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# Self-Perception and Relative Increases in Substance Use Problems in Early Adulthood

**Florence Yan**, **Meghan Costello**, **Joseph Allen**
University of Virginia

## Abstract

This study assessed self-perception as a long-term predictor of relative changes in problems related to alcohol and marijuana use in early adulthood. Self-report questionnaires were completed by a community sample of 124 individuals in the Southeastern United States who were followed longitudinally from age 19 to age 27. More problems due to substance use at age 27 were predicted by participants' negative perceptions of their social acceptance, romantic appeal, and self-worth. Predictions remained after accounting for potential confounds including gender, income, and baseline substance use problems at age 19. Social avoidance and distress in new situations at age 19 mediated the relationship between self-perception and relative changes in substance use problems, such that increases in substance use problems from age 19 to 27 were potentially explainable by the linkage of negative self-perceptions to social avoidance and distress in new situations.

## INTRODUCTION

The early- to mid-twenties are the peak age range for behaviors such as binge drinking, alcohol and marijuana consumption and resulting dependence (Chen & Kandel, 1995; Schulenberg & Zarrett, 2006; Syed, 2015). Nearly 20% of 18–25-year-olds endorsed using marijuana in the past month and around 38% of 18–25-year-olds endorsed binge drinking in a 2014 survey (Substance Abuse and Mental Health Services, 2014). Not only does substance use peak at this time, but adjustment experiences during early adulthood have critical implications for an individual's well-being for years to come (Desjardins & Leadbeater, 2017).

### SELF-PERCEPTION AND SUBSTANCE USE

The qualities of an individual's self-perception have been repeatedly associated with substance use (Samuels & Samuels, 1974), particularly in adolescence (Carvajal et al., 1998; Murphy & Price, 1988). For example, college youth with lower self-worth may be more likely to medicate later on in adulthood to blunt negative self-feelings or adopt behaviors to reduce self-awareness (Baumeister, 1997; Karatzias et al., 2001). Low self-esteem has also been found to increase peer influence in substance use (Zimmerman et al., 1997).

Higher self-esteem, in contrast, has been associated with reduced use of maladaptive coping mechanisms and fewer alcohol-related problems (Tomaka et al., 2012). It is also linked to fewer pathologically-driven reasons to consume alcohol: Individuals with high self-esteem

tend to have reduced stress levels, suggesting an alternative coping mechanism to the self-medication effects of alcohol (Backer-Fulgham et al, 2012).

Although these findings suggest a negative association between self-esteem and substance use, other studies find evidence of positive associations. For example, some work indicates that individuals who use alcohol tend to have higher self-esteem (Glendinning, 1998; Sharp and Getz, 1996). These findings may be explained by the action of higher self-esteem in leading to greater willingness to take physical risks, such as those entailed by substance use (Emler, 2001). Alternatively, individuals with high self-esteem who drink heavily may be more resistant to accepting information regarding negative consequences of alcohol use (Neumann et al., 2009). They may also minimize their perceived vulnerability, leading them to ignore the potential negative consequences of substance use (Gerrard et al., 2000). Overall, the conflicting results of these studies seem, in part, likely due to their general failure to consider long-term outcomes (or changes) in levels of use, as well as the possible role of other unmeasured variables (such as social anxiety) in mediating observed relationships.

## SELF-PERCEPTION, SOCIAL ANXIETY, AND SUBSTANCE USE

**SELF-PERCEPTION AND SOCIAL ANXIETY**—Self-reports from socially anxious adults and children suggest that they experience low self-esteem levels (Bouvard et al., 1999; Ginsburg et al., 1998). Furthermore, high self-esteem may buffer against anxiety (Johnson et al., 2003). Of adolescents with anxiety disorder, social anxiety had the greatest relative impact on self-esteem (Maldonado et al., 2013). Recent studies have also suggested that self-esteem may serve as a factor for developing social anxiety disorder, in turn potentially deflating self-esteem further (de Jong et al., 2012).

Social skills have also been found to be positively correlated with self-esteem and negatively correlated with social anxiety (Riggio et al., 1990). For instance, training programs aimed at improving adolescents' social skills have demonstrated increases in self-esteem and decreases in social anxiety (Bijstra et al., 1998). Moreover, socially-related features such as higher perceived popularity and higher perceived equity in romantic relationships are associated with greater self-esteem in late adolescence (Galliher et al., 1999; Litwack et al., 2012). In contrast, socially anxious individuals are less likely to have satisfactory social relationships or to be in romantic relationships (Schneier et al., 1994, Wittchen et al., 2000), and greater romantic competence is associated with lower levels of social anxiety (La Greca & Lopez, 1998). Thus, despite mixed findings directly linking self-*perception* to social anxiety, actual social skills appear to be related to both self-perception and social anxiety.

**SOCIAL ANXIETY AND SUBSTANCE USE**—Social anxiety has also been repeatedly linked to substance-related problems (Buckner et al., 2013). In adolescence, social anxiety may moderate peer influences in substance use, such that the relationship between peer pressure and substance use tends to be stronger for socially anxious adolescents (Cohen & Prinstein, 2006; Prinstein, 2007). Social anxiety also appears to serve as a unique risk factor for subsequent alcohol and marijuana dependence, even relative to other forms of anxiety (Buckner et al., 2008). Within social anxiety research, both social fear and social avoidance

have been linked to problems related to marijuana use, but when considered jointly, only social avoidance was found to uniquely predict such problems (Buckner et al., 2011).

One mechanism by which social anxiety may influence substance use is by creating motivation to use substances as a coping mechanism (Ham et al., 2007). Self-medication hypothesis theory, first introduced by Khantzian (1985), posits that the psychotropic effects of drugs (alcohol, marijuana) on an individual's psychological state leads to dependence. Recent research has supported this theory, finding that individuals with social anxiety appear to use alcohol to reduce their anxiety (Carrigan et al., 2003). In a recent study of undergraduates, social avoidance and distress were significantly positively related to drinking to cope with negative emotions and conforming to peer pressure (Stewart et al., 2006). For young adults, socially anxious individuals were more likely than their non-socially anxious peers to report alcohol use as a means of feeling more comfortable in social situations (Thomas et al., 2003). Coping motives for simultaneous alcohol and marijuana use are similar to social anxiety reasons for marijuana use as well (Lee et al., 2009).

With current research suggesting that social skills influence both self-perception and social anxiety, and suggesting that social anxiety is linked to substance use, understanding the relationship between self-perception, social anxiety, and substance use in the social context could prevent maladaptive habit formation by developing effective prevention and intervention programs that targets struggling adolescents. Yet, this hypothesis has not been empirically examined to date.

## THE PRESENT STUDY

This study aims to investigate the relative changes in problems related to substance use from age 19 to age 27 as these are predicted by self-perception in late adolescence and early adulthood. Previous research has predominantly assessed the relationship between self-esteem and substance use cross-sectionally. As such, most previous studies also fail to account for baseline substance use, and as a result, are unable to examine relative changes in substance use over time (a key to ruling out reverse-causal explanations of relations observed). To expand upon the current literature, this study accounted for baseline problems associated with alcohol and marijuana use, investigated predictors of changes in problems due to usage longitudinally, and rooted the study in social context (as related to social and romantic relationships) to better understand the relationship between self-perception, social anxiety, and substance use. Specifically, we hypothesized that:

1.    Poor self-perception across three domains (e.g., social acceptance, romantic appeal, and self-worth) would predict relative increases in substance use problems from age 19 to 27.

2.    The relationship between self-perception and relative change in substance use problems would be mediated by social avoidance and distress in new situations.

# METHOD

## PARTICIPANTS

The present study is drawn from a larger longitudinal investigation of adolescent development in familial, peer, and romantic partner contexts. The sample consisted of 124 participants (51 male, 73 female), followed from age 19 to 27. The sample was racially/ethnically and socioeconomically diverse: 58% of adolescents identified themselves as Caucasian, 29% as African American, 8% as of mixed race or ethnicity, and 5% as being from other minority groups. The target adolescents' parents reported a median family income in the $40,000-$59,999 range upon initial assessment ($M = \$43,618$, $SD = \$22,420$).

Following approval from the Institutional Review Board, adolescents were initially recruited from the 7th and 8th grades of a public middle school drawing from suburban and urban populations in the Southeastern United States. Students were recruited via an initial mailing to all parents of students in the school along with follow-up contact efforts at school lunches. Families of adolescents who indicated they were interested in the study were contacted by telephone. Of all students eligible for participation, 63% agreed to participate either as either target participants or as peers providing collateral information. All participants provided informed assent before each interview session, and parents provided informed consent (until participants were old enough to provide informed consent). Interviews took place in private offices within a university academic building.

Participants' data were protected by a Confidentiality Certificate issued by the U.S. Department of Health and Human Services, which protected information from subpoena by federal, state, and local courts. Transportation and childcare were provided if necessary. Adolescents were paid for their participation ($15/person/assessment initially, increasing gradually with age to $75/person/assessment later in early adulthood).

Adolescents were first assessed for this study at age 19 ($M = 19.66$, $SD = 1.07$) in 2005 by questionnaire. At age 27 ($M = 27.7$, $SD = 0.99$), participants were reassessed.

## ATTRITION ANALYSES

Of the 146 adolescents who provided data at age 19, data were obtained for 124 (85%) at age 27. Attrition analyses assessing differences between adolescents in the study at age 19 who were versus were not included in the study at age 27 revealed no differences on demographic or primary outcome measures with the exception of gender, with male adolescents being less likely than female participants to provide data at age 27 ($t = 2.87$, $p = .005$).

# MEASURES

## SELF-PERCEPTION

Drawing from the research linking it to social skills, self-perception was calculated as the sum of three socially-related self-evaluation subscales (self-worth, romantic appeal, and social acceptance) from the Self-Perception Profile for Adolescents, measured at age 19 (Harter, 1988).

Self-worth was measured using a slightly shortened (four-item) version of the Global Self-Worth subscale from the Self-Perception Profile for Adolescents (Harter, 1988). This measure was shortened from the original (from 5 items to 4) due to time constraints, and correlated .97 with the full version. For each item, two sentence stems were presented; for example, "some teens (people) are very happy being the way they are," whereas "other teens (people) wish they were different." Participants were asked to decide which stem best described them and how true (from "not at all true" to "very true") the statement was for them. This format was designed to reduce the effects of a pull for social desirability. The self-worth scale sums four items, each assessing individuals' satisfaction with themselves and the way they are leading their lives. Internal consistency (Cronbach's α) for this sample equaled .85.

Self-perceived social acceptance was assessed using the same approach with four items relating to social adjustment within the larger peer group (e.g., "Some people are well liked by other people"/"Some people are not well liked by other people"). The shortened version of this scale showed good internal consistency (Cronbach's α = .82) and was highly correlated with the full scale in other data collected on a similar population (r = .97).

Self-perceived romantic appeal was also assessed using the same approach with four items relating to participants' perceptions that they are romantically attractive to those in whom they are interested, are dating the people they would like to be dating, and feel that they are fun and interesting on a date. (e.g., "Some people feel that other people will 'like' them (in a romantic way)"/"Some people feel that other people will not 'like' them (in a romantic way)"). The shortened version of this scale showed good internal consistency (Cronbach's α = .73) and was highly correlated with the full scale in other data collected on a similar population (r = .96).

Cronbach's alpha for the sum of all 3 subscales (global self-worth, social acceptance, and romantic appeal) was α = .84, demonstrating internal consistency of the study scale as a whole.

## SOCIAL AVOIDANCE AND DISTRESS

Social anxiety was evaluated as a measure of social avoidance and distress in new situations. This was reported by target participants at age 19 using the 6-item Social Avoidance and Distress - New (SAD-NEW) subscale from the Social Anxiety Scale for Adolescents (SAS-A) (La Greca & Lopez, 1998). This subscale examines overall levels of social anxiety with participants rated the extent to which a descriptor (i.e., "I worry about doing something new in front of others") was "not at all true" to "really true" on a 5-point scale and then summed, with higher scores reflecting higher levels of social avoidance and distress in new situations. The subscale had excellent internal consistency (Cronbach's α = .89).

## PROBLEMS RELATED TO SUBSTANCE USE

Problems related to substance use were assessed at ages 19 and again at age 27 using the CORE Alcohol and Drug Survey as adolescent or adult problems associated with alcohol and marijuana use (Presley, Meilman, & Lyerla, 1994; Presley, Meilman, Leichliter, & Harrold, 1998). This survey asked respondents to note whether they've experienced any of

20 different problems due to drinking or drug use during the 12 months prior to the study, ranging from having a hangover to being hurt or injured, to being arrested for DUI/DWI. A total problems score is created as the sum of responses to these 20 dichotomous items. It is administered nationally to more than 50,000 college-age students each year.

## RESULTS

### PRELIMINARY ANALYSES

Means, standard deviations, and inter-correlations for all substantive variables examined in the study are presented in Table 1. Gender and family income were included as covariates in all analyses. We also examined moderating effects of these demographic factors on each of the relationships examined in the primary analyses. Moderating effects were assessed by creating interaction terms based on the product of the centered main-effect variables. No moderating effects of gender or income on any of the primary relations examined were found.

Table 1 reveals significant negative correlations of self-perception with problems due to substance use, as well as significant positive correlations between potential confounding variables (income, baseline problems) and problems due to substance use. Social avoidance and distress in new situations were also significantly correlated negatively with self-perception and positively with problems due to substance use.

### PRIMARY ANALYSES

#### HYPOTHESIS 1: NEGATIVE SELF-PERCEPTION WILL PREDICT INCREASES IN PROBLEMS DUE TO SUBSTANCE USE.—To address the first hypothesis, we examined how self-perception at age 19 predicted relative changes in individuals' self-reported problems with substance use at age 27. Predictions were examined via a hierarchical regression approach in which gender and income were entered, followed by baseline levels of alcohol and marijuana use problems at age 19, and subsequently followed by self-perception as measured by the sum of self-worth, romantic appeal, and social acceptance. This allows examination of the relative change in the substance use problems after accounting for the baseline levels of this behavior. Results describing self-perception as a predictor of relative change in problems due to the use of alcohol and marijuana from ages 19 to 27 are presented in Table 2.

Consistent with our first hypothesis, results show a relationship between age 19 self-perception and relative change in substance use problems from age 19 to age 27. Lower self-perception at age 19 predicted relative increases in the individual's problems associated with substance use at age 27, and higher self-perception predicted relative decreases in the individual's problems associated with substance use at age 27 ($\beta = -.09$, $p = .02$). The variance in substance use problems explained by self-perception was relatively small ($R^2 = .188$, see table 2).

#### HYPOTHESIS 2: SOCIAL AVOIDANCE AND DISTRESS IN NEW SITUATIONS WILL MEDIATE THE RELATIONSHIP BETWEEN SELF-PERCEPTION AND PROBLEMS DUE TO THE USE OF ALCOHOL AND MARIJUANA.—Bootstrapped

confidence intervals were used to investigate the hypothesis that social anxiety and distress in new situations mediated the effect of self-perception on relative changes in later substance use problems (MacKinnon, Fairchild, & Fritz, 2007). In the mediational model, there was a significant indirect effect from self-perception at age 19 to relative changes in later substance use problems at age 27 ($\beta = -.04$, 95% CI = $-.09, -.002$). The direct effect from self-perception to relative changes in later substance use problems was no longer significant ($\beta = -.03$, 95% CI = $-.10, .05$, $p > .44$). This suggests that the effect of lower self-perception at age 19 on relative increases in substance use related problems at age 27 was significantly explained by social avoidance and distress in new situations (see Figure 1).

## DISCUSSION

This prospective, longitudinal study provided support for the hypothesis that negative self-perception predicts relative increases in problems due to substance use across an eight-year period from late adolescence into early adulthood. Even after controlling for baseline levels of substance use problems, 19-year-olds with more negative self-perception were found to have greater relative increases in problems due to substance use such as criminal behavior or interference with daily life, at age 27. Heightened levels of social avoidance and distress in new situations appeared to mediate this link. These findings are each discussed in detail below. The longitudinal scope of this study suggests that early adulthood self-perception and social anxiety levels may have enduring implications for substance use.

We observed self-perception as a predictor of relative changes in problems associated with substance use (alcohol and marijuana) over an eight-year period. Consistent with previous research, more negative self-perceptions were associated with greater increases in problems associated with substance use (Carvajal et al., 1998, Wild et al., 2004, Boden et al., 2008). This observed role of self-perception in predicting relative changes in problems due to substance has various potential explanations. A poor self-concept may directly lead to increased negative emotions and to behaviors that reduce self-awareness (Baumeister, 1997), or it may indirectly lead to higher stress levels that then motivate use of alcohol to self-medicate (Backer-Fulgham et al, 2012).

To better understand these existing proposed mechanisms, the current study sought to unpack the relationship between self-concept, social anxiety, and substance use. Social avoidance and distress in new situations appeared to mediate the relationship between self-perception and relative changes in substance use problems. The prediction from lower self-perception scores to greater relative changes in later problems associated with substance use was statistically explained by reported higher levels of social avoidance and distress in novel situations. These findings may enhance our understanding of prior findings identifying social anxiety as related to alcohol and marijuana use (Buckner et al., 2013) and studies isolating social anxiety as the unique mood and anxiety disorder most associated with subsequent dependence on alcohol and marijuana (Buckner et al., 2008). It has previously been suggested that individuals experiencing social anxiety may cope by using alcohol and marijuana (Ham et al., 2007). Alternatively, social anxiety may provoke motives for alcohol and marijuana use to enhance positive affect (Buckner et al., 2006). The identified mediation

model advances our understanding by suggesting that social anxiety and self-perception work together to predict individuals' development of substance use in the social context.

The results of this study suggest that poor self-perception and increased levels of social anxiety are potentially relevant not only to understanding concurrent levels of substance use problems, but to *longer-term* patterns of changing use. This, and future research targeting early roots of substance use, may provide an important entry point for intervention, as this research suggests that bolstering positive self-perception and offering adaptive coping for social anxiety may result in reduced relative increases in problems associated with alcohol and marijuana use.

That these findings occur within the years of emerging adulthood is particularly important given that these are the years when substance use problems have perhaps the greatest potential to negatively impact an individual's success at work or life satisfaction. Substance use problems peak during emerging adulthood, and adjustment at this age has critical implications for long-term well-being (Desjardins & Leadbeater, 2017). If the current findings are replicated, next steps could include developing and evaluating targeted social anxiety treatment and programs that foster positive self-perception during early adulthood. The current findings suggest that such an indirect approach might help to reduce the likelihood that individuals will use substances to cope with negative feelings toward themselves or others. Eventually, indirect interventions such as this might serve as a viable supplement to interventions which target substance use more directly. Understanding this relationship between self-perception, social anxiety, and substance use problems provides novel opportunities and approaches to intervene on maladaptive substance development.

Several limitations to these findings also warrant consideration. Although the potential causal import of association with self-perception is of primary interest, the longitudinal data used in this study are insufficient for establishing the presence of causal relationships between predictors and relative changes in problems associated with substance use outcomes. Our mediation model utilized 3 unequally lagged time points, and given the 8-year lag between our baseline and recorded increases in substance use, it is possible that other unmeasured processes could also be operating to explain these results. For instance, we did not examine levels of popularity, which pose a possible explanation for some of the long-term links to self-perception (Allen, Porter, McFarland, Marsh, & McElhaney, 2005), nor did we consider familial exposure or history of drug and alcohol use. This study also employed a community sample of adolescents which, though demographically diverse and representative of the population from which it was drawn, would not necessarily permit generalizations to higher-risk populations of young people. Our study results rely on adolescent self-reports from this sample, presenting another limitation of our findings. Furthermore, our attrition analyses revealed that female participants were more likely to participate from age 19 to 27 as compared to male participants, which also may limit generalizations to the broader populations. There was no moderation by gender, however. Nor was gender related to substance use problems at age 19 or 27. Additionally, the variance in substance use problems explained by self-perception was relatively small ( $R^2 = .188$; see table 2).

Notwithstanding these limitations, the results of this study provide significant further evidence of the role of self-perception during early adulthood in longer-term patterns of problematic substance use. Although much research to date has focused on the influence of self-esteem on substance use, the present study expands on current work by considering the role of social anxiety. Strengthened by its longitudinal scope and consideration of baseline substance use problems, this study uniquely emphasizes the social context linking self-perception to substance use problems as well. Our results suggest that social avoidance and distress in particular may contribute to the relationship between self-perception in early adulthood and problems with alcohol and marijuana in later adulthood. If these findings are replicated, perhaps interventions or therapeutic treatment services for young adults with lower self-perception scores could help lower the risk or rates of substance dependence and addiction in the general population.

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**Mediated Pathway:**
$\beta = -.04$, 95% CI = $(-.09, -.002)$

**Social Avoidance and Distress in New Situations**
(Age 19)

-.47***

.24**

**Self-Perception**
(Age 19)

-.03

**Relative Changes in Problems Due to Substance Use**
(Age 27)

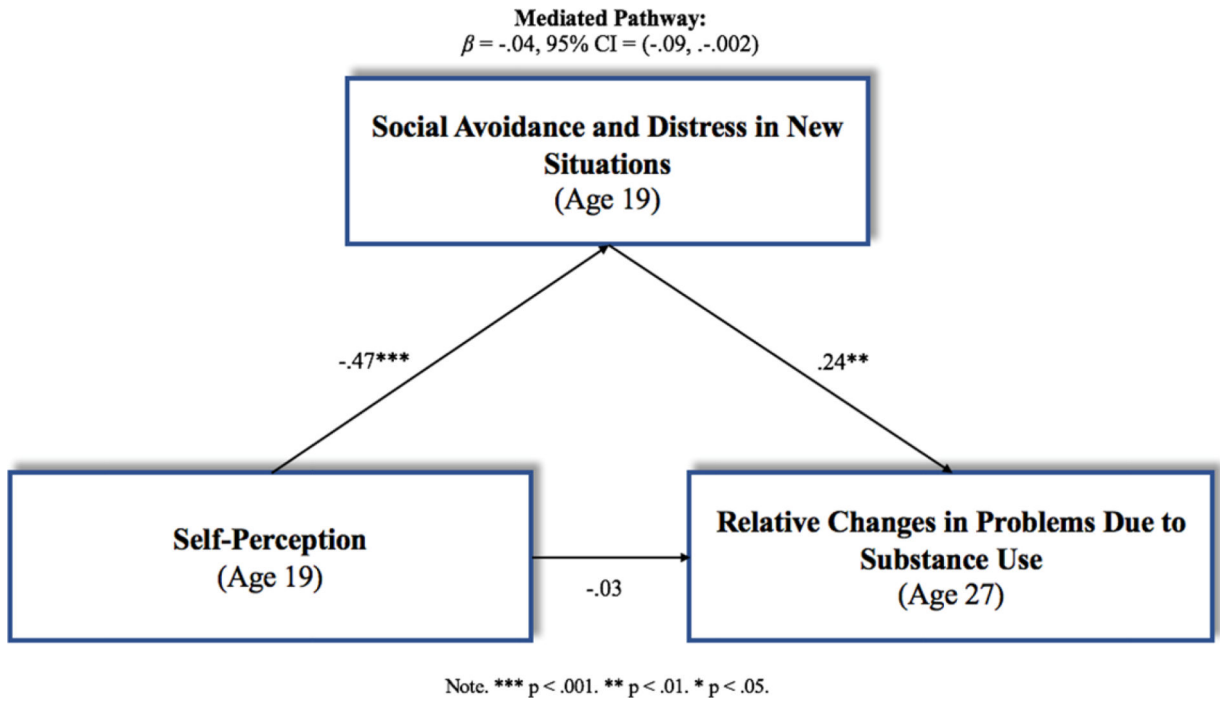Note. *** p < .001. ** p < .01. * p < .05.

**Figure 1 -**
Mediation Model featuring Social Avoidance and Distress in New Situations in the
Prediction between Self-Perception and Problems Related to Substance Use from Age 19 to
27

**Table 1 -**

Means, Standard Deviations, and Pearson Inter-correlations of Substantive Variables [†]

| | Mean | SD | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|---|---|
| 1. Gender | 1.53 | 0.50 | -- | −.11 | .041 | −.15 | −.089 | .051 |
| 2. Total Family Income | 6.10 | 1.96 | | -- | −.065 | .26[**] | .081 | .13 |
| 3. Self-Perception (19) | 43.35 | 6.25 | | | -- | −.28[**] | −.29[**] | −.47[***] |
| 4. Problems due to Substance Use (19) | 3.46 | 3.72 | | | | -- | .45[***] | .22[**] |
| 5. Problems due to Substance Use (27) | 2.17 | 2.99 | | | | | -- | .24[**] |
| 6. Social Avoidance and Distress in New Situations (19) | 12.59 | 5.32 | | | | | | -- |

Note.

[***] p < .001.

[**] p < .01.

[*] p < .05.

[†] Point-biserial correlations were calculated for gender, as it is a non-continuous variable.

**Table 2**

Predicting Relative Changes in Later Adulthood Problems Related to Substance Use (Age 27) from Early Adulthood Self-Perception (Age 19)

| | Problems Due to Alcohol & Marijuana Use (Age 27) | | | |
| --- | --- | --- | --- | --- |
| | $\beta$ entry | $\beta$ final | $R^2$ | Total $R^2$ |
| **Step I.** | | | | |
| Gender (1=M; 2=F) | −.34 | −.29 | | |
| Total Family Income (Age 13) | .11 | .02 | | |
| *Statistics for Step* | | | .010 | .010 |
| **Step II.** | | | | |
| Substance Use Problems (Age 19) | .31 [**] | .28 [**] | .188 [**] | .198 [**] |
| **Step III.** | | | | |
| Self-Perception (Age 19) | −.09 [*] | −.09 [*] | .036 [**] | .234 [**] |

Note.

[***] p < .001.

[**] p < .01.

[*] p < .05.