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## Regulatory Focus and Substance Use in Adolescents: Protective Effects of Prevention Orientation

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### Abstract

**Background:** Substance use is a major risk factor for negative health and functioning outcomes among middle schoolers. The purpose of this study was to assess whether individual differences in the adolescents' goal orientation are associated with elevated or attenuated risk for substance use. Regulatory focus theory stipulates that individuals vary in their strength of orientation toward promotion goals ("making good things happen") and prevention goals ("keeping bad things from happening").

**Objectives:** We sought to examine the association between individual differences in regulatory focus and adolescents' reports of their own and their friends' substance use.

**Methods:** Participants were 241 seventh grade students who completed measures of regulatory focus (promotion and prevention orientation), self-reported substance use, perceived substance use habits of peers, and demographics. Logistic regression models were used to examine adjusted odds of lifetime tobacco use, alcohol use, and marijuana use for both participants' own use and their reports of friends' use.

**Results:** Prevention orientation was associated with lower odds of all self-reported lifetime substance use outcomes (tobacco, alcohol, and marijuana). Prevention orientation was also associated with lower odds of reporting all types of substance use among friends. Promotion orientation was not associated with any self-reported substance use outcome, and was only associated with higher odds of reporting lifetime alcohol use among friends.

**Conclusions:** These findings underscore the importance of regulatory focus as it relates to adolescent substance use. Future research may seek to incorporate regulatory focus within interventions intended to prevent or delay initiation of substance use in adolescents.

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Declaration of interests

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## Keywords

Regulatory Focus; alcohol; marijuana; promotion; prevention; adolescents

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## Introduction

A major challenge for prevention science is to identify the factors that influence adolescents' initiation of illicit substance use (Nation et al., 2003). According to data from *Monitoring the Future*, almost 25% of all 8th graders have tried alcohol, with 9.2% reporting heavy drinking (Johnston et al., 2018). Levels of marijuana use among young adolescents are lower (13.5%), but still represent cause for concern. Of 8<sup>th</sup> graders, 9.4% have tried cigarettes, as have 26.6% of all 12<sup>th</sup> graders. While tobacco use among adolescents has decreased from previous years, it still presents a serious health risk (Johnston et al., 2018). Furthermore, the risks of initiation of substance use during early adolescence are substantial. Early substance use is associated with greater vulnerability to a range of serious problems including chronic alcohol and substance use, academic problems, engagement in risky sexual behaviors, employment problems, and criminally delinquent behavior (Schneider et al., 2012).

Research on adolescent substance use suggests the need for developmentally informed theory on substance use initiation (Chan et al., 2017). Given these gaps in knowledge, there is still much to be learned in order to optimize prevention efforts (Nation et al., 2003). We propose that individual differences in *regulatory focus*, a psychological construct representing the kinds of goals that people prefer to pursue, may be associated with adolescent substance use (Higgins, 1997).

## Self-Regulation and adolescent substance use

A number of investigators have examined the onset of adolescent substance use through the lens of social cognition and its role in late childhood and early adolescent development (Brown et al., 2005). For example, Andrews et al. (2008) found that children's social cognitions predicted their cigarette and alcohol use during adolescence. Among the social-cognitive processes documented as important influences on behavior, *self-regulation* – the ongoing process in which individuals pursue personal goals and evaluate their progress toward such goals – has been linked with well-being as well as vulnerability to maladaptive behavior (Carver & Scheier, 2001), and addiction specifically (MacKillop et al., 2011). Wills et al. (2007) observed that children's self-regulation predicted their attitudes toward substance use and initiation of use as young adolescents. Moreover, individual differences in self-regulation may influence the development of substance use through their effects on social cognition and downstream consequences such as attention to cues for reward versus threat, choices of companions, identification with role models, resisting temptation, and delay of gratification (Lockwood et al., 2002).

Other research examining the role of self-regulation in vulnerability to substance use has indicated that risk behaviors may emerge as a consequence of choices adolescents make in pursuit of an "adult" identity (Gerrard et al., 2000; Hawkins et al., 1992), implicating a lack of knowledge about long-term consequences as well as a lack of motivation to make wise

choices. Studies by Gerrard et al. (2000) have made important contributions by focusing specifically on adolescents' perspectives on risk, and specifically how adolescents can selectively alter their perceptions of others' reactions to their risk behaviors. Furthermore, self-regulation and contextual factors intersect to predict substance use, often through the interplay of identity processes and peer influence (Novak & Clayton, 2001).

### Regulatory focus theory

Regulatory focus theory is a well-validated cognitive/motivational theory of self-regulation (Higgins, 1997). It stipulates that individuals vary in their characteristic strength of orientation toward two basic classes of goals, each of which represents positive end-states toward which people strive. Each end state is associated with specific strategic inclinations and affective/motivational states. The theory distinguishes between *promotion orientation* (attaining a positive end-state by "making good things happen") and *prevention orientation* (attaining a positive end-state by "keeping bad things from happening"). Whereas both promotion and prevention orientations are associated with desired end-states, they differ in the strategies used to pursue goals. Regulatory focus theory draws upon the assumption that self-regulation operates differently when serving different needs (Blalock et al., 2015). Promotion-oriented adolescents orient to social situations that involve taking more risks, whereas prevention-oriented adolescents demonstrate a "conservative" orientation in the same kinds of situations (Lockwood et al., 2002).

Regulatory focus theory suggests the relevance of this trait-like characteristic that influences the process of substance use initiation among young adolescents. Individual differences in regulatory focus can influence decision making in complex social situations (Leone et al., 2005). However, the only work to date directly examining regulatory focus as a predictor of substance use comes from an intervention context examining regulatory fit (Kim, 2006). In this work, regulatory focus has been found to predict the effectiveness of anti-smoking campaigns among adults and adolescents (Kim, 2006), suggesting the potential utility of assessing individual differences in regulatory focus within preventive interventions. No strictly ecological work has been done to examine ongoing associations between regulatory focus orientation and substance use, however. Thus, regulatory focus theory has important potential implications for understanding risk-related choices. The initiation of substance use among young adolescents offers a potentially high-impact time to examine these naturalistic associations.

### The present study

The present study examined individual differences in regulatory focus that are associated with an adolescents' own substance use, as well as their reports of their peers' substance use. We hypothesized that promotion orientation would be associated with higher odds of lifetime substance use (tobacco, alcohol, and marijuana) and self-reported peer substance use, whereas prevention orientation would be associated with lower odds of lifetime substance use and self-reported peer substance use.

## Method

### Participants and procedures

The participants were part of a larger study of peer influences on substance use and other risk-taking behaviors. The study took place in a public school comprising grades 6 – 12 in a mid-size Southeastern city. A total of 153 of the school's 208 seventh-grade students completed the consent process to participate in the study during the spring of the academic year. During the fall of the next academic year, 168 of the 203 seventh-grade students at the same school completed the consent process for study participation. Thus, a total of 321 seventh-grade students provided consent for study participation; of that total, 241 had complete data available for all study measures and were included in the analyses presented below.

Students were asked to complete an assent form, while parents/guardians were given a consent form to complete. Both parental consent and student assent were required for participation.

### Demographics

School data on age, race/ethnicity, and sex were obtained. Table 1 presents the distribution of all demographic variables. Age was dichotomized into pre-teens (ages 11–12) and teens (ages 13–15). Based on the distribution of participants, race/ethnicity was dichotomized into white and all other races/ethnicities. Approximately 21% of students in the school receive free or reduced school lunch, compared to 45% district-wide.

### Measures

**Regulatory focus**—Participants completed a version of the Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001) with slightly modified wording adapted for adolescents. The RFQ measures individual differences in strength of orientation toward promotion (strategic approach) and prevention (strategic avoidance) goals. These two subscales measure individuals' perceived success pursuing each type of goal. An example promotion item is “I do well at different things that I try”, and an example prevention item is “I refrain from doing things that my parents consider unsafe.” Responses range from 1 (never or seldom) to 5 (very often). The subscales of the RFQ are only modestly correlated with self-report measures of dispositional positive/negative affectivity (Jones et al., 2013), and are conceptually orthogonal. Most children and adolescents have some degree of orientation toward both styles of self-regulation, as seen by the modestly positive correlation in the present sample ( $r=.25$ ). Both subscales demonstrated acceptable internal consistency (promotion orientation  $\alpha=.67$ ; prevention orientation  $\alpha=.73$ ).

**Self-Reported substance use**—Self-report of substance use among adolescents is an imperfect but nonetheless reliable indicator of substance use behaviors (O'Malley et al., 2000). Single-item measures of use have demonstrated reliability and predictive power comparable to more complex measures (LaBrie et al., 2005). Participants were asked to report whether they had ever used tobacco, alcohol, or marijuana. These three dichotomous items each had a sufficient rate of endorsement (>5%).

**Peer substance use**—Participants also completed items asking them how many of their friends had ever used tobacco, alcohol, or marijuana. For each item, the response categories were 0=*None*, 1=*1 or 2*, 2=*Some*, 3=*Most*, and 4=*All*. Based on the highly skewed distributions of these scores and conceptual distinction between none and any substance use, each item was dichotomized to 0=*None* and 1=*Any*.

### Data analytic plan

Point-biserial correlations were calculated for associations between continuous and dichotomous variables, and phi coefficients were calculated for associations between two dichotomous variables. In order to test our hypotheses regarding associations between individual differences in regulatory focus and substance use behaviors, we conducted a series of logistic regressions using PROC LOGISTIC in SAS version 9.1 modeling likelihood of three self-reported substance use behaviors: lifetime tobacco use, lifetime alcohol use, and lifetime marijuana use. We also ran logistic regressions modeling three self-reported peer substance use outcomes: peer lifetime tobacco use, peer lifetime alcohol use, and peer lifetime marijuana use. All models used dichotomized demographic variables (race, sex, age group), promotion orientation, and prevention orientation as independent variables.

## Results

### Sample characteristics

Table 1 presents descriptive statistics for all study variables. Among the demographic variables, only age group was significantly associated with substance use, with older participants reporting marginally greater lifetime alcohol use ( $r=.12$ ,  $p=.071$ ) and significantly greater lifetime tobacco ( $r=.15$ ,  $p=.013$ ) and marijuana use ( $r=.18$ ,  $p=.008$ ). The adapted RFQ subscales were moderately intercorrelated ( $r=.39$ ,  $p=.002$ ). White students reported significantly higher scores on promotion orientation ( $r=.20$ ,  $p=.005$ ) and prevention orientation ( $r=.32$ ,  $p=.002$ ) than nonwhite students. Being male was negatively correlated with prevention orientation ( $r=-.12$ ,  $p=.039$ ).

### Association between regulatory focus and Self-Reported substance use

In logistic regression models predicting self-reported substance use (Table 2), there were few demographic differences in substance use. Regarding marijuana use, boys were more likely than girls to report lifetime use, and nonwhite participants were more likely than white participants to report lifetime use. Age group was also a significant predictor of lifetime marijuana use and a marginally significant predictor of lifetime alcohol use, with older participants more likely to report use in each instance. For individual differences in regulatory focus, prevention orientation was significantly associated with lower odds of lifetime alcohol use and marijuana use. Prevention orientation was not associated with lifetime tobacco use, and promotion orientation was not significantly associated with any lifetime substance use outcome.

### Association between regulatory focus and reports of peer substance use

Next, a series of regression analyses were run to model participants' reports of peers' lifetime tobacco, alcohol, and marijuana use (Table 2). As in the previous analyses, results

for each criterion variable are presented with predictor terms for demographics and regulatory focus. Among the demographic variables, age group was strongly associated with peer use, indicating that teenage participants were more likely than pre-teen participants to report that their friends used tobacco, alcohol, and marijuana. As predicted, individual differences in regulatory focus also were associated with reports of peer substance use across types. Specifically, higher levels of prevention orientation were associated with lower odds of reporting substance use among peers, including tobacco, alcohol, and marijuana. In addition, higher levels of promotion orientation were associated with higher odds of reporting of alcohol use among peers, but not significantly associated with reporting other substance use outcomes among peers.

## Discussion

The goal of this study was to determine whether individual differences in regulatory focus were associated with self-reported substance use among young adolescents and their peers. Results indicated that prevention orientation showed reliable and unique associations with substance use, and reports about peers' use after controlling for sex, age, and race/ethnicity. As predicted, young adolescents with greater levels of prevention orientation were less likely to report lifetime alcohol or marijuana use. Prevention orientation was also associated with lower levels of reported peer lifetime use of tobacco, alcohol, and marijuana, such that adolescents with greater levels of prevention orientation were less likely to have friends who had initiated substance use.

This investigation is the first to link adolescent substance use and reports of peer use specifically with their regulatory focus orientation. Thus, measuring an adolescent's regulatory focus may provide important insight into the potential risk of uptake of substance use, and even messaging that might be beneficial in preventing this substance use (i.e. Regulatory Fit; Kim, 2006). Despite these novel associations, these results mirror other social-cognitive findings. An array of findings in the substance abuse literature links social cognition with variability in risk-taking, with peer influences, and with other interpersonal processes known to predict use (Gibbons et al., 2000). In addition, there is evidence that individual differences in regulatory focus emerge from socialization and parenting and are functionally distinct from individual differences in approach/avoidance temperament (Strauman & Wilson, 2010).

These study findings represent evidence that individual differences in regulatory focus are associated with substance use among young adolescents. Furthermore, they suggest that adolescent initiation of substance use may reflect a consequence of normal variability in the psychological mechanisms through which adolescents pursue desired states. Higgins and others have noted that promotion and prevention each involve tradeoffs and have costs and benefits that are defined in part by the social context in which the individual seeks to attain a personal goal (Higgins et al., 2001; Machell et al., 2016). To appreciate the costs and benefits of individual differences in regulatory focus, it is worth noting that although a strong prevention orientation may contribute to decreased risk for substance use initiation, such an orientation also is associated with vulnerability to anxiety (Strauman et al., 2010). Similarly, although a strong promotion orientation may not be associated with one's own

substance use, it may influence selection of peer groups, as seen in the current study, that could lead to greater risk of later life substance use.

### **Implications of regulatory focus for substance use in adolescents**

How might variability in regulatory focus affect the everyday lives of young adolescents? Research by Gerrard et al. (2000) and by Wills et al. (2007) suggests that individuals with high self-esteem engage in lower levels of risk behavior, yet at the same time neutralize the amount of risk they believe themselves to be taking. One possible interpretation of the present findings is that individual differences in regulatory focus – as world views or cognitive schemas – lead to predictable differences in perceptions of risk. That is, prevention-oriented individuals may engage in lower levels of substance use in part because they appraise such situations to have greater risk. In addition, this finding might also suggest the reciprocal social-cognitive phenomenon that individuals high in prevention orientation are more likely to themselves be chosen as friends by those who are less prone toward substance use. In either case, the interplay of regulatory focus as an individual difference mediator of adolescent variability in substance use and as a critical trigger to risk-relevant social dynamics in adolescent peer groups appears to be worthy of further study.

The current study supports the potential value of incorporating individual differences in regulatory style when designing a preventive intervention program intended to delay adolescent initiation of substance use (a strategy that has some support for curbing substance use in other naturalistic intervention settings; Tangney et al., 2016). For example, individuals with a strong promotion orientation are likely to attend to, and respond to, different kinds of messages than those with a strong prevention orientation (Kim, 2006). This *regulatory fit* between message and receiver has been supported across numerous interventions (Strauman et al., 2015).

Individuals with varying regulatory styles likewise have been found to be influenced by different types of people. Lockwood, Jordan, and Kunda (2000) observed that whereas positive role models inspire promotion-oriented individuals, prevention-oriented individuals were more influenced by negative role models. Health education efforts for young people often emphasize negative views of risk behaviors and the people engaging in those behaviors (Gibbons et al., 2000), although more recent efforts have begun targeting prosocial behaviors (Bono et al., 2019). Given the present findings, it may be useful for prevention programs to move beyond presenting a uniform negative message toward presenting messages that are meaningful to individuals of varying regulatory orientations. This notion is compatible with regulatory fit, which has demonstrated ample effect in consumer marketing literature (Motyka et al., 2014). Further, given the social group pressures in adolescence, subsequent prevention work targeting peer influence effects would do well to consider the role of regulatory focus in processes of peer group aggregation.

### **Limitations and future directions**

One important limitation of the current study is its cross-sectional design. As a result, we are considering these findings as consistent with potential contributory causal influences of regulatory focus on initiation of substance use, but we note that such a conclusion requires

prospective longitudinal data and analyses. A second limitation pertains to the use of self-reporting of substance use. Perhaps prevention oriented individuals are merely more strategic in self-presentation, as reporting of substance use can be heavily laden with social desirability bias. Although that alternative explanation cannot be ruled out without corroborative data, much research has illustrated that self-reported rates of substance use are accurate approximations of actual substance use (LaBrie et al., 2005). Nevertheless, future studies would benefit from expanding the nomological network of phenomena related to adolescents' regulatory focus and substance use to build on this initial model. A third limitation is that generalizability of study results may be limited given that the student body was likely of higher SES than the surrounding district. Future research may want to examine SES in relation to study variables.

In closing, we note that the developmental corollaries of regulatory focus theory emphasize that both types of regulatory orientations, prevention and promotion, are important for well-being and that balance between the two is likely to be optimally adaptive. As evidence accrues that individual differences in regulatory focus may be linked to adolescent initiation of substance use, future research can be guided to better elucidate the mechanisms of action that link self-regulation and adolescent substance use. Such studies, in turn, could help to provide a theory-based, developmentally informed conceptual framework by which to continue to enhance existing preventive interventions and develop new ones.

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**Table 1.**Descriptive statistics on study variables ( $N = 241$ ).

| Variable                        | <i>N</i> | %    | <i>Mean</i> | <i>SD</i> |
|---------------------------------|----------|------|-------------|-----------|
| Age                             |          |      | 12.45       | 0.65      |
| Younger (11–12)                 | 146      | 60.6 |             |           |
| Age 11                          | 11       | 4.6  |             |           |
| Age 12                          | 135      | 56.0 |             |           |
| Older (13 – 15)                 | 95       | 39.4 |             |           |
| Age 13                          | 82       | 34.0 |             |           |
| Age 14                          | 10       | 4.1  |             |           |
| Age 15                          | 3        | 1.2  |             |           |
| Sex                             |          |      |             |           |
| Male                            | 111      | 44.1 |             |           |
| Female                          | 130      | 53.9 |             |           |
| Ethnicity                       |          |      |             |           |
| White, non-Hispanic             | 106      | 44.0 |             |           |
| Nonwhite                        | 135      | 56.0 |             |           |
| Black, non-Hispanic             | 94       | 39.0 |             |           |
| Hispanic or Latino              | 28       | 11.6 |             |           |
| Asian or Pacific Islander       | 11       | 4.6  |             |           |
| Biracial or mixed race          | 1        | 0.4  |             |           |
| Other                           | 1        | 0.4  |             |           |
| Prevention orientation          |          |      | 3.38        | 0.75      |
| Promotion orientation           |          |      | 3.77        | 0.54      |
| Lifetime tobacco use            | 51       | 21.1 |             |           |
| Lifetime alcohol use            | 106      | 44.0 |             |           |
| Lifetime marijuana use          | 15       | 6.2  |             |           |
| Friends' lifetime tobacco use   | 76       | 31.5 |             |           |
| Friends' lifetime alcohol use   | 50       | 20.7 |             |           |
| Friends' lifetime marijuana use | 54       | 22.4 |             |           |

**Table 2.**

Logistic regression modeling adolescents' report of self and peer substance use.

|                        | Lifetime tobacco use odds ratio |         | Lifetime alcohol use odds ratio |         | Lifetime marijuana use odds ratio |         |
|------------------------|---------------------------------|---------|---------------------------------|---------|-----------------------------------|---------|
|                        | Self                            | Peers   | Self                            | Peers   | Self                              | Peers   |
| Race (Ref: Nonwhite)   | 1.25                            | .60     | 1.43                            | .81     | .46*                              | .79     |
| Sex (Ref: Female)      | 0.88                            | 1.34    | .80                             | 1.29    | 2.96*                             | 1.24    |
| Age (Ref: Pre-Teen)    | 1.72                            | 3.50*** | 1.63                            | 2.92**  | 3.71*                             | 5.15*** |
| Prevention orientation | .68                             | 0.44*** | .49***                          | 0.27*** | .39**                             | 0.36*** |
| Promotion orientation  | .67                             | 1.23    | .89                             | 2.37*   | 1.27                              | 1.38    |

\*  $p < .5$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

\*\*\*  $p < .001$ .

The analyses for lifetime tobacco, alcohol, and marijuana use are logistic regressions with a dichotomous criterion variable (yes/no) and the coefficients for each predictor variable are odds ratios.