









Exploring the Relationship Between Youth Information Behavior, Substance Use, and Substance Use Expectancies: A Pilot Study

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Abstract. A substantial body of research has explored the relationship between passive information seeking and youths' beliefs about and use of substances. To date, however, little work has explored other dimensions of youth information behavior (such as active information seeking, information needs, and information use) and substance use. The aim of this study was to pilot the use of an information behavior scale in order to examine the association between youth information behavior and self-reported substance use, as well as use-related expectancies. Youth 12–17 years of age ($N = 446$) across eight U. S. states completed self-report measures of their information behavior and their use of and expectancies regarding the following: cigarettes; electronic vapor products; chewing tobacco, snuff, dip, or snus; cigars, cigarillos, or little cigars; alcohol; and marijuana. Regression models were conducted to examine the relationship between information behavior, substance use, and substance use expectancies. Results indicated that information behavior was associated with expectancies for tobacco and vaping products, but not for alcohol or marijuana. There was no significant association between information behavior and actual substance use. Results have implications for the development and implementation of both information behavior measures and substance use prevention programs.

Keywords: Information behavior · Substance use prevention · Youth

1 Introduction

Youth substance use continues to be a public health concern in the United States. Sixty-two percent of American 12th graders have consumed alcohol, 44% have used marijuana, 47% have vaped, and 24% have smoked cigarettes at least once in their lifetime [34]. Youth substance abuse is tied to negative outcomes including higher risks of unintentional injury to self and others, sexual violence, suicide attempts, mental health issues, and substance abuse lasting into adulthood [10, 11, 30, 45].

To address this issue, youth prevention programs have been developed that focus on knowledge, skills, and behaviors predictive of substance use, guided by theory and prior research [25]. For example, existing prevention programs have targeted skills such as social resistance, self-management, communication, and decision making (e.g., [12, 27, 28, 46]). Recently, scholars have examined the role of information in substance use decision processes. For example, media and health literacy scholars concerned with the influence of advertising and other media messages have studied youths' abilities to critically evaluate, analyze, and use information related to alcohol, drugs, and other substances (e.g., [3, 35, 53]).

Although evidence suggests that interventions developed using this approach can have a positive impact on youth substance use [29], this area of research is relatively new. Little is known about youth information behavior (IB) within the context of substances in general, as well as the relationship between youth IB and substance use and use expectancies (the beliefs individuals hold about the positive and negative effects of substance use [6, 38]). Because the basic premise of media and health literacy interventions is that elements of IB drive substance use decisions, research that seeks to elucidate the literacy intervention – IB – outcomes pathway is important to understanding how these approaches work and subsequently moving this area of prevention science forward.

2 Youth Information Behavior and Substance Use

IB has been defined as “the totality of human behavior in relation to sources and channels of information” [65, p. 49], and includes the ways in which “people need, seek, manage, give, and use information in different contexts” [13, p. xix]. While there exist many different theories and models of IB, common among many of these approaches is the understanding that IB is complex and multifaceted, involving cognitive, affective, and behavioral dimensions and an array of actions and activities [44, 49, 65].

Although IB within the context of health is a significant area of inquiry in information science, little research has focused on youth IB in relation to substance use specifically. Existing research has focused on youth engagement with substance-related information. For example, studies have indicated that youth's information needs related to illicit substances include the effects of these substances on users; motivations for using substances; epidemiological data related to substance use; legal issues; guidance on safer substance use; and information related to preventing or ending substance use [1, 40, 48, 58]. Youth seek substance-related information from a variety of online [40, 55] and interpersonal sources [40, 51, 55]. Some young people have expressed confidence in their ability to actively seek information relevant to substances, while others have found information seeking to be difficult [51]. For many young people, seeking substance-related information is an iterative process in which they consult multiple sources of information in order to address a given information need [40, 55]. Youth use substance-related information to facilitate the adoption of harm reduction behaviors [58], and in modifications to their existing knowledge structures [62] and opinions [40] related to substances.

Although some research has examined youth IB as it relates to substance-specific information, there are few inquiries that link IB to actual substance use or theoretical predictors of use (e.g., youth's expectancies about the effects of substances [15, 38,

47, 61]. An exception to this is research examining the relationship between passive information seeking and substance use (for a recent review, see [31]). This work demonstrates that exposure to alcohol-related advertisements and user-generated online content is associated with increased alcohol consumption, future consumption intentions, and positive consumption attitudes [26, 32, 60]. Similar findings have been demonstrated in studies focused on other types of substance-related media exposure and young people's substance use and substance use intentions, such as tobacco [36, 64], e-cigarettes [4, 42, 54], and marijuana [8, 9]. A smaller number of studies have examined the relationship between active information seeking and substance use, demonstrating that actively seeking substance-related information from interpersonal and media sources is positively associated with substance use and substance use intentions (e.g., [39, 43, 66]). The link between IB and expectancies is of particular interest, as this is an important explanatory construct in health behavior theories used to explain substance use (e.g., Theory of Reasoned Action and Planned Behavior, Social Cognitive Theory) [16]. For example, studies show that positive expectancies among youth (i.e., the belief that alcohol will lead to positive effects) are associated with negative alcohol outcomes [61].

However, research has yet to examine the relationship between IB more comprehensively, incorporating constructs such as information needs, both active and passive information seeking, and information use, and youth substance use and use expectancies. Those studies that do address active information seeking use measures focused on frequency of information source use, breadth of information sources consulted, or information source preferences [41]. Missing from these measures are more holistic considerations of youth IB.

3 Current Study

As little is known about the relationship between youth IB and substance use, this study aimed to: 1) pilot test a measure of IB that captures multiple dimensions of youth IB; and 2) examine the association between youth IB and their self-reported substance use, as well as use-related expectancies.

Specifically, a shortened version of Fortier and Burkell's [14] IB scale was pilot tested in this study. The IB scale is a 28-item measure of IB with items related to information needs, information seeking, information use, and information sharing [14]. Originally developed and tested with undergraduate students [14], this scale was shortened to a 9-item version for use in this study due to the comparatively younger age of the participants under study and its use in a larger research project within a community-based setting.

Given the information-rich environment in which today's adolescents are immersed, and the emergence of media literacy in health interventions, this study sought to contribute to IB theory by demonstrating the relationship between dimensions of youths' IB and behavioral outcomes related to substance use, while also informing both the theory and application of prevention science by utilizing an information science perspective. One would expect that youths' IB would influence their expectancies as well as their substance use behaviors. Therefore, this study sought to address the following research question:

RQ: Is IB related to substance use and substance use expectancies?

4 Methods

This study draws from a community-based randomized controlled trial evaluating REAL media, a self-paced online media literacy curriculum for youth focused on substance use prevention. REAL media is designed to decrease substance use in adolescents by increasing awareness of and efficacy in resisting advertising messages. REAL media was developed through multiple iterative stages involving target youth [20, 23, 56, 57], and is based on Youth Message Development, a face-to-face media literacy curriculum designated as evidence-based by the Substance Abuse and Mental Health Services Administration's National Registry of Evidence-based Programs and Practices [2, 3, 21, 24].

The curriculum is based on the Theory of Active Involvement's [19] approach to media literacy and consists of 5 lessons or levels. Level 1 introduces concepts of media reach and cost, as well as media ethics. Level 2 focuses on target audience and persuasion strategies used in advertising. Level 3 identifies arguments or claims used in advertisements including missing information and counter-arguing. Level 4 focuses on attention-getting tactics and major advertising production techniques. In the fifth and final level, youth plan, produce, and share a counter-message (i.e., substance prevention message) targeting their peers.

4.1 Participants

Participants were recruited from 4-H clubs¹ in eight U. S. states (Arizona, Illinois, Louisiana, New Jersey, Ohio, Pennsylvania, Washington, and West Virginia), with three project cohorts launched throughout 2018. Recruitment was initiated at the state level through either local 4-H leaders or a statewide strategy. The project team gave recruitment presentations to county leaders, club leaders, and at state events, and developed a project website and social media presence that were shared widely. When youth demonstrated interest, parental consent forms were distributed and returned directly to research staff. Participants provided assent after research staff obtained parental consent; both parental consent and youth assent were necessary for youth to participate.

The sample consisted of 446 4-H youth members between 12 and 17 years of age ($M = 14.83$, $SD = 1.29$) at the time of study pretest. See Table 1 for additional participant demographic information.

¹ In the U. S., 4-H clubs are a network of youth organizations based in land-grant universities and sponsored by the United States Department of Agriculture. The largest youth development organization in the country, 4-H clubs focus on experiential learning, mentoring, and positive youth development in teaching youth leadership and life skills [48]. Prior research has found that 4-H members have patterns of risk behaviors similar to other U.S. youth [35].

Table 1. Participant demographic information

Participant characteristics	<i>n</i> (%)
Gender	
Male	148 (33)
Female	298 (67)
Race	
European-American or White	388 (87)
African-American or Black	20 (4)
Asian or Pacific Islander	16 (4)
American Indian or Alaskan Native	5 (1)
Other/Not identified	17 (4)
Ethnicity	
Hispanic	31 (7)
Non-Hispanic	415 (93)
Education	
Currently attending public school	321 (72)
Currently attending private school	40 (9)
Currently being home-schooled	71 (16)
Other	14 (3)
Have a computer or tablet at home	
Yes	441 (99)
No	5 (1)

4.2 Procedure

After assent, youth were randomly assigned to treatment ($n = 240$, 54%) or delayed use control ($n = 206$, 46%) conditions, with efforts made to balance condition assignment by participant state, gender, race, and geographic area (i.e., urban/rural). Participants in the treatment group completed the REAL media curriculum after completing the study pre-test, and participants in the delayed use control group were invited to complete the curriculum after completing all study post-tests. REAL media was designed to take approximately 90 min, excluding time spent by youth to design their substance prevention message. Although it was encouraged, not all participating youth completed the program. The attrition rates and consort diagram for the larger study are included in [22]. Study surveys were programmed and distributed via Qualtrics, an online survey tool, and typically took 15–60 min for participants to complete. Participants were given three weeks to complete the surveys on their own time, and research staff sent reminder messages to participants via email and/or text message as needed. The analyses presented here include data from two time periods (pre-test and 3-month post-test). Participants received \$10 in compensation after completion of each online survey. Only those participants who completed the pre-test survey were retained in the sample ($N = 446$). The post-test completion rate was 80% ($n = 358$).

This study was approved by a university Institutional Review Board and advised by a three-member Data Safety and Monitoring Board.

4.3 Measures

Participants completed self-report measures related to IB, substance use, and substance use expectancies.

Information Behavior. IB was measured at post-test using a subset of nine agree-dis-agree items from Fortier and Burkell's [14] IB scale (see Table 2). The questions in this scale were not specific to substance-related information but rather asked about youths' IB more generally. Although nine items were initially used to measure IB, several items displayed poor internal consistency including all three items from the information seeking subscale and one item from the information needs subscale (alphas by subscale were: information use = .63; information needs = .28; and information seeking = .29). Based on the correlations among items and other psychometrics, a composite variable for IB was created with five items; the final measure consisted of three items from the information use subscale and two items from the information needs subscale. The five items measure an orientation to rule following construct, characterized by actions that have been termed "good information behavior," or, in other words, actions that align with those encouraged by librarians and other information professionals as good practices to employ when seeking and using information, such as questioning the accuracy of information and using criteria to assess information quality ([14], p. 4). Confirmatory factor analysis (CFA) also yielded good fit of this measurement model ($\chi^2(5) = 13.68$, $p = .02$, Root Mean Square Error = .07, 90% CI = .03, .12, CFI = .97, TLI = .94). Response categories for all items ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). We averaged these 5 items' response score to make a composite variable, with a higher composite score reflecting higher orientation to rule following ($M = 5.40$, $SD = 0.83$, $\alpha = .67$).

Table 2. Information behavior scale subset [14]

Subscale	Item
Information use	I question the accuracy of information.†
	I pay attention to the details about where information comes from.†
	I have criteria that I use to assess the quality of information.†
Information needs	Looking for information comes naturally to me.†
	A lot of information overwhelms me.*
Information seeking	When I am interested in something, I have lots of questions.†
	I prefer using information sources I already know
	I prefer finding information by myself rather than asking for help
	When I have a question, I rely on my friends and family for information

* Reverse-coded item

†Items included in the composite variable.

Substance Use. Youth substance use was measured at post-test with a recall-based dichotomous (yes/no) indicator of whether the respondent reported any of the following in the past three months: cigarette smoking, even one or two puffs; electronic vapor product use, even one or two times; chewing tobacco, snuff, dip, or snus use, even one or two times; cigar, cigarillo, or little cigar use, even one or two puffs; at least one drink of alcohol; and use of marijuana. Items specific to cigarette smoking and use of electronic vapor products were taken from the 2017 National Youth Risk Behavior Survey [5], with parallel items created for all other substances. A composite variable was created by summing all items ($M = 0.31$, $SD = 0.74$, $\alpha = .59$). CFA with these six items supported a one-factor solution ($\chi^2(9) = 10.27$, $p = .33$, Root Mean Square Error = .02, 90% CI = .00, .07, CFI = .995, TLI = .992).

Substance Use Expectancies. Both social substance use expectancies and perceived harm expectancies were assessed in this study. Social substance use expectancies for all substances were assessed at post-test with three items per substance, drawn from the Population Assessment of Tobacco and Health (PATH) [63]. Respondents indicated their agreement with these statements for each substance (cigarettes; cigars, cigarillos, or little cigars; electronic vapor products; chewing tobacco, snuff, dip, or snus; alcohol; and marijuana). The three items asked respondents whether using each substance “is enjoyable,” “makes it easier to fit in at parties,” and “makes people who use the substance ‘not attractive’” (reverse coded item). Response categories ranged on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores were averaged, with higher scores reflecting more positive substance use expectancies. That is, six social expectancy variables for six different substance (smoking cigarettes ($M = 1.65$, $SD = 0.69$, $\alpha = .51$), smoking cigars, cigarillos, or little cigars ($M = 1.68$, $SD = 0.77$, $\alpha = .65$), using electronic vapor products ($M = 2.17$, $SD = 0.99$, $\alpha = .72$), using chewing tobacco, snuff, dip, or snus ($M = 1.59$, $SD = 0.68$, $\alpha = .54$), drinking alcohol ($M = 2.61$, $SD = 1.07$, $\alpha = .73$), and using marijuana ($M = 2.02$, $SD = 1.01$, $\alpha = .73$) were created.

Perceived harm from use of each substance was also measured at pre-test and post-test. An item from the PATH Study [63] specific to cigarette use was used, with parallel items created for all other target substances. Respondents were asked one question per substance to indicate their appraisal of how much people who use the substances harm themselves if they use the target substance on “some days but not every day.” Response categories ranged on a four-point Likert scale from 1 (*no harm*) to 4 (*a lot of harm*). Item scores were averaged, with higher scores reflecting greater perceived harm ($M = 3.22$, $SD = 0.57$, $\alpha = .80$).

4.4 Analyses

Prior to examining the relationship between IB and 8 outcomes (overall substance use, cigarette social expectancies, cigar social expectancies, chewing tobacco social expectancies, vaping social expectancies, alcohol social expectancies, marijuana social expectancies, and perceived harm), it was first examined whether IB differed between the treatment and control groups. A t-test indicated no significant difference regarding

the IB composite score between control ($n = 187$, $M = 5.43$, $SD = 0.83$) and treatment ($n = 171$, $M = 5.36$, $SD = 0.82$), $t(356) = 0.80$, $p = 0.43$. Thus, the entire sample was included in subsequent analyses. Eight regression models were conducted to examine the relationship between IB and expectancies for each of the six substances, perceived harm, and overall substance use using Mplus. Given the number of regression models, the p -value level was adjusted to .01 instead of .05 to avoid an increase in type 1 error. Demographic information (e.g., gender, age) and condition (control = 0 and treatment = 1) were included as covariates in the regression analyses. Because most participants were White, race was dummy-coded (White = 0 and other = 1). One dummy-coded education variable (public school = 1 and other = 0), seven dummy-coded state variables (PA served as the reference group), and lifetime substance use experience (never across any substance = 0 and experience using any substance = 1) were also included at pre-test. In order to control for previous expectancies and use, relevant pre-test versions of each outcome variable were also included as covariates for corresponding outcomes. Previous perceptions including social expectancies across all six different substances (cigarette: $M = 1.59$, $SD = 0.64$, $\alpha = 0.50$; vaping: $M = 2.01$, $SD = 0.89$, $\alpha = .69$; chewing: $M = 1.51$, $SD = 0.62$, $\alpha = .48$; cigar: $M = 1.59$, $SD = 0.67$, $\alpha = 0.55$; alcohol: $M = 2.56$, $SD = 1.01$, $\alpha = .75$; marijuana: $M = 1.91$, $SD = 0.93$, $\alpha = .70$) and as well as perceived harm ($M = 3.24$, $SD = 0.57$, $\alpha = .81$) at pre-test were also controlled for. For example, in the model examining the association between IB and cigarette social expectancies at post-test, cigarette social expectancies at pre-test was included in the model. Eight different regression models were conducted due to concerns about potential multicollinearity (see Table 3), type II error, and the purpose of this study (e.g., association between IB and outcomes by controlling for previous outcomes). Furthermore, given that the regression models are all saturated models (e.g., estimated all relationships), the model fit provides perfect fit indices (e.g., CFI = 1.00) and thus, are not reported. Full information maximum likelihood was employed to handle missing data [17]. Maximum likelihood method was used for outcomes analyses

Table 3. Zero order correlation matrix among key study variables

	1	2	3	4	5	6	7	8
1. IB	–							
2. CE	– 0.23***							
3. VE	– 0.18***	0.64***						
4. CHE	– 0.23***	0.71***	0.48***					
5. CGE	– 0.24***	0.77***	0.59***	0.75***				
6. AE	– 0.10*	0.53***	0.75***	0.37***	0.49***			
7. ME	– 0.10	0.65***	0.75***	0.49***	0.63***	0.68***		
8. PH	0.11*	–0.35***	–0.47***	–0.29***	–0.34***	–0.47***	– 0.47***	
9. 3SU	0.02	0.24***	0.41***	0.09	0.26***	0.41***	0.42***	– 0.28***

Note. 1. IB: information behavior, 2. CE: cigarette expectancy, 3. VE: vaping expectancy, 4. CHE: chewing expectancy, 5. CGE: cigar expectancy, 6. AE: alcohol expectancy, 7. ME: marijuana expectancy, 8. PH: perceived harm, 9. 3SU: 3 month substance use, * < .05, ** < .01, *** < .001

for expectancy and perceived harm and robust maximum likelihood method [7, 67] was used for 3-month substance use at post-test due to the positive skewness of this variable.

5 Results

IB at post-test was negatively related with positive social expectancies on cigarette ($b = -0.12$, $se = .04$, $p = .001$), vaping ($b = -0.19$, $se = .05$, $p < .001$), chewing tobacco, ($b = -0.15$, $se = .04$, $p < .001$), and cigar use ($b = -0.18$, $se = .04$, $p < .001$). IB was not related with alcohol ($b = -0.09$, $se = .05$, $p = .07$) and marijuana ($b = -0.09$, $se = .05$, $p = .06$) expectancy variables (see Table 4). Youth who had higher IB scores had lower positive social expectancy scores (i.e., more negative expectancies) regarding tobacco products. There was no significant association between IB and actual substance use as well as the perceived harm variable.

6 Discussion

This study examined the relationship between IB and substance use behaviors and expectancies, pilot testing a shortened version of an existing IB scale. Based on the existing body of research, studies examining additional dimensions of youth IB and substance use are warranted. Results from this study demonstrate that IB is related to drug use expectancies, a powerful predictor of future use [15, 38, 47, 61], but not to self-reported use. Perhaps with a more extended observation of effects, the predicted progression from IB to expectancies to drug use would have emerged.

This study's findings provide support for the relationship between IB and expectancies about use of most substances (and marginally significant effects on expectancies for the others) but not substance use itself nor perceived harm. There are several possible explanations for these findings. It makes sense that the primary effect of IB would be on expectancies, as expectancies are shaped by the information one has. As measured, the rule-following nature of IB involves actions such as questioning the accuracy of information, using criteria to assess information quality, and assessing where information comes from [14]. It is established in the literature that youth have information needs related to substances [1, 40, 48, 58] and use information to modify their existing knowledge and opinions [40, 62]. Thus, it makes sense that expectancies about substances would be related to these actions. If youth look closely and critically at information about substances, they are likely to perceive more negative consequences associated with consumption. Notably, the IB – expectancy association was observed for tobacco-related beliefs and not beliefs about alcohol or marijuana. Perhaps this reflects more consistent messaging and information related to negative aspects of tobacco products relative to other substances. Given the popularity of youth alcohol experimentation as well as the changing legal landscape of marijuana, youth who seek information on alcohol or marijuana may find positive messages that counter any negative information they find.

Table 4. Relationship between social expectancies, perceived harm and information behavior (N = 446)

	Social Expectancies							Perceived Harm	3-Month Substance Use
	Cigarette	Vaping	Chewing	Cigar	Alcohol	Marijuana			
Information behavior	Est (se) - 0.12(.04)*	Est (se) - 0.19(.05)**	Est (se) - 0.15(.04)**	Est (se) - 0.18(.04)**	Est (se) - 0.09(.05)	Est (se) - 0.09(.05) †	Est (se) 0.04(.03)	Est (se) - 0.01(.05)	
State dummy1	0.02(.12)	- 0.15(.16)	0.17(.13)	0.05(0.13)	- 0.03(.16)	- 0.18(.16)	0.05(.09)	- 0.11(0.16)	
State dummy2	0.01(.11)	- 0.14(.14)	- 0.07(.11)	- 0.05(.12)	0.04(.14)	0.01(.14)	- 0.01(.08)	- 0.21(.12)	
State dummy3	- 0.01(.10)	- 0.04(.13)	0.06(.11)	0.11(.11)	0.08(.13)	- 0.05(.13)	- 0.11(.08)	- 0.02(.14)	
State dummy4	0.14(.18)	- 0.05(.23)	0.21(.19)	0.27(.20)	0.17(.24)	0.15(.23)	0.05(.14)	0.12(.20)	
State dummy5	0.30(.40)	0.41(.51)	0.18(.41)	0.40(.43)	0.16(.53)	- 0.06(.51)	- 0.12(.31)	0.38(.37)	
State dummy6	- 0.10(.10)	- 0.09(.13)	- 0.03(.10)	0.02(0.11)	- 0.08(.13)	- 0.17(.13)	0.06(.08)	- 0.18(.12)	
State dummy7	- 0.14(.13)	- 0.27(.16)	0.01(.13)	0.05(.14)	- 0.07(.17)	- 0.31(.17)	0.06(.10)	- 0.06(.14)	
Male (=1, female = 0)	- 0.13(.06) †	- 0.24(.08)*	- 0.08(.07)	- 0.05(.07)	- 0.11(.09)	- 0.15(.08)	0.01(.05)	- 0.06(.07)	
Not White (=1, White = 0)	0.06(.10)	- 0.18(.13)	- 0.05(.11)	- 0.24(.11)	- 0.30(.14) †	- 0.07(.14)	- 0.02(.08)	- 0.06(.10)	
Public school (=1, others = 0)	- 0.16(.70) †	0.04(.09)lePara>	- 0.01(.07)	- 0.02(.07)	0.10(.09)	- 0.11(.09)	0.01(.05)	- 0.02(.08)	
Treatment (=1 control = 0)	0.10(.06)	0.06(.08)	0.00(.06)	0.07(.07)	- 0.01(.08)	0.02(.08)	0.02(.05)	0.02(.06)	
Age	0.01(.02)	0.04(.03)	- 0.01(.03)	0.00(.03)	- 0.01(.03)	0.05(.03)	- 0.01(.02)	0.06(.03) †	

(continued)

Table 4. (continued)

	Social Expectancies							Perceived Harm	3-Month Substance Use
	Cigarette	Vaping	Chewing	Cigar	Alcohol	Marijuana			
T1 Lifetime substance use (=1, no = 0)	0.11(.07)	0.22(.10) †	0.01(.07)	0.02(.08)	0.18(.10)	0.16(.10)	–	– 0.05(.06)	0.85(.10)***
T1 Cigarette social expectancies	0.56(.05)**	–	–	–	–	–	–	–	–
T1 Vaping social expectancies	–	0.67(.05)**	–	–	–	–	–	–	–
T1 Chewing social expectancies	–	–	0.56(.05)**	–	–	–	–	–	–
T1 Cigar social expectancies	–	–	–	0.65(0.05)**	–	–	–	–	–
T1 Alcohol social expectancies	–	–	–	–	0.70(.04)**	–	–	–	–
T1 Marijuana social expectancies	–	–	–	–	–	0.69(.05)**	–	–	–
T1 Perceived harm	–	–	–	–	–	–	–	0.64(.04)**	–
R ²	.39	.50	.33	.42	.54	.52	.45	.34	

Note. † $p < .05$, * $p < .01$, ** $p < .001$

6.1 Limitations

Three of the primary limitations of this study were due to constraints on survey length. First, it was not possible to measure IB at pre-test. This meant changes in IB could not be examined, nor could initial IB levels be controlled for. Second, it was not feasible to use the IB scale in its entirety. There are very few measures of IB in existence, and the Fortier and Burkell [14] scale is the only one found that covers multiple dimensions of IB. However, it was too long for the current purpose because this study was conducted among youth in the field where time restrictions do not allow for long, multi-item scales. Although what was believed to be an adequate number of items from each of the dimensions of information seeking, use, and needs were selected for use, contrary to expectations our modifications did not retain the hypothesized dimensionality. To construct a reliable scale, five items that had adequate reliability were chosen for inclusion based on inter-item correlations. This may have influenced the findings. Third, none of the information seeking questions were retained in the five-item composite for IB. As a result, the findings are applicable only to information needs and use, and not information seeking.

Additionally, some of the substance use expectancy scales had relatively low reliability (e.g., smoking cigarettes across two time points). Thus, interpretation should be made with caution. An additional limitation is related to the race/ethnicity of the study population. Because participants were predominantly non-Hispanic white, the findings may not be generalizable to adolescents of other racial/ethnic groups. Finally, any study that relies on self-report data is limited in the claims it can make about behavior. However, although the correlation between self-reported and actual substance use behavior is not perfect, self-reported behavior appears valid for the purposes of comparing outcomes [59]. Others also provide evidence in support of self-reported data, particularly when limited to activities during the past 30 days [18, 33, 52], such as the current focus.

6.2 Future Research

Future research should continue to explore the relationship between youths' IB, substance use, and expectancies. Further development of measures of IB is needed, particularly briefer measures that are better suited for a community-based youth population. Establishing a relationship between IB and these constructs would enable the development of prevention programs that focus on specific aspects of IB related to youth substance use.

Additionally, the lack of findings in this study related to actual substance use indicate the lack of a direct effect of IB on substance use. Given the well-established connection between expectancies and subsequent use of substances [15, 38, 47, 61], it is possible that IB has an indirect effect on use through its association with expectancies that requires a longer observation period. Future longer longitudinal studies are needed to explore expectancies as a mediator between IB and substance use.

From an information science perspective, such work would extend theorization of IB constructs, with a particular focus on information use. The ways in which youth use information related to substances, including the impact that such information has on

their behaviors, has received less attention than the information they seek and how they seek it.

Finally, causal direction cannot be clearly established given the cross-sectional nature of these data. Although it makes sense that the IBs measured here would lead to less positive expectancies about substance use, one could argue that youth have negative expectations that might make them more skeptical about positive information about substances. Future research is needed to clarify these issues.

7 Conclusion

This study pilot tested a measure of youth IB in a study examining the relationship between IB and substance use and substance use expectancies. Findings revealed that IB was associated with substance use expectancies but not substance use itself. Expectancies are a more proximal outcome of IB and suggest that longer term follow up may reveal behavioral changes as well. Additionally, there were issues related to the reliability of the shortened IB scale that indicate further work is needed in establishing a quantitative measure of youth IB.

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