HHS Public Access

Author manuscript

Sucht. Author manuscript; available in PMC 2022 May 01.

Published in final edited form as:

Sucht. 2022 April ; 68(2): 75–82. doi:10.1024/0939-5911/a000758.

Time Horizons, Drug Use, and Risky Sex in Young Women from Poor Urban Areas

JeeWon Cheong, **Jalie A. Tucker**, **Susan D. Chandler**

University of Florida and Center for Behavioral Economic Health Research, Gainesville, Florida USA

Abstract

Aims.—Emerging adulthood is marked by elevated risk-taking, and young people living in disadvantaged urban areas experience disproportionately more negative outcomes. Using a sample of young African American women living in such communities, this cross-sectional observational study investigated the hypothesis that greater substance use and sexual risk-taking would be associated with present-dominated time perspectives and higher delay discounting.

Methodology.—Young women (N = 223, M age = 20.4 years) from disadvantaged urban areas were recruited using Respondent Driven Sampling, a peer-driven recruitment method. Structured field interviews assessed substance use, sexual practices, and risk/protective factors, including time perspectives (Zimbardo Time Perspective Inventory [ZTPI]) and behavioral impulsivity (delay discounting task).

Results.—Regression models showed that present hedonism time perspectives were related to sexual risk-taking and substance involvement, whereas discounting was associated only with sexual risk-taking (ps < .05). Future time perspectives were not associated with either risk behavior.

Conclusions.—Risk behaviors among young African American women living in disadvantaged urban areas appear to be related to hedonistic rewards available in the present without considering future outcomes. Future research should investigate experimentally if lengthening time perspectives and enriching views of possible futures may aid risk reduction in this population.

Keywords

substance use; sexual risk-taking; time perspectives; delay discounting; emerging adult African American women

1.0 Introduction

Substance use and sexual risk-taking are public health concerns during emerging adulthood, spanning the period from adolescence into young adulthood (Arnett, 2011). This offers a time-limited opportunity for prevention and early intervention to reduce behavioral

Declarations

The authors have no conflict of interest to declare. The authors state that the manuscript is their intellectual property, they own the copyright, and the manuscript (as a whole or in parts) has not been published, nor has it been submitted for publication.

risk-taking and associated negative consequences, including development of substance use disorders (SUDs), unplanned pregnancy, and sexually transmitted infections. Young people who live in disadvantaged urban neighborhoods face additional obstacles and experience disproportionately more negative outcomes known as the urban health penalty (Fitzpatrick & LaGory, 2003; Sterrett et al., 2014). Compared to more advantaged youths, they tend to have more limited opportunities for positive growth into adulthood, e.g., through education, employment, and involvement in pro-social activities.

Such impoverished environments lend themselves to development of a decision-making style characterized by devaluation of delayed rewards and outcomes that support adaptive functioning in favor of persistent preference for short-term rewards that often lead to longer term costs (Acuff, Dennhardt, Correia, & Murphy, 2019). Several lines of research using different methods have converged to suggest that individual differences in sensitivity to delayed outcomes, reflecting the time horizons over which behavioral allocation is organized, is a predictive and potentially modifiable change mechanism in efforts to reduce harmful substance use and risky sex. Social psychological studies of time perspective, reflecting life orientations toward the past, present, or future, have shown that substance misusers and those engaged in other risk behaviors tend to have more present-oriented and less future-oriented perspectives compared to controls (e.g., Henson et al., 2006; Zimbardo & Boyd, 2009). For example, young adults with a present-hedonistic time perspective showed increased alcohol, drug, and tobacco use and decreased condom and seat belt use (Henson et al., 2006).

Similarly, behavioral economic models of choice conceptualize substance misuse and related risk behaviors as reflecting persistent preferences for short-term rewards that lead to long-term costs and devaluation of larger, delayed rewards that support adaptive functioning (Vuchinich & Heather, 2003). Four decades of behavioral economic research on intertemporal choices between sooner smaller rewards and later larger rewards have shown that devaluation or “discounting” of delayed rewards is exhibited by both humans and animals in research that variously used cross-sectional, longitudinal, or experimental designs (MacKillop et al., 2011; Madden & Bickel, 2010; Rachlin, 2003). Although discounting is a normative phenomenon, the rate of discounting is more extreme among persons with SUDs (Madden & Bickel, 2010), and younger age and lower income and education (e.g., Green, Myerson, Lichtman, Rosen, & Fry, 1996) are also associated with greater delay discounting. Furthermore, interventions guided by behavioral economic theory that enhanced future orientation and engagement in substance-free activities have found greater reductions in drinking and related problems compared to control conditions (e.g., Murphy et al., 2019, 2022). Similar results have been found for sexual risk-taking; e.g., African American middle school students who received an intervention aimed at envisioning their future selves showed decreased intentions to engage in sex and increased abstinence compared with those who received a health education control curriculum (Clark et al., 2005; cf. Quisenberry, Eddy, Patterson, Franck, & Bickel, 2015).

Taken together, these lines of research highlight the role of time perspectives and delay discounting processes in understanding risk behaviors among young people, particularly those from disadvantaged communities. In one of the few studies that assessed both time

perspectives and delay discounting in disadvantaged young adults (Cheong et al., 2014), substance use was positively related to time perspectives oriented toward present pleasure coupled with a lower tendency to plan for the future and lower sensitivity to longer term outcomes. In this study, however, delay discounting rates on a hypothetical money choice task assessing preferences for different money amounts available at different delays were not related to substance use, although the sample as a whole showed high levels of discounting of delayed rewards. This unexpected discontinuity with time perspective measures, also observed recently by others (Acuff, Soltis, Dennhardt, Berlin, & Murphy, 2018), merits further investigation.

Based on the findings of Cheong et al. (2014) and behavioral economic and social psychology research on the role of time horizons in risk-taking (e.g., MacKillop et al., 2011; Zimbardo et al., 1999), the present study used a cross-sectional design to investigate the hypothesis that greater substance use and sexual risk behaviors would be associated with present-dominated time perspectives and higher delay discounting rates, which reflect relative preference for sooner smaller than later larger rewards. Conversely, greater risk behaviors were hypothesized to be associated with lower future-oriented time perspectives. The study thus was a conceptual replication and extension of Cheong et al. (2014) using a new independent sample of young African American women living in disadvantaged urban communities. The research focused on young women because of their greater vulnerability to negative reproductive health outcomes, including HIV infection and unplanned pregnancy. New HIV/AIDS cases continue to rise among women in color (U.S. Centers for Disease Control & Prevention [CDC], 2016, 2017), and young African American women in the United States often do not have a regular physician or access to preventive healthcare and are a difficult to reach population for risk reduction interventions.

2.0 Methodology

African American women ages 15–25 years (N = 223, M age = 20.4 years) were recruited as an independent supplemental sample to a larger parent study of health risk behaviors in African American emerging adults living in economically disadvantaged areas of a Southern U.S. city (Tucker et al., 2016). Although emerging adulthood is often defined as ranging from 18 to 25 years (Arnett, 2011), 15- to 25-year-olds were recruited because the target population often experiences relatively more health risks and economic pressures to transition to adult roles quickly (Sterrett et al., 2014). Study procedures are summarized here. Earlier publications of findings from the larger parent study (N = 344) that included both male and female emerging adults provide additional details (Cheong, Tucker, & Chandler 2019; Cheong et al., 2014; Tucker, Cheong, & Chandler, 2020; Tucker et al., 2016). The research received university Institutional Review Board approval and a U.S. federal Certificate of Confidentiality and adhered to Strengthening the Reporting of Observational Studies in Epidemiology guidelines (Von Elm et al., 2007).

In addition to age, race, and gender eligibility criteria, participants were required to report at screening lifetime use of any substance and sex with a partner in the past 90 days. They were recruited using Respondent Driven Sampling (Heckathorn, 1997; Johnston & Sabin, 2010), a peer driven community-based method that corrects biases of snowball

sampling. Initial "seed" participants who met eligibility criteria were recruited in person in disadvantaged neighborhoods based on U.S. 2000 federal Census data. They were trained to recruit peers "like you," who then recruited peers (excluding relatives) in an iterative process until the sample was obtained. Seeds and peer recruits each received three time-limited coupons to distribute that provided a toll-free study number to call if they wished to enroll. All participants received $30 for an initial 1.5-hour data collection interview and $15 for each peer recruit who enrolled in the study (up to $45). Table 1 presents demographic characteristics and descriptive statistics for the sample of 81 seeds and 142 recruits who were combined for data analysis. As a whole, the sample was disadvantaged economically though generally educated at least through high school.

Research staff of similar age, gender, and race to the participants conducted structured field interviews to assess personal and social network characteristics, risk/protective factors including time perspectives, behavioral impulsivity, substance use, and risky sexual behaviors.

Time horizon variables.

The 56-item *Zimbardo Time Perspective Inventory* (ZTPI; Zimbardo & Boyd, 1999; cf. Zimbardo & Boyd, 2008) assessed two subscales of conceptual relevance: (1) Present-Hedonistic, which assesses a risk-taking approach to life oriented toward present pleasure rather than future consequences (15 items; Cronbach's $\alpha = .79$), and (2) Future, which assesses preparation for the future and sensitivity to longer term outcomes (13 items; $\alpha = .77$). Participants rated the extent to which each item characterized them on a 5-point Likert scale, and ratings were averaged across subscale items for analysis.

Delay discounting

Delay discounting of future outcomes in favor of more immediate rewards was assessed using an established computerized hypothetical money choice task (Richards, Zhang, Mitchell, & de Wit, 1999). Hypothetical and real money choices generate equivalent measures of discounting (e.g., Johnson & Bickel, 2002). Participants made repeated choices between a smaller U.S. dollar amount available immediately and a larger amount available at 5 delays (1, 2, 30, 180, and 365 days from now; e.g., $5 now or $20 in 30 days). An equivalence point was determined at each delay, estimating the amount of immediate money judged subjectively equivalent to the larger later amount. The equivalence points were used to derive a discount rate (k-parameter) that was log-transformed for analysis because of skewness. Higher log k values indicate more immediate reward preferences.

Risk behavior variables.

The widely validated *Alcohol, Smoking and Substance Involvement Screening Test* (ASSIST v 3.0; World Health Organization, 2010) assessed lifetime and past 90-day use of alcohol, illicit drugs, and non-medical prescription drugs and yielded a Global Continuum of Risk score (range = 0 to 280) that was used for analysis. Higher scores indicate greater substance involvement.

An adapted *Youth Risk Behavior Surveillance System Questionnaire* (CDC, 2009) assessed sexual risk-taking and reproductive health, including 7 binary variables that were summed for analysis: first sexual intercourse before age 16, not using a condom during the last sex, substance use during the last sex, having two or more sexual partners in the past 90 days, sex with injection drug users, using no birth control during the last sex, and transactional sex (e.g., in exchange for money, drugs, food, or a place to stay).

Data analyses.

Using SAS 9.4, separate linear regression models examined associations of time horizon variables with each risk behavior. Individual characteristics associated with time perspectives and delay discounting were used as covariates, including age, gender, educational level (completed high school/GED or not) and accomplishment (average grades during the last two years in school reported as 1 = mostly As, 2 = mostly Bs, 3 = mostly Cs, 4 = mostly Ds, or 5 = mostly Fs). In the regression models, risk behaviors were specified as outcome variables, and time horizon variables and covariates were included as predictors. To evaluate the unique relations between time horizons variables and risky behaviors after controlling for the other predictors, all chosen predictors were included simultaneously in the model. Effect size was estimated using squared semi-partial correlations (i.e., proportion of unique variance in the outcome variables accounted for by each predictor). Of 223 enrolled participants, 28 had missing values on the discounting task, and 14 were excluded due to invalid discounting task response patterns based on standard criteria for evaluating discounting data validity (i.e., k-parameter > 2 or equivalence point for Day 365 > Day 1 delay). This resulted in an analysis sample of 181.

3.0 Results

Table 2 shows the linear regression results. Consistent with the hypothesis, higher scores on the ZTPI present hedonism subscale were significantly related to greater substance involvement and greater sexual risk-taking (ps < .05; squared semi-partial correlation = 0.04 and 0.02, respectively). Greater discounting was significantly related to greater sexual risk-taking (p < .05; squared semi-partial correlation = 0.02) but not to substance involvement. Future time perspectives were not significantly associated with either risk behavior. Age was the only significant covariate in both models, with older age being associated with higher risk behaviors.

4.0 Discussion

The pattern of results suggests that behavioral health decision-making among young African American women living in disadvantaged urban neighborhoods was related to hedonistic rewards available in the present whereas little consideration was given to future outcomes. The present-hedonistic time perspective results replicate and extend to sexual risk behaviors the Cheong et al. (2014) findings for substance involvement obtained using an independent sample of young men and women recruited from the same disadvantaged neighborhoods. These associations suggest that present-dominated time perspectives may be a common construct involved in different risk behaviors.

Also as hypothesized, the present study found that higher delay discounting rates were positively associated with sexual risk behaviors among young women. Neither study, however, found the expected association between greater discounting and substance use common in the behavioral economic literature on SUDs (Madden & Bickel, 2010), nor were future time perspectives related to either risk behavior. Older age was associated with greater risk behaviors in this young adult sample, an expected association because of the additional time available for risk-taking to occur.

The lack of association between delay discounting and substance use adds to growing mixed support for this relationship, particularly among younger adults (Acuff et al., 2018), even though the association is more reliable among person who meet SUD diagnostic criteria. By comparison, time perspectives, which appear to be more stable and trait-like than log *k*, have utility in predicting substance use in young adults (e.g., Acuff et al., 2018; Henson et al., 2006), and post-hoc analyses showed that log *k* in the present study was not significantly correlated with either ZTPI subscale (rs < −.07). Also, the present sample had discounting rates similar to active illicit drug users (e.g., Petry, Bickel, & Arnett, 1998) and rural substance users living with HIV/AIDS (Tucker, Blum, Xie, Roth, & Simpson, 2012). Given the resource scarcity and environmental instability these young women face, focusing on meeting immediate needs at the expense of longer term planning is understandable (Oshri et al., 2019; Sheehy-Skeffington, 2020; Watts et al., 2018). Thus, there may have been a ceiling effect and insufficient variability in discounting rates to find significant associations, at least with respect to substance involvement though the predicted association was found for sexual risk-taking. These discrepancies in the utility of various time horizon measures with different populations deserve further study.

The study has limitations. First, given the cross-sectional design, causal relations between the time horizon and risky health behaviors cannot be determined from these findings. Present-oriented time perspectives and steeper delay discounting may serve as risk factors for engaging in risk behaviors, may be a consequence of engagement in those behaviors, or some combination of both; alternatively, the associations observed may reflect the contribution of an unmeasured third variable. Second, the present sample was smaller than originally planned and insufficient to apply RDS analysis procedures to check and adjust for possible recruitment bias due to network sizes and chain referrals (Gile & Handcock, 2010). Nevertheless, checks conducted on the larger parent sample that recruited participants of the same race and age range in the same neighborhoods showed no evidence of bias (Tucker et al., 2016). Third, other than the computer-administered discounting task, verbal report measures were used that are subject to reporting biases. To safeguard against bias, measures with sound psychometric properties were used, and comparisons of reports of substance use and sexual behaviors in the parent study with matched national surveys showed the expected higher risk profiles in our urban emerging adult sample (Tucker et al., 2016).

With these qualifications, the present results are aligned with prior social psychological and behavioral economic research that directed attention to the role of foreshortened time horizons in addictive and other health risk behaviors and suggested that lengthening time horizons may be a key target in interventions aimed at reducing health risk behaviors (e.g., Bickel, Johnson, Koffarnus, MacKillop, & Murphy, 2014; Clark et al., 2005; Rachlin,

Green, Vanderveldt, & Fisher, 2018; Zimbardo & Boyd, 2008). Recent research guided by this framework has focused on developing interventions to lengthen time perspectives and promote a longer view of the future, and several have been found to be efficacious in preventing or reducing risky health behaviors among college students as well as among persons with SUDs (e.g., Murphy et al., 2019; cf. Murphy, Dennhardt, & Gex, 2022). Young adults residing in disadvantaged communities likely have need for such interventions because they tend to have more constrained economic and social opportunities that can compete with present choices to use substances and engage in risky sex. Although the present study is limited to an examination of associations among these key variable domains, establishing the associations among the present target risk population is a basic first step. Future research should be aimed at verifying causal relationships among the variable domains and devising interventions that manipulate them in beneficial ways to reduce risk behaviors. These issues deserve consideration in future research and applications with this priority risk population of young adults living in disadvantaged environments.

Acknowledgements

This research was supported in part by the U.S. Centers for Disease Control and Prevention [cooperative agreement #5U48DP001915] awarded to the University of Alabama at Birmingham Prevention Research Center/Center for the Study of Community Health. The authors thank Cathy A. Simpson, Ph.D. and Ms. Julie Hope for contributing to measurement development.

References

Acuff SF, Dennhardt AA, Correia CJ, & Murphy JG (2019). Measurement of substance-free reinforcement in addiction: A systematic review. Clinical Psychology Review, 70, 79–90. [PubMed: 30991244]

Acuff SF, Soltis KE, Dennhardt AA, Berlin KS, & Murphy GJ (2018). Evaluating behavioral economic models of heavy drinking among college students. Alcoholism: Clinical and Experimental Research, 42, 1304–1314.

Arnett JJ, Kloep M, Hendry LB, & Tanner JL (2011). Debating emerging adulthood: Stage or process? Oxford, UK: Oxford University Press.

Bickel WK, Johnson MW, Koffarnus MN, MacKillop J, & Murphy JG (2014). The behavioral economics of substance use disorders: Reinforcement pathologies and their repair. Annual Review of Clinical Psychology, 10, 641–677.

Cheong J, Tucker JA, & Chandler SD (2019). Reasons for accepting and declining free HIV testing and counseling among young African American women living in disadvantaged Southern urban communities. AIDS Patient Care and STDs, 33, 25–31. [PubMed: 30328693]

Cheong J, Tucker JA, Simpson CA, & Chandler SD (2014). Time horizons and substance use among African American youths living in disadvantaged urban areas. Addictive Behaviors, 39, 818–823. [PubMed: 24531637]

Clark LF, Miller KS, Nagy SS, Avery J, Roth DL, Liddon N, & Mukherjee S (2005). Adult identity mentoring: Reducing sexual risk for African-American seventh grade students. Journal of Adolescent Health, 37, 337.e1–337.e10.

Fitzpatrick K, & LaGory M (2003). Placing health in an urban sociology: Cities as mosaics of risk and protection. City & Community, 2, 33–46.

Gile KH, & Handcock MS (2010). Respondent-driven sampling: An assessment of current methodology. Sociological Methodology, 40, 285–327. [PubMed: 22969167]

Heckathorn DD (1997). Respondent-driven sampling: A new approach to the study of hidden populations. Social Problems, 44, 174–199.

Henson JM, Carey MP, Carey KB, & Maisto SA (2006). Associations among health behaviors and time perspective in young adults: Model testing with boot-strapping replication. Journal of Behavioral Medicine, 29, 127–137. [PubMed: 16421652]

Johnson MW, & Bickel WK (2002). Within-subject comparison of real and hypothetical money rewards in delay discounting. Journal of the Experimental Analysis of Behavior, 77, 129–146. [PubMed: 11936247]

Madden GJ, & Bickel WK (Eds.) (2010). Impulsivity: The behavioral and neurological science of discounting. Washington, DC: American Psychological Association.

Murphy JG, Dennhardt AA, Martens MP, Borsari B, Witkiewitz K, & Meshesha LZ (2019). A randomized clinical trial evaluating the efficacy of a brief alcohol intervention supplemented with a substance-free activity session or relaxation training. Journal of Consulting and Clinical Psychology, 87, 657–669. [PubMed: 31070386]

Murphy JG, Dennhardt AA, & Gex KS (2022). Individual behavioral interventions to incentivize sobriety and enrich the natural environment with appealing alternatives to drinking. In Tucker JA & Witkiewitz K (Eds.), Dynamic pathways to recovery from Alcohol Use Disorder: Meaning and methods. Cambridge, UK: Cambridge University Press.

Oshri A, Hallowell E, Liu S, McKillop J, Galvan A, Kogan SM, & Sweet LH (2019). Socioeconomic hardship and delayed reward discounting: Associations with working memory and emotional reactivity. Developmental Cognitive Neuroscience, 37, 10062. https://www.journals.elsevier.com/developmental-cognitive-neuroscience

Petry NM, Bickel WK, & Arnett M (1998). Shortened time horizons and insensitivity to future consequences in heroin addicts. Addiction, 93, 729–738. [PubMed: 9692271]

Quisenberry AJ, Eddy CR, Patterson DL, Franck CT, & Bickel WK (2015). Regret expression and social learning increases delay to sexual gratification. PLoS One, 10, e0135977. [PubMed: 26280349]

Rachlin H, Green L, Vanderveldt A, & Fisher E (2018). Behavioral Medicine's Roots in Behaviorism: Concepts and Applications. In Fisher EB, Cameron LD, Christensen AJ, Ehlert U, Guo Y, Oldenburg B & Snoek FJ (Eds.), Principles and Concepts of Behavioral Medicine: A Global Handbook. New York: Springer.

Richards JB, Zhang L, Mitchell SH, & de Wit H (1999). Delay or probability discounting in a model of impulsive behavior: Effect of alcohol. Journal of the Experimental Analysis of Behavior, 71, 121–143. [PubMed: 10220927]

Sheehy-Skeffington J (2020). The effects of low socioeconomic status on decision-making processes. Current Opinion in Psychology, 33, 183–188. [PubMed: 31494518]

Sterrett EM, Dymnicki AB, Henry D, Byck B, Bolland J, & Mustanski B (2014). Predictors of co-occurring risk behavior trajectories among economically disadvantaged African-American youth: Contextual and individual factors. Journal of Adolescent Health, 55, 380–387.

Tucker JA, Blum E, Xie L, Roth DL, & Simpson CA (2012). Interactive Voice Response self-monitoring to assess risk behaviors in rural substance users living with HIV/AIDS. AIDS and Behavior, 16, 432–440. [PubMed: 21311964]

Tucker JA, Cheong J, & Chandler SD (2020). Predicting HIV testing in low threshold community contexts: A naturalistic study of test choices among young African American women in the Southern United States. AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, 32, 175–181.

Tucker JA, Simpson CA, Chandler SD, Borch CA, Davies SL, Kerbawy SJS, Lewis TH, Crawford MS, Cheong J, & Michael M (2016). Utility of respondent driven sampling to reach disadvantaged emerging adults for assessment of substance use, weight, and sexual behaviors. Journal of Health Care for the Poor and Underserved, 27, 194–208.

U.S. Centers for Disease Control and Prevention. (2009). Youth Risk Behavior Survey. Retrieved June 8, 2021, from https://www.cdc.gov/healthyyouth/data/yrbs/questionnaires.htm

Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, & Vandenbroucke JP (2007). STROBE initiative. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. Epidemiology, 18, 800–804. [PubMed: 18049194]

Vuchinich RE, & Heather N (Eds.) (2003). Choice, behavioural economics and addiction. New York: Pergamon/Elsevier Science Inc.

Watts TW, Duncan GJ, & Quan H (2018). Revisiting the marshmallow test: A conceptual replication investigating links between early delay of gratification and later outcomes. Psychological Science, 29, 1159–1177. [PubMed: 29799765]

World Health Organization. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) v3.0. Geneva, Switzerland: WHO Press. Retrieved June 8, 2021, from http://www.who.int/substance_abuse/activities/assist_test/en/

Zimbardo P, & Boyd J (2008). The time paradox: The new psychology of time that will change your life. New York: Free Press.

Zimbardo PG, & Boyd JN (1999). Putting time in perspective: A valid, reliable individual-differences metric. Journal of Personality and Social Psychology, 77, 1271–1288.

Practical Implications

- Risky substance use and sexual behaviors among young African American women living in disadvantaged urban neighborhoods appear to be related to hedonistic rewards available in the present without considering future outcomes.
- These associations suggest future research should evaluate whether lengthening time perspectives and promoting enriched views of possible futures may help prevent and reduce substance involvement and sexual risk-taking among disadvantaged young African American women.
- Such interventions may be particularly helpful for young adults living in disadvantaged communities because they tend to have limited economic and social opportunities that can compete with present choices to use substances and engage in risky sex.

Table 1.

Sample demographic characteristics and descriptive statistics

Variable	Frequency (%)/Mean (SD)
High school or GED completed[a]	189 (84.75)
Average grades[b]	
Mostly As	40 (17.94)
Mostly Bs	133 (59.64)
Mostly Cs or lower	50 (22.42)
Employed[c]	124 (55.61)
Receipt of public assistance	163 (73.09)
Married	25 (11.21)
Have children	63 (28.25)
Age in years	20.44 (2.47)
Substance use[d]	
Alcoholic beverages	203 (91.03)
Tobacco products	131 (58.74)
Illicit drugs	139 (62.33)
ASSIST GCR substance involvement[d]	20.54 (18.25)
Risky sexual behaviors (sum)[e]	1.26 (1.21)
Delay discount rate (log *k*)[f]	−3.16 (1.98)
ZPTI Present Hedonism score	3.52 (0.55)
ZPTI Future score	3.66 (0.43)

N = 223. Descriptive statistics are frequencies (percentages) for categorical variables and means (standard deviations) for continuous variables based on participants who provided data for a given variable. ASSIST, Alcohol, Smoking and Substance Involvement Screening Test; GCR, Global Continuum of Risk; GED, general educational diploma; ZPTI, Zimbardo Time Perspective Inventory.

[a] Participants who completed high school, GED, or higher education.

[b] Average grades last two years in school (1 = mostly As, 2 = mostly Bs, 3 = mostly Cs, 4 = mostly Ds, 5 = mostly Fs).

[c] Employment resulting in at least weekly pay.

[d] Use of specific substances and global risk scores based on ASSIST reports of lifetime substance use; the GCR scale also assessed lifetime network concerns about substance use, failed quit attempts, and injection drug use (range = 0 to 280).

[e] Sum of seven binary measures of risky sexual behaviors (see text).

[f] Log-transformed delay discount rate to reduce skewness based on 181 participants, excluding 42 with either invalid response patterns (n = 14) or missing data (n = 28) on the delay discounting task.

Table 2.

Associations among measures of time horizons, substance involvement, and risky sexual behaviors

Predictors	ASSIST GCR substance involvement[a]		Risky sexual behaviors[b]	
	B	SE	B	SE
Age (years)	1.176	0.592*	0.094	0.038*
High school completed[c]	0.090	4.363	−0.123	0.282
Average grades[d]	1.383	1.951	0.113	0.126
Delay discount rate (log *k*)[e]	0.561	0.667	0.086	0.043*
ZPTI Present Hedonism	6.804	2.463**	0.321	0.159*
ZPTI Future	−3.756	3.249	−0.128	0.210

N = 181. ASSIST, Alcohol, Smoking, and Substance Involvement Screening Test; GCR, Global Continuum of Risk; GED, general educational diploma; ZPTI, Zimbardo Time Perspective Inventory.

[a] ASSIST GCR score range = 0–280; GCR scores based on ASSIST reports of lifetime substance use and lifetime social network concerns about substance use, failed quit attempts, and injection drug use.

[b] Sum of seven binary measures of risky sexual behaviors (see text).

[c] Participants who completed high school, GED, or higher education.

[d] Average grades last two years in school.

[e] Log-transformed delay discounting rate to reduce skewness.

* p <.05;

** p <.01.