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Marijuana Use, Motives, and Change Intentions in Adolescents

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Abstract

Research typically focuses on motives to use or abstain from marijuana (MJ) in isolation; few studies have integrated both constructs in models of MJ use decision making. We expand the existing literature by integrating these motives in cognitive models of use and cessation in adolescents. We expected use motives to account for past use and intentions for future use, and for motives to abstain to dominate models explaining intention, desire, and self-efficacy for quitting. Adolescent MJ users (N = 162) reported their use and abstinence motives as well as their use and cessation behavior via online survey conducted in high schools. Past use was related to high conformity and low coping, while past cessation attempts were related to high enhancement motives. Intentions to use were related to low negative consequences and conformity, and high enhancement and expansion motives to use. Quitting intention was related to social motives to use, as was quitting self-efficacy. Self-efficacy was also related to high personal/peer beliefs motives to abstain. While past MJ use and intended future use were almost exclusively accounted for by use motives, both motives to use and abstain impacted self-reported cognitions associated with cessation in this sample of adolescent MJ users.

Keywords

abstinence motives; adolescents; marijuana; motives to use; quitting

INTRODUCTION

Adolescent marijuana (MJ) use is an important health concern, as a majority of annual MJ initiates are under the age of 18 and about half of high school seniors have tried MJ at least once (Substance Abuse and Mental Health Services Administration [SAMHSA] 2014; Terry-McElrath, O'Malley & Johnston 2008). Initiation of use at a young age can increase the risk of heavy use, continued use, abuse, and dependence (SAMHSA 2014; Gruber et al. 2012; Meier et al. 2012). Although a majority of adolescent users report wanting to decrease use or abstain completely (Terry-McElrath et al. 2008; Weiner et al. 1999), little work has examined the cognitive processes underlying youth cessation attempts from MJ, an understanding crucial to the development of effective prevention and intervention programs. The present study seeks to examine use and cessation motives simultaneously as a means of

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understanding past use and cessation behavior and predicting cognitions surrounding future use and cessation.

As with alcohol and other drugs of abuse, MJ cessation is a difficult process involving cycles of increasing and decreasing motivation to quit (Prochaska, DiClemente & Norcross 1992). In one study, 96% of adult MJ users attempting to quit reported smoking MJ at least once during a two-week monitoring period (Buckner, Zvolensky & Ecker 2013). While intention to reduce or quit use did not accurately predict success in a sample of adult, non-treatment seeking habitual MJ users (Hughes et al. 2008), self-efficacy has been linked to confidence in quitting success in adults (Chauchard et al. 2013). In adolescents, the effectiveness of voluntary school-based interventions using motivational enhancement on reducing MJ use in regular users has been demonstrated (Walker et al. 2006), supporting the importance of motivation in cessation. Among adolescent MJ users in a community sample, well over half indicated that they had tried to quit in the past and almost 60% reported that they would participate in a teen-focused cessation program if available, indicating a widespread interest in quitting among adolescents (Sheer et al. 2009). Work on adolescent MJ use suggests that MJ-related cognitions, such as expectancies and motives, are important cognitive factors in process-oriented models of use and cessation (Patrick et al. 2011; Terry-McElrath et al. 2008; Skenderian et al. 2008; Simons et al. 1998). For the purposes of this investigation, we focused on motives, or substance-specific reasons individuals hold for use or abstinence (Anderson, Briggs & White 2013).

Youth across the spectrum of MJ engagement endorse motives to abstain. In a study examining 28 years of data from high school seniors, Terry-McElrath et al. (2008) found that motives to quit or abstain can be categorized into *negative consequences* (e.g., concerned about psychological damage), *lack of interest/impractical* (e.g., don't feel like getting high), and *personal/peer beliefs* (e.g., my parents would disapprove) subtypes. Concerns about psychological or physical damage were the most frequently endorsed, consistent with findings from Bailey, Flewelling and Rachal (1992) where low endorsement of motives regarding psychological or physical damage resulting from MJ use were predictive of continued use. Additionally, Sussman and Dent (1999) found that youth who had successfully quit using MJ reported lower levels of peer approval of use, demonstrating the importance of personal/peer beliefs motives in the process of cessation. In a longitudinal study of youth in the community, Anderson, Sitney and White (2015) found that endorsing more MJ abstinence motives across adolescence (ages 12–18) predicted less MJ use in emerging adulthood (age 25) and fewer MJ-related problems. As there is a relation between motives to abstain from MJ and continued use versus cessation, examining how these motives relate to intention and desire to quit could inform motivational enhancement strategies that promote quitting behavior in MJ users (e.g., Miller & Rollnick 2002).

MJ use motives also relate to patterns of use engagement (Fox et al. 2011; Patrick et al. 2011; Lee, Neighbors & Woods 2007; Simons et al. 1998) and may be important in decision making about cessation. Social (social facilitation), coping (decreasing negative affect), enhancement (increasing positive emotions), conformity (avoidance of social rejection), and expansion motives (related to the drug's psychedelic properties) are differentially associated with MJ use and quitting (Zvolensky et al. 2007; Chen & Kandel 1998; Simons et al. 1998).

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In longitudinal work, MJ use motives, assessed between the ages of 15 and 18, predicted increased MJ consumption and problems at age 25 with the exclusion of expansion motives, which related to lower MJ use in emerging adulthood (Anderson et al. 2015). Social motives relate to increased MJ use at age 18 but less frequent use or quitting in adulthood (Patrick et al. 2011; Chen & Kandel 1998). Contradictory evidence exists regarding conformity motives; such motives have been associated with both MJ-related problems (Fox et al. 2011; Comeau, Stewart & Loba 2001; Simons et al. 1998) and decreased likelihood of using (Zvolensky et al. 2007). Little or no work to date has examined how these motives might influence MJ cessation.

Although research on MJ-related motives is not lacking, there is little information on how these factors play out when examined simultaneously as a means of understanding both past and future behavior. The present study aimed to examine the relations between specific motives to use and abstain from MJ, past use and attempts to reduce or stop use, and expand on the current literature by also examining understudied aspects of cessation, including measures of future intention to use and self-efficacy, desire, and intent to cut down or stop use. This investigation has the potential to further our understanding of the interplay of motives to use and abstain in relation to cognitions associated with MJ use and cessation, important factors in purposeful quit attempts for youth.

Overall, we anticipated that motives to use would dominate models for MJ use behavior and cognition, while motives related to abstention would be the strongest predictors of cessation attempts, intentions, and desires. Specifically, higher rates of past use were expected to relate to high coping and enhancement motives, as these particular motives are commonly endorsed by adolescent users (Weiner et al. 1999) and predict current MJ engagement (Zvolensky et al. 2007; Simons et al. 1998). Intention to use MJ in the future was expected to be influenced by coping, social, enhancement, and expansion motives, given their utility in predicting future use (Malmberg et al. 2012; Zvolensky et al. 2007; Weiner et al. 1999; Simons et al. 1998). For cessation-related factors, we expected that past quit attempts would be predicted by high negative consequences motives, as adolescents report avoidance of trouble as a primary reason for quitting (Weiner et al. 1999). Ratings of self-efficacy and desire to quit in the future were hypothesized to related to personal/peer beliefs motives and, consistent with Hansen and McNeal's (2001) findings that adolescents who quit using MJ believed more strongly in the negative consequences of use than did those who continued to use, intention and desire to quit were expected to relate to negative consequences motives to abstain (Terry-McElrath et al. 2008; Bailey et al. 1992).

METHOD

Participants

Participants were students in grades 9–12 at two public high schools in the Pacific Northwest. Of the approximately 3,000 students enrolled in these schools, 926 (31%) had parental consent to participate in school surveys using an active consent procedure. Approximately 55% of students with consent could participate given their academic schedule, provided assent, and participated in the survey. Four hundred and fifty-three students completed the survey; 162 identified as MJ users (34 ninth, 61 tenth, 46 eleventh,

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and 21 twelfth graders) and were included in the analyses. The average age of participants was 15.65 (*SD* = 1.05), 53% were boys, and 65.1% were Caucasian. Within the sample, 15.4% identified as Hispanic or Latino, 6.0% as Black or African American, 8.7% as Asian American, and 4.7% as Native American or Pacific Islander.

Measures

MJ use.—Past 30 day use was assessed in participants who indicated that they had used MJ at least once in their lifetime, an item derived from the California Healthy Kids Survey (WestEd 2009). This variable was divided into three categories for analysis (0 uses, 1–9 uses, and 10+ uses) due to non-normality.

Motives to use.—The Marijuana Motives Measure (MMM; Simons et al. 1998) is a 25-item self-report measure assessing social (α = .89; e.g., “to celebrate a special occasion with friends”), coping (α = .90; e.g., “to forget about my problems”), enhancement (α = .93; e.g., “because it’s fun”), conformity (α = .90; e.g., “to fit in with the group I like”), and expansion (α = .93; e.g., “to be more open to experiences”) reasons to use MJ. Each motive was rated on a scale of *almost never/never* (1) to *almost always/always* (5). As described in Simons et al. (1998), subscale scores represent the average of the five scale items (range: 1–5). As shown earlier, this measure demonstrated good reliability in this adolescent sample and has been used successfully in past investigations with college students (Zvolesnky et al. 2007; Simons et al. 1998).

Motives to quit or abstain (MQAM).—The MQAM is a 17-item self-report measure assessing negative consequences (nine items; α = .94; e.g., “concerned about getting arrested”), lack of interest/impractical (five items; α = .77; e.g., “not enjoyable, I didn’t like it,” “not available”), and against personal/peer beliefs (three items; α = .70; e.g., “it’s against my beliefs,” “my friends don’t use it”) motives to quit or abstain from MJ (Terry-McElrath et al. 2008). This measure was adapted from a study by Terry-McElrath et al. (2008), using items generated in a sample of college students and subsequently verified within a large sample of high school students. Participants indicated on a scale of *completely not important* (1) to *very important* (5) their relative endorsement of these motives (the original measure used a summary count of endorsed motives). As seen earlier, this measure demonstrated adequate internal consistency in this sample.

Past reduction and quit attempts.—Participants responded to the questions, “Over the past year, did you try to cut down (not stop) using MJ?” and “Over the past year, did you try to stop using MJ?” on a scale ranging from *once* (1) to *over 10 times* (5) with an option for *never,* consistent with past versions of the California Healthy Kids Survey (WestEd 2009). Due to low endorsement and variability within these items, they were collapsed, dichotomized, and coded as 0 (no attempt to cut down and/or stop) and 1 (at least one attempt to cut down and/or stop) for analysis.

Intention to use and quit.—Participants responded to the statement, “In the next 30 days, I will …” with one of five choices, ranging from *definitely not use MJ* (1) to *definitely will use MJ* (5; cf. California Healthy Kids Survey; WestEd 2009). In addition, they were

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asked to respond to the question, "Will you try to cut down or stop using MJ in the next 30 days?" on scale ranging from *definitely not* (1) to *definitely will* (5) with an option for *not applicable*/*I don't use MJ* (cf. California Healthy Kids Survey; WestEd 2009). Responses for MJ users endorsing the *not applicable* option ($n = 34$) were recoded as missing due to ambiguity of the response.

Self-efficacy to quit and desire to quit.—Participants were asked to respond to the question, "In the next year, how likely is it that you will try to cut down or stop using MJ?" on a scale ranging from *definitely won't try* (1) to *definitely will try* (5) with an option for *not applicable*/*I don't use MJ* (cf. California Healthy Kids Survey; WestEd 2009). As noted previously, responses for MJ users endorsing the *not applicable* option ($n = 34$) were recoded as missing due to ambiguity of the response. This item has been used as an index of self-efficacy in past investigations on youth use and cessation (Kelly et al. 2010; Kelly, Myers & Brown 2000; Sklar, Annis & Turner 1997).

Youth were also asked to respond to the question, "How much do you want to cut down or stop using MJ?" on a scale ranging from *not at all* (1) to *very much* (5; cf. California Healthy Kids Survey; WestEd 2009) and indexed desire to quit.

Procedure

The Reed College Institutional Review Board and the participating school district approved this project. Consent forms and information about the study were mailed to the homes of all students before the beginning of the school year, and parents were asked to return the form with other enrollment materials. Consent forms were also gathered at school-based events, such as back-to-school nights and parent teacher conferences. Parents of potential participants provided informed consent, and all participating youth provided assent.

Students with parental consent were invited to participate in a school-based online survey about drug and alcohol use and attitudes. Eligible students were directed to a computer lab during class time, study hall, or a free period to take the survey with no teachers, faculty, or school staff present. Students were seated at individual computers and took the survey anonymously after providing assent and being given instructions by a proctor unaffiliated with the school. The survey was presented via SurveyMonkey, an online tool for creating and distributing surveys, using Secure Sockets Layer (SSL) encryption.

Analytic Plan

A series of regressions were conducted using MPlus 7.1 (Muthén & Muthén 2013) to examine relations between motives as predictors and MJ-related behaviors (i.e., past use and cessation attempts) and cognitions (i.e., future intention to use; intention, self-efficacy, and desire to cut down or stop use) as outcomes. Full information maximum likelihood (FIML) was used to account for the missing data on variables of interest (motives: 1–13% dependent on analysis). Robust standard errors were estimated for continuous outcomes, and Monte Carlo integration was used for analyses using categorical outcomes. When the dependent variables were not continuous, logistic regression was used to model binary outcomes (i.e., past change attempts) and multinomial logistic regression for categorical outcomes (i.e., past

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30-day MJ use). MPlus does not provide omnibus tests, such as F-tests, for regressions; as such, all available information regarding model fit for fully saturated models is presented. As age had a significant bivariate relation with intention to use MJ, it was included as a covariate within the analysis. No other baseline characteristics were related to outcomes, and therefore no covariates were included within other models. As multiple analyses are presented, a Holm correction was used to account for family-wise error rates for omnibus tests (Holm 1979).

RESULTS

Samples from participating schools differed by age, $t(151) = 2.95$, $p = .004$, and grade, $\chi^2(df = 3) = 22.78$, $p < .001$. These differences are likely due to having a smaller sample at one school ($n = 37$ users) than at the other ($n = 114$ users; 11 users did not report which school they attended). Outcome variables of interest (past 30 day use; past change attempts; future use or change measures) did not differ by demographic characteristics or school placement, with the exception of intention to use differing by age, $F(3, 149) = 4.22$, $p = .003$. Those who endorsed *definitely will not use MJ* versus *not sure* or *probably will use MJ* were significantly younger. No other outcome variables differed by demographic characteristics using Holm corrected p values.

Means were compared on available data from MJ users. Endorsements for motives to use and abstain from MJ and the dependent variables are presented in Table 1.

Past MJ Use and Quit Attempts

The likelihood of being a light MJ user (1–9 uses) versus MJ abstainer in the past 30 days was predicted by greater conformity motives to use MJ, $B = 1.25$, $SE = 0.51$, $OR = 3.52$, $p = .01$. Both lower coping, $B = -0.58$, $SE = 0.29$, $OR = 0.56$, $p = .04$, and higher conformity motives, $B = 0.94$, $SE = 0.45$, $OR = 2.56$, $p = .04$, influenced the likelihood of being a heavy user (10+ use episodes) versus nonuser in the past 30 days. No other motives emerged as significant predictors of recent use (AIC = 3417.73; BIC = 3609.16; Adj BIC = 3412.89).

Having attempted to cut down or stop MJ use in the past year was predicted by enhancement motives to use MJ, $B = .63$, $SE = .23$, $OR = 1.87$, $p = .005$; none of the other motives were significant (pseudo $R^2 = .13$, $p = .04$).

Future Intentions, Self-Efficacy, and Desire to Change

Table 2 presents associations between MJ-related motives and intention to use, self-efficacy for quitting, intention to quit, and desire to quit. Intention to use in the next 30 days was predicted by low negative consequences motives to abstain and conformity motives to use, as well as high enhancement and expansion motives to use; age was not a significant covariate. Self-efficacy for quitting in the next year was predicted by low social motives for MJ use and high personal/peer beliefs motives to abstain. Intention to quit in the next 30 days was also related to low social motives for use, as well as high negative consequences motives to abstain. Desire to quit was predicted by high personal/peer beliefs motives to abstain, further demonstrating the influence of social factors on cessation-related cognitions.

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DISCUSSION

The present study examined the relative influences of both motives to use and abstain from MJ on intentions to use and quit, quitting self-efficacy, and desire to quit. Interestingly, retrospective measures of MJ use and cessation related to use motives alone, whereas various levels of both motives to use and abstain, impacted self-reported cognitions relating to future use, cutting down, stopping or quitting. Although numerous studies have examined the relationship between MJ use and motives, the potential impact of these motives on the cognitive and behavioral processes of future cessation is novel. Understanding how current motives could influence future MJ use and cessation behavior may provide valuable insight and contributions to prevention and intervention programming.

Results showed that various levels of MJ use were predicted by high endorsement of conformity motives to use. Conversely, intention to use in the future was predicted by low levels of conformity motives, in conjunction with high enhancement and expansion motives. Research on conformity motives for alcohol suggests that the local social group may influence whether endorsement of these motives related to increased use (using to conform with a using crowd) or less use (not using to conform with non-using crowd; Kuntsche & Labhart 2013), indicating contextual specificity. Past 30 day MJ use was predicted by low endorsement of coping motives, supporting findings that coping motives are not necessarily indicative of use (e.g., Zvolensky et al. 2007; Simons et al. 1998). More attempts to quit in the past were associated with greater enhancement motives. As enhancement motives are often associated with increased use (Zvolensky et al. 2007; Simons et al. 1998), it may be the case that participants endorsing greater enhancement motives were more likely to experience negative consequences from higher levels of MJ use and thus felt the need to quit; unfortunately, this temporal association could not be examined here. Lower intention to quit and poorer quitting self-efficacy were predicted by high endorsement of social motives. This finding suggests that using MJ for social facilitation may be a barrier to quitting and highlights the importance of social motives to use in persistence of MJ use and possibly resistance to cessation.

Future intentions to use and cognitions related to cessation (intention, self-efficacy, desire) were associated with different motives to abstain from MJ. Intention to use in the future was predicted by low levels of negative consequences motives, while intention to quit was predicted by its increased endorsement. This supports past research showing negative consequences to be highly motivating (Terry-McElrath et al. 2008; Bailey et al. 1992) and negatively associated with relapse after quitting in adults (Chauchard et al. 2013). Consistent with findings that lower endorsement of positive ideas about drugs predicts MJ cessation one year later (Little et al. 2013), self-efficacy and desire to quit were exclusively influenced by personal/peer beliefs abstention motives. Lack of interest motives to abstain did not contribute to MJ use intention or measures of quitting intention, self-efficacy, or desire, likely as this motive is more germane to the behavior of non-users (i.e., choosing never to begin due to a lack of interest) than youth who have initiated use.

Although this study was limited by a small, non-random sample of MJ users, this research provides novel insights into cognitive processes associated with MJ use and cessation in

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adolescents. However, it is necessary to acknowledge the limitations of the current study. First, an underrepresentation of twelfth graders likely resulted in a smaller number of users in our sample and limits the generalizability of the results. While survey items were validated in adolescents (e.g., Brown et al. 2005; Kelly, Myers & Brown 2000), the single item outcome measures used here would be better operationalized through more comprehensive measures of these constructs (e.g., multidimensional self-efficacy scales). Given the cross-sectional design, the impact of MJ motives on future use or quit attempts cannot be determined.

This study explores the simultaneous assessment of MJ motives and cognitive precursors to using and quitting, thus providing an important cornerstone for future research assessing the impact of motives to use and abstain from MJ on patterns of use over time. Given the findings of this investigation, the present study provides insight into the relationship between motivational factors and potential future behaviors with respect to MJ, and the relationships between self-assessments of current motives and prospective behaviors validates longitudinal research into the specific outcomes of these measures. The information gleaned from this study can provide insight into specific motivating factors for users as a means of increasing effectiveness and accessibility of intervention efforts, and later work may aid in the development of motivation-based substance prevention and intervention programs. Youth intervention programs for alcohol and MJ use that include a motivational component have been demonstrated to impact future use and abstention behavior (Conrod, Castellanos-Ryan & Mackie 2011; Conrod, Castellanos-Ryan & Strang 2010; Swan et al. 2008; Brown et al. 2005). Understanding individual motives for using or abstaining from MJ, in combination with assessing their long-term impact on behavior, could lead to the development of effective motivation-specific targeted prevention programs for adolescents.

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TABLE1

Descriptive Statistics for Study Variables

Motives	**M (SD)**	**Range**
Motives to Abstain		
Neg. Consequences	2.67 (1.13)	1–5
Lack of Interest	2.57 (1.1G)	1–5
Personal/Peer Beliefs	2.26 (1.11)	1–5
Motives to Use		
Social	2.44 (1.2G)	1–5
Coping	1.98 (1.12)	1–5
Enhancement	3.1G (1.33)	1–5
Conformity	1.43 (G.8G)	1–5
Expansion	2.11 (1.22)	1–5
Dependent Variables		
Marijuana Use (MJ)		
Intention to use: next 30 days	2.84(1.39)	1–5
Quitting		
Self-efficacy to quit: next year	2.57 (1.3G)	1–5
Intention to quit: next 30 days	2.39 (1.21)	1–5
Desire to quit	2.13 (1.3G)	1–5
Past 30 day MJ use	n (%)	
0 uses	64 (39.5G)	
1–9 uses	73 (45.86)	
10+ uses	25 (15.43)	
Past year cut/stop attempt		
No	86 (54.8)	
Yes	71 (45.2)	

Note: Neg. Consequences = abstinence motives related to negative consequences associated with marijuana (MJ) use; *Lack of Interest* = abstinence motives associated with disinterest in MJ use; *Personal/Peer Beliefs* = abstinence motives associated with personal/peer belief against MJ use; *Social* = MJ use motives associated with social facilitation; *Coping* = MJ use motives relating to decreasing negative affect; *Enhancement* = MJ use motives associated with increasing positive emotions; *Conformity* = MJ use motives indexing avoidance of social rejection; *Expansion* = MJ use motives related to marijuana's psychedelic properties. All motive items were rated on a 1–5 Likert scale and averaged to determine subscale means.

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TABLE2

Prediction of Marijuana-Related Cognitions and Use Characteristics by Marijuana Motives

	Using	Quitting		
	Intention B (SE)	**Self-Efficacy B (SE)**	**Intention B (SE)**	**Desire B (SE)**
Motives to Abstain				
Neg. Consequences	−.32 (.16)*	.12 (.17)	.41 (.17)*	.07 (.14)
Lack of Interest	.21 (.17)	.07 (.17)	−.13 (.17)	−.15 (.15)
Personal/Peer Beliefs	−.18 (.13)	.41 (.17)*	.21 (.17)	.58 (.15)***
Motives to Use				
Social	−.03 (.13)	−.31 (.14)*	−.28 (.15)*	−.07 (.15)
Coping	.02 (.10)	−.03 (.11)	−.05 (.12)	−.22 (.12)
Enhancement	.34 (.10)***	−.02 (.12)	−.17 (.11)	−.19 (.11)
Conformity	−.36 (.15)*	.04 (.13)	.17 (.13)	.20 (.13)
Expansion	.33 (.11)**	−.02 (.10)	.08 (.11)	.13 (.01)
Overall Model				
Total R^2	.45***	.36***	.44***	.35***
N	162	162	161	161

Note. Neg. Consequences = abstinence motives related to negative consequences associated with marijuana use; *Lack of Interest* = abstinence motives associated with disinterest in marijuana use; *Personal/Peer Beliefs* = abstinence motives associated with personal/peer belief against marijuana use; *Social* = marijuana use motives associated with social facilitation; *Coping* = marijuana use motives relating to decreasing negative affect; *Enhancement* = marijuana use motives associated with increasing positive emotions; *Conformity* = marijuana use motives indexing avoidance of social rejection; *Expansion* = marijuana use motives related to marijuana's psychedelic properties. Unstandardized parameter estimates presented above.

* $p \leq .05$,

** $p \leq .01$,

*** $p \leq .001$.