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Future Expectations and Resiliency Among Adolescents: The possible moderating role of future expectations.

By
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Abstract

Background: Future expectations are the extent to which an individual believes certain events will occur in their lifetime. Positive expectations for the future are well understood to be independently protective for both risk factors in times of transition—specifically adolescence—and for health outcomes in the future. Resiliency theory suggests that certain protective factors may interact with baseline risk to weaken or eliminate the association between risks and poor outcomes, providing enhanced protection for at-risk youth. This study aimed to determine if future expectations can moderate the association between high-risk adolescent behaviors and adult outcomes; specifically if high expectations can be a form of resiliency for these youth.

Methods: Using the National Longitudinal Study of Adolescent Health (Add Health Study) the interaction between adolescent risk (sexual and substance use) and positive future expectations was measured using multivariate logistic regression.

Results: This analysis suggests there is no significant interaction between positive future expectations and adolescent sexual and substance use behaviors; future expectations continues to be independently protective for both high-risk behaviors in adolescence, and some adult outcomes.

Conclusion: Future research on this topic is needed to understand the mechanisms and extent to which positive expectations effect decisions, behaviors, and subsequent health outcomes.

Furthermore, understanding resilience factors for the most at-risk youth should continue to be a priority in adolescent health research.

Key words: Resilience, Adolescents, Substance Use, Sexual Health

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Introduction

Future expectations are described as the extent to which an individual expects an event to occur in their lifetime (Sipsma, 2012; Seginer, 2008). Future expectations thus guide behaviors and the developmental course by influencing goals, planning, and decision-making—such that the individual both consciously, and unconsciously, prepares for and creates their own future. Such orientations are believed to be particularly important during times of psychosocial and emotional transition, and for that reason have been used in adolescent health and development research for decades (Seginer, 2008).

Future expectations are conceptually and empirically distinct from aspirations and wishes (Constantine et al. 1998; Sagy and Adwan, 2006). For example, African American and Latino adolescents are likely to have similar career aspirations as their Caucasian counterparts, however, are more likely have lower expectations of what will actually happen (Constantine, 1998). These lower expectations exist within the socio-political environment in which youth develop, and—unlike aspirations, which may exist outside the constraint of subjective reality—are likely to encode experiences and trajectories observed and modeled in their surroundings.

Low expectations for the future have been associated with several problem adolescent behaviors, such as risky sexual behaviors (Cubbin et al., 2012), delinquency and violence (Borowsky et al, 2009), lack of physical activity (McDade et al., 2011), substance abuse, and suicidal ideation and attempts (Nguyen et al., 2012). These adolescent behaviors are likely to persist and/or worsen into adulthood, which is often the mechanism through which adolescent behaviors predict adult outcomes. Adolescents labeled as “high-risk” are often viewed as a homogenous population and are otherwise studied as such.

Resilience theory, however, posits there are individual, family, community, and sociocultural factors that can protect youth from harm when other factors such as poverty, oppression, and

maltreatment threaten their development (O'Dougherty et al., 2013). Studying this interaction between protective factors and risk factors can guide interventions and policy, to buffer the effects that high risk situations and activities may have on adolescents. Future expectations as an individual level protective factor, may have a moderating role between baseline risk and future decisions, such that future expectations differentially impact subsequent behaviors. Previous studies that have examined other individual protective factors like self-esteem and self-efficacy, and previous adolescent risk behavior, suggests that protective factors may act as a buffer for suicide (Sharaf et al., 2009), substance abuse (Ostaszewski and Zimmerman, 2006), and sexual risk outcomes (Dilorio et al., 2004). Other studies have examined the possible moderating role of future expectations on high-risk environments (Wyman et al., 1993; Cubbin, 2012; Chen et al., 2013).

The present study aims fill this gap by determining if positive future expectations moderate the association between adolescent sexual and substance use risk behaviors, and poor adult reproductive health and substance dependence outcomes respectively. Specifically, if positive future expectations among high risk adolescents attenuate the association while negative future expectations exacerbate the associations.

I hypothesize high-risk adolescents with positive future expectations will have a significantly lower risk of poor adult outcomes than high-risk adolescents with negative future expectations.

This study expands on previous future expectations literature by examining at a combination of future expectations as a single construct. Many studies that have examined the role of future expectations and adolescent risk behaviors have focused on “survival expectations,” or the likelihood that they will die or be killed at a young age. While these studies that focus on the “nothing to lose” attitude (Harris et al., 2002; Borowsky et al., 2009; Nguyen, et al., 2012), shed light on the importance of life expectations on risk assessment and the engagement in possibly dangerous activities, these studies do not assess positive expectations for the future as a whole. This study aims

to understand how high expectations across important developmental themes (i.e. career, health, and survival) work in concert to buffer the effects of risky adolescent actions on poor adult outcomes. Studies that focus on only one construct of future expectations risk oversimplifying the decision making processes of adolescents.

Methods

Data Source and Study Population

This study used data from the Longitudinal Study of Adolescent Health (Add Health). The Add Health study was a prospective observational study from 1994-2008 that collected information from a nationally representative sample of adolescents in grades 7-12 during the 1994-1995 school year. Three waves of data collection followed the first, in 1996, 2002, and 2008 respectively (Add Health, 2012) For the purpose of this study, Wave I data was collected for baseline characteristics and Wave IV for young adult outcomes. Waves II and III were used for pregnancy-related data as mentioned below. The public-use datasets were acquired electronically through the Inter-university Consortium for Political and Social Research (ICPSR), via the Institute for Social Research at the University of Michigan.

Measures

Future Expectations. Five items from the “Expectations, Employment, and Income” section of the Add Health wave 1 survey were used to measure future expectations in this analysis. Respondents rated the likelihood that events would happen in their lifetime on 0-8 point Likert scale: *You will live to age 35; You will graduate from college; You will have a middle-class family income by age 30; You will be killed by age 21; You will get HIV or AIDS.* The two latter questions were reverse coded such that higher scores represented more positive expectations for the future. A composite score was created to measure positive future expectations by taking the average of the 5 responses,

adjusting for nonresponse. The dichotomized item “Positive future expectations” was defined as having a certainty of a positive future; consistent with previous studies, certainty was defined as having on average, greater than a 50/50 chance of having a positive future based on these five items (Borowsky, 2009; Nguyen, 2012;).

Primary Predictor Variables. Age at sexual debut served as the primary predictor variable for the reproductive health analysis. Age at first intercourse was gathered at Wave IV from self-report. Wave IV was used for this predictor because studies suggest older adolescents are more likely to accurately report on this measure than younger adolescents (Siegel et al., 1998). Moreover, this allowed for a less restrictive analysis by including debut information on the majority who initiated sexual intercourse after Wave I. For the purposes of this analysis, individuals who reported sexual debut before the age of 11 were excluded as well as individuals who reported ever being forced (female) or forcing someone else (male) to have intercourse. Individuals were then trichotomized into sexual debut categories: early debut (≤ 14 years old), middle debut (15 -18 years old), late debut (≥ 19 years old based on distribution, such that the 25 percentile and 75 percentile ages served as cutoffs for the early and late categories respectively).

Substance-related adolescent risk factors were measured as a composite score based on tobacco, marijuana, and alcohol use, and hard drug experimentation. Tobacco use was measured by the number of days in the past 30 days in which the individual had smoked or chewed tobacco (1-30). Anything greater than or equal to 1 day was considered non-abstinence from tobacco. Alcohol use was measured via 3 items, measuring how often in the past year the adolescent had had a drink, been intoxicated, or binged on alcohol (1- Everyday – 7-None). The three items were averaged and reverse-coded such that higher scores indicated greater problem behaviors. Marijuana was measured using one item, “how many times in the past 30 days had the [participant] used marijuana?” Anything greater than 1 was considered non-abstinence from marijuana. Hard drug experimentation

was measured using 3 items, age at which they first tried cocaine, inhalants, or other hard drugs (MDMA, heroine, pills, ice, etc.). Individuals who indicated they'd tried these drugs before the age of 11 were set to missing. For the "hard drug experimentation" construct, ever trying these substances was considered a high-risk behavior since it is often initiated after the use of other substances such as marijuana or alcohol. This escalation alone—aligned with the gateway theory—is a risk behavior that is associated with poor substance use related adult outcomes (Kandel et al., 1992; Shamblen et al., 2012; Degenhardt et al., 2010).

In independent analysis these four constructs were associated with both future expectations and adult substance dependence outcome. Thus, the presence of any one these risk-factors was classified as "high risk adolescent substance use" and used as the composite predictor variable for this analysis. (Cronbach's alpha=0.71).

Primary Outcome Variables. Pregnancy by Wave III and self-reported STI at Wave IV served as the adult reproductive health outcome variables. Pregnancy by Wave III was selected as an adverse young adult outcome for this cohort since the oldest participants would be 22 years old at the time of the interview. Pregnancy before the age of 24 is more strongly associated with unintendedness and thus worse health outcomes for the child and mother (Mohllajee et al, 2007). Given that age at pregnancy was not collected in any of the Add Health waves, using 22 as the oldest possible age better establishes pregnancy as a problem outcome. History of STI was measured by the self-report multiple response question: "Have you ever been told by a doctor, nurse, or other health professional that you had any of the following sexually transmitted diseases?" Chlamydia, gonorrhea, trichomoniasis, syphilis, genital herpes, genital warts, hepatitis B, human papillomavirus, pelvic inflammatory disease, cervicitis, urethritis, and other STI were used to create this variable.

Adult substance abuse outcomes are measured in Wave IV and used a proxy of substance dependence available in the Add Health questionnaire from the DSM-IV (APA, 2000). Respondents

were asked if they'd experienced any significant symptoms association with abuse and dependence such as tolerance "A need for more to get the desired effect," withdrawal, taking more, trying to cut down, spending significant time trying to acquire the substance, couldn't continue normal activities due to the drug, or continuing despite emotional, psychological or physical health problems.

Respondents were then asked if they had experienced "three or more" of these experiences in a one year period. A positive response to this question was classified as "exhibited a history of substance abuse" for the drug(s) they'd responded for.

Covariates. Covariates were selected based on established relationships with adolescent predictor variables in Wave I. Variables included in the analysis include race/ethnicity , age (years), gender, religiosity, parental education (4 levels), parental income (0-750 thousand), household structure (2 parent home, single parent home, other), school connectedness, and parent connectedness. The same covariates we used for both the reproductive health, and the substance abuse analysis, however the substance abuse analysis also controlled for depression.

Race/ethnicity and gender were determined by the interviewer. Age was based on the date of the interview and the respondent birth month and year. Religiosity was measured as the sum of 4 items: "how often do you attend church?" "how often do you attend youth services?" "how important is religion to you?" and "how often do you pray?". One item "what is your religion" was used to code "non-religious" respondents as they were skipped to the next section and thus received a religiosity score of 0 (Cronbach's alpha=0.77). (Nonnemaker et al., 2003)

Parental education and parental income were self-reported and based on parent interviews. Household structure was based on the household roster. Adolescents who reported that they lived with two parents in the household, and at least one was a biological parent were given the code of 3; single biological parent homes were given the code of 2; and "other" 1. School connectedness was measured based on previous Add health reserach with 6 items: "I feel close to people at this

school,” “I feel like I am part of this school,” “I am happy at this school,” “the teachers at this school treat students fairly,” and “I feel safe at my school.” The items were answered on a 5-point Likert scale (1-Strongly agree, 5-Strongly disagree). Responses were summed and reverse-coded such that higher scores reflected higher school connectedness (Cronbach’s alpha=0.79) (McNeely et al. 2002). Parental connectedness was measured using six self-reported responses to “How close do you feel to your mother/father figure” “Most of the time, your mother/father figure is warm and loving toward you.” and “How much do you think your mother/father figure cares about you?” Responses were averaged with missing variables accounted for, such that higher scores indicated greater parental connectedness (Cronbach’s alpha=0.82) (Resnick et al., 1997).

Depression was measured using 18 questions from the “Feelings Scale,” which used the Center for Epidemiological Studies Depression Scale (Add Health, 2012). Wave I uses 19 of the 20 items from this scale and uses slightly different language for two. “I felt too tired” was not included since it would bias adolescents who worked. Use of this scale from Add Health responses has varied across studies; for this analysis items were reverse-coded such that higher scores indicated higher levels of depression, and kept continuous as a covariate (Cronbach’s alpha=0.86).

Data Analysis

Two separate populations were used for the reproductive health and substance abuse analyses. While the main restrictions remained the same for both analyses, further restrictions were placed on the reproductive health analysis to control for sexual contact that was likely involuntary and abusive. Correlations within future expectation variables, and between future expectations and predictor and outcome variables were conducted initially to visually examine associations and inform decisions on later analyses. Chi-square analyses and means were calculated for demographic information about the population. Crude analyses examining the association between future expectations and the predictor variables were also conducted. For each outcome variable, a series of

univariate logistic regression analyses were conducted to determine the unadjusted associations with future expectations and the predictor variables.

Multivariate logistic regression analyses were conducted to determine the predictive ability of positive future expectations and the predictor variables separately on the main outcomes. Finally, to determine if future expectations can moderate the association between adolescent risk behaviors and adult outcomes, an interaction term between the risk behaviors and positive future expectations was added to the logistic regression models. For sexual health outcomes, early debut x positive future expectations, and middle debut x positive future expectations were added to the model. For the substance abuse outcomes, high risk teen substance use x positive future expectations was added. All analyses were performed in SAS 9.3.

Results

Analysis 1: Reproductive Health Analyses

Baseline Characteristics

The vast majority of respondents (89.1%) met the criteria for having positive expectations for the future (n=1277). There were significantly more females (59.0%), non-Hispanic whites (63.6%), and adolescents from two-parent homes (63.9%) (Table 1). Positive future expectations was significantly associated with the age of sexual debut: individuals who initiated sexual intercourse at an early age (OR: 0.39) and at the middle age (OR: 0.57) were less likely to report positive future expectations than those who initiated sexual intercourse later ($p < 0.01$, $p = 0.03$, respectively).

Future Expectations as an effect modifier

The interaction terms for both STI outcomes and pregnancy outcomes were non-significant. Early debut x positive future expectations and middle debut x positive future expectations were non-

significant for self-reported STI ($p=0.25$ and $p=0.46$ respectively) and for pregnancy at Wave III, ($p=0.64$ and $p=0.76$ respectively).

Main Effects Analyses

STI Diagnosis. Consistent with previous studies, early age at first sex was significantly associated with STI diagnosis by Wave IV. Early age at sexual debut (≤ 14) and middle age at sexual debut (15-18) were associated with a 6.59 and 3.79 likelihood of STI diagnosis compared to late age at sexual debut (≥ 19) in the unadjusted analysis (both $p < 0.01$). Positive future expectations was protective and approached significance (OR: 0.72, $p=0.09$). Other covariates independently associated with an increased risk of STI was female sex ($p < 0.01$), and black race ($p < 0.01$). Household structure, i.e. having at least 2 parental figures ($p=0.01$), school connectedness ($p=0.02$), and parent connectedness ($p < 0.01$) were all protective. (Table 2.)

When controlling for various covariates, the association between early (OR: 6.61, $p < 0.01$) and middle debut (OR: 3.62, $p < 0.01$) remained highly significant. While the association between future expectations and STI was attenuated and remained non-significant. (Table 2.)

Pregnancy by Wave III. Table 2 also shows age at sexual debut was highly significantly associated with pregnancy by Wave III. Individuals who reported early sexual debut were 10.9 times as likely to report pregnancy by Wave III than those who reported a late debut ($p < 0.01$), while those with a middle age of sexual debut were 7.1 times as likely to report pregnancy by Wave III ($p < 0.01$). Positive future expectations was also independently protective for pregnancy by Wave III (OR: 0.46, $p < 0.01$). Age, female sex, and black and Hispanic background, were all significantly associated with an increased risk for pregnancy ($p < 0.01$). Religiosity, parent education, parent income, school connectedness, and parent connectedness were all protective for self-reported pregnancy at Wave III (all $p < 0.05$).

Early (OR: 6.42, $p<0.01$) and middle (OR: 4.73, $p<0.01$) sexual debut remained significant in the multivariate logistic regression model predicting pregnancy at Wave III. Positive future expectations also remained protective in the multivariate model (OR: 0.56, $p<0.05$). (Table 2.)

Analysis 2: Substance Use Analyses

Baseline Characteristics

The majority (88.4%) of the sample met the criteria of positive future expectations ($n=1877$). Likewise, there were significantly more females (57.6%), non-Hispanic whites (60.3%), and adolescents from two-parent homes (58.6%) (Table 1.). Those who were considered high-risk substance use adolescents (35.8%) were significantly less likely to report high future expectations than low-risk adolescents (OR: 0.54, $p<0.01$).

Future expectations as an effect modifier

The interaction term testing moderation for adolescent substance use and positive future expectations was non-significant for all three outcome variables: alcohol dependence ($p=0.49$), marijuana dependence ($p=0.85$), and other, non-marijuana drug dependence ($p=0.67$).

Main Effects Analyses

Alcohol Dependence. Both adolescent drug use (OR: 1.90, $p<0.01$), and having positive future expectations (OR: 0.56, $p=0.01$), were both independently associated with a history of alcohol dependency in Wave IV. Furthermore female sex ($p<0.01$), black race ($p<0.01$), religiosity ($p<0.01$), and parental income ($p=0.02$) are all protective against alcohol dependence in young adulthood. Depression is associated with a slightly increased risk of alcohol dependence ($p=0.05$). In the multivariate analysis, adolescent substance abuse remained a significant predictor of alcohol dependence in young adulthood (OR: 1.51, $p=0.03$), and positive future expectations was a marginally significant protective factor (OR: 0.62, $p=0.05$). (Table 3.)

Marijuana Dependence. Substance use in adolescence was a significant independent predictor of marijuana dependence in Wave IV (OR: 2.63, $p < 0.01$) while positive future expectations was non-significant. Furthermore female sex ($p < 0.01$), household structure ($p = 0.03$), religiosity ($p = 0.03$), parental education ($p = 0.03$), school connectedness ($p < 0.01$), and parental connectedness ($p < 0.01$) were all significant protective factors for marijuana dependence. Depression ($p = 0.03$) was associated with a slight risk in marijuana dependence.

When controlling for individual and family related factors, adolescents who used substances in Wave I were 2.3 times as likely to report marijuana dependence in Wave IV. ($p < 0.01$).

Unexpectedly, positive future expectations was significantly associated with increased odds of marijuana dependence in Wave IV, once the covariates were added to the model, (OR: 2.13, $p = 0.05$) (Table 4.)

Other Substance Abuse Dependence. In the univariate model, adolescent substance abuse was independently associated with an increased likelihood of reporting other, non-marijuana substance (MDMA, heroin, methamphetamines, etc.) dependence in adulthood (OR 4.35 $p < 0.01$). Furthermore, high future expectations was protective (OR: 0.57, $p = 0.04$). Additionally, black race, religiosity, and parental and school connectedness were all independently protective against substance dependence in Wave IV (all $p < 0.01$). In the multivariate analysis, substance abuse in adolescence remained predictive of reporting other substance dependence in young adulthood (OR: 3.74, $p < 0.01$). Positive future expectations also remained protective and significant when controlling for individual and family level variables (OR: 0.53, $p = 0.04$). (Table 5)

Discussion

The main analysis of this study examined if positive future expectations could moderate the association between risky adolescent behaviors and subsequent young adult outcomes. The null

results of these analyses suggest that having positive expectations for the future could not protect high-risk adolescents from related reproductive health and substance abuse outcomes.

Several reasons can explain this null result. One reason is that future expectations alone is not enough to be protective against risk behaviors that have already begun. Other analyses that examined risk and resilience often used a combination of protective, including individual factors such as future expectations, but also school, peer, and familial factors (DiLorio et al., 2004; Ostaszewski and Zimmerman, 2006). This analysis controlled for these factors to determine the specific predictive ability of positive future expectations as resilience; these results suggest that future expectations can enhance protection (as seen in the main effects model) but may only serve as a form of resilience within the context of other protective factors. Studies that examine future expectation's moderating effect on environmental risk support this theory, as future expectations failed to be as protective in some high-risk environments (Chen and Vazsonyi, 2013), and was detrimental in others (Cubbin et al., 2012).

Another reason may be due to the analysis itself. Other studies that have sought to determine if protective factors can prove resiliency among high-risk adolescents have also had difficulty finding strong, and significant moderator effects. McClelland and Judd (1993) note that detecting moderation in observational studies is more difficult than in experimental studies due to reduced power and efficiency, and furthermore, tends to explain only a small proportion of the variance (McClelland and Judd, 1993). Nevertheless, researchers interested in youth and adolescent resilience continue use this strategy since the theoretical concept of resilience necessitates an interaction between risk and protection (O'Dougherty et al., 2013).

The main effects analyses in this study support present literature in the field of adolescent development and health by consistently observing the expected association between adolescent risk behaviors and adult outcomes. Early sexual debut was associated with an increased risk for early

parenthood and STI. Previous research was also supported that links early exposure to drugs and alcohol increase the likelihood of dependence in the future (Rachel et al. 1982; Robins and Przybeck, 1985; Lewinsohn et al., 1999; Trenz et al., 2012). The main analyses also enhance literature on the association between positive future expectations and adult outcomes, and further support the breadth of this construct. The effect of future expectations varied by all adult outcomes measured, both in the reproductive health analysis, and the substance abuse analysis.

When controlling for demographics, and other protective factors, positive future expectations was not associated with a significant decrease in risk for STI, but was related to subsequent pregnancy as an adolescent or young adult. One likely reason for this is that future expectations may be less salient in the decisions leading up to the perhaps one-time exposure such as condom use, than for other behaviors that may have more obvious, lasting consequences, such as contraceptive behavior. Adolescents differentially assess their risks for pregnancy and acquiring an STI; pregnancy is seen as a more adverse and likely consequence of inconsistent condom use than STI (Whaley, 2000; Kershaw et al, 2003). In this respect, it is likely that future expectations may only be protective against outcomes that are a significant perceived threat to the individual's future.

Future expectations were significantly protective for self-reported alcohol dependence, and non-marijuana drug dependence. Paradoxically, positive future expectations were associated with a significant increase in marijuana dependence. The protective nature of future expectations and substance dependence in young adulthood is consistent with the concept of future expectations as an individual-level protective factor. It is likely that both persistent abstinence behaviors, and motivation to achieve a positive future, influenced this association.

The association between positive future expectations and marijuana dependence, however, is unexpected, and does not appear to be driven by adolescent usage. Adolescents who had reported using marijuana in the past month were significantly less like to have positive future expectations

than who had not. This association has not been found in other populations. Period and cohort studies suggest that societal norms heavily influence adolescent and young adult marijuana use (Keyes, 2011); additionally, like this study population, individuals born in the 1974-1988 birth cohort are less likely to oppose the legalization of marijuana (Nielsen, 2010). It is possible future expectations may not be protective in marijuana use, and subsequent dependence in this population, due to more positive views towards marijuana. More rigorous examinations of longitudinal data linking generally protective factors in adolescence with marijuana-specific substance abuse outcomes in adulthood is needed to further explore this relationship.

Limitations

There are several limitations to this study. All behaviors and outcomes were self-report, increasing the likelihood for social desirability bias. While under-reporting of stigmatized behaviors outcomes is expected, differential underreporting by study group is highly unlikely, though this cannot be tested. Another limitation is temporality is difficult to establish since baseline risks and future expectations were collected simultaneously. In addition to understanding when and how future expectations develop, more research will be needed to determine in which contexts positive future expectations are most important.

The results of this analysis suggest that future expectations are not enough to act as a buffer for adolescents who have previously engaged in high risk sexual or drug-related behaviors. As researchers continue to look for the true role of future expectations for protection and resiliency (or possibly harm) in the face of previous risk-behaviors, it will likely be important to include a comprehensive future expectations variable along with other protective factors to determine the long term impact of global protection on those populations.

Conclusions

Though adolescent and young adult health outcomes continue to improve, the disparities between those in resource-rich and resource-poor environments persist. A thorough understanding of individual level factors that could be a source of resilience for high-risk adolescents is important to help counter the negative effects that their socio-political, neighborhood, and home environments may have. This knowledge could greatly inform policy and programming by helping interventionists meet adolescents where they are, and improving adult outcomes despite having a history of high-risk behavior.

While the associations between future expectations and adolescent risk behaviors are well studied, the mechanism through which future expectations influence decisions in the present and throughout development is not well understood. This study suggests that positive future expectations in young adolescence—while predictive of risk behaviors—are not enough to counter the long-term behaviors that often lead to poor health in adulthood.

Understanding the developmental pathway through which future expectations in the past influence decision-making, future behaviors, and outcomes over time should continue to be pursued by adolescent health research. The realistic expectation of a happy, healthy, and long life should be something all youth experience.

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Tables

Table 1. Wave I Demographic Statistics

Proportion, means, standard deviations and p-values for individual future expectations, and covariates for both reproductive health and substance abuse analyses.

	Reproductive Health Analysis n=1277		Substance Abuse Analysis n=1851	
	n (%)	p-value*	n (%)	p-value*
High Future Expectations (>50/50 Chance)				
(Not) Killed by 21	1080 (88.4)	<0.01	1560(88.2)	<0.01
Live to 35	1095 (88.0)	<0.01	1559 (86.5)	<0.01
Graduate College	907 (82.7)	<0.01	1309(82.1)	<0.01
Middle-class Income	719 (59.6)	<0.01	1039 (59.4)	<0.01
(Not) Get HIV	1040 (91.0)	<0.01	1504 (90.7)	<0.01
Combined FE Score	1138 (89.1)	<0.01	1636 (88.4)	<0.01
Covariates				
	Age	14.0± 0.9	14.0± 0.9	
Gender	Female	754 (59.0)	1069 (57.6)	<0.01
	Male	523 (41.0)	787 (42.4)	
Race	White	812(63.6)	1120 (60.3)	<0.01
	Black	270 (21.1)	476 (25.7)	
	Hispanic	112 (8.8)	147 (7.9)	
	Other	83 (6.5)	113 (6.1)	
Household Structure	2-parent	816(63.9)	1085 (58.6)	<0.01
	Single parent	415 (32.5)	690 (37.3)	
	Other	46 (3.6)	76 (4.1)	
Religiosity Mean (SD)		11.8±5.0	11.8±4.9	
Parent's Education	< High School	138(11.8)	214 (12.6)	<0.01
	HS Graduate	348(29.7)	519 (30.6)	
	Some College	343(29.3)	491 (28.9)	
	College Graduate	341(29.2)	474 (27.9)	
School Connectedness		3.77±0.7	3.76±0.7	
Parent Connectedness		4.58±0.5	4.59±0.5	
Median Parental Income		42,500	40,000	
Depression Mean(SD)		N/A	9.23±2.7	

*p-values generated by χ^2 test.s.

n may not add to total due to missing data.

Table 2. Main Effects Model for Sexual Health Outcomes in Young Adulthood.

Unadjusted and adjusted logistic regression modeling sexual health outcomes in young adulthood.

	Diagnosis of STI in Wave IV						Pregnancy by Wave III					
	Unadjusted Associations		Adjusted – Age at sexual debut		Adjusted – Positive future expectations		Unadjusted Associations		Adjusted –Age at sexual debut		Adjusted– Positive future expectations	
	OR	p	OR	p	OR	p	OR	p	OR	p	OR	p
Age at sexual debut †												
Early Debut (≤14)	6.59	<0.01	6.61	<0.01			10.88	<0.01	6.42	<0.01		
Middle Debut (15-18)	3.79	<0.01	3.62	<0.01			7.12	<0.01	4.73	<0.01		
Late Debut (>18)	1.00	-	1.00	-			1.00	-	1.00	-		
High Future Expectations ^{ns}	0.72	0.09			0.73	0.22	0.46	<0.01			0.56	0.05
Covariates												
Age at Wave I	0.97	0.62	0.98	0.79	0.93	0.42	1.30	<0.01	1.17	0.18	1.23	0.30
Female	3.59	<0.01	3.94	<0.01	3.48	<0.01	1.94	<0.01	1.96	<0.01	1.91	<0.01
White	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Black	3.10	<0.01	3.23	<0.01	3.37	<0.01	2.47	<0.01	2.59	<0.01	2.79	<0.01
Hispanic	1.45	0.11	1.62	0.1	1.57	0.12	3.24	<0.01	2.2	0.02	2.08	0.03
Other	1.64	0.06	1.96	0.04	1.93	0.04	1.84	0.07	1.64	0.24	1.67	0.22
Household Structure	0.69	0.01	0.93	0.61	0.81	0.14	0.77	0.07	1.22	0.33	1.09	0.68
Religiosity	0.98	0.15	0.97	0.11	0.97	0.03	0.97	0.04	0.97	0.17	0.96	0.08
Parent Education	0.94	0.38	1.04	0.67	0.95	0.56	0.52	<0.01	0.63	<0.01	0.6	<0.01
Parent Income	1.00	0.11	1.00	0.04	1.00	0.04	0.98	<0.01	0.99	0.08	0.99	0.1
School Connectedness	0.80	0.02	0.90	0.4	0.88	0.26	0.69	<0.01	0.92	0.57	0.93	0.59
Parent Connectedness	0.63	<0.01	0.84	0.25	0.73	0.03	0.61	<0.01	0.75	0.13	0.69	0.05

Adjusted p-value main effects : †p<0.01; ^a p≤0.05

Table 3. Main Effects Models for Alcohol Dependence in Wave IV

Unadjusted and adjusted logistic regression modeling alcohol dependence in young adulthood.

	Unadjusted Associations		Adjusted -Substance use in adolescence		Adjusted-Positive future expectations	
	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Substance Use in Adolescence ^a	1.9	<0.01	1.51	0.03		
Positive Future Expectations ^a	0.56	0.01			0.62	0.05
Covariates						
Age at Wave I	0.97	0.74	0.8	0.03	0.86	0.11
Female	0.53	<0.01	0.52	<0.01	0.53	<0.01
White	1.00	-	1.00	-	1.00	-
Black	0.25	<0.01	0.25	<0.01	0.27	<0.01
Hispanic	0.78	0.36	0.81	0.53	0.76	0.4
Other	0.82	0.53	0.78	0.49	0.79	0.49
Household Structure	1.14	0.34	1.02	0.92	0.93	0.64
Religiosity	0.96	<0.01	0.97	0.09	0.97	0.11
Depression	1.02	0.05	1.01	0.37	1.01	0.52
Parent Education	1.08	0.31	1.09	0.39	1.11	0.27
Parent Income	1	0.02	1	0.19	1	0.08
School Connectedness	0.83	0.06	0.96	0.76	1.07	0.65
Parent Connectedness	0.65	<0.01	0.68	0.03	0.67	0.01

Adjusted *p*-value main effects : †*p*<0.01; ^a*p*≤0.05

Table 4. Main Effects Models for Marijuana Dependence in Wave IV
Unadjusted and adjusted models predicting marijuana dependence in Wave IV.

	Unadjusted Associations		Adjusted -Substance use in Adolescence		Adjusted-Positive future expectations	
	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Substance Use in Adolescence †	2.63	<0.01	2.30	<0.01		
Positive Future Expectations ^a	1.56	0.19			2.13	0.05
Covariates						
Age at Wave I	1.05	0.61	0.80	0.07	0.89	0.29
Female	0.60	<0.01	0.52	<0.01	0.57	0.01
White	1.00	-	1.00	-	1.00	-
Black	0.90	0.65	1.01	0.98	0.92	0.76
Hispanic	1.01	0.99	1.05	0.9	1.06	0.89
Other	1.62	0.14	1.42	0.38	1.51	0.27
Household Structure	0.72	0.03	0.74	0.12	0.78	0.17
Religiosity	0.96	0.03	0.98	0.25	0.97	0.2
Depression	1.03	0.03	1.01	0.7	1.01	0.59
Parent Education	1.23	0.03	1.32	0.02	1.31	0.01
Parent Income	1.00	0.97	1.00	0.57	1.00	0.57
School Connectedness	0.65	<0.01	0.78	0.14	0.71	0.02
Parent Connectedness	0.65	<0.01	0.81	0.29	0.75	0.13

Adjusted *p*-value main effects : †*p*<0.01; ^a *p*≤0.05

Table 5. Main Effects Models for non-Marijuana Substance Dependence in Wave IV. Unadjusted and adjusted models predicting non-marijuana substance dependence in Wave IV.

	Unadjusted Associations		Adjusted—Substance use in adolescence		Adjusted—Positive future expectations	
	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Substance Use in Adolescence [†]	4.35	<0.01	3.74	<0.01		
Positive Future Expectations ^a	0.57	0.04			0.53	0.04
Covariates						
Age at Wave I	0.25		0.87	0.31	1.00	0.98
Female	0.87	0.48	0.96	0.87	0.97	0.89
White	1.00	-	1.00	-	1.00	-
Black	0.41	<0.01	0.47	0.04	0.37	<0.01
Hispanic	0.47	0.11	0.42	0.15	0.48	0.17
Other	1.02	0.97	1.00	1.00	1.01	0.99
Household Structure	0.83	0.28	0.70	0.10	0.72	0.09
Religiosity	0.95	<0.01	0.98	0.36	0.97	0.24
Depression	1.04	<0.01	1.01	0.66	1.01	0.71
Parent Education	1.11	0.32	1.29	0.05	1.23	0.09
Parent Income	1.00	0.93	1.00	0.60	1.00	0.60
School Connectedness	0.64	<0.01	0.93	0.69	0.90	0.55
Parent Connectedness	0.61	<0.01	0.90	0.64	0.78	0.22

Adjusted *p*-value main effects : [†]*p*<0.01; ^a*p*<0.05