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Effects of the Youth Empowerment Seminar on Impulsive Behavior in Adolescents

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A B S T R A C T

Purpose: Because impulsivity during adolescence predicts health-risk behaviors and associated harm, interventions that attenuate impulsivity may offer protection. We evaluated effects of the Youth Empowerment Seminar (YES!), a biopsychosocial workshop for adolescents that teaches skills of stress management, emotion regulation, conflict resolution, and attentional focus, on impulsive behavior.

Methods: High school students (14–18 years of age) in the United States participated in YES! during their physical education classes. Students in a control group attended their usual curriculum and were tested in parallel. We used items from the Barratt Impulsiveness Scale (framed to reflect recent behavior) to assess students' behavior before and after they underwent the program.

Results: Compared with the control group, YES! participants reported less impulsive behavior after the program.

Conclusions: The results suggest that YES! can promote mental health in adolescents, potentially protecting them from harmful coping behaviors.

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IMPLICATIONS AND CONTRIBUTION

The study indicates that adolescents undergoing the YES! program show reduced impulsive behavior. Given the link between impulsivity and harmful coping behavior, the program may be protective against risk behavior detrimental to adolescent health.

Impulsivity, the tendency to act without thinking, is linked to risky behaviors during adolescence [1–3] that can become difficult to modify over time [4]. Interventions that reduce impulsive behavior may therefore have a significant impact in deterring its negative consequences.

YES! is a workshop designed for 12- to 18-year-olds that aims to promote emotional and physical wellbeing via psychosocial education combined with yoga and meditation. Although no empirical studies of YES! have been published, anecdotal reports from school administrators suggest that it reduces externalizing problem behaviors. We hypothesized that this effect may be

attributable to the program reducing impulsivity. To determine the effect of YES! on impulsive behavior, we obtained structured self-reports from high school students undergoing YES! and a control group that attended their usual curriculum. We expected YES! participants to show reduced impulsive behavior.

Methods

The University of California—Los Angeles Institutional Review Board and the Los Angeles Unified School District Research and Planning Division approved this study.

Participants

Participants were drawn from three Los Angeles–area high schools between spring 2010 and fall 2011. In total, 788 students (524 YES! and 264 controls) participated and submitted at least

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Table 1
Demographics of participants in study

	Controls	YES!	χ^2 (df, n)	<i>t</i> (df)	<i>p</i>
Sex			1.51 (1,445)		.22
Male (n [%])	55 (46.6)	174 (53.2)			
Female (n [%])	63 (53.4)	153 (46.8)			
Age (years)				19.14 (443)	<.001
Mean age (mean [SD]) (years)	16.50 (1.05)	14.42 (1.00)			
Age range (years)	14–18	13–18			
Ethnicity			8.82 (6,432)		.18
Hispanic/Latino (n [%])	95 (84.8)	280 (87.5)			
Mixed (n [%])	7 (6.3)	16 (5.0)			
Asian-American (n [%])	6 (5.4)	9 (2.8)			
African-American (n [%])	0	9 (2.8)			
Native American (n [%])	0	2 (.6)			
Caucasian (n [%])	1 (.9)	2 (.6)			
Other (n [%])	3 (2.7)	2 (.6)			
Unreported (n)	6	7			
Primary language			1.52 (1,302)		.22
English (n [%])	95 (81.9)	162 (87.1)			
Other (n [%])	21 (18.1)	24 (12.9)			
Mother's education			8.16 (6,270)		.23
<7th grade (n [%])	34 (32.7)	46 (27.7)			
8th or 9th grade (n [%])	13 (12.5)	37 (22.3)			
10th or 11th grade (n [%])	16 (15.4)	27 (16.3)			
High school graduate or Graduate Equivalency Diploma (n [%])	15 (14.4)	28 (16.9)			
Some college (n [%])	11 (10.6)	17 (10.2)			
College education (n [%])	8 (7.7)	6 (3.6)			
Graduate degree (n [%])	7 (6.7)	5 (3.0)			
Socioeconomic status					
MacArthur subjective social status					
Family standing, (mean [SD])	5.05 (1.90)	4.78 (1.60)		1.27 (273)	.21
School standing (mean [SD])	5.94 (2.24)	5.57 (2.03)		1.42 (276)	.16
Bedrooms per tenant	.50 (.24)	.50 (.24)		.19 (295)	.85

df = degrees of freedom; SD = standard deviation.

one of the questionnaire packets from the pre/post-YES! testing sessions. Because of scheduling limitations, we were not able to balance sample sizes across groups. Nevertheless, the final sample sizes provided sufficient statistical power for group comparisons.

YES! program

YES! (www.youthempowermentseminar.org) is a life skills workshop that the International Association for Human Values has taught to over 35,000 students in the United States since 2004. It is composed of three modules: Healthy Body, Healthy Mind, and Healthy Lifestyle. The Healthy Body module consists of physical activity that includes yoga stretches, mindful eating processes, and interactive discussions about food and nutrition. The Healthy Mind module includes stress management and relaxation techniques. Breathing exercises (e.g., Sudarshan Kriya [5]) and mindfulness techniques are used to calm the mind, bringing awareness to the moment and enhancing concentration. Group processes promote personal responsibility, respect, honesty, and service to others. In the Healthy Lifestyle module, students learn strategies for handling challenging emotional and social situations, especially peer pressure. Mindful decision making and leadership skills are taught via interactive games.

Procedure

Classes were either placed into YES! (about 1 hour per day) or continued their standard curriculum (control group). Instruction

occurred over 4 weeks (about 20 hours). Both groups completed questionnaires 1 week before and 1 week after the program.

Measures

Participants completed a 20-item version of the Barratt Impulsiveness Scale (BIS-11) [6], adapted for repeated measurement in adolescents. Ten questions from the BIS-11 regarding employment and financial security were removed because they were not age appropriate. Questions were framed to reflect behavior in the preceding week (e.g., "In the past week, I have done things without thinking"). Patterned/invalid responses (e.g., lack of variability in responses despite reverse-coded questions) were excluded from analyses. To accommodate occasional missing data (maximum of two missing items), we used mean scores instead of summed scores. Both mean total score and three traditional BIS-11 subscales were examined.

All students completed a demographics questionnaire, including information about age, sex, language, mother's education, and ethnicity (Table 1). We evaluated questions regarding students' primary language to determine exclusion owing to potential lack of comprehension. Indications of comprehension problems (e.g., "I don't understand" or question marks written in the margins) resulted in exclusion of student responses. We assessed socioeconomic status with the MacArthur Scale of Subjective Social Status [7], assessing both their own standing within the school community and their family's standing in the community, and by questions regarding living situation and parents' occupations and education.

Table 2

Barratt Impulsiveness Scale results: total and subscale means and standard deviations, by group

	Pre-YES!	Post-YES!
Total	Mean (Standard Deviation)	Mean (Standard Deviation)
Control***	2.34 (.36)	2.41 (.39)
YES!**	2.39 (.40)	2.32 (.41)
Attentional		
Control***	2.28 (.51)	2.38 (.54)
YES!	2.31 (.56)	2.30 (.55)
Motor		
Control***	2.23 (.63)	2.35 (.59)
YES!	2.28 (.55)	2.25 (.54)
Non-Planning		
Control	2.45 (.47)	2.45 (.45)
YES!**	2.48 (.46)	2.35 (.45)

Protected post hoc paired *t*-tests (i.e., comparing pre- and post-YES!) after omnibus doubly repeated multivariate analysis of variance. Higher scores indicate greater impulsiveness.

** $p < .0005$.

*** $p < .11$.

Results

Participants

We analyzed data from 327 YES! and 118 control participants (Table 1). The groups did not differ significantly on demographic variables (assessed using unpaired *t*-tests and chi-square tests where appropriate) except for age, which was included as a nuisance covariate in all models. Although data were not obtained from control participants in one school, all reported analyses remained significant when excluding data from that school.

Univariate analysis of variance showed that before implementing YES!, students from the three schools did not differ significantly on mean total impulsiveness ($F_{[2, 442]} = .26$; $p > .75$), nor did the groups differ at baseline ($F_{[1, 443]} = 1.14$; $p > .25$).

Group \times Time interactions

Doubly repeated multivariate analysis of variance revealed a significant Group \times Time interaction for mean total impulsiveness in both an uncorrected model ($F_{[1, 443]} = 13.24$; $p < .001$) and a model correcting for age, sex, and school ($F_{[1, 439]} = 12.94$; $p < .001$). Paired *t*-tests comparing mean total impulsiveness over time revealed a significant reduction for the YES! group and no difference for controls (Table 2).

Tests of the three BIS subscales (doubly repeated multivariate analysis of variance) indicated a significant Group \times Time interaction ($F_{[3, 300]} = 3.07$; $p < .03$) (correcting for age, sex, and school). Post hoc univariate models testing each subscale revealed significant Group \times Time interactions for the Motor ($F_{[1, 302]} = 4.96$; $p < .03$) and Non-Planning ($F_{[1, 443]} = 4.78$; $p < .03$) subscales. Paired *t*-tests revealed a significant reduction in mean scores for Non-Planning in the YES! group only (Table 2) and indicated that the significant interaction for the Motor subscale was driven by a marginally significant increase in the control group. To investigate the possibility of unequal sample sizes influencing the results, we examined random subsamples of the YES! group that were equal to the size of the control group, and found no change in results.

Discussion

These results indicate divergence in impulsive behavior between high school students who participate in the YES! program and those who do not, especially concerning lack of planning. Because impulsive behavior is often linked to adolescent substance abuse, the intervention may help prevent such risky behavior. Specifically, it may fulfill a need for biopsychosocial interventions that address behavioral antecedents to substance abuse [8]. The program may also help ameliorate impulsivity-related externalizing behaviors, such as those linked to attention deficit–hyperactivity disorder.

Given the association between poor executive function and impulsive behavior [9], further studies may determine whether the program aids development of executive function, similar to other interventions for youth [10], and may also evaluate its long-term efficacy. Because YES! uses multiple approaches (e.g., group processes, yoga), future research may identify specific aspects that most strongly target impulsivity and its subcomponents. Moreover, subsequent studies may benefit from examining other relevant factors, including depression, anxiety, stress, mindfulness, and social connectedness. Because the current study included adolescents of primarily Hispanic descent from low- to middle-income communities, examination of more diverse samples is warranted.

Overall, the findings suggest that programs such as YES!, which combine psychosocial education and yoga-based practices, including breathing exercises and meditation, can reduce impulsive behavior during adolescence, a period when impulsive actions may have lifelong consequences.

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References

- [1] Nigg JT, Wong MM, Martel MM, et al. Poor response inhibition as a predictor of problem drinking and illicit drug use in adolescents at risk for alcoholism and other substance use disorders. *J Am Acad Child Adolesc Psychiatry* 2006;45:468–75.
- [2] Tarter RE, Kirisci L, Mezzich A, et al. Neurobehavioral disinhibition in childhood predicts early age at onset of substance use disorder. *Am J Psychiatry* 2003;160:1078–85.
- [3] Ivanov I, Schulz KP, London ED, et al. Inhibitory control deficits in childhood and risk for substance use disorders: A review. *Am J Drug Alcohol Abuse* 2008;34:239–58.
- [4] Irwin Jr CE, Burg SJ, Uhler Cart C. America's adolescents: Where have we been, where are we going? *J Adolesc Health* 2002;31(Suppl 6):91–121.
- [5] Kjellgren A, Bood SA, Axelsson K, et al. Wellness through a comprehensive yogic breathing program—a controlled pilot trial. *BMC Complement Altern Med* 2007;7:43.
- [6] Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt Impulsiveness Scale. *J Clin Psychol* 1995;6:768–74.
- [7] Goodman E, Adler NE, Kawachi I, et al. Adolescents' perceptions of social status: Development and evaluation of a new indicator. *Pediatrics* 2001;108:E31.
- [8] Schepis TS, Rao U. Smoking cessation for adolescents: A review of pharmacological and psychosocial treatments. *Curr Drug Abuse Rev* 2008;1:142–55.
- [9] Crews FT, Boettiger CA. Impulsivity, frontal lobes and risk for addiction. *Pharmacol Biochem Behav* 2009;93:237–47.
- [10] Diamond A, Lee K. Interventions shown to aid executive function development in children 4 to 12 years old. *Science* 2011;333:959–64.