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Role of Causality Orientations in Predicting Alcohol Use and Abstinence Self-Efficacy

Allison Dukes [iD], Patrick R. Mullen [iD], Jennifer Niles [iD], Daniel Gutierrez [iD] and Samantha Jensen

William & Mary School of Education, Williamsburg, Virginia, USA

ABSTRACT

In the present study, we examined the ability of Self-Determination Theory's causality orientations to predict alcohol use and abstinence self-efficacy. We also provided suggestions for counselors supporting client and student autonomy in clinical practice. *Objectives:* This study sought to answer the following questions: (a) Does a person's causality orientation (autonomy, control, and impersonal) predict their alcohol use? (2) Does a person's causality orientation (autonomy, control, and impersonal) predict their temptation to use drugs and alcohol? (3) Does a person's causality orientation (autonomy, control, and impersonal) predict their confidence to use drugs and alcohol? *Method:* We utilized Amazon's Mechanical Turk (MTurk), a crowdsourced online labor market approach to collect data from a community sample. *Results:* The results suggest heightened impersonal orientation was predictive of increased alcohol use and increased temptation to use while control orientation was also predictive of increased temptation. Higher autonomous orientation was predictive of increased confidence to not use while impersonal and controlled were not. *Conclusion:* This study's findings underline the importance of SDT in substance use prevention, initiation, and treatment, and open the door to more empowering interventions. Through the intentional use of SDT, individuals may feel more empowered to set and achieve goals, feel a greater sense of control in their lives, strengthening their overall autonomy.

Problematic substance use remains a public health concern with continued high prevalence rates for alcohol consumption and treatment (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). In fact, rates of alcohol use and high-risk drinking have increased in recent years among adults (Grant et al., 2017). The cost of treating substance use disorders continues to be a significant burden (Trautmann et al., 2016). Substance use interventions often top the costs of other critical health concerns, including diabetes and cancer (Whiteford et al., 2013). This emphasizes the need for a continued effort to provide effective substance use interventions for the benefit of individuals and public health. Smith (2011) notes that an emerging approach to understanding problematic substance use is the application of Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000), which is an organismic metatheory based on the idea that humans naturally pursue health, growth, and connectedness. It also focuses on understanding the way people develop the motivation to start new behaviors and maintain them over time.

SDT is an integrative framework of six-mini theories that explain human motivation and psychological health (Ryan & Deci, 2020). SDT highlights the motivations behind goals and behaviors as ways of satisfying both physiological and psychological needs (Ryan & Deci, 2019). Researchers and clinicians use this metatheory to create interventions by targeting the mechanisms that foster change in problematic

behaviors. Researchers have applied SDT in the creation of interventions for health-related behavior, such as parenting consultation (Allen et al., 2019), tobacco dependence (Williams et al., 2009), and physical activity (González-Cutre et al., 2018). SDT can also be useful for conceptualizing an individual from the perspective of their motivation for change (Smith, 2011).

Substance use scholars have utilized SDT as a foundation to understanding alcohol use across various developmental stages (Richards et al., 2021; Wormington et al., 2011). Motivations for behavior range from intrinsic to extrinsic motivation, both highlighting the position of the motivator (Wormington et al., 2011). Intrinsic motivation comes from within the individual; they have free will over their behavior decision-making. The resulting behavior is often interesting and pleasurable to engage in, due to the individual autonomously deciding this process. The ability to operate and engage in activities intrinsically leads to greater levels of self-esteem, creativity, and autonomy, contributing to increased satisfaction within the individual; these outcomes make this a positive source of motivation in individuals (Deci & Ryan, 2000; Wormington et al., 2011). Extrinsic motivation refers to behaviors done by an individual because of an outside source (e.g., an entity, organization, and person). This type of motivation involves identified regulation (behaviors done as part of an individual's long-term goal that is not necessarily enjoyable), introjected regulation

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(when the individual experiences shame or guilt as a result of the internalization of outside sources), and external regulation (behaviors due to solely outside forces; often due to punishments or rewards; Wormington et al., 2011). Unlike intrinsic motivation, extrinsic motivation is less sustainable because it negatively affects an individual's autonomy in decision-making.

Intrinsically motivated behaviors result in greater "interest, excitement, and confidence" (p. 69) leading to greater performance, tenacity, creativity, self-esteem, and overall well-being (Ryan & Deci, 2000). Intrinsic motivation results from an individual's autonomy and competence (Deci & Ryan, 1985; 2010): people need to feel they have free will and are capable of making decisions. Developmentally, the human capacity to wonder and learn begins at birth and evolves throughout life (Deci & Ryan, 2010), a natural process of intrinsic motivation. Because intrinsic motivation is a naturally occurring phenomenon, a person's focus centers on (a) conditions that foster optimal progress and (b) conditions that threaten its existence.

Conditions that support intrinsic motivation encourage autonomous goal-seeking behavior. When an individual receives positive feedback, it increases their perceived competence (Deci & Ryan, 2010), and subsequently fosters intrinsically motivated behavior. Conversely, negative feedback, directives, consequences, and deadlines threaten the behavior, infringing upon both autonomy and competence (Deci & Ryan, 2000). Interpersonally, relationships and authoritative figures serve as conditions affecting this as well. In the classroom, teachers can increase students' intrinsic motivation by incorporating creativity and individual student perspectives, positively influencing students' abilities to learn and overall performance (Deci & Ryan, 2000). In the workplace, managers and supervisors who encourage autonomy and competence of subordinates foster higher job satisfaction and intrinsic motivation in their employees (Deci & Ryan, 2000). By introducing and maintaining support to a group or setting, the inhabitants will experience higher autonomy and competence, thus increasing their performances and life satisfaction.

Causality orientations

The six mini-theories of the SDT framework provide context for understanding a person's motivation. Causality orientations theory is one of the theories associated with SDT, which represents the way in which people view themselves as self-determined and how they orient themself to their environment (Deci & Ryan, 1985; Ryan & Deci, 2019). According to Ryan and Deci (2019), three orientations exist that guide how a person interacts with their environment: autonomy, impersonal, and control. An autonomy orientation represents when a person has both a high degree of initiative and the ability to regulate their behavior independently (internal locus of control). Highly autonomous people pursue opportunities for choice and appear to have an internal locus of control. An impersonal orientation to the world represents a person who sees their actions and behavior as

being outside of their own control, often feeling incompetent (lack of control). Someone who is highly impersonal-oriented likely sees the environment as uncontrollable and actions are taken without concern of personal initiation. A control orientation to an environment represents decision-making that is reliant on controls within the environment or in an individual themself (external locus of control). A highly control-oriented person is likely to act based on actions they should take according to existing protocol or events.

Further, the three causality orientations (Deci & Ryan, 1985) also offer a framework for understanding a person's wellbeing and decision-making process. The strength of an individual's orientations can help understand differences in behavior and choices. As an example, someone who is autonomous-oriented is likely to take an initiative on a project or task, being driven by an intrinsic interest and satisfaction. Orientations develop through the experiences a person has over time (Deci & Ryan, 1987), which reinforces a particular understanding of the environment. To support an autonomous orientation, one must create environments with the freedom to make choices, healthy challenges, and developing competency for a task (Black & Deci, 2000). A person who experiences a high degree of control (e.g., limited choices, evaluation of performance) in their environment may likely form a control-orientation, viewing external sources as reasoning for behaviors and actions. An impersonal orientation can develop from situations where a person does not experience relatedness, competence, or autonomy; these individuals act out of a lack of initiation on their part due largely to incompetence (Ryan et al., 2016). Causality orientations, as an element of SDT, provides a mechanism to better understand elements that predict problematic substance use.

Scholars have recently discovered an association between addictive behaviors and individuals' causality orientations. In a study examining causality orientations and adults with marijuana dependence, Blevins et al. (2016) found autonomous-oriented individuals reported a decrease in marijuana use, while impersonal-oriented participants reported an increase in use-related problems; control-oriented participants' results ranged between a reduction in marijuana use, marijuana use-related symptoms (e.g. impulsivity), and use-related problems (e.g. hostility with others; see Ansell et al., 2015). When looking at causality orientations and gambling, Rodriguez et al. (2015) found individuals with control orientations to be at greater risk of "chasing losses," (p. 1611) suggesting that control-oriented individuals believe external sources have control over their life outcomes. Those who were autonomous-oriented were more likely to accept outcomes and disengage from gambling behavior. Furthermore, participants in Rodriguez et al.'s study who were impersonal-oriented experienced the ability to either disengage or chase losses; the research team posited that impersonal-oriented individuals experienced extrinsic motivators (like control-oriented participants) but lacked the intrinsic motivation (e.g., personal initiation) to continue in the potentially problematic behavior. These findings lead us to believe there is a potential interaction between

abstinence self-efficacy and autonomous-orientation in individuals. Abstinence self-efficacy refers to an individual's confidence to maintain their sobriety (DiClemente et al., 1994), and higher autonomous-orientation likely relates to increased abstinence self-efficacy. Findings from both Blevins et al. (2016) and Rodriguez et al. (2015) suggest the causality orientations' places on the continuum of intrinsic to extrinsic motivation, and potential impact on outcomes for individuals with problematic substance use.

Purpose of this study

The aim of this study is to build upon the existing research in the application of self-determination theory as variables related to alcohol use. As it has been noted, SDT as a metatheory provides unique opportunities to conceptualize substance use and interventions to prevent or reduce its problematic use (Smith, 2011). Specifically, a greater understanding of how causality orientations relate to substance use may shed light on the justification for addressing elements of motivation through intervention programing. The following research questions guided this study:

1. Does a person's causality orientation (autonomy, control, and impersonal) predict their alcohol use?
2. Does a person's causality orientation (autonomy, control, and impersonal) predict their temptation to use drugs and alcohol?
3. Does a person's causality orientation (autonomy, control, and impersonal) predict their confidence to use drugs and alcohol?

Method

Participants

This study includes 223 (61.3%) male and 140 (38.5%) female participants with one (.3%) identifying as Transgender or Gender Nonconforming. The mean age was 39.17 ($SD = 11.58$) with a range from 20 to 70 years old. The sample included participants who identified as White ($n = 261$, 72.0%), Black or African American ($n = 58$, 15.9%), Hispanic ($n = 31$, 8.5%), Asian ($n = 14$, 3.9%), Native Hawaiian or Other Pacific Islander ($n = 2$, .6%), American Indian or Alaska Native ($n = 10$, 2.8%), and Other Race Unspecified ($n = 1$, .3%). The majority of the sample reported being married ($n = 290$, 79.7%) followed by single ($n = 59$, 16.2%) and other marital statuses (e.g., divorced, widowed, cohabitating; $n = 15$, 4.1%). We used the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001) to screen for participants' level of alcohol use. Scores ranged from nine to 42 with a mean score of 24, indicating that all participants scored within the range of hazardous or harmful alcohol consumption to the possibility of moderate-severe alcohol use disorder (Babor et al., 2001; Hagman, 2016; Källmen et al., 2019).

Procedures

Prior to starting this study, the authors received approval from the university institutional review board. We utilized Amazon's Mechanical Turk (MTurk), a crowdsourced online labor market approach to collect data from a community sample (Mullen et al., 2021). First, the authors created a Qualtrics web-based survey; then, this survey was linked to an MTurk task request restricting the job to workers from the United States. For completing the task, participants received $0.25 and a positive rating in MTurk for successful completion of the survey. Several validation checks were used to screen for participants that were not answering the survey with fidelity. We initially received 400 participants that started the survey but after removing participants who failed the validity checks or didn't complete the entire survey (listwise deletion), we had a total sample of 364.

Measures

General causality orientations scale

We employed the General Causality Orientations Scale (GCOS; Deci & Ryan, 1985) to examine participants' autonomy, impersonal, and control orientations. The GCOS includes 12 written vignettes for which participants review and rate their agreement on options that represent autonomy-oriented, impersonal-oriented, and control-oriented perspectives to the vignette. Participants rated their agreement on a scale from 1 (*Very Unlikely*) to 7 (*Very Likely*). A sample vignette is "You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is" with the following three questions "What if I can't live up to the new responsibility? (impersonal-oriented)", "Will I make more at this potion? (control-oriented)", and "I wonder if the new work with be interesting? (autonomy-oriented)". We averaged scores across the autonomy (α=.90), impersonal (α=.93), and control (α=.91) scales, which all produced strong internal consistency reliability.

Alcohol use disorders identification test

We utilized the Alcohol Use Disorders Identification Test (AUDIT, Saunders et al., 1993) as a measure of participants' overall alcohol usage. The AUDIT is a 10-item measure that assessed participants' individual alcohol use. Study participants rated their consumption of alcohol and experience related to alcohol use over the past 12 months using a 3 or 5-point rating scale. A sample item is, "How often do you have a drink containing alcohol?" We calculated an average score for the total scale as a measure of total alcohol consumption (α=.87), which resulted in strong internal consistency reliability.

Brief alcohol abstinence Self-Efficacy scale

We employed the Brief Alcohol Abstinence Self-Efficacy Scale (BAASE; McKiernan et al., 2011) to capture information about the participants' self-efficacy regarding their use

of drugs and alcohol. The BAASE is a short version of the Alcohol Self-Efficacy Scale (DiClemente et al., 1994) that includes two subscales that were the focus of this investigation. The subscales include 6 items on the temptation to use drugs and alcohol and 6 items on confidence to not use drugs and alcohol. Participants rated their level of temptation and confidence on a scale from 1 (*Not At All*) to 5 (*Extremely*). Some sample items include, "How tempted would you be to drink or use drugs when you have thoughts of using—while either awake or dreaming?" (temptation scale) and "How confident would you be not to drink or use drugs when you have thoughts of using—while either awake or dreaming?" (confidence scale). We averaged the scores on these subscales with strong internal consistency reliability (temptation α=.88, confidence α=.85).

Data analysis

Upon completing the survey, we downloaded the data and inputted it into SPSS (Version 26). We first screened for missing data and failure of the validity checks. This resulted in the removal of 36 cases that were not missing at random or cases where the participants incorrectly responded to a validity check resulting in a total sample of 364. The statistical analyses we employed include descriptive statistics, Pearson's correlation, and multiple linear regression analysis.

Results

The preliminary analysis included an examination of the statistical assumptions associated with multiple linear regression analysis. First, a scatter plot indicated a linear relationship between the predictor and dependent variables. In addition, an inspection of the P-P plots and residual statistics ensured assumptions regarding normality were met. Lastly, multicollinearity was satisfactory with variance inflation factor scores less than 10. Table 1 displays the correlations, means, and standard deviations for the variables in this study. As the correlation table indicates, the three orientations (autonomy, impersonal, and control) correlated independently with alcohol use, temptation to use, and confidence to not use. The effect sizes range from medium to large (*r* values ranging from .27 to .70; Sink & Stroh, 2006).

Our initial research question examined the ability of the motivational orientations to predict substance use among a community-based sample. Table 2 presents these results. To achieve this aim we employed a multiple linear regression whereby the predictor variables include scores on the GCOS subscales (autonomy, control, and impersonal motivational orientations). We also used scores on the AUDIT to measure the dependent variable of alcohol use. The linear composite of the independent variables predicted 21% ($R = .46$, $R^2 = .21$) of the variance in the dependent variable, $F = 31.50$, $p < .001$. Examination of the standardized regression weights revealed that impersonal motivational orientation significantly ($\beta = .56$, $p < .001$) predicted the outcome variable but not the other independent variables. As noted by the squared-partial correlations (sr^2), impersonal motivational orientation accounted for 9% of the variation in alcohol use uniquely whereas autonomy motivational orientation accounted for 1% and control motivational orientation accounted for less than 1%.

Our second research question examined the ability of motivational orientations to predict temptation to use drugs and alcohol. To achieve this aim we employed a second multiple linear regression whereby the predictor variables include scores on the GCOS subscales. We also used scores on a subscale on the BASEM to evaluate the dependent variable of temptation to use drugs and alcohol. The linear composite of the independent variables predicted 50% ($R = .71$, $R^2 = .50$) of the variance in the dependent variable, $F = 92.46$, $p < .001$. Examination of the standardized regression weights revealed that impersonal motivational orientation significantly ($\beta = .55$, $p < .001$) and control ($\beta = .29$, $p < .001$) predicted the outcome variable while the autonomous motivational orientation did not. The squared-partial correlations indicate that impersonal motivational orientation accounted for 8% of the variation in temptation to use drugs and alcohol exclusively, control motivational orientation accounted for 2%, and autonomy motivational orientation controlled for less than 1%.

In our third research question, we examined the ability of the motivational orientations to predict confidence to not use drugs and alcohol. To achieve this aim we employed a third and final multiple linear regression with the predictor variables of scores on the GCOS subscales. We also used scores on a subscale on the BASEM to evaluate the dependent variable of confidence to use drugs and alcohol. The linear composite of the independent variables predicted 28% ($R = .53$, $R^2 = .28$) of the variance in the dependent variable, $F = 44.08$, $p < .001$. Examination of the standardized regression weights revealed that autonomous motivational orientation ($\beta = .29$, $p < .001$) and impersonal motivational orientation significantly ($\beta = .22$, $p < .01$) predicted

Table 1. Correlations between variables and descriptive statistics.

	1	2	3	4	5	6
1. Autonomy						
2. Impersonal	.76*					
3. Control	.85*	.85*				
4. Alcohol Use	.26*	.45*	.34*			
5. Tempted to Use	.55*	.70*	.66*	.56*		
6. Confidence to Not Use	.50*	48*	.49*	.20*	.36*	
M	5.39	5.15	5.31	2.42	3.61	3.68
SD	.86	1.07	.92	.71	.85	.76

Note. * *p* < .001.

Table 2. Multiple linear regression analyses.

	B	$SE\ B$	β	sr^2	R^2	F
Outcome Variable: Alcohol Use						
					.21	31.50**
Autonomy	−1.38	.75	-.17	.01		
Impersonal	3.72	.60	.57**	.09		
Control	.11	.86	.01	.00		
Outcome Variable: Tempted to Use						
					.50	117.42**
Autonomy	-.12	.07	-.12	.00		
Impersonal	.43	.06	.55**	.09		
Control	.26	.08	.29**	.02		
Outcome Variable: Confidence to Not Use						
					.28	44.08**
Autonomy	.26	.08	.29**	.02		
Impersonal	.16	.06	.22*	.01		
Control	-.05	.09	-.06	.00		

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

confidence to not use drugs and alcohol. However, the control motivational orientation did not produce statistically significant coefficients. The squared-partial correlations revealed that autonomous motivational orientation accounted for 2% of the variation in confidence to not use drugs and alcohol, impersonal motivational orientation accounted for 1%, and control motivational orientation controlled for less than 1%.

Discussion

Causality orientation refers to a person's mostly stable, trait-like view of their ability to create change in their lives (Deci & Ryan, 1985). One's beliefs regarding their source of causality relates to their motivational orientation and decision-making. In this study, we explored to see if a person's causality orientation is related of their use of alcohol and abstinence self-efficacy. To achieve this aim, we first examined the relationship between causality orientation and alcohol consumption. An examination of the correlation table indicated that scores for each orientation type individually related to alcohol use scores. These relationships were positive and ranged from medium to large effects, suggesting that as each orientation score increased, participants' alcohol use also increased. The findings also revealed that that among the scores for autonomous, impersonal, and controlled orientation, only impersonal predicted alcohol use. This means that participants who reported higher impersonal orientation, a sense that they lack control of their environment and lack personal competence, also reported higher alcohol consumption, while the degree of autonomy and control orientation did not in the composite of these variables. The results are logical and align with prior researchers who found impersonal orientation is also associated with depression (Deci & Ryan, 1985; Rodriguez et al., 2015; Young et al., 2016) and poorer substance use treatment outcomes (Blevins et al., 2016). Our findings echo this prior research and highlight the important role an impersonal orientation may have in drinking behavior.

We also examined the relationship between the causality orientations and participants' temptation to use drugs or alcohol. In the bivariate correlation, all three orientations

independently correlated with the temptation to use with large, positive relationships. Furthermore, when examined as a composite of scores for the three orientations, impersonal and control both predicted temptation to use but not autonomy. This finding reveals that both a higher degree of impersonal and control significantly increased a person's temptation to use drugs in challenging situations. Prior research on these two orientations have found that they also relate to higher likelihoods of drinking and subsequent intimate partner violence (IPV) in college-aged students (Hove et al., 2010), increased likelihood of problematic gambling (Rodriguez et al., 2015), and adult marijuana-dependence (Blevins et al., 2016). The present study's findings add to the field of addictions through suggesting that a person who feels a heightened lack of control over their environment and an increased sense of external control may experience a higher level of temptation to drink during challenging circumstances.

The final research question focused on the relationship between scores on the three causal orientations and participants' report of confidence to not use drugs or alcohol. The results indicated that the three orientations individually correlated with participants' confidence to not use drugs or alcohol. In the regression analysis, the only significant predictor of the three variables was autonomy, which indicates that as a participant reports higher levels of autonomy orientation they may have greater confidence to not use substances. Our findings for this research question are logical and follow with prior research. For example, Blevins et al. (2016) illustrate that those who are autonomously motivated experience better treatment outcomes from adult marijuana-dependence. College-aged students (Hove et al., 2010) and adults (Øverup et al., 2017) who are autonomously motivated are less likely to engage in risky drinking, therefore being less likely to initiate IPV. Autonomous-oriented individuals are better equipped to stop gambling despite the outcomes (Rodriguez et al., 2015). These studies and the findings found in the present study bring attention to the importance of an autonomous orientation when considering a person's confidence for not using drugs or alcohol.

Taken together, the results of our study paint a picture regarding the relationship between causality orientations and alcohol use. In brief, heightened impersonal orientation was

predictive of increased alcohol use and increased temptation to use while control orientation was also predictive of increased temptation. Higher autonomous orientation was predictive of increased confidence to not use while impersonal and controlled were not. It is interesting to note that we do not see the three orientations in competing roles, like one may think they would. For example, if autonomous orientation scores predict higher confidence, one might think that impersonal or controlled scores would also inversely predict confidence given the concepts are theoretically opposing.

Implications

The present study's findings illustrate the critical role causality orientations have in subsequent alcohol initiation and continued use. This suggests several implications for counselors, counselor educators, and substance prevention program providers. Deci and Ryan (2010) describe autonomous environments as those that support individuals' goal-seeking behavior, hence their growth and development. For clinical mental health counselors, setting specific goals with impersonally or control-oriented clients can support their autonomy. Empowering these clients to achieve the goals they have made for themselves may encourage healthy decision-making because it will a sense of control of factors impacting their choices in life. A focus on goal-setting and attainment is not new to counseling; for instance, Cooper and Law (2018) bring attention to the value of intense focus on client goal-setting as a therapeutic experience. Our findings bring added meaning to using goals as a way to build client autonomy that may lead to decreased alcohol consumption.

For school counselors, the school environment provides both intrinsic support (e.g. positive feedback acknowledging their autonomy) and extrinsic support (e.g. rewards, directives, deadlines, and threats; Deci & Ryan, 2010). Additionally, school counselors can collaborate with teachers and school administrators to create autonomy-nurturing classrooms by supporting student perspectives, providing them with choices, avoiding the use of controlling language (Deci & Ryan, 2010). School counselors also serve as a first line helper with regards to reducing or preventing substance use among students. Mullen et al. (2019) described the application of Screening, Brief Intervention and Referral to Treatment (SBIRT) by school counselors and within school settings. SBIRT utilizes motivational interviewing approaches of building and enhancing a person's motivation for changing a problematic behavior, which aligns with our study in that increased sense that life is controllable relates to decreased alcohol use. As another example, the program GPS for Success (Niles et al., in press) is a school-based reflective intervention that encourages students to identify a purpose and vision for life with the aims of reducing substance use. School counselors can create interventions that help students establish a sense of control of one's life with an added goal to decrease their potential for alcohol use.

According to the present study's findings and similar literature regarding causality orientations and substance use, autonomous environments serve a protective role. Blevins et al. (2016) found that autonomous-oriented individuals in substance use treatment for marijuana had better treatment outcomes. Rodriguez et al. (2015) discussed autonomous individuals' sense of control within their environments, thus allowing them to disengage from gambling before playing becomes consequential. Hove et al. (2010) and Øverup et al. (2017) discovered that autonomous individuals engaged in significantly less alcohol consumption. These trends, as well as the findings discussed in this study, illustrate the need to create more autonomous-oriented environments and individuals. Supporting impersonal and control-oriented individuals and environments to become more autonomous may have long-term effects, including decreased alcohol consumption and better treatment outcomes for those with alcohol dependence.

Limitations and future research

We have identified a few future research directions based on our findings. First, it would be useful to retest our findings to validate them with a new sample through a replication study. Furthermore, it may be useful to test other elements of SDT, such as using different measures of intrinsic and extrinsic motivation as predictors of substance use to examine SDT's relationship to substance use from a broader perspective. Another next step to further this research would be to examine interventions to prevent problematic substance use designed from SDT theory, with a focus on building intrinsic motivation for abstinence. Examining interventions could employ the use of experimental designs that then help demonstrate causality of an SDT based program to prevent substance use. Additionally, it may be useful to the field of SDT research to implement autonomy-fostering strategies into classrooms or workplaces to understand how to reorient control and impersonal-oriented individuals. Research regarding the applicability of causality orientations literature for mental healthcare workers in rehabilitation facilities would also further the field of SDT, potentially cementing SDT as a core component of substance use.

Conclusion

SDT research has existed for decades, yet little has been done to determine the role of causality orientations in substance use initiation, prevention, and treatment outcomes. Specifically, less is known about incorporating the causality orientation literature into understanding alcohol use. This study's findings underline the potential importance of SDT in substance use prevention, initiation, and treatment, and open the door to more empowering interventions. Incorporating SDT into substance use prevention programs in schools may benefit students' overall well-being, academic achievement, and self-esteem, and may prevent substance

use initiation. Family counselors hoping to better home environments for children may find interventions aimed at increasing intrinsic motivators (see Deci & Ryan, 2010) to be fruitful for children and family members. Through the intentional use of SDT, individuals may feel more empowered to set and achieve goals, feel a greater sense of control in their lives, strengthening their overall autonomy.

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ORCID

Allison Dukes ⓘ http://orcid.org/0000-0002-8128-1566
Patrick R. Mullen ⓘ http://orcid.org/0000-0003-3561-9244
Jennifer Niles ⓘ http://orcid.org/0000-0001-8894-3895
Daniel Gutierrez ⓘ http://orcid.org/0000-0002-6102-8694

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