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The relationship between substance abuse and identity development

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THE RELATIONSHIP BETWEEN SUBSTANCE ABUSE AND IDENTITY DEVELOPMENT

by

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ABSTRACT

This research examined the relationship between substance use and identity variables. The sample consisted of 76 students undergraduate psychology students. Relationships were found between identity variables and both alcohol and marijuana usage. People with a foreclosed identity status tended to have the lowest rates of substance use, while people in the moratorium identity status tended to have the highest rates. The hypotheses that identity variables would predict substance usage above and beyond psychological adjustment, and that identity distress symptoms would predict substance use beyond other identity development variables alone, was mostly not confirmed. The strongest and most consistent predictor of substance use was age. Possible reasons for this relationship are discussed, and calls for further research into this as well as other mediators and moderators of the relationship between identity and substance use are suggested.

ACKNOWLEDGMENTS

I must first express thanks to the members that make up my committee, Dr. Steven L. Berman, Dr. H. Edward Fouty, and Leslee D'Amato-Kubiet, for insights regarding the finer points of statistical methods and ideas for futures studies. A very special thanks goes to my thesis chair Dr. Steven L. Berman, for always making time for any concerns or any questions I had and for often working with me on extremely tight schedules.

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INTRODUCTION

Research on the relationship between identity development and substance abuse has found an inverse relationship with higher use of intoxicants correlating with lower levels of identity development (Bishop, Weisgram, Holleque, Lund, & Wheeler-Anderson, 2005; Jones & Hartmann, 1988; Schwartz, et al., 2009; White, Montgomery, Wampler, & Fischer, 2003). This has led some researchers to suggest that the use of psychotropic drugs and alcohol interfere with an adolescent's ability to develop a sense of personal identity (Baumrind & Moselle, 1985). Research does suggest that lower levels of identity development are related to a variety of adjustment problems and psychopathology (Bourne, 1978; Burket, Myers, Lyles, & Carrera, 1994; Ivarsson, Gillberg, Arvidsson, & Broberg, 2002; Marcia, 1994). However, whether substance use is a contributing cause or resultant effect of arrested identity development has not been determined.

Berman, Weems, and Petkus (2009) found that identity distress predicted psychological symptom scores beyond traditional identity variables (e.g., identity status, identity diffusion, identity commitment), and traditional identity variables accounted for substantially less variance in psychological symptom severity when controlling for identity distress. Thus, it is not low levels of identity development, per se, that is directly related to poorer psychological adjustment, but rather, it is the sometimes accompanying symptoms of identity distress that is responsible for the relationship. Likewise, although relationships between identity formation and substance abuse have been found, these associations may be largely a function of identity distress. The purpose of this thesis is to further investigate the relationship between identity and substance abuse.

Identity Status

Erik Erikson has written extensively on the process of identity development (Erikson, 1963; 1968). He posited that identity versus role confusion was a psychosocial crisis that epitomized the stage of adolescence. James Marcia (1966) operationalized many of Erikson's concepts and created the identity status paradigm. He suggested that the process of identity development involves two underlying processes: identity exploration and identity commitment. Identity exploration is the process whereby one investigates the potential roles, goals, and values, that could give direction, meaning, and purpose to one's life. Identity commitment refers to the process of selecting and affirming the specific roles, goals, and values, which people use to define their personal identity and inform their life choices throughout their adult development.

Developmentally, all young people begin in the status of Identity Diffusion (low exploration, low commitment), whereby they have neither explored their identity options, nor committed to specific roles, goals, and values that will come to form their identity. For a young adolescent to be in the status of identity diffusion is normal. However, if a person continues into adulthood without forming a sense of identity, it becomes increasingly pathological. People in the diffused identity status tend not to think too much about the direction and purpose of their lives. They tend to be either apathetic and socially withdrawn or compulsive playboys/girls (Marcia, 1994). Either way, they tend to be interpersonally shallow. They tend to be high in anxiety, conformity, and impulsivity, and low in self-directedness, locus of control, intimacy, and moral reflection. They also tend to be distant from their families and susceptible to self-esteem manipulations.

From the diffused status, most people would begin to explore their identity options; however, some people begin forming identity commitments prematurely without first exploring

their many options. These people are considered to be in the identity status of Foreclosure (low exploration, high commitment). Typically, their commitments represent those goals, roles, and beliefs about the world suggested by others, often parental figures, and are adopted uncritically without being questioned or examined, and therefore are attained more from a process of modeling rather than through self-reflection. People in the foreclosed identity status tend to be high in rigidity, conformity, authoritarianism, and need for social approval (Marcia, 1994). In terms of psychological adjustment, foreclosed individuals often appear emotionally healthier than they may really be. For example, while they often score lower on measures of anxiety and depression, they also score high on measures of social desirability, so they are probably less likely to admit to psychological problems (Marcia, 1993). While foreclosure may be adaptive within a particular cultural encapsulation, it may become far less adaptive if the context changes and flexibility becomes required (Marcia, 1994).

For the majority of people who do not take a developmental detour into foreclosure, the normal pathway out of identity diffusion would be to begin to explore one's identity options. This represents the entry into the identity status of Moratorium (high exploration, low commitment). Individuals in this status often experience an identity "crisis" (Who am I? What do I want to do with my life? What do I believe in?), as they actively explore different options with no clear solutions. Although this status is a necessary precursor to identity achievement, the uncertainty of being actively focused on not knowing where one is going in life can be very disconcerting. Perhaps this is why the most consistently reported psychological correlate to identity status is that between moratorium and anxiety (Bourne, 1978; Marcia, 1967; Oshman & Manosevitz, 1974; Waterman, 1988). Although they are often high in intimacy and moral reasoning, they are also high in ambivalence and uncertainty. Still, there are wide individual

differences in the degree to which this status is conflict-driven and problematic. As Waterman (1988) noted above, for some it is an enjoyable time of active discovery, and for others it is a distressful time of uncertainty.

Finally, those individuals who are able to move beyond the moratorium status and choose their goals, roles, and beliefs about the world are said to be in the Identity Achievement status. This status tends to have the most positive psychological correlates which are consistently found in empirical research. People in the achieved status tend to perform better under stress than their counterparts in the other identity statuses, and they are more resistant to self-esteem manipulations (Marcia, 1967). They also tend to be high in locus of control, need for achievement, intimacy, and moral reasoning (Bourne, 1978; Orlofsky, 1978; Podd, 1972).

Identity Distress

The term identity distress refers to "severe subjective distress regarding [the] inability to reconcile aspects of the self into a relatively coherent and acceptable sense of self" (American Psychiatric Association, 1980, p. 65). It is the core feature of Identity Disorder in DSM III and DSM III-R (American Psychiatric Association, 1980, 1987), and Identity Problem in DSM IV (American Psychiatric Association, 1994). Although relationships between identity formation and mental health have been found, Berman and colleagues (2009) have suggested that these associations may be largely a function of identity distress symptoms. They examined the incremental validity of identity distress in a sample of high school students (N=140) aged 15 to 18. Findings suggested that 7.9% of the sample would meet DSM III-R criteria for Identity Disorder and 14.3% would meet the looser DSM IV criteria for Identity Problem. Identity distress predicted psychological symptom scores beyond level of identity formation, and identity formation accounted for substantially less variance in psychological symptom severity when

controlling for identity distress. This data suggests that greater attention to the role of identity issues in clinical practice is probably warranted. Although they did not study identity distress per se, Schwartz, Mason, Pantin, and Szapocznik (2008) looked at what may be a related concept and found that adolescents whose identity confusion scores increased over time were most likely to initiate cigarette and alcohol use, as well as sexual behavior during the course of the 3 year study. Adolescents whose identity confusion scores remained stable were less likely to initiate such behaviors, while those who decreased in identity confusion were least likely to initiate these behaviors.

Identity and Substance Abuse

Alcohol consumption has been found to be strongly correlated with levels of identity sophistication. (Bishop, et al., 2005). Jones and Hartmann (1988), found that in a sample of close to 13,000 adolescents, individuals with a diffused identity had double the likelihood of having tried both smoking cigarettes and drinking alcohol, triple the likelihood of having smoked marijuana, quadruple the likelihood of having used inhalants in the past, and five times as likely to have used cocaine than adolescents with a foreclosed identity. In regard to recovery from substance abuse, individuals in the diffused identity status stayed abstinent for shorter periods of time, had fewer behaviors that facilitated recovery, and made less progress in the recovery process (White, et al., 2003).Burket, Myers, Lyles, & Carrera (1994) found high rates of comorbidity between Identity Disorder diagnosis and alcohol and hallucinogen abuse and Identity distress has been linked to drug use (Hernandez, Montgomery, & Kurtines, 2006)

In summary, based on the limited literature in regard to identity development and substance use, it is hypothesized that participants that used drugs and alcohol will have greater identity exploration, greater identity distress, more psychological symptoms, and will be lower in

identity commitment. It is further hypothesized that participants in the moratorium identity status will be the most likely to use drugs and alcohol due to their tendencies toward conflict with authority and high anxiety. Substance use may be a form of exploration, rebelliousness, and/or self-medication. Those in diffusion are hypothesized to be the next highest in regard to substance use. These people tend to be drifters who are easily influenced, making them susceptible to substance use and abuse. Those in the identity achievement status are hypothesized to report lower rates of substance use than the former two identity statuses, but the lowest rates are hypothesized to be among the foreclosed identity status. People in foreclosure tend to be obedient, conformist, and close to their parents, and thus least likely to experiment with drugs and alcohol.

Although relationships between identity formation and substance abuse have previously been found, it is further hypothesized that these associations may be largely a function of identity distress. Specifically, it is hypothesized that identity distress symptoms will predict substance use beyond other identity development variables alone, even after controlling for other symptoms of psychological maladjustment; and that other identity development variables will account for substantially less variance in substance use patterns when controlling for identity distress.

METHOD

Participants

The participants for the study were university students recruited from undergraduate classes at the University of Central Florida. The sample consisted of 76 participants (14 males, 59 females, and 3 who did not specify) from the ages of 18 to 25 (M = 18.85, SD = 1.48), with 72.4 % being freshmen, 7.9% sophomores, 14.5% juniors, and 5.3% seniors. Participants were predominantly female (77.6%) and Caucasian (55.3%), with 13.2% African American, 11.8% Hispanic, 5.3% Asian, 13.1% mixed or other, and 1 person who did not report.

Measures

A self-administered questionnaire was developed for the present study which asked about demographic information and included the following measures.

The Identity Distress Survey (Berman, Montgomery, & Kurtines, 2004) is a ten item measure used to assess distress associated with unresolved identity issues (i.e., identity disorder symptoms, the time frame associated with experiencing those symptoms, and the overall impairment of the endorsed symptoms). The survey was originally modeled on the DSM-III and III-R criteria for Identity Disorder, although it can also be used to assess DSM-IV criteria for Identity Problem. Participants are asked to rate on a 5 point scale (Not at all, Mildly, Moderately, Severely, Very Severely) "To what degree have you recently been upset, distressed, or worried over the following issues in your life:" long-term goals, career choice, friendships, sexual orientation and behavior, religion, values and beliefs, and group loyalties. In addition to asking for a distress rating in each of these seven areas, it also includes an assessment of how long they have been experiencing distress over these issues and to what degree the symptoms are interfering with daily functioning. Internal consistency has been reported as 0.84 with test-retest

reliability of 0.82, and the survey has demonstrated convergent validity with other measures of identity development. In this study, the internal consistency reliability (Cronbach's alpha) was calculated as .77.

The Ego Identity Process Questionnaire (Balistreri, Busch-Rossnagel, & Geisinger, 1995) was used to identify participants' identity status. The EIPQ has two subscales, identity exploration and identity commitment. Cronbach's alpha for the exploration subscale has been reported to be 0.86 with test-retest reliability of 0.76. Cronbach's alpha for the commitment subscale has been reported to be 0.80 with test-retest reliability of 0.90. Balistreri et al. used median splits on the two subscales to assign participants into one of four identity statuses as defined by Marcia (1966). Participants with low scores on exploration and commitment are classified as diffused, low in exploration but high in commitment are classified as foreclosed, high in exploration but low in commitment classified as moratorium, and high in both exploration and commitment are classified as achieved. In this study, the internal consistency reliability (Cronbach's alpha) was calculated as .69 for exploration and .81 for commitment.

Brief Symptom Inventory – 18 (Derogotis, 2000). The BSI-18 is a self-report measure that consists of 18-items assessing psychological symptoms and is a briefer version of the Symptom Checklist-90-R. Items are rated on a 5-point scale ranging from 0 (not at all) to 4 (extremely) to reflect the level of distress an individual has experienced by each of the symptoms during the previous week. Designed to be brief and easy to administer, the test measures three primary symptom dimensions (Depression, Anxiety, and Somatization) as well as global severity and is designed to provide an overview of a patients symptoms and their intensity at a specific point in time. The scale has good reliability and validity. Dimension and global scores form the BSI-18 test correlate highly (i.e., > .90) with analogous scores from the SCL-90-R test based in a large

community population (*N* = 1,122; 605 males and 517 females). In this study, the internal consistency reliability (Cronbach's alpha) was calculated as .92.

The Youth Risk Behavior Surveillance System (Centers for Disease Control and Prevention, 2009) monitors priority health-risk behaviors, including alcohol and drug use, among adolescents and young adults. The YRBSS includes a national school-based survey conducted by the Centers for Disease Control and Prevention (CDC). Questions are asked about recent and life time usage of substances. The CDC has conducted several test-retest reliability studies of the national YRBS questionnaire, and found most items to have substantial or higher reliability (kappa = 61%–100%), and no statistically significant differences were observed between the prevalence estimates for the first and second times that the questionnaire was administered. In this study, the internal consistency reliability (Cronbach's alpha) was calculated as .80.

Procedure

Participants were recruited from psychology classes at UCF using the SONA system, whereby students receive course credit for research participation. The survey was administered online. Participants were provided with a University of Central Florida IRB waiver of signed consent form to assure their anonymity. The SONA system has options that allow for students to take surveys anonymously and still receive their course credit via the use of identification codes instead of names.

RESULTS

Preliminary and Descriptive Analyses

In regard to substance use, 78.9% reported having used alcohol, 38.2% had used marijuana, 11.8% used ecstasy, 5.3% used cocaine, 5.3% used methamphetamine, 3.9% used inhalants, 1.3% used heroine, and none reported having used steroids. The most frequent age of having had their first alcoholic drink was between the ages of 15 and 16 (32.9%), with 57.9% reporting that they have had a drink within the last month, and 32.9% reporting that they have engaged in binge drinking (5 or more drinks in a row within a couple hours). The most frequent age of having first smoked marijuana was similarly between the ages of 15 and 16 (22.4%), with 13.2% reporting that they have smoked marijuana within the last month. For more details on substance usage frequencies, see Table 1.

The only gender differences in substance usage was for marijuana and ecstasy, with males reporting greater lifetime usage of marijuana ($\chi^2_{(6)} = 17.45$, $p = .008$), usage of marijuana in the last 30 days ($\chi^2_{(5)} = 20.18$, $p = .001$), and lifetime usage of ecstasy ($\chi^2_{(2)} = 8.57$, $p = .014$). Age was positively correlated with most of the substance use variables including lifetime days of drinking ($r = .48$, $p < .001$), drinking in the past 30 days ($r = .35$, $p = .004$), drinking 5 or more drinks in one sitting in the past 30 days ($r = .33$, $p = .004$), lifetime usage of cannabis ($r = .50$, $p < .001$), cannabis usage in the past 30 days ($r = .30$, $p = .008$), lifetime usage of cocaine ($r = .27$, $p = .041$), lifetime usage of inhalants ($r = .44$, $p < .001$), lifetime usage of meth ($r = .39$, $p = .002$), and lifetime usage of ecstasy ($r = .48$, $p < .001$). The only substance use variables that were not significantly correlated with age were drinking at school in the last 30 days, cocaine usage in the last 30 days, and lifetime heroin usage.

In regard to identity development, 25.3% were in the diffused identity status, 34.7% were

foreclosed, 26.7% were in moratorium, and 13.3% were achieved. In addition, 13.2%, met DSM IV-TR criteria for Identity Problem. There were no gender differences in identity status distribution or Identity Problem diagnostic status, however, there were age differences. Age was positively correlated with identity exploration (r = .33, p = .007) and identity distress (r = .26, p = .035), and negatively correlated with identity commitment (r = -.25, p = .046). In addition, a ONEWAY analysis of variance (ANOVA) indicated that the identity status groups were significantly different in age ($F_{(3, 60)}$ = 4.65, p = .005). A least squared difference (LSD) post hoc analysis indicated that participants in the achieved (mean age = 19.5) and moratorium statuses (mean age = 19.5) were significantly older (p < .05) than those in the foreclosed identity status (mean age = 18.05). The mean age for participants in the diffused identity status (mean age = 18.79) was not significantly different from the other three groups. There was also no significant age differences between those that met for DSM IV Identity Problem diagnosis, and those that did not.

Main Analyses

Correlation analyses (see Table 2) determined relationships between lifetime days of drinking alcohol and greater identity exploration (r = .29, p = .012), less identity commitment (r = -.41, p < .001), and greater identity distress (r = .32, p = .005). Lifetime days of usage of marijuana was also related to less identity commitment (r = -.31, p = .007), but not related to identity exploration and commitment. There was no relationship between identity variables and usage of cocaine, inhalants, heroine, and methamphetamine (although the *n*'s for these groups were very small), but there was a correlation between lifetime use of ecstasy and less identity commitment (r = -.25, p = .033).

Comparing users to non-users, people who never used alcohol were higher in identity

commitment ($t_{(72)} = 3.03$, $p = .003$), lower in identity distress ($t_{(73)} = -2.28$, $p = .026$), and lower in psychological symptoms ($t_{(73)} = -2.25$, $p = .028$). People who never used marijuana were also higher in identity commitment ($t_{(73)} = 2.17$, $p = .033$), lower in identity distress ($t_{(74)} = -2.80$, $p = .006$), and lower in psychological symptoms ($t_{(74)} = -2.19$, $p = .034$).

A one way Analysis of Variance (ANOVA) uncovered a significant difference between the identity statuses on lifetime days of drinking, $F_{(3, 71)} = 6.76$, $p < .001$. An LSD post hoc analysis suggested that those in the foreclosed identity status engaged in significantly less drinking than the other three statuses ($p < .05$). A significant difference was also found between identity statuses on lifetime days of using marijuana, $F_{(3, 71)} = 2.81$, $p = .045$. An LSD post hoc analysis suggested that those in the foreclosed identity status engaged in significantly less marijuana usage than those in the moratorium status ($p = .007$). Those in the diffused and achieved statuses reported usage levels between the other two statuses and not significantly different from either of them.

In relation to DSM IV-TR diagnostic status, those who met for Identity Problem diagnosis reported significantly more lifetime days of drinking than those who did not meet the diagnosis ($t_{(74)} = -2.39$, $p = .020$).

To test whether identity variables could predict substance usage a series of regression analyses were run with age and sex entered on step one, psychological symptom score from the BSI entered on step two, and identity exploration, identity commitment, and identity distress entered on step three with various categories of usage as the dependent variable. See Tables 3 – 14.

Age was the only significant predictor of lifetime days of drinking ($F_{(6, 56)} = 4.39$, $p = .001$, $\beta = .37$, $t = 3.10$, $p = .003$), days of drinking in the past month ($F_{(6, 56)} = 1.97$, $p = .086$, $\beta = .31$, $t =$

2.37, p = .021), days of having had 5 or more drinks in the past month ($F_{(6, 56)}$ = 1.90, p = .097, β = .32, t = 2.39, p = .020), and lifetime methamphetamine use ($F_{(6, 56)}$ = 2.38, p = .041, β = .37, t = 2.86, p = .006). Lifetime cannabis use was significantly predicted by both age ($F_{(6, 56)}$ = 4.89, p < .001, β = .48, t = 3.79, p < .001) and gender (β = -.32, t = -2.23, p = .030). Lifetime use of inhalants was significantly predicted by age ($F_{(6, 56)}$ = 3.57, p = .005, β = .41, t = 3.32, p = .002) and psychological symptoms (β = .30, t = 2.20, p = .032). None of the variables predicted number of days of drinking at school in the past month nor lifetime cocaine usage.

In regard to identity variables predicting substance use, several usage variables were predicted by identity exploration and gender, including days of cannabis use in the last month ($F_{(6, 55)}$ = 4.67, p = .001) with standardized beta coefficients reaching significance for gender (β = -.39, t = -3.19, p = .002) and identity exploration (β =.45, t =3.22, p =.002), days of cocaine use in the last month ($F_{(6, 56)}$ = 2.65, p = .025) with standardized beta coefficients reaching significance for gender (β = -.40, t = -3.03, p =.004) and identity exploration (β =.38, t =2.60, p =.012), and lifetime heroin use ($F_{(6, 56)}$ = 2.65, p = .025) with standardized beta coefficients reaching significance for gender (β = -.40, t = -3.03, p =.004) and identity exploration (β =.38, t =2.60, p =.012). Finally, lifetime ecstasy use was predicted by identity distress ($F_{(6, 56)}$ = 4.70, p = .001, β = -.28, t = -2.16, p =.035) and age (β =.45, t =3.76, p <.001).

DISCUSSION

Similar to previous findings, clear relationships were found between identity variables and both alcohol and marijuana usage. It was hypothesized that participants that used drugs and alcohol would have greater identity exploration, greater identity distress, more psychological symptoms, and will be lower in identity commitment. There was some but not complete support for these hypotheses. The strongest and most consistent relationships were in regard to identity commitment, which was inversely correlated with lifetime days of drinking and recent binge drinking, but not to recent days of drinking. It was also inversely correlated to both recent and lifetime cannabis usage, as well as lifetime days of ecstasy usage. Identity exploration was only correlated with drinking (both recent and lifetime), but not with any other drug usage, and identity distress was only correlated lifetime days of drinking. There was no relationship between identity variables and usage of cocaine, inhalants, heroine, and methamphetamine (although the *n*'s for these groups were very small). Psychological symptom score was only correlated with lifetime days of drinking and lifetime usage of inhalants. So, in summary, the strongest support for this set of hypotheses was in regard to drinking, and in particular regard to lifetime days of drinking, which was, as predicted, inversely correlated with identity commitment, and directly correlated with identity exploration, identity distress, and psychological symptoms. Cannabis usage was only correlated (inversely) with identity commitment.

The next set of hypotheses dealt with identity status and substance usage. It was predicted that the highest rates would be found among those in moratorium, followed by diffusion, then achievement, with the lowest rates among those in foreclosure. Again, only partial support for the hypotheses was found. Although the general pattern of means often fell out as predicted, only two of the analyses revealed statistically significant differences between means, and those were

for lifetime days of drinking and lifetime days of cannabis use. For drinking, although those in moratorium had the highest rates, followed by diffusion, then achievement, and finally foreclosure, only the foreclosure group was statistically different than the other three statuses. Similarly, in regard to cannabis usage, the order of the statuses were the same and as predicted, but those in foreclosure were significantly lower in usage than those in moratorium, with the other two groups in the middle and not significantly different from each other. Usage of other substances was probably too low to attain meaningful differences.

The main hypotheses that identity variables would predict substance usage above and beyond psychological adjustment, and that identity distress symptoms would predict substance use beyond other identity development variables alone, was mostly not confirmed. Although identity exploration did significantly predict recent usage of cannabis and cocaine, as well as lifetime heroin use, and identity distress did predict lifetime ecstasy use, in none of the cases did identity commitment predict substance usage, none of the identity variables predicted alcohol consumption (where usage rates were highest) and identity distress did not better account for the variance in substance use rates than the other two identity variables. In fact, the strongest and most consistent predictor of substance use turned out to be age. Despite a restricted range in age of the sample (18 to 25 years old), older age was the single best predictor of substance use. Thus, although identity variables are significantly related to substance usage, these results argue against any direct relationship such as the postulate that lack of identity formation (low identity commitment, high exploration, and high identity distress) increases substance use, or that substance use interferes with identity commitment and increases exploration and distress. More likely there are one or more mediating and/or moderating variables, such as age. In this college sample, older age was associated with greater identity exploration, less identity commitment,

greater identity distress, and more psychological symptoms (e.g., anxiety and depression). Older age was also correlated with more alcohol and substance use. Of course if they are still using, with each year older there will be greater lifetime usage, so the variables might be confounded. Age is also confounded with years of college experience which might increase stress (especially the stress of needing to make identity choices, such as career goals, with graduation fast approaching), and the stress could be the cause of all these correlations. Thus, future studies are needed to tease out these potential mediators and moderators.

This study is not without its limitations which should be noted. The sample was predominantly female (77.6%) and Caucasian (55.3%). Future studies might want to pursue a more diverse sample. Also, the analyses are correlational and thus no causal assumptions can be inferred. Longitudinal studies would be helpful in this regard. Finally, the data is self-report and while there is probably no better way to obtain this information, one does have to be aware of the potential for minimization or exaggeration of substance use as well as psychological traits and symptoms. Despite these limitations, it appears that the relationship between identity and substance use is more complex than one might suspect from perusing the limited available literature. Clearly this thesis speaks to the need for further research into the mediators and moderators that may exist within this complex relationship.

APPENDIX A: IRB APPROVAL LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Steven L Berman and Joshua J Mester**

Date: **June 25, 2010**

Dear Researcher:

On 6/25/2010, the IRB approved the following activity as human participant research that is exempt from regulation:

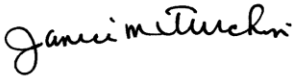
Type of Review:	Initial Review
Project Title:	Substance Use and Identity
Investigator:	Steven L Berman
IRB Number:	SBE-10-06973
Funding Agency:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Joseph Bielitzki, DVM, UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 06/25/2010 01:53:41 PM EDT



IRB Coordinator

APPENDIX B: BACKGROUND QUESTIONAIR

BACKGROUND QUESTIONNAIRE

SONA generated temporary STUDENT ID:_____

SEX: MALE or FEMALE

GRADE: Chose your grade in school:

(13)=Freshman
(14)=Sophomore
(15)=Junior
(16)=Senior

AGE:_____

ETHNICITY: Click the ethnic/racial identifier that best describes you:

(0)=White, non-Hispanic
(1)=Black, non-Hispanic
(2)=Hispanic
(3)=Asian or Pacific Islander
(4)=Native American or Alaskan Native
(5)=Mixed ethnicity
(6)=Other

APPENDIX C: YOUTH RISK BEHAVIOR SURVEILLANCE SYSTEM

YRBS – the following 16 questions are regarding drug and alcohol use.

1. During your life, on how many days have you had at least one drink of alcohol?

A. 0 days B. 1 or 2 days C. 3 to 9 days D. 10 to 19 days
E. 20 to 39 days F. 40 to 99 days G. 100 or more days

2. How old were you when you had your first drink of alcohol other than a few sips?

A. I have never had a drink of alcohol other than a few sips
B. 8 years old or younger C. 9 or 10 years old D. 11 or 12 years old
E. 13 or 14 years old F. 15 or 16 years old G. 17 years old or older

3. During the past 30 days, on how many days did you have at least one drink of alcohol?

A. 0 days B. 1 or 2 days C. 3 to 5 days D. 6 to 9 days
E. 10 to 19 days F. 20 to 29 days G. All 30 days

4. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

A. 0 days B. 1 day C. 2 days D. 3 to 5 days E. 6 to 9 days
F. 10 to 19 days G. 20 or more days

5. During the past 30 days, on how many days did you have at least one drink of alcohol **on school property**?

A. 0 days B. 1 or 2 days C. 3 to 5 days D. 6 to 9 days
E. 10 to 19 days F. 20 to 29 days G. All 30 days

6. During your life, how many times have you used marijuana?

A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 to 99 times G. 100 or more times

7. How old were you when you tried marijuana for the first time?

A. I have never tried marijuana B. 8 years old or younger C. 9 or 10 years old
D. 11 or 12 years old E. 13 or 14 years old F. 15 or 16 years old
G. 17 years old or older

8. During the past 30 days, how many times did you use marijuana?

A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

9. During your life, how many times have you used **any** form of cocaine, including powder, crack, or freebase?

A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

10. During the past 30 days, how many times did you use **any** form of cocaine, including powder, crack, or freebase?

A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

11. During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

12. During your life, how many times have you used **heroin** (also called smack, junk, or China White)?
A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

13. During your life, how many times have you used **methamphetamines (**also called speed, crystal, crank, or ice)?
A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

14. During your life, how many times have you used **ecstasy** (also called MDMA)?
A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

15. During your life, how many times have you taken **steroid pills or shots** without a doctor's prescription?
A. 0 times B. 1 or 2 times C. 3 to 9 times D. 10 to 19 times
E. 20 to 39 times F. 40 or more times

16. During your life, how many times have you used a needle to inject any **illegal** drug into your body?
A. 0 times B. 1 time C. 2 or more times

APPENDIX D: EIPQ

EIPQ - For the following 32 statements, please decide how much you agree or disagree with each, using the following scale.

1	2	3	4	5
Strongly Disagree	**Slightly Disagree**	**Neutral**	**Slightly Agree**	**Strongly Agree**

17. I have definitely decided on the occupation I want to pursue.
18. I don't expect to change my political principles and ideals.
19. I have considered adopting different kinds of religious beliefs.
20. There has never been a need to question my values.
21. I am very confident about which kinds of friends are best for me.
22. My ideas about men's and women's roles have never changed as I became older.
23. I will always vote for the same political party.
24. I have firmly held views concerning my role in my family.
25. I have engaged in several discussions concerning behaviors involved in dating relationships.
26. I have considered different political views thoughtfully.
27. I have never questioned my views concerning what kind of friend is best for me.
28. My values are likely to change in the future.
29. When I talk to people about religion, I make sure to voice my opinion.
30. I am not sure about what type of dating relationship is best for me.
31. I have not felt the need to reflect on the importance I place on my family.
32. Regarding religion, my views are likely to change in the near future.
33. I have definite views regarding the ways in which men and women should behave.
34. I have tried to learn about different occupational fields to find the one best for me.
35. I have undergone several experiences that made me change my views on men's and women's roles.
36. I have re-examined many different values in order to find the ones which are best for me.
37. I think that what I look for in a friend could change in the future.
38. I have questioned what kind of date is right for me.
39. I am unlikely to alter my vocational goals.
40. I have evaluated many ways in which I fit into my family structure.
41. My ideas about men's and women's roles will never change.
42. I have never questioned my political beliefs.
43. I have had many experiences that led me to review the qualities that I would like my friends to have.
44. I have discussed religious matters with a number of people who believe differently than I do.
45. I am not sure that the values I hold are right for me.
46. I have never questioned my occupational aspirations.
47. The extent to which I value my family is likely to change in the future.
48. My beliefs about dating are firmly held.

APPENDIX E: IDS

IDS - To what degree have you recently been upset, distressed, or worried over any of the following issues in your life? (Please select the appropriate response, using the following scale).

None at all	Mildly	Moderately	Severely	Very Severely
1	**2**	**3**	**4**	**5**

49. Long term goals? (e.g., finding a good job, being in a romantic relationship, etc.)
50. Career choice? (e.g., deciding on a trade or profession, etc.)
51. Friendships? (e.g., experiencing a loss of friends, change in friends, etc.)
52. Sexual orientation and behavior? (e.g., feeling confused about sexual preferences, intensity of sexual needs, etc.)
53. Religion? (e.g., stopped believing, changed your belief in God/religion, etc.)
54. Values or beliefs? (e.g., feeling confused about what is right or wrong, etc.)
55. Group loyalties? (e.g., belonging to a club, school group, gang, etc.)
56. Please rate your overall level of ***discomfort*** (how bad they made you feel) about all the above issues as a whole.
57. Please rate how much uncertainty over these issues as a whole has interfered with your life (for example, stopped you from doing things you wanted to do, or being happy)
58. How long (if at all) have you felt upset, distressed, or worried over these issues as a whole? (Use rating scale below)

Never or less than a month	1 to 3 months	3 to 6 months	6 to 12 months	More than 12 months
1	2	3	4	5

APPENDIX F: BSI 18

BSI 18 - Below is a list of problems people sometimes have. Read each one carefully and fill in the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY.

1	2	3	4	5
Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**

59. Faintness or dizziness
60. Feeling no interest in things
61. Nervousness or shakiness inside
62. Pains in heart or chest
63. Feeling lonely
64. Feeling tense or keyed up
65. Nausea or upset stomach
66. Feeling blue
67. Suddenly scared for no reason
68. Trouble getting your breath
69. Feelings of worthlessness
70. Spells of terror or panic
71. Numbness or tingling in parts of your body
72. Feeling hopeless about the future
73. Feeling so restless you couldn't sit still
74. Feeling weak in parts of your body
75. Thoughts of ending your life
76. Feeling fearful

APPENDIX G: TABLES

Table 1: Correlations and p Values for Age, Identity Variables, Psychopathology, and Substance Use Variables

	Age	Identity Exploration	Identity Commitment	Identity Distress	Psychological Symptoms
Identity Exploration	.334** (.007)				
Identity Commitment	-.250* (.046)	-.318** (.005)			
Identity Distress	.264* (.035)	.364** (.001)	-.401*** (.000)		
Psychological Symptoms	.271* (.030)	.380** (.001)	-.231* (.046)	.429*** (.000)	
Lifetime days of drinking	.478*** (.000)	.290* (.012)	-.412*** (.000)	.318** (.005)	.361** (.001)
Days of drinking in last month	.354** (.004)	.232* (.045)	-.209 (.071)	.170 (.141)	.199 (.085)
Days of 5+ drinks in last month	.327* (.008)	.142 (.227)	-.237* (.042)	.167 (.153)	.060 (.611)
Days drank at school in past month	-.005 (.971)	.157 (.177)	-.135 (.250)	.105 (.367)	-.010 (.933)

Lifetime	.501**	.226	-.310**	.171	.031
Cannabis	(.000)	(.051)	(.007)	(.141)	(.793)
usage					
Days of	.295*	.145	-.241*	.102	.021
Cannabis use	(.019)	(.219)	(.039)	(.386)	(.860)
in last month					
Lifetime cocaine	.256*	.027	-.008	-.015	.132
use	(.041)	(.821)	(.453)	(.889)	(.254)
Cocaine use in	.099	.155	.038	-.133	-.028
last month	(.436)	(.183)	(.743)	(.252)	(.811)
Lifetime	.438***	.190	-.121	.019	.228*
inhalants use	(.000)	(.103)	(.300)	(.871)	(.047)
Lifetime heroin	.099	.155	.038	-.133	-.028
use	(.436)	(.183)	(.743)	(.252)	(.811)
Lifetime meth.	.386**	.202	-.198	-.007	.080
Use	(.002)	(.082)	(.089)	(.951)	(.490)
Lifetime ecstasy	.476**	.215	-.247*	-.035	.085
usage	(.000)	(.064)	(.033)	(.761)	(.463)

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

Table 2 Frequency Distribution of Substance Use

Variables	%	%	%	%	%	%	%
Lifetime days of drinking	0 days 21.1%	1-2 days 13.2 %	3-9 days 15.8%	10-14 7.9%	20-39 15.8%	40-99 7.9%	100 + 18.4%
Age of first alcoholic drink	never 21.1%	8 or less 5.3%	9 -10 0%	11-12 3.9%	13-14 11.8%	15-16 32.9%	17 or up 23.7%
Days of drinking in last month	0 days 42.1%	1-2 days 22.4%	3-5 days 18.4%	6-9 days 6.6%	10-19 10.5%	20-29 0%	All 30 0%
Days of 5+ drinks in last month	0 days 67.1%	1 days 14.5%	2 days 2.6%	3-5 days 6.6%	6-9 days 5.3%	10-19 2.6%	20 -30 0%
Days drank at school in past month	0 days 93.4%	1-2 days 5.3%	3-5 days 0%	6-9 days 0%	10-19 1.3%	20-29 0%	All 30 0%

Lifetime cannabis use	never 61.8%	1-2 9.2%	3-9 3.9%	10-19 5.3%	20-39 3.9%	40-99 3.9%	100 + 11.8%
Age of first cannabis use	never 57.9%	8 or less 0%	9-10 0%	11-12 3.9%	13-14 6.6%	15-16 22.4%	17 or up 9.2%
Days of Cannabis use in last month	none 86.8%	1-2 1.3%	3-9 1.3%	10-19 3.9%	20-39 1.3%	40-99 3.9%	100 + 0%
Lifetime cocaine use	never 94.7%	1-2 2.6%	3-9 1.3%	10-19 0%	20-39 0%	40 + 1.3%	
Cocaine use in last month	none 98.7%	1-2 1.3%	3-9 0%	10-19 0%	20-39 0%	40 + 0%	
Lifetime inhalants use	none 96.1%	1-2 2.6%	3-9 0%	10-19 1.3%	20-39 0%	40 + 0%	
Lifetime heroin use	none 98.7%	1-2 1.3%	3-9 0%	10-19 0%	20-39 0%	40 + 0%	

Lifetime meth. use	none 94.7%	1-2 2.6%	3-9 02.6%	10-19 0%	20-39 0%	40 + 0%
Lifetime ecstasy use	none 88.2%	1-2 5.3%	3-9 6.6%	10-19 0%	20-39 0%	40 + 0%

Table 3 Summary of Regression Analysis Predicting Lifetime Days of Drinking

Variables	B	S.E.	β	*t*	p-value
Age	**0.53**	**0.17**	**0.37**	**3.10**	**0.003**
Gender	-0.04	0.68	-0.01	-0.06	0.952
Psychological symptoms	0.911	0.61	0.20	1.49	0.143
Identity Exploration	0.01	0.04	0.02	0.17	0.865
Identity Commitment	-0.06	0.03	-0.22	-1.66	0.103
Identity Distress	-0.22	0.47	-0.06	-0.48	0.636

Note: Full Model $F_{(6, 56)} = 4.39$, $p = .001$. $R^2 = .32$

Table 4 Summary of Regression Analysis Predicting Drinking Within Last 30 Days

Variables	B	S.E.	β	*t*	p-value
Age	**0.29**	**0.12**	**0.31**	**2.37**	**0.021**
Gender	-0.14	0.47	-0.04	-0.29	0.770
Psychological symptoms	0.57	0.43	0.19	1.31	0.197
Identity Exploration	0.01	0.03	0.05	0.35	0.730
Identity Commitment	-0.01	0.02	-0.08	-0.56	0.575
Identity Distress	-0.38	0.33	-0.17	-1.15	0.254

Note: Full Model $F_{(6, 56)} = 1.97$, $p = .086$. $R^2 = .17$

Table 5 Summary of Regression Analysis Predicting Number of Days in the Last Month Having Had at Least 5 Drinks in a Row

Variables	B	S.E.	β	*t*	p-value
Age	**0.29**	**0.12**	**0.32**	**2.39**	**0.020**
Gender	-0.53	0.48	-0.15	-1.11	0.273
Psychological symptoms	0.16	0.43	0.06	0.38	0.708
Identity Exploration	-0.01	0.03	-0.05	-0.31	0.762
Identity Commitment	-0.03	0.02	-0.19	-1.32	0.193
Identity Distress	-0.27	0.33	-0.12	-0.82	0.417

Note: Full Model $F_{(6, 56)} = 1.90$, $p = .097$. $R^2 = .17$

Table 6 Summary of Regression Analysis Predicting Number of Days of Drinking at School Within the Last Month

Variables	B	S.E.	β	*t*	p-value
Age	-0.01	0.05	-0.03	-0.19	0.850
Gender	0.11	0.19	0.08	0.55	0.588
Psychological symptoms	-0.15	0.18	-0.13	-0.85	0.399
Identity Exploration	0.01	0.01	0.15	0.93	0.359
Identity Commitment	-0.01	0.01	-0.13	-0.82	0.414
Identity Distress	-0.08	0.14	-0.09	-0.59	0.561

Note: Full Model $F_{(6, 56)} = 0.45$, $p = .845$. $R^2 = .05$

Table 7 Summary of Regression Analysis Predicting Lifetime Cannabis Use

Variables	B	S.E.	B	*t*	p-value
Age	**0.65**	**0.17**	**0.48**	**3.79**	**< 0.001**
Gender	**-1.50**	**0.67**	**-0.27**	**-2.23**	**0.030**
Psychological symptoms	0.20	0.61	0.04	0.33	0.742
Identity Exploration	0.05	0.04	0.16	1.21	0.230
Identity Commitment	-0.02	0.03	-0.08	-0.61	0.544
Identity Distress	-0.25	0.47	-0.07	-0.53	0.601

Note: Full Model $F_{(6, 56)} = 4.89$, $p < .001$. $R^2 = .34$

Table 8 Summary of Regression Analysis Predicting Days of Smoking Cannabis Within the Last Month

Variables	B	S.E.	β	*t*	p-value
Age	0.15	0.08	0.23	1.91	0.062
Gender	**-1.04**	**0.23**	**-0.39**	**-3.19**	**0.002**
Psychological symptoms	-0.39	0.28	-0.18	-1.39	0.171
Identity Exploration	**0.06**	**0.02**	**0.45**	**3.22**	**0.002**
Identity Commitment	< -0.01	0.02	-0.02	-0.11	0.910
Identity Distress	-0.26	0.22	-0.16	-1.19	0.239

Note: Full Model $F_{(6, 55)} = 4.67$, $p = .001$. $R^2 = .34$

Table 9 Summary of Regression Analysis Predicting Lifetime Cocaine Use

Variables	B	S.E.	β	*t*	p-value
Age	0.19	0.06	0.25	1.86	0.068
Gender	-0.11	0.25	-0.06	-0.45	0.655
Psychological symptoms	0.37	0.23	0.25	1.63	0.108
Identity Exploration	-0.01	0.01	-0.11	-0.73	0.467
Identity Commitment	< -0.01	0.01	-0.04	-0.30	0.769
Identity Distress	-0.15	0.18	-0.13	-0.84	0.404

Note: Full Model $F_{(6, 56)} = 1.27$, $p = .287$. $R^2 = .12$

Table 10 Summary of Regression Analysis Predicting Number of Days of Cocaine Use in the Last Month

Variables	B	S.E.	β	*t*	p-value
Age	0.01	0.01	0.07	0.51	0.611
Gender	**-0.13**	**0.04**	**-0.40**	**-3.03**	**0.004**
Psychological symptoms	0.02	0.04	0.08	0.54	0.594
Identity Exploration	**0.01**	**< 0.01**	**0.38**	**2.60**	**0.012**
Identity Commitment	< 0.01	< 0.01	0.13	0.94	0.350
Identity Distress	-0.06	0.03	-0.27	-1.87	0.066

Note: Full Model $F_{(6, 56)} = 2.65$, $p = .025$. $R^2 = .22$

Table 11 Summary of Regression Analysis Predicting Lifetime Inhalants Use

Variables	B	S.E.	β	*t*	p-value
Age	**0.11**	**0.03**	**0.41**	**3.32**	**0.002**
Gender	< 0.01	0.14	< 0.01	0.02	0.982
Psychological symptoms	**0.27**	**0.12**	**0.30**	**2.20**	**0.032**
Identity Exploration	< 0.01	0.01	0.01	0.09	0.930
Identity Commitment	<0.01	0.01	0.01	0.05	0.963
Identity Distress	-0.13	0.10	-0.18	-1.34	0.186

Note: Full Model $F_{(6, 56)} = 3.57$, $p = .005$. $R^2 = .28$

Table 12 Summary of Regression Analysis Predicting Lifetime Heroin Use

Variables	B	S.E.	β	*t*	p-value
Age	0.01	0.01	0.07	0.51	0.611
Gender	**-0.13**	**0.04**	**-0.40**	**-3.03**	**0.004**
Psychological symptoms	0.02	0.04	0.08	0.54	0.594
Identity Exploration	**0.01**	**< 0.01**	**0.38**	**2.60**	**0.012**
Identity Commitment	< 0.01	< 0.01	0.13	0.94	0.350
Identity Distress	-0.06	0.03	-0.27	-1.87	0.066

Note: Full Model $F_{(6, 56)} = 2.65$, $p = .025$. $R^2 = .22$

Table 13 Summary of Regression Analysis Predicting Lifetime Methamphetamine Use

Variables	B	S.E.	β	*t*	p-value
Age	**0.10**	**0.03**	**0.37**	**2.86**	**0.006**
Gender	0.11	0.13	0.11	0.83	0.409
Psychological symptoms	< 0.01	0.12	< 0.01	0.03	0.979
Identity Exploration	< 0.01	0.01	0.06	0.39	0.697
Identity Commitment	-0.01	0.01	-0.17	-1.21	0.230
Identity Distress	-0.12	0.09	-0.18	-1.26	0.215

Note: Full Model $F_{(6, 56)} = 2.38$, $p = .041$. $R^2 = .20$

Table 14 Summary of Regression Analysis Predicting Lifetime Ecstasy Use

Variables	B	S.E.	β	*t*	p-value
Age	**0.17**	**0.05**	**0.45**	**3.76**	**< 0.001**
Gender	-0.31	0.18	-0.21	-1.76	0.084
Psychological symptoms	0.09	0.16	0.07	0.56	0.579
Identity Exploration	0.02	0.01	0.23	1.68	0.098
Identity Commitment	-0.01	0.01	-0.08	-0.58	0.567
Identity Distress	**-0.27**	**0.12**	**-0.28**	**-2.16**	**0.035**

Note: Full Model $F_{(6, 56)} = 4.70$, $p = .001$. $R^2 = .34$

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