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AUTHOR Kuther, Tara L.; Higgins-D'Alessandro, Ann
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ABSTRACT

This paper examines the relation of cognitive and developmental-contextual variables to alcohol use in adolescence and early adulthood in an attempt to increase the understanding of alcohol use during this age period. Components for each of the rational decision making theories, specifically attitude, subjective norm, and self-efficacy, were incorporated into this study. The proposed model of relationships among cognitive and developmental variables was similar to that of the theory of planned behavior in that it included attitudes, norms, and self-efficacy; however, it differed in several ways. Results of the study involving eleventh graders (n=87), college freshmen (n=105), and college juniors (n=107) demonstrated that a model incorporating rational decision and developmental-contextual variables accounts for a substantial proportion of the variance in alcohol consumption among adolescents and young adults. Rational decision variables, namely positive attitude and self-efficacy, predicted alcohol consumption in all three age groups, in accord with previous research; however, multisample analyses revealed that the predictive power of rational decision components was not equivalent across age groups sampled. Age differences and patterns emerged such that positive attitudes and self-efficacy were less important predictors among young adults than among adolescents. (Contains 27 references and 3 figures.) (MKA)

RUNNING HEAD: Alcohol Consumption

Rational and Developmental-Contextual Predictors of Alcohol Consumption by Youth

Tara L. Kuther
Western Connecticut State University

Ann Higgins-D'Alessandro
Fordham University

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Address correspondence to Dr. T. Kuther, Department of Psychology, Western Connecticut State University, 181 White Street, Danbury, CT 06810. Send electronic mail to Kuthert@wcsub.ctstateu.edu

Rational and Developmental-Contextual Predictors of Alcohol Consumption by Youth

From adolescence through early adulthood, alcohol consumption in the United States is highly prevalent (Johnston et al., 1996a, 1996b) and places youth at risk for alcoholism, violence, and death from traffic fatalities, suicide, accidental overdose, and homicide. Longitudinal studies have suggested that alcohol consumption by youth exhibits a developmental trajectory whereby it increases until approximately age 20 or 21 and steadily decreases thereafter (Chen & Kandel, 1995). The present study attempted to expand our understanding of cognitive and developmental factors that influence alcohol consumption in high school and college students.

Research attempts to understand and predict alcohol and substance use have most often been based in theories of decision-making, specifically rational decision-making. Theories of health decision-making propose that decisions to engage in risky activities, such as alcohol and substance use, are the result of a rational cost-benefit analysis. For example, decision-theorists have demonstrated that alcohol use can be predicted by its subjective expected utility, the product of the expected probability and the subjective desirability of positive and negative consequences of engagement (Furby & Beyth-Marom, 1992). Similarly, beliefs or expectations about the positive and negative effects of alcohol have been shown to influence the frequency and quantity of alcohol use (Fromme et al., 1993).

A cost-benefit analysis is also a component of the theories of planned behavior (Ajzen, 1991), and reasoned action (Ajzen & Fishbein, 1980). According to these theories, intentions are the direct determinants of behavior. The theory of reasoned action proposes that intentions are determined by attitudes (beliefs and evaluations of the consequences of the behavior) and subjective norms (beliefs about the opinions of others and the motivation to comply with them). This theory has been applied to predict cigarette smoking and drinking behaviors in high school and college students (Laflin et al., 1994; Schlegel et al., 1987). The theory of planned behavior is identical to the theory of reasoned action, but it adds self-efficacy as an additional determinant of intentions; it has been shown to predict more of the variance in alcohol use (Schlegel et al., 1992) than the theory of reasoned action alone. In both of these theories, attitudes and norms are not conceptualized as direct determinants of behavior, but are mediated by intention. Research has not always supported this assumption (Bentler & Speckart, 1979;

Stacy et al., 1994). Expectancy theory has shown that specific measures of attitudes are direct influences on behavior (Fromme et al., 1993), congruent with the Ajzen and Fishbein (1980) argument that the more specific the measurement of attitude, the closer its relation with behavior.

Rational decision-making approaches have difficulty explaining developmental differences in alcohol use, as adolescents and adults have been shown to have similar cognitive processes and perceive similar consequences of alcohol use (Beyth-Marom et al., 1993; Quadrel et al., 1993). Recently, rational approaches have been criticized for neglecting noncognitive, emotional, and developmental factors, which may influence decision-making (Steinberg & Cauffman, 1996). Socio-emotional variables, as well as closeness to, and autonomy from, parents have been related to engagement in risk behaviors (Barnes et al., 1994; Flannery et al., 1994; Lamborn & Steinberg, 1993; Turner et al., 1991; Turner et al., 1993); however, rational models have not included such variables in models of decision-making.

The present study examined the relation of cognitive and developmental-contextual variables to alcohol use in adolescence and early adulthood in an attempt to increase our understanding of alcohol use during this age period. Components from each of the rational decision-making theories, specifically attitude, subjective norm, and self-efficacy, were incorporated into the present research. The proposed model of relationships among cognitive and developmental variables, indicated in Figure 1, was similar to that of the theory of planned behavior in that it included attitudes, norms, and self-efficacy (referred to as perceived behavioral control in the theory of planned behavior); however, it differed in several ways. First, intentions were not assessed, based upon research findings demonstrating that attitudes, norms, and self-efficacy directly predict alcohol use, without the need for intentions (Bentler & Speckart, 1979; Laflin et al., 1994; Schlegel et al., 1987; Schlegel et al., 1992; Stacy et al., 1994).

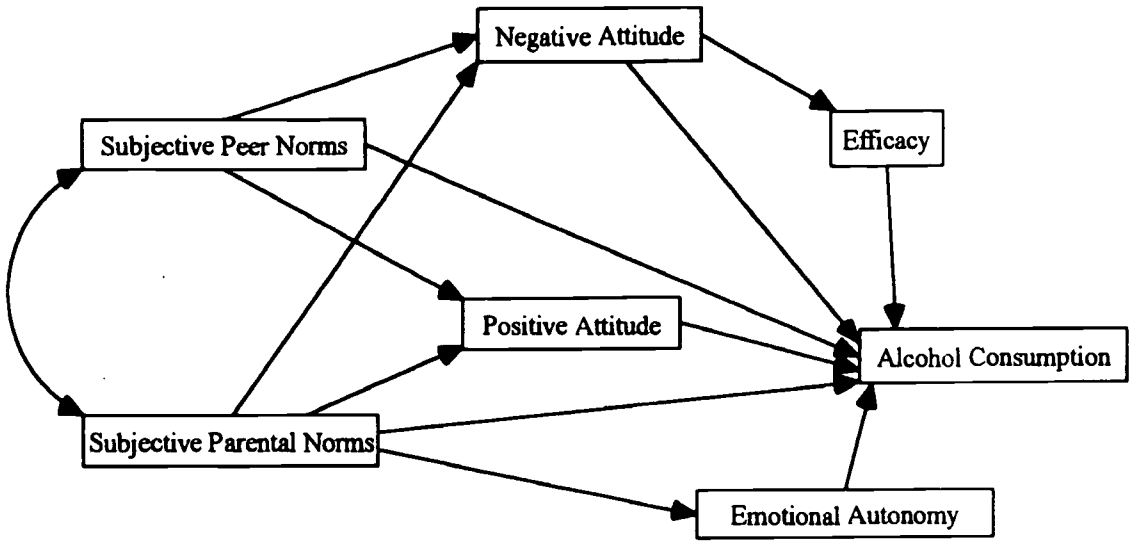

Figure 1. Hypothesized relation among study variables.

Second, instead of the standard Ajzen-Fishbein measure of attitude, expectancy theory underlay the measurement of positive and negative attitudes about alcohol consumption (Fromme et al., 1993). Third, subjective norms were conceptualized more broadly than in the theory of planned behavior to include the perceived behavior and attitudes of parents and peers, as a wealth of literature suggests that such perceptions influence alcohol consumption by youth (Barnes et al., 1994; Flannery et al., 1994; Webb & Baer, 1995). Fourth, the present research included the developmental factor of emotional autonomy (Steinberg & Silverberg, 1986) as a potential influence on adolescent and young adult alcohol consumption, as empirical research indicates that emotional autonomy is associated with alcohol and substance use (Lamborn & Steinberg, 1993; Turner et al., 1991, 1993). A final way in which the present research differed from the theory of planned behavior was that alcohol-related self-efficacy (tapping perceptions of control over drinking in several contexts) was measured instead of perceived behavioral control.

Method

Participants

Participants (N = 299) were 87 eleventh graders (ages ranging from 15 to 17, M = 15.96, SD = .52), 105 college freshmen (ages 17 to 19, M = 17.85, SD = .43), and 107 college juniors (ages ranging from 19 to 20, M = 19.84, SD = .37). The eleventh grade students were drawn from a private Catholic high school in Danbury, CT. The college students were drawn from the Fordham University introductory psychology subject pool, advanced level courses in several academic departments, and Fordham's residence halls.

Females comprised approximately one-half of the eleventh grade, college freshmen, and college junior groups, and 50% of the total sample. The majority of the students identified themselves as White/Non-Hispanic (82% to 88%), with approximately 8% (5% to 12%) identified as Hispanic, 4% (0 to 6%) identified as Asian American, 2% (0 to 4%) identified as African American, and 1% (0 to 5%) identified as Other.

Instruments

Demographic Survey

The demographic survey gathered information on sex, grade, age, ethnicity, socio-economic status, grade point average, and religious background and practice.

Subjective Parental Norms Scale

The Subjective Parental Norms Scale contains 7 items that assess participant perceptions regarding the frequency and typical quantity of parental alcohol use, and the frequency of intoxication. Additional items assess participant perceptions of the propriety of alcohol use in the home by the youth, parental attitudes about the participant's consumption of alcohol, and the individual's motivation to comply with parental wishes regarding drinking. Participants respond by choosing response a through e, where a is coded as 1 and e is coded as 5. A total score is computed by summing participant responses to the seven items. The subjective parental norm total score may range from 7 to 35, where higher scores indicate the perception of parental norms favorable toward alcohol consumption. The items composing the subjective parental norm score yielded a Cronbach alpha of .67 for the present

sample.

Subjective Peer Norms Scale

The Subjective Peer Norms Scale contains 6 items that assess participant perceptions about the frequency and typical quantity of peer alcohol use, and the frequency of intoxication. Additional items assess participant perceptions of the number of friends that regularly drink, peer attitudes about the participant's consumption of alcohol, and motivation to comply with peer norms. Participants respond by choosing response a through e, where a is coded as 1 and e is coded as 5. A total score is computed by summing participant responses to the six items. The subjective peer norm score may range from 6 to 30, where higher scores indicate the perception of peer norms favorable toward alcohol consumption. The subjective peer norm score yielded a Cronbach alpha of .78 for the present sample.

Emotional Autonomy Scale

The Emotional Autonomy Scale (Steinberg & Silverberg, 1986) measures the development of a mature, balanced perception of parents that accompanies a sense of autonomy and responsibility in decision-making. Participants indicate the degree to which they agree with each of 20 items on a four-item Likert scale ranging from "strongly agree" to "strongly disagree." Although the scale yields 4 subscales, the total score for emotional autonomy was utilized in the present study. The total score may range from 20 to 80, where higher scores indicate the perception of emotional autonomy from parents. The present study yielded a Cronbach alpha of .81.

Comprehensive Effects of Alcohol Questionnaire

A modified version of the Comprehensive Effects of Alcohol Questionnaire (Fromme et al., 1993) measured attitudes about the possible outcomes from drinking. At the request of high school principal, the sexuality subscale of the Comprehensive Effects of Alcohol Questionnaire was modified in the present research in three ways: a) the item, "I would feel sexy," was modified to "I would feel attractive," b) the item, "I would be a better lover," was modified to "I would be a better boyfriend or girlfriend,"and c) the item, "I would enjoy sex more," was deleted. Although the sexuality subscale was modified, the 7 subscale scores were not utilized in the present research. Instead, a positive attitude score was computed by summing the product of each positive outcome expectancy response and each

positive value response. A negative attitude score was computed in an identical fashion, by summing the product of each negative outcome expectancy response and each negative value response. This methodology is in accord with recommendations by Ajzen and Fishbein (1980; Ajzen, 1991).

The possible range for the positive attitude score was 22 to 340, where higher scores indicated a more favorable overall attitude toward the potentially positive consequences associated with drinking. The possible range for the negative attitude score was 18 to 366, where higher scores indicated a more favorable overall attitude toward the potentially negative consequences associated with drinking. The items composing the positive and negative attitude scores yielded Cronbach alphas of .89 and .78, respectively.

Survey of Alcohol-Related Self-Efficacy

The Survey of Alcohol-Related Self-Efficacy was created by modifying the Drinking Self-Efficacy Questionnaire (Young et al., 1991), to measure self-efficacy. The present research modified the Drinking Self-Efficacy Questionnaire for several reasons: a) the original response format may have been confusing to participants (i.e., it requires that they decide whether they could or could not "resist drinking"), b) the measure tapped self-efficacy in a variety of situations, but did not capture whether participants consume alcohol in each of those situations, and c) the measure was lengthy.

The Survey of Alcohol-Related Self-Efficacy contains 12 items, representing 12 potential drinking contexts. For each item, participants respond to two statements: (1) "In this situation, I would drink," to which they respond on a 6-point Likert scale ranging from "Very sure I would not drink" to "Very sure I would drink," and (2) "Suppose you were drinking in this situation. How difficult would it be for you to stop?" to which they respond on a 6-point Likert scale ranging from "Very difficult" to "Not very difficult." Therefore, two pieces of information are obtained for each drinking situation: whether the participant would drink, and his or her perceived control over drinking. A total self-efficacy score is computed by summing the perceived control responses across the 12 items, and may range from 12 to 72. The self-efficacy scale yielded a Cronbach alpha of .89 with the present sample.

A situational drinking score is computed by summing participant responses to whether they would drink across the 12 items. The situational drinking score may range from 12 to 72. Because

pilot tests revealed that the situational drinking score was correlated significantly with the items from the Alcohol Use Intensity Scale, $r(37) = .82$, $p < .001$, the two scales were combined to measure alcohol consumption in the present study, as described in the following section.

Alcohol Use Intensity Scale

Alcohol consumption was measured by a summed composite of the situational drinking score (from the Survey of Alcohol-Related Self-Efficacy and the three items composing the Alcohol Use Intensity Scale: frequency and quantity of alcohol use, and frequency of intoxication. The frequency of drinking within the last six months was measured on a five-point scale from "Never" to "Two to three times a week or more." Quantity of alcohol consumed on a typical occasion was measured on a five-point scale from "None" to "Six or more drinks." Finally, the frequency of intoxication was rated on a five-point scale from "Never" to "Two to three times a week or more." Because pilot tests revealed that the sum of the items composing the Alcohol Use Intensity Scale was correlated significantly with the situational drinking score, the two scales were summed in the present study to measure alcohol consumption. The items composing the alcohol consumption score yielded a Cronbach alpha of .90 in the present sample.

Results

A multisample path analysis, an extension of multiple regression, was utilized to: a) examine the fit of the hypothesized model to the three age groups, b) determine significant differences in the paths between the three age groups, and c) examine the significance of the paths within each of the three age groups. A multisample analysis conducted to compare the goodness of fit of the hypothesized model for each of the three age levels revealed that the fit of the model was not adequate, χ^2 (24, $N = 299$) = 69.82, $p < .001$; AGFI = .79. Nevertheless, the hypothesized model accounted for 76%, 46%, and 58% of the variance in alcohol consumption among 11th grade students, college freshmen, and college juniors, respectively.

Between-Group Differences

Age differences in the relations among the variables were assessed by comparing the unstandardized regression weights, b, for each path across the three age groups, as suggested by

Arbuckle (1997). As shown in Figure 2, significant age differences were observed among each of the following paths and alcohol consumption: positive attitude, subjective parental norms, subjective peer norms, and emotional autonomy.

Positive attitudes were more strongly related to alcohol consumption among the 11th grade students than among the college juniors, t (190) = -1.97, $p < .05$. Subjective parental norms were better predictors of alcohol consumption among college juniors than among 11th grade students, t (190) = 2.13, $p < .05$. Subjective peer norms were better predictors of alcohol consumption among 11th grade students than among college freshmen, t (188) = -2.52; $p < .05$. Finally, emotional autonomy was a better predictor of alcohol consumption among 11th grade students and college juniors than among college freshmen, t (188) = -2.82, $p < .01$ for the comparison with 11th grade students and t (208) = 2.58, $p < .01$ for the comparison with college juniors.

Within-Group Differences

Within-group differences in the strength of the paths were examined in each of the three samples, as shown in Figure 3. For each, standardized regression coefficients are reported to allow for the comparison of within-group paths (Licht, 1995).

High School Students

The predictors accounted for 76% of the variance in alcohol consumption among the 11th grade students. Alcohol consumption was predicted by positive attitude, subjective peer norms, emotional autonomy, and self-efficacy. Subjective peer norms positively predicted positive and negative attitude.

College Freshmen

The hypothesized model accounted for 46% of the variance in alcohol consumption among college freshmen. Positive attitude alcohol-related self-efficacy and subjective peer norms predicted alcohol consumption.

Subjective peer norms positively predicted negative attitude and positive attitude Alcohol-related self-efficacy mediated the relation of negative attitude and alcohol consumption. Although negative attitude did not directly predict alcohol consumption, indirect effects were observed through self-efficacy, as negative attitude was a significant predictor of self-efficacy. As negative attitudes

about alcohol use increased, perceptions of alcohol-related self-efficacy decreased; as perceptions of alcohol-related self-efficacy decreased, self-reports of alcohol consumption increased.

College Juniors

The hypothesized model accounted for 58% of the variance in alcohol consumption among college juniors. Positive attitude, alcohol-related self-efficacy, subjective parental norms, subjective peer norms, and emotional autonomy predicted alcohol consumption.

Subjective peer norms positively predicted negative attitude and positive attitude Alcohol-related self-efficacy mediated the relation of negative attitude and alcohol consumption. Although negative attitude did not exert a direct effect on alcohol consumption, it exerted indirect effects through its relation with self-efficacy. As negative attitudes about alcohol use increased, perceptions of alcohol-related self-efficacy decreased; as perceptions of alcohol-related self-efficacy decreased, self-reports of alcohol consumption increased.

Discussion

The present study examined the fit of a model that incorporates constructs from rational decision and developmental-contextual perspectives to predict alcohol consumption during adolescence and early adulthood. The model of cognitive and developmental-contextual predictors of alcohol use accounted for 46% to 76% of the variance in alcohol consumption among the 11th grade students, college freshmen, and college juniors sampled. Each of the cognitive and developmental variables predicted alcohol consumption, directly or indirectly, supporting the components of the hypothesized model tested in the present study.

The results of the present study demonstrate that a model incorporating rational decision and developmental-contextual variables accounts for a substantial proportion of the variance in alcohol consumption among adolescents and young adults. Rational decision variables, namely positive attitude and self-efficacy, predicted alcohol consumption in all three age groups, in accord with previous research (Schlegel et al., 1987; Schlegel et al., 1992; Young et al. 1991); however multisample analyses revealed that the predictive power of rational decision components was not equivalent across all age groups sampled. Age differences and patterns emerged such that positive attitudes and self-efficacy

were less important predictors among young adults than among adolescents.

Perhaps as individuals gain experience with alcohol consumption, attitudes become less important predictors of use; use may become more habitual and decision-rules may form such that attitudes may not be evaluated in making decisions about whether to drink each time an opportunity arises. For young adults, the question of whether to drink alcohol may no longer be a cognitive decision in the sense that the rational cost-benefit analysis may have been conducted throughout the adolescent and early college years. By the junior year of college, most young adults may have come to a general decision-rule; a rational cost-benefit may not be necessary each time a drinking opportunity arises. Whether to use alcohol may evoke a conscious weighing among the adolescent participants, but not among the young adults, as they may have already come to a decision.

These findings indicate that, during adolescence, decisions to use alcohol are rational decisions based on an analysis of the positive outcomes, as well as one's sense of control regarding alcohol consumption, while discounting the negative outcomes of alcohol consumption. Among older adolescents and young adults, negative attitudes indirectly and positively predicted alcohol use, through self-efficacy. As negative attitudes about alcohol increased, feelings of alcohol-related self-efficacy decreased, and alcohol consumption increased. This suggests that young people are aware of the potential risks associated with alcohol consumption, but drink in spite of this awareness, perhaps coping with the contradiction between beliefs and behavior by perceiving the behavior and negative consequences as uncontrollable, in agreement with the findings of prior studies (Gerrard et al., 1996).

The present results question the adequacy of rational decision components as the sole predictors of alcohol consumption among older adolescents and young adults. Although attitude and self-efficacy were significant predictors of alcohol consumption among all three age groups sampled, developmental-contextual factors, namely emotional autonomy, and perceptions of the behavior and attitudes about alcohol consumption by parents and peers, were also important predictors of alcohol consumption, with their predictive value varying with age.

Although the present study demonstrates the overall importance of cognitive and developmental predictors of alcohol consumption, enthusiasm for these findings must be tempered by the following limitations. As the data were cross-sectional, age differences in the relations among variables imply developmental change; however, only through longitudinal research can such change be examined and inferred. The use of multisample path analyses enabled the examination of the fit of the hypothesized model across the three age groups sampled and allowed for the investigation of age differences in each of the paths, but directions of causation are ambiguous and the relations observed may have been caused by other unmeasured variables. Finally, participants were predominantly White/Non-Hispanic, middle class, and Catholic. While the well-matched samples of high school and college students may allow for generalizability of the present results to the general population of White/Non-Hispanic middle class Catholic adolescents and young adults, participant samples should reflect the diversity of contemporary society (Graham, 1992).

In conclusion, the present findings suggest that rational decision components are not enough to explain engagement in risk behaviors such as alcohol consumption; a life-span developmental perspective aids in theoretically and empirically accounting for behavior during adolescence and early adulthood. Specifically, the recognition that development is influenced by extrapersonal variables, interpersonal variables, and within-person variables allows for the examination of several spheres of influence, as well as the interactions among them, on behavior throughout the life-span (Lerner, 1991). Thus, a developmental perspective requires the examination of multiple levels of context: the environment, interpersonal relationships, and biological/psychological factors. The present study examined within-person factors and perceived interpersonal factors; further research might examine how these contextual levels influence, and are influenced by, other levels of context, such as actual interpersonal factors (e.g., parent and peer self-reports of attitudes and behaviors). Finally, the assumption that development is characterized by plasticity and multidirectional change allows for an examination of how the relations among rational decision factors, developmental-contextual factors, and behavior vary with age. The present study examined the changing pattern of relations among these variables; it is hoped that future research investigations will continue to pursue a developmental perspective in investigating human behavior across the life-span.

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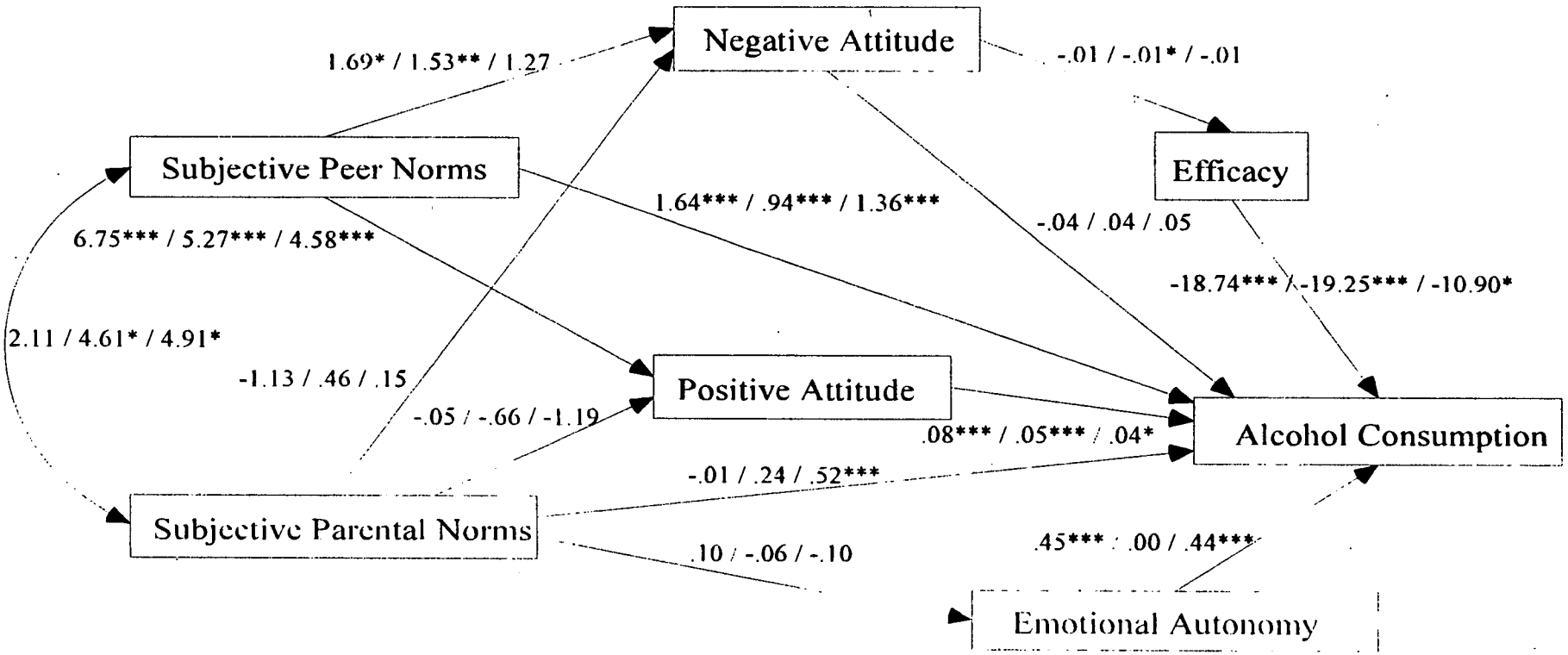

Figure 2. Model of predictors of alcohol consumption, as tested with 11th grade students (n = 87), college freshmen (n = 105), and college juniors (n = 107). Unstandardized regression weights are reported.

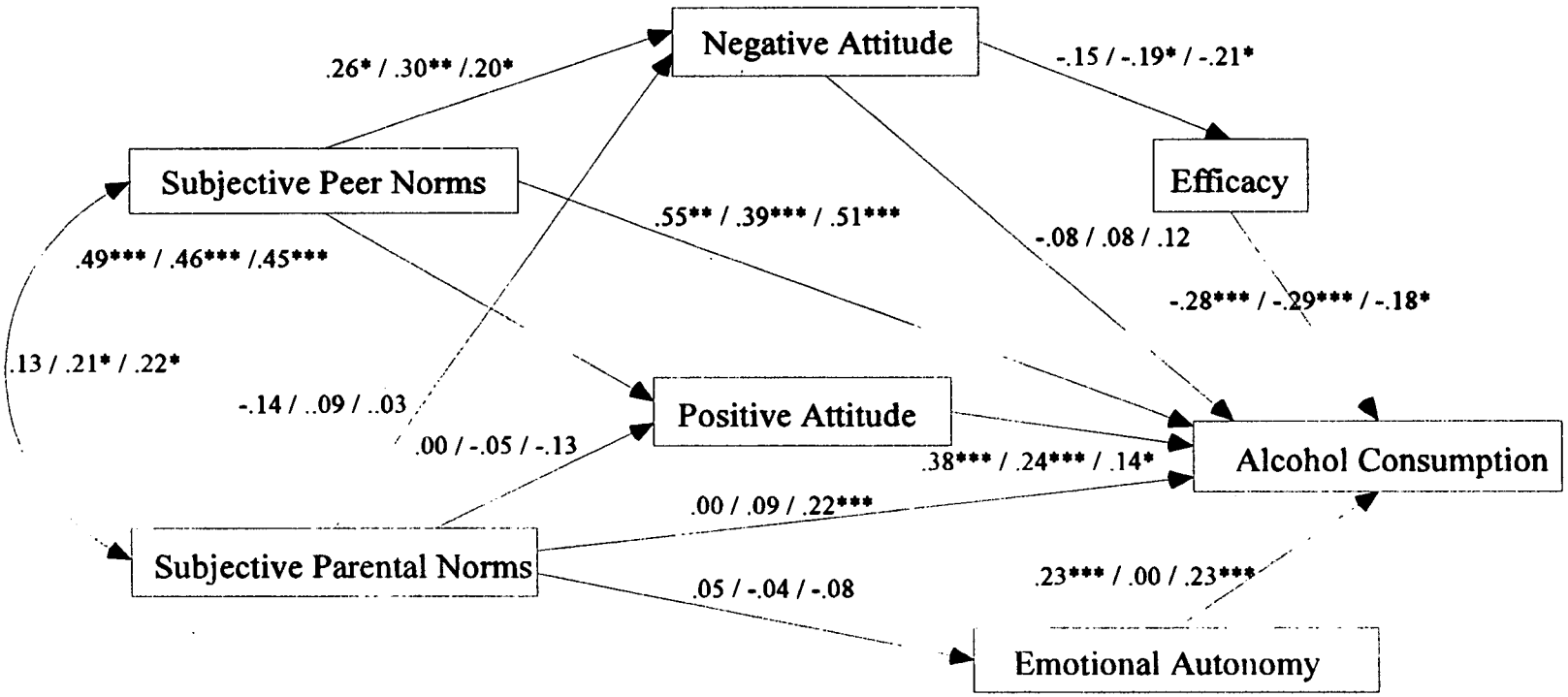

Figure 3. Hypothesized model of predictors of alcohol consumption, as tested with 11th grade students (n = 87), college freshmen (n = 105), and college juniors (n = 107). Unstandardized regression weights are reported.

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