters were associated with higher likelihood of depressed mood relative to nonrisk takers. Youths who were involved with multiple risky behaviors at extreme or moderate levels had odds of experiencing depressed mood that were between 6 and 14 times greater than those for nonrisk takers. Nearly all of those youths were also involved with moderate to extreme sexual risk taking. These results are outlined in Table 3.

The demographic variables age, gender, and race were investigated for significant association with risk cluster membership and depressed mood. Overall, females were more likely to report depressed mood compared to males. Of the racial groups considered, African Americans were less likely to report having depressed mood than Hispanics or Others. Of the three highest risk clusters described in Table 3, Others were less likely than African Americans to be in cluster 5 (comprehensive moderate risk takers) and less likely than Hispanics to be in cluster 10 (substance abusers and sexual risk takers). African Americans were less likely than Whites to be in cluster 10.

Critique/Analysis

Measurement Issues

The authors did not define how they determined low, moderate, and high levels of risk. Readers are left to make assumptions from the following Sexual Risk Scale: 0.00= Never had sex; 0.50 = one to two

TABLE 1

Severity and Frequency of Sexual Risk Behavior

Value	Severity of Behavior	Frequency	Weighted %	Cumulative %
0.00	Never had sex	6,208	54.5	54.5
0.50	1 to 2 lifetime partners, none past 3 months	1,285	9.9	64.4
1.00	3 or more lifetime partners, none past 3 months	474	2.6	67.0
1.50	1 partner past 3 months	3,657	25.3	92.4
2.00	2 or more partners, with protection, no drugs	593	3.6	95.9
2.50	Sex while high, multiple partners, used condom	369	2.2	98.1
3.00	Multiple partners, sex while high, no condom use	261	1.9	100.0

TABLE 2*Description of Health-Risk Clusters and Composition of Cluster Membership*

Cluster Name	Frequency	Sexual Risk (Weighted %)	Other Risk Behavior
1. Passengers of drinker and light substance users	<i>n</i> = 1,288 (7.48)	23% had sex	40% reported alcohol and tobacco use
2. Frequent alcohol abusers	<i>n</i> = 869 (5.37)	71% reported low sexual risk	100% reported high alcohol use, 99% reported high-risk binge drinking
3. Comprehensive extreme risk takers	<i>n</i> = 378 (2.53)	97% reported extreme-risk sexual intercourse	100% reported high illicit substance, alcohol, and tobacco use
4. Marijuana users	<i>n</i> = 1,297 (8.50)	79% reported moderate levels of sexual risk	99% reported high levels of marijuana use
5. Comprehensive moderate risk takers	<i>n</i> = 498 (2.79)	96% reported moderate levels of sexual risk	95–99% reported high levels of marijuana and alcohol use, 11% low levels of illicit use, 70–80% moderate levels of fighting and carrying a weapon, 95% high levels of riding with a drinker
6. Moderately violent/ Aggressive alcohol users	<i>n</i> = 913 (6.26)	No levels of sexual risk taking reported	66% reported moderate levels of carrying a weapon, 91% moderate levels of fighting, 85% low levels of alcohol use
7. Alcohol and sexual risk takers	<i>n</i> = 2,433 (13.47) 2nd largest cluster	100% reported moderate levels of sexual risk	85% reported low levels of alcohol use, 63% low levels of tobacco use, 41% low levels of marijuana use
8. Illicit substance users	<i>n</i> = 597 (3.96)	72% reported low levels of marijuana use and low levels of sexual risk	100% reported high levels of illicit substance use with some using IV drugs, 91% low levels of tobacco use, 82% low levels of alcohol use, 43% low levels of fighting
9. Low-level risk takers	<i>n</i> = 5,008 (35.54) largest cluster	None in high frequency	71% reported low levels of alcohol use, 45% low levels of tobacco use, 2–20% engaged in remaining risk behaviors
10. Substance abusers and sexual risk takers	<i>n</i> = 692 (4.74)	91% reported moderate levels of sexual risk	90–100% reported high levels of alcohol, tobacco, binge drinking, and illicit substance use; 70% moderate levels of riding with drinker; 68% moderate levels of fighting
11. Nonrisk takers	<i>n</i> = 1,241 (9.36)	Did not engage in any of the 10 measured risk behaviors	

TABLE 3*Extreme Risk Takers and Odds for Depressed Mood*

Highest Risk Clusters	Sexual Risk Reported	Odds Ratio (Relative to Nonrisk takers)
Cluster 3. Comprehensive extreme risk takers	97% reported risky sexual intercourse	OR = 14.2
Cluster 10. Substance abusers/sexual risk takers	91% reported moderate levels of sexual risk	OR = 9.6
Cluster 5. Comprehensive moderate risk takers	96% reported moderate levels of sexual risk	OR = 5.8

Note: $OR > 1$ = cluster members more likely to report depressed mood than nonrisk takers.

lifetime partners, none in the past three months; 1.00 = three or more lifetime partners, none in the past three months; 1.50 = one partner in the past three months; 2.00 = two or more partners, with protection, no drugs; 2.50 = Sex while high, multiple partners, used condom; 3.00 = Multiple partners, sex while high, no condom use.

Statistical Issues

The methods used in the study generally were quite sound. The authors used cluster analysis to identify clusters of youths that demonstrated similar patterns of risk behavior. Logistic regression was used to investigate associations of cluster membership and demographic variables with depressed mood. Two aspects of the authors' approach should be pointed out. First, since some racial groups were oversampled, results of analyses had to be re-weighted using specialized statistical software (SUDAAN). This is necessary to avoid bias. Secondly, the authors used a Bonferroni adjusted significance level when making multiple group comparisons. Conducting multiple significance tests increases the probability of finding at least one significant group difference, even if none truly exist in the population. To compensate for this phenomenon, it is recommended to employ an adjusted significance level for each individual comparison.

Summary

The Paxton article provides a closer look at how risk behaviors manifest in some adolescents. This article can be used when abstinence programs are working with school districts, parent groups, and community action groups to plan prevention initiatives. When local jurisdictions and concerned citizens are better informed about actual risks occurring, prevention programs may be tailored specifically to the needs of the community. This article supports the notion that most youth are not engaged in the highest risk behaviors. It documents a high percentage of youth who are not having sex (68%) either

because they have not initiated sex or they were not having sex at the time of the survey. Combining social norming campaigns with abstinence program interventions would be a good way to strengthen school-based prevention efforts.

It affirms the need for abstinence programs to send clear messages to youth about the benefits of sexual abstinence and re-establishing sexual boundaries for those youth who may have initiated sexual activity. It also reinforces the importance of teaching youth about the relationship between alcohol use and sexual risk taking. This combination of risks represented the second largest group of adolescents in the study.

References

- Cialdini, R.B. (2001). The science of persuasion. *The Scientific American*, 284(2), 76-82.
- Halfors, D.D., Waller, M.W., Ford, C.A., et al. (2004). Adolescent depression and suicide risk association with sex and drug behavior. *American Journal of Preventive Medicine*, 27(3), 224-230.
- Johnston, L.D., Bachman, J.G., O'Malley, P.M., Schulenberg, J.E. (2004). Monitoring the future: A continuing study of American youth. University of Michigan, Institute for Social Research, Survey Research Center. ICPSR04264-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producer and distributor], 2005-12-15.
- The National Campaign to Prevent Teen Pregnancy. (2003). *With one voice: America's adults and teens sound off about teen pregnancy*. Washington, DC: National Campaign to Prevent Teen Pregnancy, Inc.
- Perkins, H. W., & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some implications for campus alcohol education programming. *International Journal of the Addictions*, 21, 961-976.

Dating, Sex, and Substance Use as Correlates of Adolescents' Subjective Experience of Age

Arbeau, K.J.; Galambos, N.L.; Jansson, S.M. (2007). Dating, sex, and substance use as correlates of adolescents' subjective experience of age. *Journal of Adolescence*, 30, 435-447.

Background

Do you remember wanting to be “older” when you were a child? Being older meant you were able to do the fun things “adults” get to do. Or perhaps you experienced a stigma of being “too young” and you had to stay back with a babysitter when your older siblings or friends got to do something. Previous research has identified this stigma (Moffitt, 1993; Zebrowitz & Montepare, 2000). It has led to a body of research that explores how youth perceive their own age. In this article, researchers used youths' perception of their own age, known as the subjective experience of age (SEA), to determine how age perception influences risks. The definition of SEA is how old one feels relative to one's chronological age. Individuals can feel younger, older, or about the same age as their chronological age (Montepare & Lachman, 1989). When someone feels older than their chronological age, their likelihood of involvement in “adult” behaviors such as sex and use of substances may increase. Some studies have found that self-perceived maturity mediated the relation between pubertal change and behavior of adolescents (Stattin & Magnusson, 1990). Other studies found that youth gain a rewarding sense of maturity when they become involved with early sexual intercourse, drug use, and delinquent behaviors (Jessor, 1992; Newcomb & Bentler, 1988). One interpretation may be that youth feel more adult when they participate in these behaviors.

Purpose

The purpose of this study was to conduct a large random sample of adolescents age 12-19 to explore the relationship of SEA with chronological age, dating behavior, sexual behaviors, and use of substances. Researchers had the following hypotheses:

1. There would be a positive, linear relationship between SEA and chronological age.

2. Dating, sexual, and substance use experience would be linked with SEA. Researchers thought that adolescents who were dating at the time of study, had an older dating partner, and/or were in a longer-term dating relationship would feel older, and that more sexual experience (having had sex), an earlier age at first sexual experience, greater number of sexual partners, and more consistent contraceptive use would be connected to an older SEA.
3. Smoking, drinking alcohol, and drug use would be associated with an older SEA.

Practical Application

This study found that youth who felt older were more likely to be dating, and those who dated were more likely to have an older dating partner. It is not uncommon for communities to report that many high school girls do not date boys their own age, but instead frequent nearby college campuses to find older dating partners. It is hard to determine if girls do this because they mature at different rates than boys or because they feel older and therefore see themselves as more mature than boys in their own peer group. It is important to note that feeling older for boys was also correlated to having an older dating partner.

Many abstinence education programs offer units or lessons about dating. Our (adult) understanding of dating may be significantly different than how adolescents view dating. Today's youth may not understand dating in the traditional sense of the word. For example, what is the difference between “hookups” and “dating”? For this study, dating was defined as “seeing someone or going out with someone who is more than just a friend.” If the program objectives include helping youth understand differences between traditional dating and hookups, program staff may want to add activities that teach youth about the potential influence of their own SEA as it pertains to making healthy choices about dating. By developing the intrapersonal skills of youth, programs may be able to sensitize students and participants to their own vulnerability in this area. Adolescents may benefit from understanding the risks involved with dating someone two or more years older than they are, especially if they tend to see themselves as older than their actual age. Programs can creatively explore this notion of SEA and generate discussions and activities about this concept.

Adding an item such as the one used in this study to pre and post questionnaires may serve to enrich evaluations of abstinence programs. If programs have specific units that

address healthy dating strategies, the program impacts can be measured by adding questions about dating, in conjunction with the SEA question.

For example, “Compared to most boys/girls my age, most of the time I feel ____ (A lot younger, younger, the age I am, older, a lot older) and “Are you currently dating” (yes, no). If they answer yes, the question is followed up with, “Are you in an exclusive relationship?”

“How old is the person you are dating?” and “How long have you been dating this person?”

By adding these items, program evaluations may be able to determine the SEA of participants and how the program impacts the actual dating behaviors of youth who have participated in the programs. Evaluations can also determine if this variable mediates the impact of the program with youth. We may find out that abstinence programs are either more effective or less effective with youth reporting an older SEA. Programs can be tailored to meet the needs of youth with older SEA. This may be an important key to how to improve program impacts with sexually experienced youth.

Methods

Data were collected from a sample of 664 adolescents in a medium-sized city in Canada. Consent was garnered first from parents/guardians and then from the adolescents. The sample was nearly evenly divided by gender (48% boys), and was primarily Caucasian (85%). Nearly half of the adolescents’ parents had completed college or university. Adolescents ranged in age from 12 to 19 years (with mean of 15.5).

The survey was administered by a trained interviewer in the home or other safe environment. Some of the items were read and recorded by the interviewer. Other more sensitive items were read by the interviewer, but responses were recorded by the adolescent. Questions pertaining to sexual practices and attitudes were self-administered by the youth.

Measures

The primary variable of interest was SEA. This was measured with one interview item: “Compared to most boys/girls my age, most of the time I feel ____.” The adolescent could choose from responses ranging from 1 (*a lot younger*) to 3 (*the age I am*) to 5 (*a lot older*). Participants were also asked questions regarding their dating experience; sexual experience; and recent alcohol, tobacco, and drug use.

Statistical Analysis

The relationships between SEA and chronological age, dating experience, sexual experience, and substance use were primarily investigated by using simple bivariate correlations. Multiple linear regression was used to determine whether the relationship between SEA and chronological age was linear or curvilinear.

Results

On average, the sample adolescents felt somewhat older than their chronological age ($M = 3.5$, $SD = 0.9$), with girls showing an older SEA than boys. Chronological age had a positive association with dating, sexual experiences, and substance use. Older youths tended to report higher levels of dating, sexual experiences, and substance use. Chronological age and SEA were positively correlated for both males and females ($r = 0.24$ for total sample). Adolescents who felt older were slightly more likely to be dating, and those who reported dating exclusively were more likely to have an older partner. Adolescents who had experienced sex reported feeling older than adolescents who had not experienced sex.

When the researchers controlled for chronological age, the relationship between SEA and current dating became nonsignificant. However, SEA and age at first sex demonstrated a significant negative correlation after controlling for chronological age. Thus, earlier sexual experience was associated with older SEA. SEA was not associated with contraceptive use or number of sexual partners.

Adolescents who smoked tended to use more alcohol, reported more drug use, and felt older. Associations between SEA and risk-taking behaviors were similar for boys and girls with the exception of smoking. Smoking was correlated with older SEA for boys but not for girls. Additionally, whether or not an adolescent had sex was related to smoking ($r = 0.32$), alcohol use ($r = 0.46$), and drug use ($r = 0.43$).

Critique/Analysis

Because the majority of the sample was Caucasian (85%) and about half of the fathers and mothers had completed college or university, the results of this study may not generalize to less educated and racially diverse populations. Additionally, with the sample being taken solely from telephone listings, it may not be representative of a more general population. It is possible that eligible families with listed telephone numbers are in some ways different from those who don’t have phones or listed numbers.

The data were collected by trained researchers in person at the participants' home or in a safe environment using a standardized process for administration. This helps to increase the confidence in the data. The participation rate was 64%, which is good for social science research. Having a fairly high response rate such as this avoids potential threats to the generalizability of the sample data.

Measurement Issues

The dating measure did not distinguish between dating and hooking up. Dating was defined as "seeing someone or going out with someone who is more than a friend." It is difficult to determine how youths operationalize dating. Dating in the traditional sense of the word would include doing fun, recreational, nonsexual activities. Seeing someone who is more than a friend in today's culture could be a "friend with benefits" situation whereby they get together to have sex, but they don't really do other fun, nonsexual activities. This study could have been improved by being more specific about the term dating.

Statistical Issues

Although many of the correlations reported in the study may have been statistically significant, it is important to consider the magnitude of the correlations. The statistical test for determining whether a correlation is significant is highly sensitive to the sample size. For very large sample sizes, even the smallest correlation may be significant. Hence it is imperative to consider both the statistical significance and practical significance when considering the correlation coefficient. General guidelines have been suggested for considering the meaningfulness of a correlation, but their relevance may vary across fields of study.

Cohen (1992) provided the following guidelines for interpreting the size of correlations: values of 0.1, 0.3, and 0.5 should be considered as cutoffs for small, medium, and large effect sizes, respectively. One way to interpret these values is to consider the coefficient of determination, or r^2 . This coefficient measures the percent of variation in the dependent variable (DV) that can be explained by the independent variable (IV). These cutoffs correspond to 1%, 9%, and 25% of variance in the DV that is explained by the predictor. For example, SEA and chronological age had a correlation of $r = 0.24$ in this study. Thus, less than 6% ($0.24^2 = 0.058$) of the variation in SEA is explained by chronological age. Though statistically significant, it is debatable whether a meaningful proportion of variance is shared by these

variables. Concordantly, by Cohen's suggestion, this would be considered a small effect.

According to Cohen's (1992) effect size criteria, two variables had correlations with SEA that would be considered a medium-sized effect. These were dating partner age and had sex ($r = 0.31$ for both variables in the total sample). Three variables had large correlations with chronological age: dating partner age ($r = 0.69$), age at first sex ($r = 0.51$), and alcohol use ($r = 0.51$). Three other variables had medium-sized correlations with chronological age: how long dating ($r = 0.32$), had sex ($r = 0.41$), and drug use ($r = 0.35$).

Concerning the choice of analyses, it would have been better for the authors to use one multiple linear regression model with SEA as the dependent variable and chronological age, plus the risk behavior variables as predictors. This is preferred when considering only simple correlations between each predictor and SEA. A multiple linear regression model can estimate the unique contribution of each independent variable after all the others have been accounted for. This is important when predictors are correlated with one another, as they were in this study. Failure to include other variables in a regression (or equivalently a correlation) model violates underlying statistical assumptions, and can lead to incorrect conclusions.

Summary

This study poses two important questions: 1) How does SEA positively or negatively affect abstinence education program outcomes? and 2) How can programs be tailored to meet the needs of youth who have an older SEA? It may be as simple as acknowledging this phenomenon in curriculum and activities. Incorporating skill building and awareness within units that teach healthy dating strategies may also be considered. It is our hope that this review will shed light on the factors important to consider when delivering abstinence education programs to youth associated with multiple risk-taking behaviors.

References

- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112 (1), 155-159.
- Jessor, R. (1992). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Developmental Review*, 12, 374-390.

Moffitt, T.E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674-701.

Montepare, J.M., & Lachman, M.D. (1989). "You're only as old as you feel": Self-perceptions of age, fears of aging, and life satisfaction from adolescence to old age. *Psychology and Aging*, 4, 73-78.

Newcomb, M.D., & Bentler, P.M. (1988). Consequences of adolescent drug use: Impact on the lives of young adults. Newbury Park, CA: Sage.

Nunnally, Jum (1978) *Psychometric Theory* (2nd ed.). New York: McGraw Hill.

Stattin, H., & Magnusson, D. (1990). Pubertal maturation in female development. Hillsdale, NJ: Lawrence Erlbaum.

Zebrowitz, L.A., & Montepare, J.M. (2000). "Too young, too old": Stigmatizing adolescents and elders. In T. Heatherton, P. Kleck, & J.H. Hull (Eds.), *The social psychology of stigma* (pp.334-373). New York: Guilford Press.

GLOSSARY

TERM	DEFINITION
Bonferroni adjustment	A mathematical procedure used to control the probability of making a Type I error (concluding there is a difference when there is not) when multiple comparisons are tested. The adjustment is to divide the desired overall significance level (often 0.05) by the number of desired comparisons. Each individual hypothesis test is then evaluated relative to this smaller α level.
Cluster analysis	An exploratory statistical procedure used to identify clusters of objects that are in some way similar. There are many different methods of clustering as well as a degree of subjectivity in choosing how many clusters to retain.
Coefficient of determination	A measure of the correlation between the dependent and independent variables in a regression analysis.
Dependent variable (DV)	The variable observed for an effect that is presumed to result from a change in the independent variable (IV). The DV is also referred to as the outcome variable or response variable.
Effect size	An estimate of the degree to which a phenomenon is present in a population. It may be considered a measure of practical significance as opposed to statistical significance. According to the Publication Manual of the American Psychological Association (5th ed., 2001, p. 25), "it is almost always necessary to include some index of effect size or strength of relationship in your Results section." Common measures of effect size are Cohen's d , r^2 , and η^2 (eta-squared).
Independent variable (IV)	The variable manipulated by the researcher.
Logistic regression	Statistical procedure typically used to examine the extent that a set of variables is able to explain (or predict) membership in one of two groups. Results of a logistic regression are often reported using an odds ratio. <i>Example research question: Which of a set of socioeconomic variables is a predictor of whether an adolescent will graduate from high school?</i>
Multiple linear regression (MLR)	A statistical procedure in which multiple independent variables are used to explain or predict a continuous (numerical) DV. For example, a study on the effect of anxiety on math test performance may use an MLR model with IQ and a measure of anxiety as predictors (IVs) and math test scores as the DV. The research question could ask whether anxiety helps explain test performance after the effect of IQ has been accounted for.
Odds ratio (OR)	The ratio of the odds of an event occurring in one group to the odds of the event occurring in another group. An OR greater than 1 indicates the event is more likely for the first group than for the second group. An OR less than 1 indicates the event is less likely for the first group. The OR is a measure of effect size in logistic regression.

TERM	DEFINITION
Oversampling	A method of sampling in which subgroups are purposefully sampled with higher likelihood than the general population. The result is that these groups constitute a higher proportion of the sample than they do in the population. The purpose is to have a large enough sample size from each group to permit statistically reliable results, which wouldn't otherwise be expected for some subpopulations (e.g., smaller ethnic groups, low-incidence disabilities, geographic regions) without oversampling. Statistical methods must be modified to incorporate sample weights when oversampling is employed.
Significance level (alpha, or α)	The desired probability of making a Type I error. Commonly used values are 0.05 or 0.01.
Standard deviation	Describes the variability of a distribution. A larger standard deviation means the data are more spread out. Typical values fall within two standard deviations of the mean (average score).
Statistical control	Accounting for the effect of (an)other variable(s) before examining the effect of a variable of interest. In the MLR example above, anxiety would be tested for its effect on test performance only after controlling for IQ.
Test-retest reliability	A method of estimating reliability in which the same set of items is given to the same people at two times. Nunnally (1978, pp. 233–23) describes this method as having “serious defects.” Internal consistency and alternative forms of reliability methods should be preferred for most situations.

Abstinence Education Grantees Research Update #3

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