Running Head: IMPULSIVITY, GIST, AND ADOLESCENT RISK TAKING

Gist for Risk: Link between Impulsivity and Fuzzy-Trace Theory Explanations of Adolescent Risk Behavior

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Abstract

Adolescence is characterized by a steep increase in risk taking behaviors. Research indicates that individual differences in impulsivity are highly correlated with adolescent risk taking (Verdejo-Garcia, Lawrence, & Clark, 2008). Fuzzy-Trace Theory, a dual-process theory, proposes that differences in decision-relevant information processing predict decision outcomes (Reyna & Brainerd, 1995). Gist-based reasoning relies on qualitative information processing that emphasizes the abstract meaning of decision alternatives (e.g., “avoid risk”), whereas verbatim-based reasoning represents a form of quantitative, literal information processing (e.g., the specific risk of getting pregnant). Research suggests that gist processing is risk preventing, whereas verbatim processing is risk promoting (Mills, Reyna, & Estrada, 2008). The present study examines whether positively-valenced gist processing of decision-relevant information (e.g., “approach risk”) can account for the information processing of highly impulsive adolescents. Participants were 929 (28% male) late-adolescent students (mean age 19.7 years) recruited from undergraduate classes at Cornell University. They were administered an online survey with self-report measures of gist and verbatim processing associated with sex- and alcohol-related risk behavior, self-report measures of different facets of impulsivity, a delay discounting task, and a measure of real-world risk taking behavior. Results show that positive gist and impulsivity measures are positively associated with sex- and alcohol-related risk behavior. Mediation analyses suggest that positive gist is a significant mediator between impulsivity and risk behavior. The results indicate that positive gist is an important correlate of adolescent risk behavior and a significant mediator of the association between impulsivity and risk taking.

Gist for Risk: Link between Impulsivity and Fuzzy-Trace Theory Explanations of Adolescent Risk Behavior

Adolescence has long been considered a difficult transition period characterized by a steep increase in risk taking behaviors (Arnett, 1992; Arnett, 1999). According to the Centers for Disease Control and Prevention (CDC), among U.S. high school students, 34.2% were currently sexually active and 38.9% of those currently sexually active students had not used a condom during their last sexual intercourse (CDC, 2010). The leading causes of morbidity and mortality in youth are linked to risky behaviors, such as sexual activity leading to unintended pregnancies and/or sexually transmitted diseases (STDs), especially human immunodeficiency virus (HIV) (CDC, 2010). In 2009, there were approximately 757,000 pregnancies among women aged 15 to 19 years, an estimated 9.1 million cases of STDs in 15 to 24 year-olds, and an estimated 6,610 cases of HIV/acquired immunodeficiency syndrome (AIDS) among youth 15 to 24 years occurring annually (CDC, 2010). Similarly, there are 1,825 college students between the ages of 18 and 24 that die from alcohol-related injuries, including motor vehicle crashes (Hingson et al., 2005). These troubling rates of STDs, unintended pregnancies, and alcohol-related deaths in youth provide impetus for the importance of research on adolescent health. Specifically, an understanding of why adolescence is such a distinct period of increased risk taking and what predictors and mechanisms are involved in adolescent risky behaviors is of great importance for the development of potential interventions to reduce adolescent risk behaviors.

Impulsivity and Adolescent Risk Taking

Although there is a general trend for increased risk taking during adolescence, prior research indicates that adolescent risk taking is subject to considerable individual variation. More specifically, researchers have found that individual differences in impulsivity are highly

correlated with risk taking behaviors in adolescents (Hoyle, Fejfar, & Miller, 2000; Verdejo-Garcia, Lawrence, & Clark, 2008). Impulsivity is a relatively stable trait, whereas gist and verbatim reasoning are parallel forms of processing that are activated during decision-making. Impulsivity also is a multidimensional construct, with a variety of distinct facets. Whiteside and Lynam (2001) conducted a factor analysis to determine the main features of impulsivity and found that there were four distinct components of this personality trait: urgency, the tendency to act on strong impulses often under conditions of negative affect; (lack of) premeditation, the tendency to think about the consequences of an act before acting; (lack of) perseverance, the tendency to remain focused on a task that may be difficult; and sensation-seeking, the tendency to pursue new and exciting experiences. Poor ability to delay gratification (often measured by delay discounting tasks) also has been described as a feature of impulsivity and has been shown to be associated with increased risk taking (Reynolds, 2006).

Individual differences in sensation seeking, the fourth distinct component in Whiteside's and Lynam's (2001) factor analysis, recently has been a hot topic in research on adolescent risk taking. According to Romer (2010), there is a sharp rise in sensation seeking during adolescence that is likely to have a biological underpinning associated with dopamine functioning. Individual differences in sensation seeking have been linked to increased alcohol use, other drug use, promiscuous sexual activity, gambling, and dangerous sports (Roberti, 2004; Zuckerman, 1994). There also has been evidence of an association between individual differences in Behavioral Approach System (BAS) activation, a drive to pursue goals and rewards, including enhanced substance use (Franken & Muris, 2006; Loxton & Dawe, 2006).

Although prior research has examined the association between various facets of impulsivity and adolescent risk taking, no study to date has examined all of these components of

impulsivity together as predictors of real-world risk behavior in adolescents. The present study expands on prior work by investigating multiple components of impulsivity in the same study, including urgency, lack of premeditation, lack of perseverance, sensation seeking, delay discounting, and BAS sensitivity as predictors of adolescents' real-world alcohol abuse and unprotected sexual intercourse.

Fuzzy-Trace Theory and Adolescent Risk Taking

Given the findings of a link between different facets of impulsivity and risk taking in adolescence, it is important to examine the psychological mechanisms that may contribute to this association. One line of research has focused on different memory processes associated with risky decision-making. Reyna and Brainerd (1995) proposed a dual-process model of decision-making called Fuzzy-Trace Theory (FTT). These researchers hypothesized that differences in how decision-relevant information is conceptualized will determine the outcome of a decision. Reyna and Brainerd (1995) theorized that there are two forms of parallel thought processing: gist and verbatim. Gist-based reasoning relies on qualitative information processing that emphasizes the abstract meaning of decision alternatives (e.g., "avoid all risk"), whereas verbatim-based reasoning represents a form of quantitative, literal information processing (e.g., the specific risk of getting pregnant) that emphasizes weighing the risks and benefits of decision alternatives. In subsequent research, Reyna and her colleagues have found evidence for the association between this dual-process model and risky decision-making in adolescence (Reyna & Rivers, 2004; Reyna, 2004; Reyna & Farley, 2006; Reyna & Ellis, 1994; Mills, Reyna, & Estrada, 2008, Reyna, Estrada, DeMarinis, Myers, Stanisz, & Mills, 2011, Reyna, 2008). According to research conducted by Mills, Reyna, and Estrada (2008), gist processing of decision-relevant information is negatively associated with sexual risk taking and acts as protection against such risk behavior.

Conversely, verbatim processing of decision-relevant information is positively associated with sexual risk behavior and tends to reflect risk taking.

Although Reyna and Brainerd's Fuzzy-Trace Theory suggests a relationship between memory processes and adolescent risk taking, research has yet to examine the relationship between individual differences in personality traits such as impulsivity, often linked to increased risk taking in the literature (Franken & Muris, 2006; Hoyle et al., 2000; Loxton & Dawe, 2006; Reynolds, 2006; Roberti, 2004; Romer, 2010; Verdejo-Garcia et al., 2008; Whiteside & Lynam, 2001; Zuckerman, 1994), and differences in memory processing of such risk information. For example, Whiteside and Lynam (2001) found that some of the facets of impulsivity are associated with failure to plan ahead and the urgency to act on strong impulses, which often leads to increased risk taking. Given these findings, it is unlikely that individuals high on these facets of impulsivity are verbatim processers, which according to Mills et al. (2008), is supportive of risky behavior, inasmuch as these impulsive individuals do not tend to process details or take the time to weigh the risks and benefits of decisions. Yet, highly impulsive individuals cannot be gist processers either, because prior research (Mills et al., 2008) suggests that gist is protective against risky behavior. Therefore, there must be a different type of memory processing that can explain increased risk taking in highly impulsive adolescents.

The Present Study

The present study examines the possibility of a positively-valenced gist processing of decision-relevant information that can account for the information processing of highly impulsive, sensation seeking adolescents. Positive gist can also be defined as the abstract meaning of decision information (e.g., "taking risks is fun") similar to the type of gist examined in previous studies (Mills et al., 2008), but instead it elicits risk-seeking behaviors (e.g., approach

risk). Positive gist is the exact reverse of the type of gist examined in Mills et al. (2008); thus, the type of gist featured in Mills et al. (2008) will now be termed negative gist, given that it elicits risk-avoidant behaviors (e.g., avoid risk). More specifically, this study will examine the relationships between individual differences in impulsivity and memory processing of risk-relevant information (positive gist, negative gist, and verbatim) and overall risk taking behavior. This study will focus on sexual- and alcohol-related risk taking in a group of late adolescent and young adult students at Cornell University.

Based on prior research (Mills et al., 2008), it is hypothesized that negative gist endorsement will be inversely associated with engaging in sex- and alcohol-related risk behaviors, as well as measures of impulsivity. Conversely, endorsement of positive gist will be positively associated with sex- and alcohol-related risk behaviors, as well as measures of impulsivity. Verbatim processing will also be positively associated with sex- and alcohol-related risk-taking, yet the magnitude of this association will be smaller than the magnitude of the association between positive gist and risk taking behaviors. Finally, it is hypothesized that positive gist will act as a mediator between traits of impulsivity and sex- and alcohol-related risk taking behaviors in adolescents.

The present study may help to clarify some of the psychological mechanisms responsible for the steep increase in sexual- and alcohol-related risk taking behaviors, which pose such a health risk for adolescents in the United States. Understanding potential psychological processes that link personality vulnerabilities such as impulsivity and sensation seeking to adolescent risky behaviors could lead to the development of effective prevention programs aimed at decreasing the high rates of STDs, unintended pregnancies, and alcohol-related hospitalizations and deaths in adolescents.

Method

Participants

This study included 929 (28% male) adolescent and young adult participants, primarily students from Cornell University, who responded to an online survey. The participants' ages ranged from 18 to 25 (M=19.7, SD=1.18). More specifically, the sample consisted of 18% 18-year-olds, 28% 19-year-olds, 28% 20-year-olds, 19% 21-year-olds, 3% 22-year-olds, and less than 1% 23- to 25-year-olds. The sample consisted of individuals of various racial-ethnic identities, including Caucasian (60%), Asian or Asian American (23%), African American (6%), Hispanic (4%), and those categorized in other groups (7.5%). The sample also included students from other U.S. universities, including 5 from Indiana University, 1 from Lynn University, and 1 from Emory University.

Materials

Participants were administered six self-report measures and one behavioral task:

Verbatim Processing Scenarios. Two different scenarios about sex and alcohol use were created to measure verbatim processing. The first scenario described a situation in which the participant would have to decide whether to "get drunk" at a party. The second scenario described a situation in which the participant would have to decide whether to engage in sexual intercourse with a boy/girl. After each scenario was presented, participants were asked to think about what risks and benefits they would consider when deciding whether or not to get drunk and to engage in sex (e.g., "I could get an STD"). Respondents were instructed to check "yes" or "no" for whether they think about each risk or benefit statement when making such a decision. They also were instructed to only check "yes" (score of 1) or "no" (score of 0) for a given statement if they would actually consider the risk or benefit in their decision-making process,

and not if they agree or disagree with the given statement. The alcohol scenario and list of alcohol-related risk and benefit statements were always followed by the sex scenario and related risk and benefit statements. In a follow-up study, the alcohol and sex scenarios and risk and benefit statements were counterbalanced and randomized

A total of 18 alcohol risk (9) and benefit (9) statements and 20 sex risk (10) and benefit (10) statements were administered (see Appendix Table 9 for list of sex and alcohol risk and benefit statements). Scales of alcohol risk (α=0.79) and benefit (α=0.76) as well as sex risk (α=0.77) and benefit (α=0.73) were created by summing the number of statements that were considered for each risk. Two scores were created from these scales called "Verbatim Sum" and "Verbatim Difference" in order to evaluate verbatim processing. The Verbatim Sum score was created by adding the total number of risk and benefit statements, which were each coded with 0 if participants did not consider the statement when making the hypothetical decisions, or 1 if participants did consider the statement in their decision-making process. The Verbatim Sum score, which consisted of the sum of risk and benefit scales (risks + benefits) for alcohol and sex, assessed the overall tendency to consider risks and benefits when deciding whether to get drunk or have sex. This verbatim sum score was intended to measure the extent to which participants weigh the total risks and benefits that they would actively think about when deciding whether to get drunk or have sex in the hypothetical scenarios.

The Verbatim Difference score, which consisted of the difference between the benefits and the risks (benefits - risks) for alcohol and sex, assessed the degree to which benefits prevailed over risks when weighing all the possible risks and benefits of getting drunk or having sex. This verbatim difference score differed from the verbatim sum score in that it measures the valence of participants' verbatim processing in terms of how much each participant favors the

benefits over the risks when making risky decisions. This difference score reflects standard theoretical cost/benefit processing models of decision-making (Fischoff, 2008). Subscales of benefits for alcohol and sex also were created. These subscales included Social Benefits (e.g., "Getting drunk is a great way to meet new people"), Exuberance (e.g., I want to celebrate by getting drunk"), and Anxiety Reduction (e.g., "I want to relieve stress by getting drunk") for alcohol-related benefits and Protection Benefits (e.g., "If I use protection, the likelihood that I will get an STD is minimal") for sex-related benefits.

Gist Principles. Separate gist principles were administered regarding alcohol-related risk taking (e.g., "better to have fun getting drunk now while you can") and sexual risk taking (e.g., "better to have fun (sex) now while you can"). These statements differed from the verbatim items by describing a categorical principle for either approaching (positive gist) or avoiding (negative gist) a risky situation without pertaining to specific risks or benefits that might be associated with the decisions described in the scenarios. Each type of gist principle consisted of both positively-valenced (e.g., "better to enjoy sex in the moment than worry about the consequences") and negatively-valenced categorical gist statements (e.g., "it only takes ONCE to get alcohol poisoning and end up in the hospital"). A total of 13 alcohol gist principles (6 negative; 7 positive) and 13 sex gist principles (6 negative; 7 positive) were administered. Only two negative gist principles were used in the analyses given that a preliminary factor analysis of all of the gist principle items suggested that these two negative gist principles loaded together and were separate from the other negative gist items. Also, these two negative gist principles possessed greater reliability than the total number of negative gist items; therefore a composite of these two gist items was used in all analyses (see Appendix Table 10 for the list of positive and negative gist for alcohol and sex risk behaviors). Each of these gist principles was rated on a five-point

scale from “Strongly Disagree” to “Strongly Agree.” The alcohol (positive: α=0.81; negative: α=0.86) and sex (positive: α=0.87; negative: α=0.84) gist principles exhibited high internal consistency. Similar to the verbatim scenarios, the alcohol gist principles were always followed by the sex gist principles, but in a follow-up study these alcohol and sex gist principles were counterbalanced and randomized as well.

Adolescent Risk Questionnaire (ARQ). The 22-item Adolescent Risk Questionnaire was administered to participants in order to assess real-world risk taking experience and has been normed in a large sample of adolescents (*N*=970) by Gullone, Moore, Moss, and Boyd (2000). The measure asks about the frequency of experience with highly risky activities (e.g., unprotected sex and taking drugs) as well as less risky activities (e.g., Tae Kwon Do and entering a competition). The amount of experience with each activity was measured with a five-point scale from “Never Done” to “Done Very Often.” A composite of the ARQ items “underage drinking” and “getting drunk” was created by averaging the responses to form an outcome measure of alcohol-related risk behavior. The ARQ item, “unprotected sex” was used as an outcome measure of risky sexual behavior. A total ARQ scale score also was created as a third outcome measure in order to assess general risk taking behavior. The ARQ exhibited good internal consistency (α=0.76).

Urgency Premeditation Perseverance Sensation-Seeking Questionnaire (UPPS). The UPPS was administered in order to measure various types of impulsivity (Whiteside & Lynam, 2001). UPPS scales Urgency (e.g., “I have trouble controlling my impulses”), (lack of) Premeditation (e.g, “My thinking is usually careful and purposeful”), and (lack of) Perseverance (e.g., “I generally like to see things through to the end”) were each administered to participants with 33 total items. The Sensation-Seeking subscale was removed from this measure and

replaced with the 8-item Brief Sensation-Seeking Scale (BSSS) in order to avoid redundancy (Hoyle, Stephenson, Palmgreen, Pugzles, Lorch, & Lewis, 2002). Participants rated each item on a five-point scale from "Strongly Disagree" to "Strongly Agree." The BSSS has been designed to tap all four of the dimensions of sensation seeking defined by Zuckerman (1994) in his original work with this personality trait. The scales for Urgency (α=0.86), Premeditation (α=0.86), Perseverance (α=0.84) and Sensation Seeking (α=0.79) exhibited high internal consistency.

Behavioral Inhibition System/Behavioral Activation System (*BIS/BAS) Scales*. The 20-item BIS/BAS Scales were administered to participants in order to measure BAS sensitivity as a form of impulsivity (e.g., "I often act on the spur of the moment") and BIS sensitivity as a form of anxiety sensitivity (e.g., "I worry about making mistakes;" Carver & White, 1994). BAS subscales include Reward Responsiveness (e.g., "When I get something I want, I feel excited and energized"), Drive (e.g., "When I go after something, I use a 'no holds barred' approach"), and Fun Seeking (e.g., "I will often do things for no other reason than that they might be fun"). Participants rated each item on a five-point scale from "Strongly Disagree" to "Strongly Agree." The BIS (α=0.78) and BAS subscales of Reward Responsiveness (α=0.75), Drive (α=0.75), and Fun Seeking (α=0.70) each exhibited adequate internal consistencies.

Temporal Discounting. A 27-item behavioral task measuring participants' ability to delay gratification, taken from Kirby, Petry, Bickel, and Warren (1999), was administered. Participants were instructed to decide whether they would like a certain amount of money now or a different amount of money later (e.g., 100 days from now). The amount of money offered immediately relative to the amount of money offered later changed for each item. The amount of time delay for the money offered later differed from one item to the next as well. For example,

$54 now	$31 now
OR	OR
$55, 117 days from now	$85, 7 days from now

Based on responses to these items, it is possible to determine a "discount rate" that describes the extent to which respondents are unwilling to wait for a delayed reward. Three discount rates for items with small, medium, and large monetary values are defined by the task, which are then averaged to create an overall discount rate, or score of impatience for each participant according to Kirby et al. (1999). This averaged discount rate exhibited high internal consistency (α=0.95).

Procedure

Participants took an online, anonymous survey accessible by laptop or other computer. Respondents were recruited through Cornell University's psychology experiment website, SUSAN, as well as via email and posts on Facebook. Participants were instructed that this was an online, anonymous survey that could be taken at their convenience. They were also told that the survey would take approximately half an hour and that (for Cornell students) they would receive one extra credit point for their participation.

Statistical Analysis

Data analysis was conducted using IBM SPSS version 19. Separate principal axis factor analyses with varimax rotation were conducted of positive and negative gist items for sex and alcohol, verbatim benefit and risk items for sex and alcohol associated with each scenario, and the UPPS, BSSS, and BIS/BAS in order to create reliable scales for the hypothesis testing analyses. These analyses revealed that each of the scales, Urgency, Premeditation, Perseverance, BSSS Sensation Seeking, Behavioral Inhibition, BAS Reward Responsiveness, BAS Drive, and BAS Fun Seeking closely corresponded to the composition of the scales as defined in the

literature (Whiteside & Lynam, 2001; Hoyle et al., 2002; Carver & White, 1994); therefore, the standard scales for the UPPS, BSSS, and BIS/BAS were used. As noted above, there were two categorical negative gist items for sex and alcohol that loaded together and were separate from the rest of the gist principle items; thus, the negative gist scale was composed of just these two items. The factor analysis also revealed that all of the positive gist items loaded together for both sex and alcohol.

Correlational analyses were conducted in order to examine the relations between gist and verbatim thought processing, various impulsivity measures, and risk behavior. A second principal axis factor analysis with varimax rotation was conducted with all of the scales to determine whether any of the scales were measures of the same underlying construct. The main hypotheses were tested with a series of hierarchical linear regression analyses with either alcohol abuse composite or unprotected sex as dependent variables. Each dependent variable was regressed onto demographic variables (age, gender, and race) and impulsivity scales in Step 1, gist processing scales in Step 2, and verbatim processing in Step 3. Finally, mediation analyses were conducted in order to examine whether positive gist and verbatim difference were significant mediators of any obtained associations between measures of impulsivity and risk behavior (either alcohol abuse or unprotected sex behavior). Sobel-Goodman tests as implemented in Stata were used to quantify the degree of mediation and test for statistical significance of the mediational effect.

Results

A table of descriptive statistics provides means and standard deviations for the demographic variables and each of the study scales (Table 1).

Correlations

A Spearman correlational analysis of the individual difference scales with the ARQ total score was conducted in order to examine the associations between the impulsivity scales and the general assessment of risk behavior (Figure 1). Results show that sensation seeking (r=0.50, p<0.001), urgency (r=0.21, p<0.001), BAS reward responsiveness (r=0.13, p<0.001), BAS drive (r=0.27, p<0.001), BAS fun seeking (r=0.39, p<0.001), and temporal discounting (r=0.07, p<0.05) were all significantly positively related to overall engagement of risk behavior. Conversely, premeditation (r=-0.32, p<0.001) and behavioral inhibition (r=-0.14, p<0.001) were significantly negatively related to risk behavior.

Two separate correlational analyses for alcohol and sex risk behavior also were conducted (Tables 2 and 3 and Figures 2 and 3, respectively). As predicted, positive gist was significantly positively correlated with alcohol risk behavior (r=0.64, p<0.001) and with unprotected sex behavior (r=0.25, p<0.001), and negative gist was significantly negatively correlated with alcohol risk behavior (r=-0.08, p<0.05). Verbatim sum was positively correlated with alcohol risk behavior (r=0.12, p<0.001), and verbatim difference was positively correlated with alcohol risk behavior (r=0.61, p<0.001) and unprotected sex behavior (r=0.26, p<0.001; Figures 2 and 3).

As shown in Table 2, positive gist for alcohol was significantly positively correlated with verbatim difference and sum for alcohol (r=0.65, p<0.001; r=0.24, p<0.001, respectively). Positive gist for alcohol was also significantly correlated with each of the impulsivity scales (refer to Table 2). Table 2 also shows that each of the impulsivity measures was significantly correlated with one another.

As seen in Table 3, positive gist for sex was significantly positively correlated with verbatim difference and sum for sex (r=0.67, p<0.001; r=0.10, p<0.001 respectively; Table 3). Table 3 also shows that positive gist for sex was significantly correlated with each of the impulsivity scales.

Some of the impulsivity scales also correlated significantly with alcohol and unprotected sex behavior. Sensation seeking (r=0.37, p<0.001), urgency (r=0.12, p<0.001), BAS reward responsiveness (r=0.09, p<0.001), BAS drive (r=0.22, p<0.001), BAS fun seeking (r=0.26, p<0.001), and temporal discounting (r=0.11, p<0.001) were all positively correlated with alcohol risk behavior, and premeditation (r=-0.026, p<0.001) was negatively correlated with alcohol risk behavior (Figure 2). Similarly, sensation seeking (r=0.15, p<0.001), urgency (r=0.18, p<0.001), BAS drive (r=0.13, p<0.001), BAS fun seeking (r=0.13, p<0.001) and temporal discounting (r=0.07, p<0.05) showed a significant positive correlation with unprotected sex behavior, and premeditation (r=-0.16, p<0.001) and behavioral inhibition (r=-0.11, p<0.01) showed a significant negative correlation with unprotected sex behavior (Figure 3).

Factor Analysis

A principal axis factor analysis with varimax rotation of all the alcohol and sex gist and verbatim scales and impulsivity scales was conducted in order to assess whether any of the scales were measures of the same underlying construct (Table 4). Based on the factor analysis, sensation seeking and each of the BAS subscales were measures of fun/sensation seeking impulsivity. The three subscales of the UPPS, urgency, premeditation, and perseverance, were all measures of a lack of deliberation impulsivity. Temporal discounting did not load with any of the other impulsivity measures and was considered a separate measure of poor delay of gratification impulsivity. The verbatim sum scales for sex and alcohol were separate measures of verbatim

processing from the verbatim difference scales for sex and alcohol. According to this factor analysis, positive gist and verbatim difference for alcohol and sex were similar measures of thought processing for each risk behavior.

Based on the factor analysis, factor scores using a regression procedure were defined for sensation/fun seeking and overall UPP impulsivity. Scores for these two factors were used in subsequent hypothesis testing regression analyses to assess sensation seeking and UPP impulsivity personality traits. Discounting was also entered in regression analyses given that it did not load with any of the other impulsivity factors, suggesting that it measured a different type of impulsivity.

Hypothesis Testing Regressions

A series of linear regression analyses was conducted with the outcome variables, alcohol abuse composite, unprotected sex, and ARQ total risk, regressed on each predictor variable (sensation seeking factor, UPP impulsivity factor, discounting, positive and negative gist, verbatim sum and difference) separately, controlling for demographic variables of age, gender, and race-ethnicity (Table 5). These regressions show the magnitude and direction of the effect of each predictor on each outcome, controlling only for demographics age, gender, and race. Positive gist for alcohol was positively related to ARQ total risk (B=0.44, p<0.001) and alcohol behavior (B=0.62, p<0.001), and positive gist for sex was positively related to ARQ total risk (B=0.28, p<0.001) and unprotected sex (B=0.27, p<0.001), controlling for age, gender, and race. Negative gist for alcohol was negatively related to ARQ total risk (B=-0.09, p<0.01) and alcohol behavior (B=-0.12, p<0.001) controlling for age, gender, and race. Verbatim sum for sex was positively related to ARQ total risk (B=0.08, p<0.05) and verbatim sum for alcohol was

positively related to alcohol risk behavior (B=0.12, p<0.001), controlling for age, gender, and race (Table 5).

Even more stringent hierarchical linear regression analyses also were conducted with alcohol and sex risk behavior as outcome variables (Tables 6 and 7, respectively). Step 3 of Tables 6 and 7 shows that positive gist was a significant predictor of alcohol (B=0.44, p<0.001) and unprotected sex behavior (B=0.15, p<0.001) respectively controlling for demographics, impulsivity, and verbatim sum and difference, suggesting that participants who endorse positive gist principles are more likely to engage in increased alcohol abuse and unprotected sex behavior even after controlling for other predictors. Verbatim difference also was a significant positive predictor of alcohol (B=0.30, p<0.001) and unprotected sex behavior (B=0.17, p<0.001), controlling for demographics, impulsivity, and positive and negative gist. These results suggest that both positive gist and verbatim difference are unique predictors of risk behavior, given that they both are strong positive predictors when controlling for one another.

Other significant predictors of risk behavior included the sensation seeking factor (B=0.13, p<0.001), temporal discounting (B=0.06, p<0.01), and verbatim difference (B=0.30, p<0.001) for alcohol abuse (Table 6), and the sensation seeking factor (B=0.10, p<0.01) and verbatim difference (B=0.17, p<0.001) for unprotected sex behavior (Table 7). However, in Step 1 of Tables 6 and 7, all three of the impulsivity factors, sensation seeking (B=0.26, p<0.001), UPP impulsivity (B=0.09, p<0.01), and temporal discounting (B=0.13, p<0.001), uniquely predicted alcohol risk behavior, and sensation seeking (B=0.13, p<0.001) and UPP impulsivity (B=0.10, p<0.01) uniquely predicted unprotected sex behavior when controlling for demographics.

In order to examine whether positive gist processing was predicted by the impulsivity measures, linear regressions also were conducted with positive gist for alcohol and for sex regressed onto the various impulsivity predictor variables, controlling for age, gender, and race (see Table 8). These regressions show that the sensation seeking factor (B=0.14, p<0.001), UPP impulsivity factor (B=0.20, p<0.001), and temporal discounting (B=0.05, p<0.001) were significant predictors of positive gist for alcohol, and that the sensation seeking (B=0.08, p<0.001) and UPP impulsivity factors (B=0.14, p<0.001) were significant predictors of positive gist for sex, controlling for demographic variables. Similar regressions were conducted with the three impulsivity measures as predictors and negative gist, verbatim sum, and verbatim difference for alcohol and sex as outcome variables (see Appendix Tables 11, 12, and 13).

Hypothesis Testing Mediation Analyses

Given that positive gist was an important factor in predicting alcohol and unprotected sex behavior and was, in turn, predicted by several of the impulsivity measures, mediation analyses were conducted to determine if positive gist was also a mechanism contributing to the relationship between impulsivity and risk behavior. Sobel-Goodman tests of mediation suggested that positive gist was a significant partial mediator of the relationship between various forms of impulsivity and risk behavior (Figures 4 and 5). More specifically, the mediating effect of positive gist on the association between sensation seeking and alcohol risk behavior was significant (Z=6.43; p<0.001), with positive gist accounting for 50% of the total effect of sensation seeking on alcohol behavior, controlling for age, gender, and race (Figure 4a). Similarly, the mediating effect of positive gist on the association between UPP impulsivity and alcohol risk behavior was significant (Z=9.05; p<0.001), with positive gist accounting for 100% of the total effect of the UPP impulsivity factor on alcohol risk behavior, controlling for age,

gender, and race (Figure 4b). Finally, the mediating effect of positive gist on the association between temporal discounting and alcohol risk behavior was significant (Z=5.16; p<0.001), with positive gist accounting for 75% of the total effect of the discounting score on alcohol risk behavior, controlling for age, gender, and race (Figure 4c).

Similarly, the mediating effect of positive gist on the association between sensation seeking and unprotected sex behavior also was significant (Z=3.52; p<0.001), with positive gist accounting for 28% of the total effect of sensation seeking on unprotected sex behavior, controlling for age, gender, and race (Figure 5a). The mediating effect of positive gist on the association between the UPP impulsivity factor and unprotected sex behavior was significant (Z=4.96; p<0.001), with positive gist accounting for 45% of the total effect of the UPP impulsivity factor on unprotected sex behavior, controlling for age, gender, and race (Figure 5b). Given that temporal discounting was not a significant predictor of unprotected sex behavior, positive gist was not tested as a mediator of the discounting – sex behavior association.

Mediation analyses also were conducted to determine whether verbatim difference was a significant mediator between impulsivity and risk behavior, given that it also was a strong predictor of risk behavior in the hierarchical linear regressions. More specifically, the mediating effect of verbatim difference on the association between sensation seeking and alcohol risk behavior was significant (Z=3.98; p<0.001), with verbatim difference accounting for 28% of the total effect of sensation seeking on alcohol behavior, controlling for age, gender, and race (Figure 6a). The mediating effect of verbatim difference on the association between UPP impulsivity and alcohol behavior was significant (Z=7.02, p<0.001), with verbatim difference accounting for 100% of the total effect of UPP impulsivity on alcohol behavior, controlling for age, gender, and race (Figure 6b). Finally, the mediating effect of verbatim difference on the

association between temporal discounting and alcohol behavior was significant (Z=2.52, p<0.05), with verbatim difference accounting for 33% of the total effect of discounting on alcohol behavior, controlling for age, gender, and race (Figure 6c).

Similarly, the mediating effect of verbatim difference on the relationship between the impulsivity factors and unprotected sex behavior also was significant. More specifically, the mediating effect of verbatim difference on the association between sensation seeking and unprotected sex was significant (Z=3.13, p<0.01), with verbatim difference accounting for 26% of the total effect of sensation seeking on unprotected sex controlling for age, gender, and race (Figure 7a). In addition, the mediating effect of verbatim difference on the relationship between UPP impulsivity and unprotected sex behavior was significant (Z=4.96, p<0.001), with verbatim difference accounting for 40% of the total effect of UPP impulsivity on unprotected sex controlling for age, gender, and race (Figure 7b).

In sum, these mediation analyses suggest that both positive gist and verbatim difference mediate the associations between various facets of impulsivity and risk behavior. Yet, positive gist seems to mediate a larger proportion of the relationship between impulsivity and risk behavior as compared to verbatim difference (see Table 9). Also, these analyses only controlled for demographics, but did not control for the other two types of impulsivity that were not included as the independent variable or for the other potential mediator. Thus, even more conservative mediation analyses were conducted by controlling for the other two impulsivity factors and the other mediator to examine the unique mediation effects of positive gist and verbatim difference.

These highly stringent mediation analyses found that the mediating effect of positive gist on the association between sensation seeking and alcohol behavior was significant (Z=4.88,

$p<0.001$), with positive gist accounting for 29% of the total effect of sensation seeking on alcohol behavior, controlling for demographics, UPP impulsivity, discounting, and verbatim difference (Figure 8a). Thus, positive gist uniquely mediates the relationship between sensation seeking and alcohol behavior, separate from verbatim difference. Similarly, the mediating effect of positive gist on the association between discounting and alcohol behavior was significant ($Z=3.88$, $p<0.001$), with positive gist accounting for 43% of the total effect of discounting on alcohol behavior, controlling for demographics, sensation seeking, UPP impulsivity, and verbatim difference (Figure 8b). However, when controlling for verbatim difference, positive gist was no longer a significant mediator between UPP impulsivity and alcohol behavior, suggesting that positive gist is not a unique mediator separate from verbatim difference in the relationship between UPP impulsivity and alcohol behavior (see also Appendix Figure 9a for the mediation analysis of positive gist on the relationship between UPP impulsivity and alcohol behavior controlling for demographics and the other impulsivity factors).

Similarly, when controlling for verbatim difference, positive gist was no longer a significant mediator between sensation seeking and unprotected sex behavior, suggesting that positive gist is not a unique mediator separate from verbatim difference in this case as well. In terms of the relationship between UPP impulsivity and unprotected sex behavior, positive gist was only a significant mediator with demographics alone controlled (see also Appendix Figure 9b for the mediation analysis of positive gist on the relationship between UPP impulsivity and unprotected sex behavior controlling for demographics and the other impulsivity factors).

In contrast to positive gist, verbatim difference was no longer a significant mediator between any of the three types of impulsivity and both alcohol and sex risk behaviors with positive gist controlled, suggesting that it is not a unique mediator separate from positive gist

(see also Appendix Figures 10a and b and 11a and b for the mediation analyses of verbatim difference on the relationship between impulsivity and risk behavior controlling for demographics and the other impulsivity factors).

Therefore, in total, these more conservative mediation analyses suggest that positive gist is a unique mediator of the associations between sensation seeking and alcohol risk behavior and discounting and alcohol risk behavior, even controlling for verbatim difference. These analyses also suggest that verbatim difference is not a unique mediator separate from positive gist (see Table 10).

Discussion

The present study tested whether positively-valenced gist-based reasoning predicts greater real-world alcohol and sex risk behavior, and whether positive gist-based and verbatim-based reasoning mediates the association between various facets of impulsivity and increased risk behavior. The results supported the major hypothesis that positive gist is positively associated with both sex- and alcohol-related risk behavior. In addition, as predicted, verbatim processing, as measured by verbatim sum and difference, was also positively associated with risk behavior, yet the magnitude of the association was smaller than that of the association between positive gist and risk behavior, especially for verbatim sum. Similarly, correlational analyses showed that negative gist is negatively associated with risk behavior, consistent with prior research conducted by Mills et al. (2008) and the Fuzzy-Trace Theory literature (Reyna & Brainerd, 1995; Reyna, 2004; Reyna & Rivers, 2004; Reyna & Farley, 2006; Reyna & Ellis, 1994; Reyna et al., 2011, Reyna, 2008).

The positive association between various impulsivity measures and risk behavior also replicates and extends prior research that suggests a link between impulsive personality traits and

risk behavior tendencies (Hoyle et al., 2000; Verdejo-Garcia et al., 2008). The present study's factor analysis also replicates findings from Reynolds' (2006) study, which found that delay discounting is an entirely distinct type of impulsivity. Similarly, the factor analysis results, which showed that urgency, premeditation, and perseverance are measures of the same underlying concept, are also consistent with findings from Duckworth and Kern (2011). These researchers found that sensation seeking is significantly different from the urgency, premeditation, and perseverance subscales, but that urgency, premeditation, and perseverance were not significantly different from each other. The present study's factor analysis results also replicate findings from Reyna et al. (2011), which found that sensation seeking and the behavioral activation system subscales all load together on the same factor. Moreover, the results suggest that different facets of impulsivity are predictors of positive gist processing, which is an important new finding, and is congruent with the idea that positive gist-based reasoning may be one of the mechanisms by which different forms of impulsivity lead to greater adolescent risk taking behavior.

Consistent with this possibility, hierarchical linear regressions showed that positive gist and verbatim difference are both unique predictors of risk behavior. Similarly, mediation analyses supported the main hypothesis that there is a positively-valenced "gist for risk" that explains the relation between impulsive personality and risk behavior. More specifically, this positively-valenced gist processing is a significant mediator of different types of impulsivity including sensation seeking, UPP impulsivity, and temporal discounting. These findings suggest that positive gist is not specific to one type of impulsivity, but instead is a general type of thought processing that may be used by individuals who are highly impulsive in different ways, such as in sensation seeking or inability to delay gratification as measured by temporal discounting. Similarly, the mediation analyses suggest that positive gist is a unique mediator

between the three types of impulsivity and risk behavior separate from verbatim difference. In contrast, verbatim difference is not a unique mediator between the various types of impulsivity and risk behavior separate from positive gist.

Although this study focused on the relationships among positive gist processing, impulsivity and risk behavior, negative gist processing exhibited protective features by correlating inversely with sex- and alcohol-related risk taking. Nevertheless, positive gist was a stronger predictor of risk taking than negative gist. This was not unexpected, since prior research suggests that individuals tend to place more emphasis on benefits (as measured through positive gist) than risks (as measured through negative gist) when considering decisions about risky behavior (Reyna & Farley, 2006; Reyna et al., 2011). Consequently, negative gist may not predict risk behavior as well as positive gist.

Verbatim processing, as measured by verbatim sum and difference of risk and benefit statements, was a positive predictor of risk behavior, as expected. One could argue that these risk and benefit statements for sex and alcohol were merely “mini” gist statements and that verbatim difference may be another measure of positive gist, given its focus on benefits over risks and the strong positive correlation between these two variables. Nevertheless, respondents were asked to indicate whether they would consider these risks and benefits when making a decision about the behaviors in the scenarios that were presented. As such, they were more clearly a measure of verbatim than gist processing, given that they were expressions of weighing the pros and cons of sex- and alcohol-related risk taking for that specific scenario. Gist processing, on the other hand, is more an expression of categorical principles (such as, “seek fun”) than of specific risks and benefits and was not assessed in the context of the specific scenarios that were presented.

Although the assessment of gist and verbatim processing in this study was designed to distinguish the two thought processes, verbatim-based reasoning could have been measured as more of a quantitative, detailed thought processing instead of relying on the sum and difference of risk and benefit gist statements. In essence, the verbatim sum score was the more theoretically relevant measure of verbatim processing as defined by Fuzzy-Trace Theory (FTT). Yet, the verbatim sum score was not as highly related to risk behavior as the verbatim difference score, which was a measure of more traditional cost-benefit processing. Nevertheless, the results suggest that gist processing is an important predictor of risk behavior over and beyond either form of verbatim processing, a prediction that is consistent with FTT.

These results have important implications for creating effective prevention programs for at-risk youth. This research suggests that positive gist processing is risk promoting, especially for highly impulsive adolescents. Given that it mediates the associations with risky behavior for at least three forms of impulsivity, positive gist processing is an important target for prevention research. Future studies should examine strategies to reduce reliance on positive gist processing. One approach might be to increase negative gist processing in order to enhance it as a protective mechanism for persons high in impulsivity. If negative gist is a significant mediator of various forms of impulsivity and decreased risk behavior, just as positive gist mediates increased risk behavior, then it may be possible to create a curriculum for youth to teach impulsive students to think more in terms of negative than of positive gist.

One of the present study's major strengths is that it measured all types of impulsivity simultaneously and showed that there are at least three major types of impulsivity: sensation/fun seeking, UPP impulsivity, and impatience as defined by temporal discounting. These results also

demonstrated that positive gist processing is a common pathway between all of these independent forms of impulsivity and sex- and alcohol-related risk taking behaviors.

At the same time, the study had limitations. One limitation was the use of self-report measures of impulsive personality, gist and verbatim processing, and engagement in risk taking behaviors. Self-report measures may not be as reliable as behavioral measures given that they rely solely on participants' self-perceptions and truthfulness. However, prior research conducted by Berns, Capra, and Moore (2009) suggests that the ARQ used here is an accurate and reliable measure of real-world risk taking by demonstrating that participants' responses to the alcohol- and drug-related items of the ARQ were correlated with results from a urine test. Thus, although the ARQ is a self-report measure, it has been shown to accurately assess real-world adolescent risk taking.

Another limitation of this study is that it was cross-sectional in design, which limits its ability to effectively examine whether various forms of impulsivity predict change in sex- and alcohol-related risk behavior and whether positive gist and verbatim difference processing are significant mediators of this change. A longitudinal design would more effectively test whether different types of impulsivity predict increased risk behavior over time as well as more accurately assess whether positive gist and verbatim difference are significant mediators. Similarly, a structural equation modeling analysis instead of hierarchical linear regression analyses would more sensitively parse out the independent effects of all predictor variables (gist, verbatim, and impulsivity) on outcome measures (alcohol, sex, and general risk). Nevertheless, it is important to note that positive gist and verbatim difference processing were highly predictive of risk behavior and mediated impulsivity's relation with risk behavior even after controlling for a variety of demographic variables in a cross-sectional design. Similarly, positive gist was a

significant mediator between impulsivity and risk behavior even when controlling for not only demographic variables, but also for the other impulsivity factors and verbatim difference, in this cross-sectional design. This study suggests that future studies using a more sensitive analysis such as structural equation modeling in a longitudinal design should find similar results.

In conclusion, this study's findings suggest that positive gist processing is an important predictor of adolescent risk taking and an important mechanism underlying the association between impulsivity and adolescent risk taking behaviors. Future research should attempt to extend these findings to other samples and predictions of other forms of risk behavior.

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Table 1

Descriptive Statistics of Demographic Variables and Scales.

	N	Minimum	Maximum	Mean	Std. Dev
Age	910	18.00	25.00	19.65	1.18
Gender	927	0.00	1.00	0.28	0.45
Race	925	1.00	9.00	2.64	2.37
Alcohol Composite	928	1.00	5.00	3.29	1.27
Unprotected Sex	928	0.00	1.00	0.36	0.48
ARQ Total	928	1.00	3.55	2.23	0.39
Urgency	927	1.00	4.75	2.74	0.64
Premeditation	927	1.09	5.00	3.67	0.55
Perseverance	927	1.50	5.00	3.63	0.57
Sensation Seeking	923	1.00	5.00	3.23	0.72
BIS	924	1.14	5.00	3.79	0.60
BAS Reward	924	2.20	5.00	4.10	0.46
BAS Drive	924	1.00	5.00	3.29	0.66
BAS Fun Seeking	924	1.25	5.00	3.42	0.65
Discounting	928	-8.60	-1.39	-5.12	1.69
Positive Gist for Alcohol	928	1.00	4.33	2.24	0.64
Negative Gist for Alcohol	928	1.00	5.00	4.29	0.80
Alc Verbatim Sum	925	0.00	2.00	1.17	0.32
Alc Verbatim Diff	925	-1.00	1.00	-0.26	0.44
Positive Gist for Sex	928	1.00	4.33	2.06	0.69
Negative Gist for Sex	928	1.00	5.00	4.50	0.65
Sex Verbatim Sum	927	0.10	2.00	1.13	0.31
Sex Verbatim Sum	923	-1.00	1.00	-0.33	0.41

Table 2

Spearman Correlation Coefficients of Alcohol Behavior, Gist, Verbatim, and Impulsivity Scales.

	Alc Beh	Pos Gist	Neg Gist	Verb Sum	Verb Diff	SS	Urgency	Premed	Persever	BIS	BAS Reward	BAS Drive	BAS Fun	Temp Disc
Alc Beh	1.00													
Pos Gist	0.63***	1.00												
Neg Gist	-0.07*	-0.28***	1.00											
Verb Sum	0.12***	0.24***	0.05	1.00										
Verb Diff	0.60***	0.65***	-0.16***	0.11***	1.00									
SS	0.37***	0.37***	-0.06	0.06	0.28***	1.00								
Urgency	0.11***	0.23***	-0.13***	0.11***	0.21***	0.20***	1.00							
Premed	-0.25***	-0.33***	0.18***	0.02	-0.25***	-0.35***	-0.46***	1.00						
Persever	0.03	-0.19***	0.17***	-0.06	-0.13***	-0.10**	-0.37***	0.43***	1.00					
BIS	-0.05	-0.14***	0.20***	0.10**	-0.01	-0.23***	0.11***	0.27***	0.08*	1.00				
BAS Reward	0.10**	-0.08*	0.23***	0.06	0.04	0.20***	0.04	0.18***	0.22***	0.33***	1.00			
BAS Drive	0.22***	0.19***	0.00	0.05	0.13***	0.29***	0.17***	-0.07*	0.22***	-0.10**	0.31***	1.00		
BAS Fun	0.27***	0.27***	-0.05	0.04	0.22***	0.65***	0.27***	-0.30***	-0.06	-0.16***	0.33***	0.43***	1.00	
Temp Disc	0.11***	0.16***	-0.12***	0.04	0.07*	0.03	0.12***	-0.12***	-0.13***	-0.06	-0.02	0.04	0.04	1.00

Note. Pos Gist=Positive Gist; Neg Gist=Negative Gist; Verb Sum=Verbatim Sum; Verb Diff=Verbatim Difference; SS=Sensation Seeking; Premed=Premeditation; Persever=Perseverance; BIS=Behavioral Inhibition System; BAS Reward=BAS Reward Responsiveness; BAS Fun=BAS Fun Seeking; Temp Disc=Temporal Discounting. *p<0.05, **p<0.01, ***p<0.001.

Table 3

Spearman Correlation Coefficients of Unprotected Sex Behavior, Gist, Verbatim, and Impulsivity Scales.

	Unprot-ected Sex	**Pos Gist**	**Neg Gist**	**Verb Sum**	**Verb Diff**	**SS**	**Urgency**	**Premed**	**Persever**	**BIS**	**BAS Reward**	**BAS Drive**	**BAS Fun**	**Temp Disc**
Unprot-ected Sex	1.00	0.24***	-0.06	-0.05	0.27***	0.16***	0.17***	-0.17***	-0.01	-0.09**	0.01	0.15***	0.14***	0.06
Pos Gist	0.24***	1.00	-0.44***	-0.10**	0.67***	0.27***	0.15***	-0.27***	-0.19***	-0.26***	-0.18***	0.13***	0.19***	0.11***
Neg Gist	-0.06	-0.44***	1.00	0.08*	-0.24***	-0.06	-0.11***	0.21***	0.14***	0.20***	0.24***	-0.01	-0.05	-0.11***
Verb Sum	-0.05	0.10**	0.08*	1.00	0.21***	0.06	0.17***	0.00	-0.05	0.20***	0.12***	0.08**	0.07*	0.01
Verb Diff	0.27***	0.67***	-0.24***	-0.21***	1.00	0.29***	0.12***	-0.23***	-0.13***	-0.18***	-0.01	0.10**	0.19***	0.11***

Note. Pos Gist=Positive Gist; Neg Gist=Negative Gist; Verb Sum=Verbatim Sum; Verb Diff=Verbatim Difference; SS=Sensation Seeking; Premed=Premeditation; Persever=Perseverance; BIS=Behavioral Inhibition System; BAS Reward=BAS Reward Responsiveness; BAS Fun=BAS Fun Seeking; Temp Disc=Temporal Discounting. *p<0.05, **p<0.01, ***p<0.001.

Table 4

Principal Axis, Varimax Rotated Factor Analysis of all Scales.

Scale	Sensation Seeking	Sex Benefits	UPP Impulsivity	Negative Gist	Verbatim Sum	Alcohol Gist
Alcohol						
Pos Gist	0.21	**0.43**	0.26	-0.26	0.17	**0.49**
Neg Gist	0.00	-0.05	-0.10	**0.68**	0.04	-0.12
VerbatimS	0.02	0.14	0.04	0.04	**0.94**	-0.03
VerbatimD	0.14	0.36	0.20	-0.04	0.03	**0.83**
Sex						
Pos Gist	0.12	**0.69**	0.15	-0.36	0.06	0.14
Neg Gist	0.02	-0.14	-0.07	**0.72**	-0.03	-0.04
VerbatimS	0.06	-0.34	0.10	0.09	**0.70**	**0.52**
VerbatimD	0.11	**0.88**	0.11	-0.08	-0.05	0.16
UPP						
Urgency	0.18	-0.01	**0.56**	0.00	0.08	0.16
Premed	-0.20	-0.14	**-0.69**	0.21	0.06	-0.04
Persevere	0.17	-0.08	**-0.73**	0.06	-0.01	-0.01
BSSS	**0.66**	0.22	0.27	-0.05	0.00	0.04
BIS	-0.13	-0.20	-0.08	0.35	0.12	0.15
BAS						
Reward	**0.45**	-0.08	-0.23	0.39	0.03	0.08
Drive	**0.55**	0.05	-0.10	-0.04	0.03	0.09
Fun	**0.86**	0.07	0.25	-0.04	0.00	0.01
Discounting	0.00	0.08	0.13	-0.08	0.03	0.05

Note. Factor loadings > 0.40 are in boldface. VerbatimS=Verbatim Sum; VerbatimD=Verbatim Difference; UPP=Urgency Premeditation Perseverance; Premed=Premeditation Scale; Persevere=Perseverance Scale; BSSS=Sensation Seeking; BIS=Behavioral Inhibition Scale; BAS=Behavioral Activation Scale; Reward=BAS Reward Responsiveness; Fun=BAS Fun Seeking.

Table 5

Linear Regression Analysis of ARQ Total Risk, Alcohol Risk Behavior, and Unprotected Sex Behavior with Impulsivity, Gist and Verbatim Scales as Individual Predictors.

Predictors	**Dependent Variables**		
	ARQ Total Risk	**Alcohol Risk Behavior**	**Unprotected Sex**
Sensation Seeking	0.37***	0.27***	0.13***
UPP Impulsivity	0.24***	0.13***	0.12***
Discounting	0.09**	0.15***	0.06
Positive Gist	0.44*** (A) 0.28*** (S)	0.62***	0.27***
Negative Gist	-0.09** (A) -0.05 (S)	-0.12***	-0.05
Verbatim Sum	0.06 (A) 0.08* (S)	0.12***	-0.05
Verbatim Difference	0.38*** (A) 0.37*** (S)	0.58***	0.28***

Note. Each cell refers to a separate regression analysis with the dependent variable regressed on the predictor, controlling for demographics (age, gender, and race). (A) refers to alcohol gist or verbatim; (S) refers to sex gist or verbatim. Coefficients are standardized betas. *p<0.05, **p<0.01, ***p<0.001.

Table 6

Hierarchical Linear Regression Analysis of Alcohol Risk Behavior with Impulsivity Scales, Alcohol Gist and Verbatim Scores as Predictors.

Independent Variable	Dependent Variable: Alcohol Risk Behavior (underage drinking & getting drunk composite)		
	(Step 1)	**(Step 2)**	**(Step 3)**
Age	0.10***	0.05	0.03
Male	0.01	-0.07**	-0.08***
Black[a]	-0.16***	-0.09***	-0.07**
Asian[a]	-0.26***	-0.18***	-0.15***
Other[a]	-0.14***	-0.08***	-0.06**
Sensation Seeking	0.26***	0.13***	0.13***
UPP Impulsivity	0.09**	-0.07**	-0.08***
Discounting	0.13***	0.05*	0.06**
Positive Gist		0.62***	0.44***
Negative Gist		0.05*	0.05*
Verbatim Sum			0.01
Verbatim Diff			0.30***
Total R^2	0.20	0.50	0.55

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. N=895. *p<0.05, **p<0.01,***p<0.001.

Table 7

Hierarchical Linear Regression Analysis of Unprotected Sex Behavior with Impulsivity Scales, Sex Gist and Verbatim Scores as Predictors.

Independent Variable	Dependent Variable: Unprotected Sex		
	(Step 1)	**(Step 2)**	**(Step 3)**
Age	0.20***	0.18***	0.18***
Male	0.04	-0.06	-0.10*
Black[a]	0.00	0.02	0.02
Asian[a]	-0.10**	-0.07*	-0.05
Other[a]	0.01	0.02	0.03
Sensation Seeking	0.13***	0.10**	0.10**
UPP Impulsivity	0.10**	0.06	0.05
Discounting	0.04	0.03	0.03
Positive Gist		0.26***	0.15***
Negative Gist		0.05	0.04
Verbatim Sum			-0.03
Verbatim Diff			0.17***
Total R^2	0.08	0.12	0.14

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. N=895. *p<0.05, **p<0.01, ***p<0.001.

Table 8

Linear Regression Analysis of Positive Gist for Alcohol and Sex with Impulsivity Scales as Predictors.

Predictor	**Positive Gist for Alcohol**		**Positive Gist for Sex**	
	Unstandardized Beta	**95% CI**	**Unstandardized Beta**	**95% CI**
Constant	1.41**	0.76, 2.06	1.21	0.56, 1.85
Age	0.06***	0.02, 0.09	0.04**	0.01, 0.07
Male	0.19***	0.11, 0.28	0.66***	0.57, 0.74
Black[a]	-0.30***	-0.46, -0.13	-0.17*	-0.33, 0.00
Asian[a]	-0.17***	-0.26, -0.08	-0.13**	-0.22, -0.03
Other[a]	-0.23**	-0.38, -0.08	-0.13	-0.28, 0.01
SS	0.14***	0.10, 0.18	0.08***	0.04, 0.12
UPP Impulsivity	0.20***	0.15, 0.24	0.14***	0.09, 0.18
Discounting	0.05***	0.03, 0.07	0.02	0.00, 0.05
R^2	0.20		0.26	
F	27.73		39.11	

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. SS=Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

Table 9

Mediation Analysis of Positive Gist versus Verbatim Difference as Mediators between Impulsivity and Risk Behavior.

	Mediators			
	Positive Gist		Verbatim Difference	
	% Mediated	Z	% Mediated	Z
Alcohol				
SS	50	6.43***	28	3.98***
UPP Impulsivity	100	9.05***	100	7.02***
Discounting	75	5.16***	33	2.52*
Sex				
SS	28	3.52***	26	3.13***
UPP Impulsivity	45	4.96***	40	4.96***
Discounting	0	0	0	0

Note. SS: Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

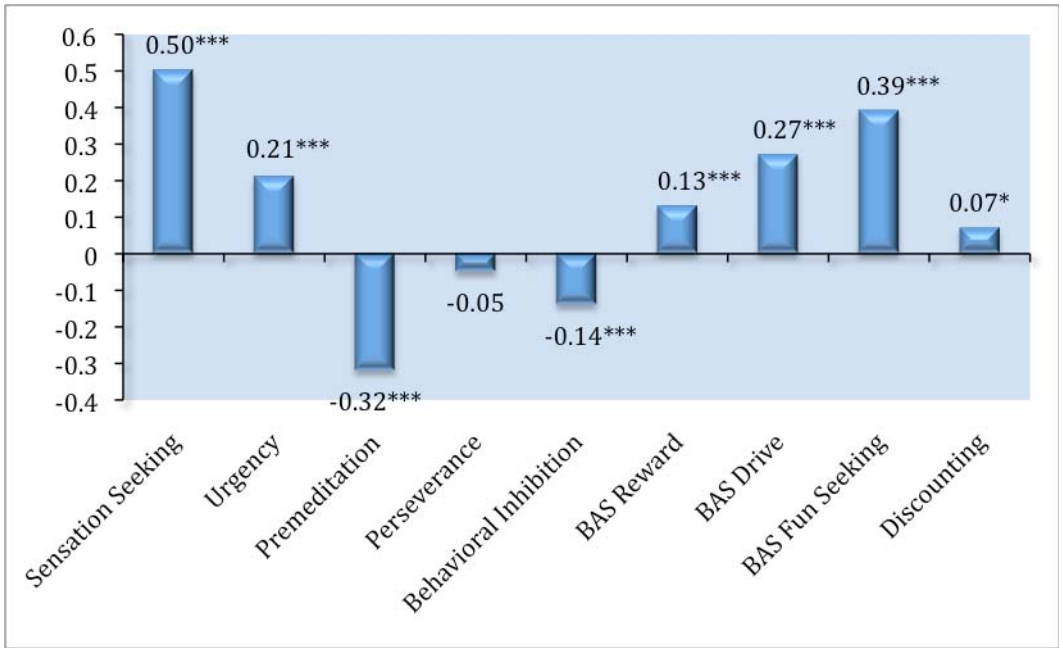
Table 10

Mediation Analysis of Percent Mediation of Positive Gist versus Verbatim Difference between Impulsivity and Risk Behavior when Controlling for Each Other.

	Gist controlling for Verbatim	Verbatim controlling for Gist
	% Mediated	% Mediated
Alcohol		
SS	29***	0
UPP Impulsivity	0	0
Discounting	43***	0
Sex		
SS	0	0
UPP Impulsivity	0	0
Discounting	0	0

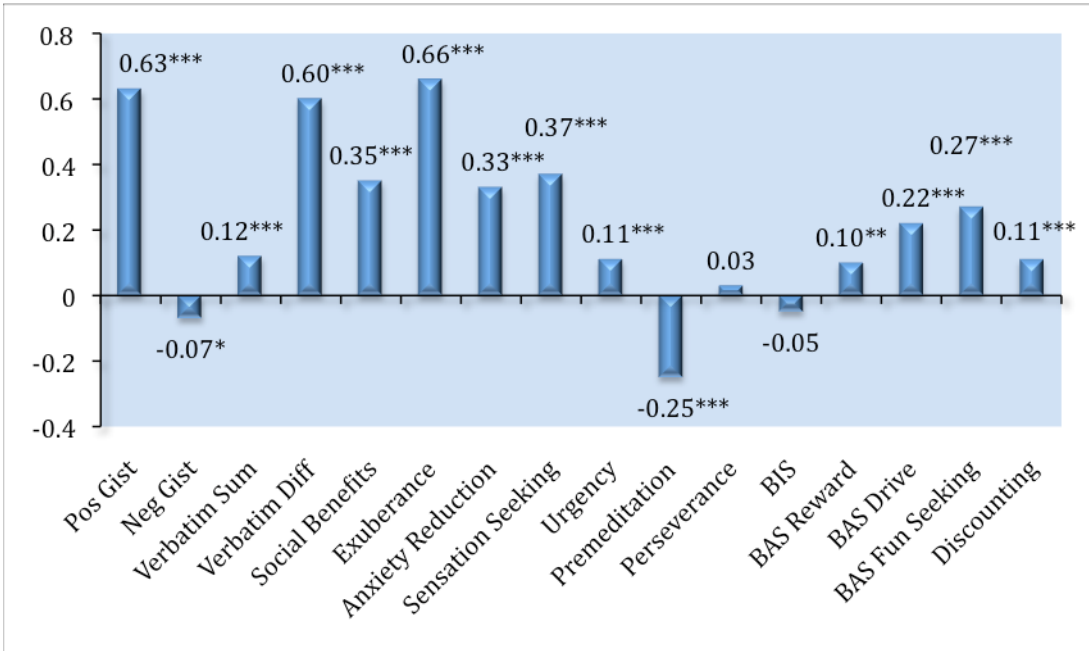
Note. SS: Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

Figure 1



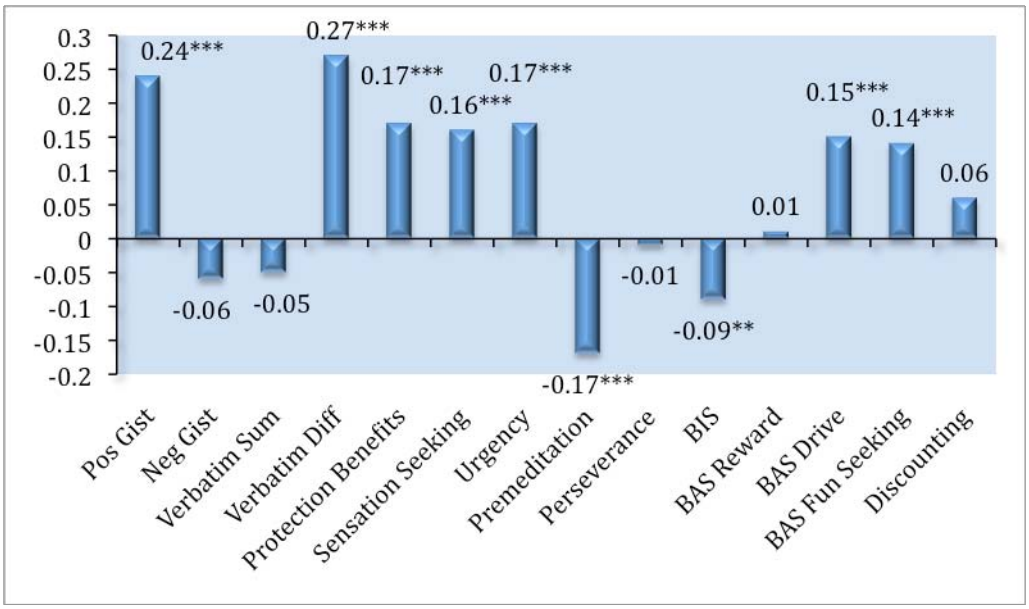
Spearman correlation coefficients of impulsivity scales with ARQ total risk. *p<0.05, **p<0.01, ***p<0.001.

Figure 2



Spearman correlation coefficients of gist, verbatim, and impulsivity scales with underage drinking and getting drunk composite. *p<0.05, **p<0.01, ***p<0.001.

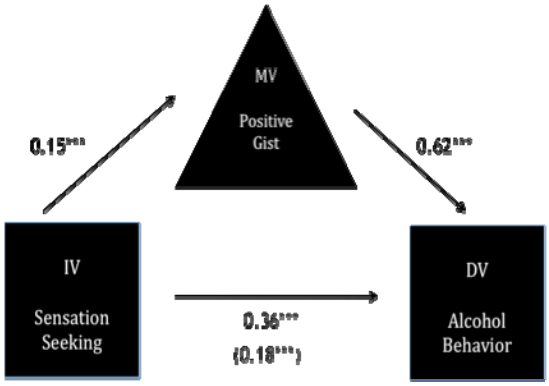
Figure 3



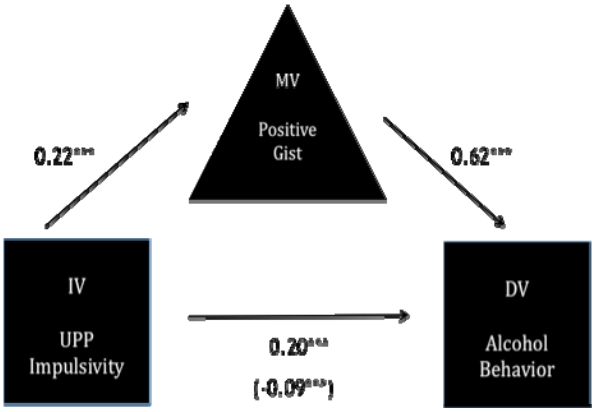
Spearman correlation coefficients of gist, verbatim, and impulsivity scales with unprotected sex.

*p<0.05, **p<0.01, ***p<0.001.

Figure 4a



4b



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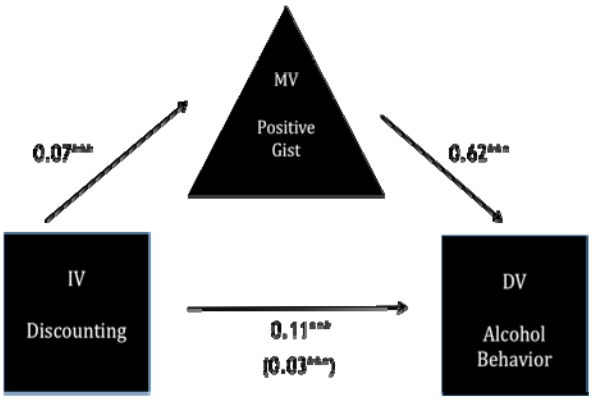
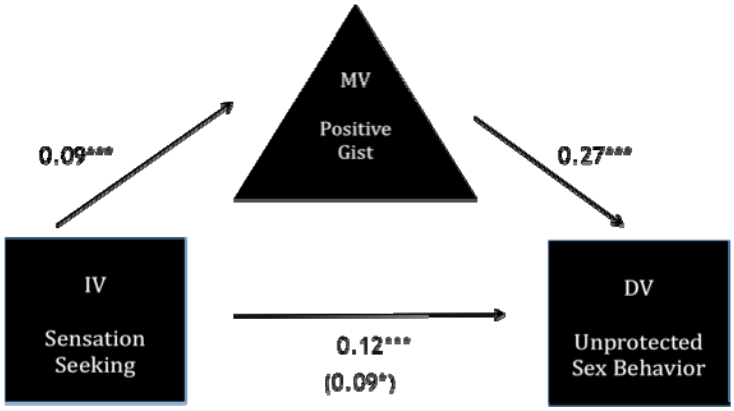


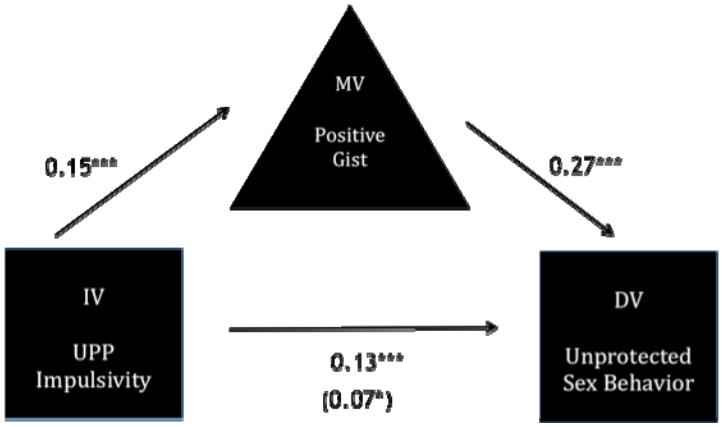
Three separate mediation analyses of the mediating effect of positive gist for alcohol on the relationship between impulsivity and alcohol behavior controlling for age, gender, and race. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Figure 5a



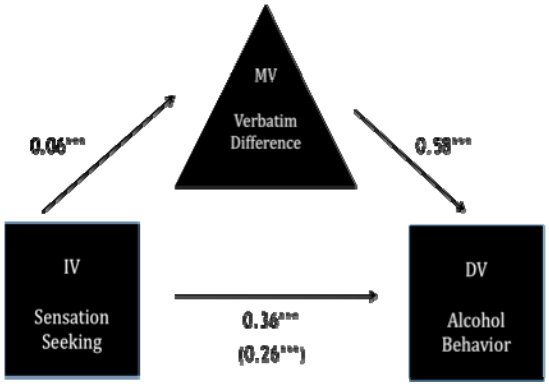
5b



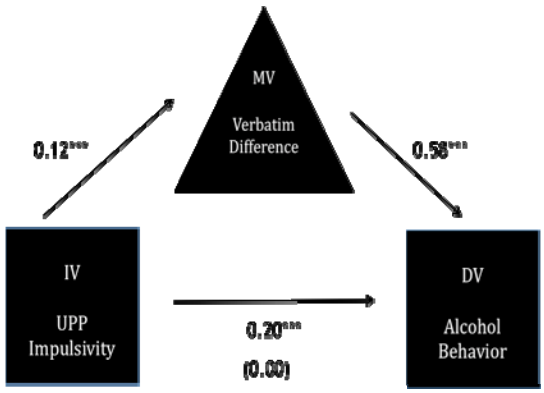
Two separate mediation analyses of the mediating effect of positive gist for sex on the relationship between impulsivity and unprotected sex behavior controlling for age, gender, and race. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

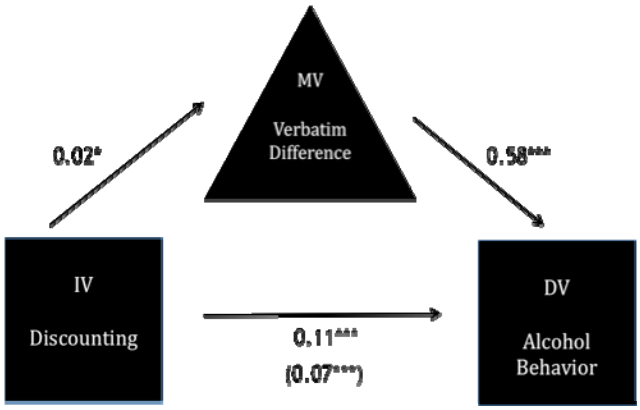
Figure 6a



6b



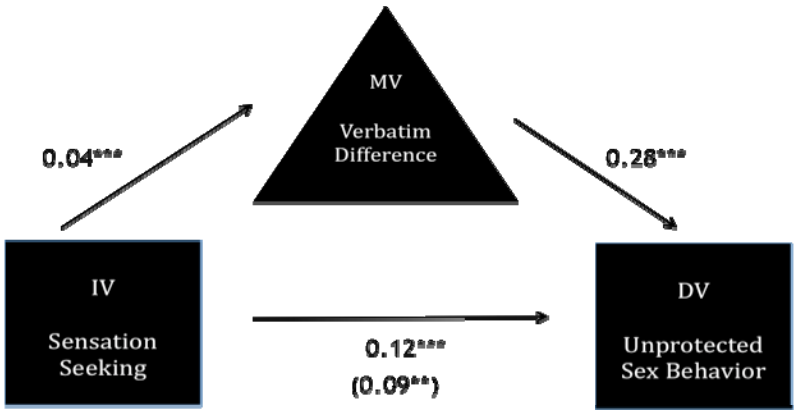
6c



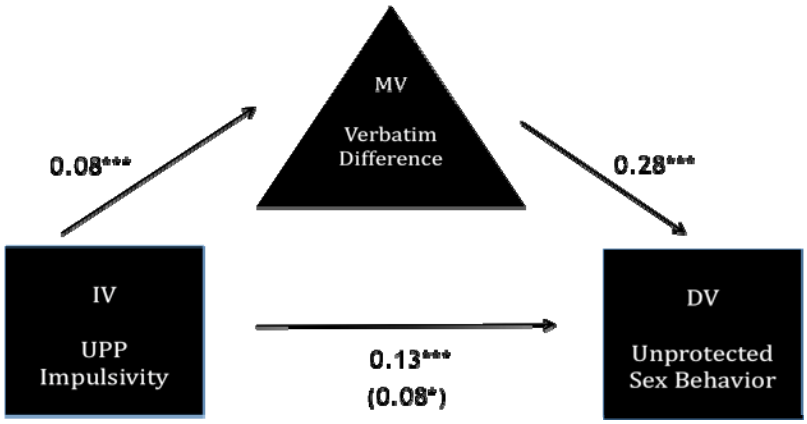
Three separate mediation analyses of the mediating effect of verbatim difference for alcohol on the relationship between impulsivity and alcohol behavior controlling for age, gender, and race. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Figure 7a



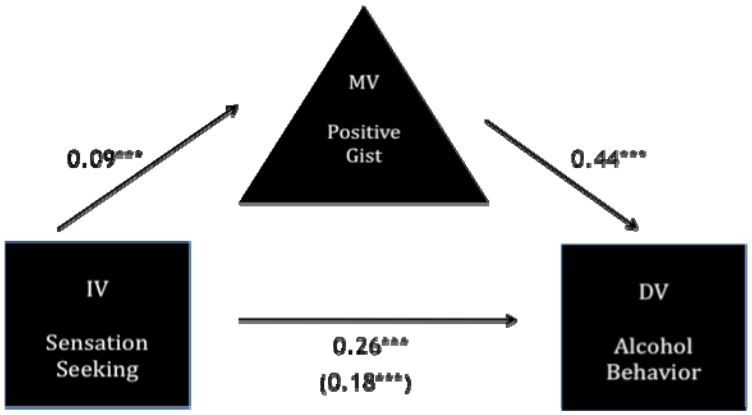
7b



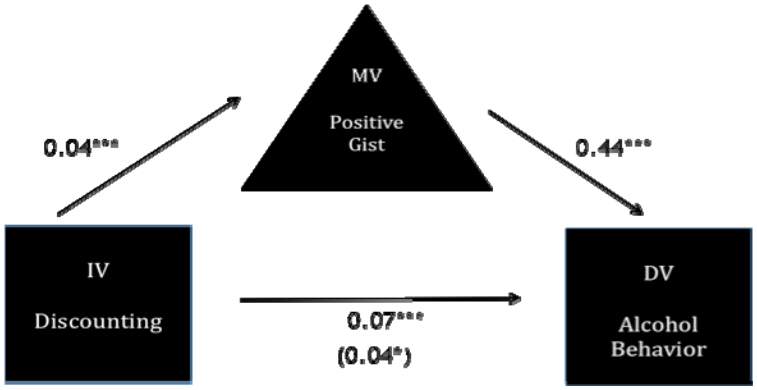
Two separate mediation analyses of the mediating effect of verbatim difference for sex on the relationship between impulsivity and unprotected sex behavior controlling for age, gender, and race. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Figure 8a



8b



Two separate mediation analyses of the mediating effect of positive gist for alcohol on the relationship between impulsivity and alcohol behavior controlling for demographics, other impulsivity factors, and verbatim difference. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Appendix

Table 9

List of Verbatim Processing Scenario Items Split by Risk Behavior and Risks and Benefits.

Verbatim Scenario Items			
Alcohol Scenario		Sex Scenario	
Risks	Benefits	Risks	Benefits
I don't like the way I act when I'm drunk	Getting drunk will make me more fun to be around	I don't want to rush into a sexual relationship with this person	If I use protection, the likelihood that I will get an STD is minimal
I don't want to make choices that I will later regret	Getting drunk is a great way to meet new potential sexual partners	I want to have unprotected sex; using protection ruins the moment	I don't want to regret a missed opportunity
I don't want to risk getting alcohol poisoning or going to the hospital for alcohol-related injuries	I want to forget my problems by getting drunk	I don't feel comfortable having sex with someone I barely know	All of my friends are having sex, so I should too
I want to have fun without getting drunk	I want to feel more confident by getting drunk	I don't know how many sexual partners this boy/girl has	I want to enjoy the moment and not worry about the consequences
I like to be in control over what I say and do	I want to relieve stress by getting drunk	I don't want others to find out that I had sex	I don't want to disappoint this boy/girl by saying no
I don't want to make a fool of myself by saying or doing something I would not normally say or do if I hadn't gotten drunk	I want to fit in with my peers by getting drunk	I could get pregnant or get my partner pregnant	Having sex with someone you don't know well means there are "no strings attached"
I don't want to risk getting in trouble with the police or campus officials	I want to celebrate by getting drunk	I don't want to have sex until I am in a monogamous relationship	If I use protection, the likelihood that I will get pregnant or get my partner pregnant is minimal
I don't want to feel sick or vomit from drinking too much	Getting drunk is a great way to meet new people	Even if I use protection, there is still a chance that I may get an STD	I want to have sex because it is fun
I don't want to have a hangover	Getting drunk is fun	I could get an STD	I don't want to look like a prude
		Even if I use birth control (the pill, condom, etc.), I could still get pregnant or get my partner pregnant	

Table 10

List of Gist Principle Items Split by Risk Behavior and Valence.

Gist Principle Items			
Alcohol		Sex	
Negative	Positive	Negative	Positive
It only takes ONCE to get alcohol poisoning and end up in the hospital	Better to have fun getting drunk now while you can	It only takes ONCE to get pregnant or get an STD from having sex	When in doubt about having sex, go for it
It only takes ONE time of drinking too much to die from alcohol poisoning	Partying and getting drunk is better than focusing on school	It only takes ONE time of unprotected sex when drunk to get an STD	Better to have fun (sex) while you can
	Better to drink and be social than be alone		Sometimes having sex is worth risking an STD
	Better to be drunk than face reality		Better to have sex than regret a missed opportunity
	Getting drunk is better than being bored		Better to enjoy sex in the moment than worry about the future consequences
	Driving with a buzz is a risk worth taking		Having a sexual relationship is better than not taking a risk
	More is better when it comes to alcohol		Sometimes having sex is worth risking pregnancy

Table 11

Linear Regression Analysis of Impulsivity Scales as Predictors of Negative Gist for Alcohol and Sex.

Predictor	**Negative Gist for Alcohol**		**Negative Gist for Sex**	
	Unstandardized Beta	**95% CI**	**Unstandardized Beta**	**95% CI**
Constant	5.79***	4.93, 6.66	5.13***	4.44, 5.82
Age	-0.08***	-0.12, -0.04	-0.03	-0.07, 0.00
Male	-0.15**	-0.27, -0.04	-0.23***	-0.32, -0.14
Black[a]	-0.04	-0.26, 0.19	0.04	-0.14, 0.22
Asian[a]	-0.25***	-0.37, -0.12	-0.20***	-0.30, -0.10
Other[a]	0.03	-0.17, 0.23	0.11	-0.05, 0.26
SS	-0.01	-0.06, 0.05	0.01	0.04, 0.12
UPP Impulsivity	-0.10***	-0.16, -0.04	-0.06*	-0.10, -0.01
Discounting	-0.03	-0.06, 0.00	-0.03*	-0.05, -0.00
R^2	0.06		0.07	
F	6.71		7.72	

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. SS=Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

Table 12

Linear Regression Analysis of Impulsivity Scales as Predictors of Verbatim Difference for Alcohol and Sex.

Predictor	Verbatim Difference for Alcohol		Verbatim Difference for Sex	
	Unstandardized Beta	**95% CI**	**Unstandardized Beta**	**95% CI**
Constant	-1.00***	-1.46, -0.54	-0.98***	-1.37, -0.59
Age	0.04***	0.02, 0.07	0.03***	0.01, 0.05
Male	0.09**	0.03, 0.15	0.40***	0.35, 0.45
Black[a]	-0.24***	-0.36, -0.12	-0.11*	-0.21, 0.00
Asian[a]	-0.20***	-0.27, -0.14	-0.15***	-0.21, -0.10
Other[a]	-0.17***	-0.28, -0.07	-0.08	-0.17, 0.01
SS	0.06***	0.03, 0.09	0.04***	0.02, 0.07
UPP Impulsivity	0.11***	0.08, 0.14	0.07***	0.04, 0.10
Discounting	0.01	0.00, 0.03	0.01	0.00, 0.03
R^2	0.15		0.27	
F	18.99		41.37	

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. SS=Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

Table 13

Linear Regression Analysis of Impulsivity Scales as Predictors of Verbatim Sum for Alcohol and Sex.

Predictor	Verbatim Sum for Alcohol		for Sex	
	Unstandardized Beta	95% CI	Unstandardized Beta	95% CI
Constant	1.26***	0.91, 1.61	1.27***	0.93, 1.60
Age	0.00	-0.02, 0.01	0.00	-0.02, 0.01
Male	0.03	-0.02, 0.08	-0.14***	-0.19, -0.10
Black[a]	-0.09*	-0.18, 0.00	-0.10*	-0.19, -0.01
Asian[a]	0.01	-0.04, 0.07	0.02	-0.03, 0.07
Other[a]	-0.03	-0.11, 0.05	-0.04	-0.11, 0.04
SS	0.01	-0.02, 0.03	0.02*	0.00, 0.04
UPP Impulsivity	0.02	-0.01, 0.04	0.03**	0.01, 0.06
Discounting	0.01	-0.01, 0.02	0.00	-0.01, 0.02
R^2	0.01		0.07	
F	1.31		8.25	

Note. Coefficients are standardized betas. [a]Reference group is Caucasian. SS=Sensation Seeking. *p<0.05, **p<0.01, ***p<0.001.

Figure 9a

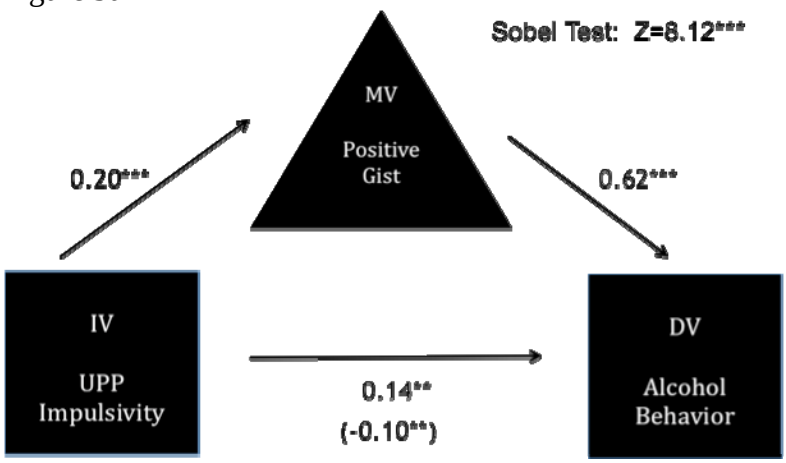
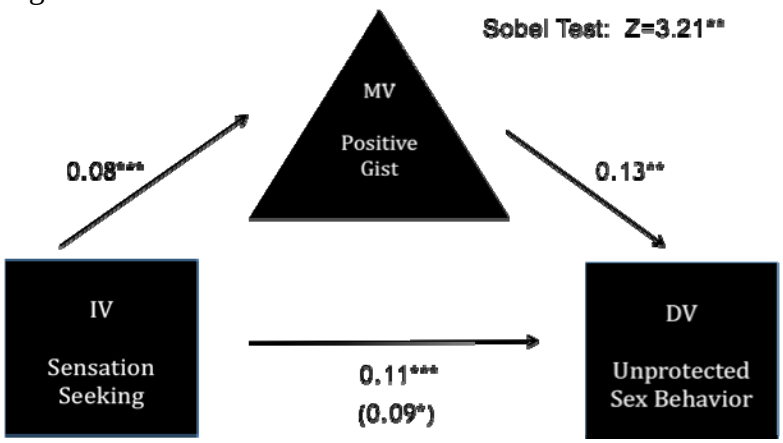


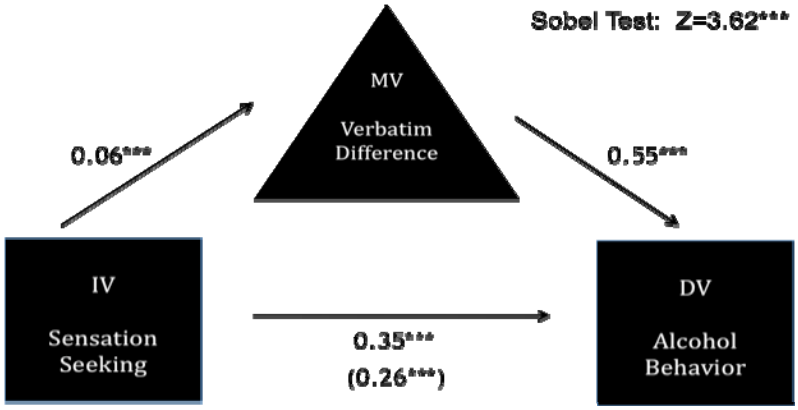
Figure 9b



Two separate mediation analyses of the mediating effect of positive gist on the relationship between impulsivity and alcohol and sex risk behavior controlling for demographics and the other impulsivity factors. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Figure 10a



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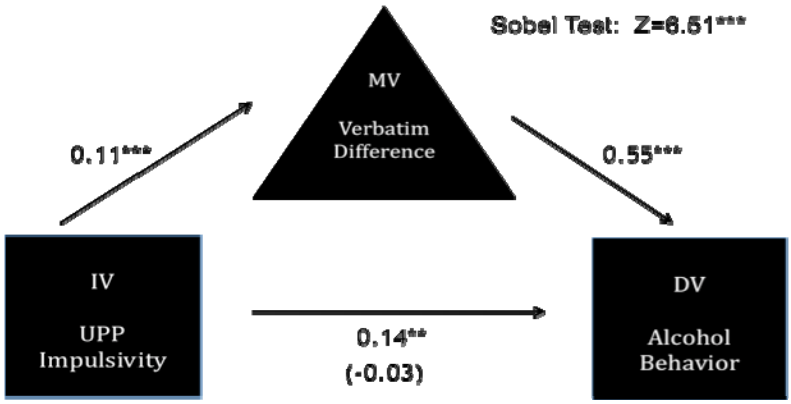
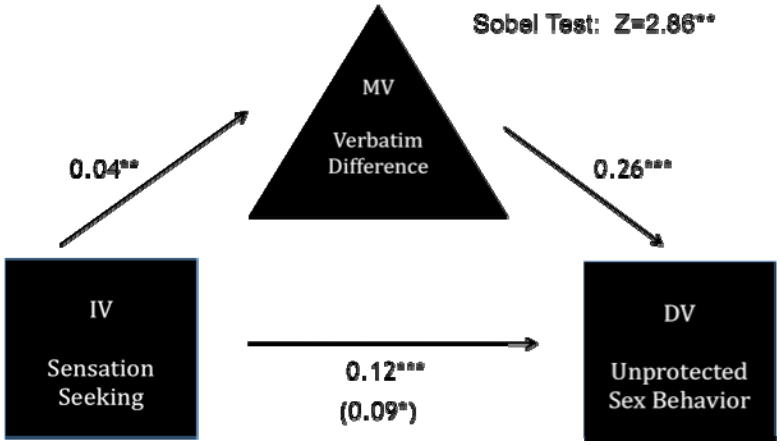


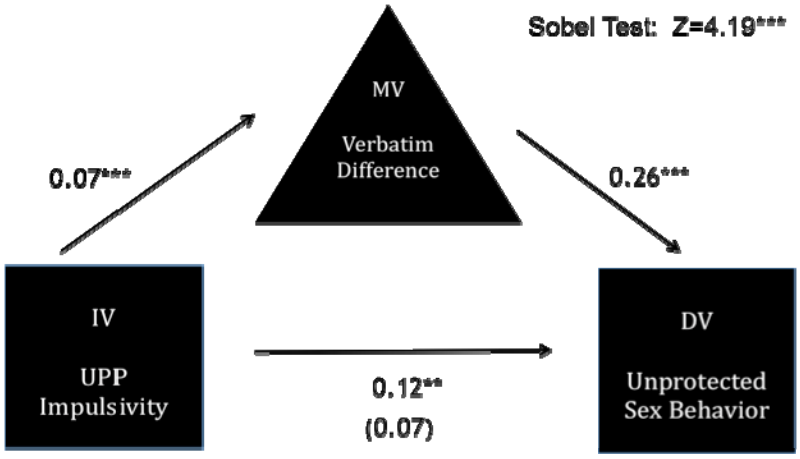
Two separate mediation analyses of the mediating effect of verbatim difference for alcohol on the relationship between impulsivity and alcohol risk behavior controlling for demographics and the other impulsivity factors. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Figure 11a



11b



Two separate mediation analyses of the mediating effect of verbatim difference for sex on the relationship between impulsivity and unprotected sex behavior controlling for demographics and the other impulsivity factors. The coefficients in parentheses are the values of the predictor after the mediator was entered into the model.

Note. *p<0.05, **p<0.01, ***p<0.001.

Decisions, Decisions Consent

You are invited to take part in an online research study about decision making. We are inviting you to take part because you signed up at the SUSAN web site for this study.

What the study is about: The purpose of this study is to learn about how people make decisions. You must be at least 18 years of age to complete this online study.

What we will ask you to do: If you agree to be in this study, we will ask you to answer some questions about how you make decisions about real life events. The study will take up to 30 minutes to complete.

Risks and benefits:
I do not anticipate any risks to you participating in this study other than those encountered in day-to-day life. You may find some of the questions to be sensitive, but you may skip any questions at any time.
There are no direct benefits to you other than contributing to a greater understanding of decision making.

Compensation: You will receive 1 extra credit point for participating in this online study.

Confidentiality: Since this study is completed over the internet, there is a chance that your responses could be read by a third party. However, this study is completely anonymous. Your name will not be recorded and cannot be linked to your online responses.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at any time.

If you have questions: The researchers conducting this study are Adrienne Romer and Dr. Valerie Reyna. If you have questions later, you may contact Adrienne Romer at alr239@cornell.edu. You can reach Dr. Reyna at vr53@cornell.edu. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) at 607-255-5138 or access their website at http://www.irb.cornell.edu. You may also report your concerns or complaints anonymously through Ethicspoint or by calling toll free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

Imagine it is a Friday night and you and your friends are going to a party to celebrate the end of exams. You are exhausted from all the cramming and hard work you have put into studying and really need to let loose and have a good time at the party. You know that there will be lots of alcohol available and that many people will be drinking. When considering whether to get drunk at the party, what factors might lead to your decision?

Check "yes" or "no" for whether you would consider each factor to be a part of your decision making. DO NOT check "yes" or "no" for what you think to be TRUE or FALSE, only what specifically applies to how you would make your decision.

Getting drunk is fun (yes/no)

I don't like the way I act when I'm drunk (yes/no)

I want to celebrate by getting drunk (yes/no)

I want to forget my problems by getting drunk (yes/no)

I don't want to make a fool of myself by saying or doing something I would not normally say or do if I hadn't gotten drunk (yes/no)

I want to feel more confident by getting drunk (yes/no)

I don't want to risk getting in trouble with the police or campus officials (yes/no)

I don't want to have a hangover (yes/no)

Getting drunk will make me more fun to be around (yes/no)

Getting drunk is a great way to meet new people (yes/no)

I want to have fun without getting drunk (yes/no)

I don't want to make choices I will regret later (yes/no)

I want to fit in with my peers by getting drunk (yes/no)

I want to relieve stress by getting drunk (yes/no)

I don't want to feel sick or vomit from drinking too much (yes/no)

Getting drunk is a great way to meet potential sexual partners (yes/no)

I like to be in control over what I say and do (yes/no)

I don't want to risk getting alcohol poisoning or going to the hospital for alcohol-related injuries (yes/no)

Then imagine during this party you meet a boy/girl that you have never met before. You two are really having a good time together at the party. Then the boy/girl asks you if you would like to leave the party and come back to his/her room. You agree and once back in his/her room you think that you two may have sex. When considering whether to have sex with this boy/girl, what factors might lead to your decision?

Check "yes" or "no" for whether you would consider each factor to be a part of your decision-making. DO NOT check "yes" or "no" for what you think to be TRUE or FALSE, only what specifically applies to how you would make your decision.

I could get an STD (yes/no)

I could get pregnant or get my partner pregnant (yes/no)

I want to have sex because it is fun (yes/no)

I don't know how many sexual partners this boy/girl has (yes/no)

I want to enjoy the moment and not worry about the consequences (yes/no)

I don't feel comfortable having sex with someone I barely know (yes/no)

I don't want to regret a missed opportunity (yes/no)

I don't want to rush into a sexual relationship with this person (yes/no)

All of my friends are having sex, so I should too (yes/no)

If I use protection, the likelihood that I will get an STD is minimal (yes/no)

If I use protection, the likelihood that I will get pregnant or get my partner pregnant is minimal (yes/no)

I don't want to have sex until I am married (yes/no)

I don't want to have sex until I am in a monogamous relationship (yes/no)

I don't want to look like a prude (yes/no)

Even if I use protection, there is still a chance that I may get an STD (yes/no)

Even if I use birth control (the pill, condom, etc.), I could still get pregnant or get my partner pregnant (yes/no)

I want to have unprotected sex; using protection ruins the moment (yes/no)

I don't want others to find out that I had sex (yes/no)

I don't want to disappoint this boy/girl by saying no (yes/no)

Having sex with someone you don't know well means there are "no strings attached" (yes/no)

What do you think?

Here are several statements. There are no right or wrong answers. We want to know what you think. Please mark whether you agree or disagree with each statement. The choices are strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Avoid all risk					
Taking risks makes life worth living					
Better to be safe than sorry					
Better to take risks than be bored					
Don't avoid risk; go for it					
No risk is better than some risk					
Less risk is better than more risk					
Better to do what feels good now than worry all the time about the future					
The amount of risk does not matter if the outcome if really bad					
Better to take risks than do nothing					

What do you think?

Here are several statements about alcohol. There are no right or wrong answers. We want to know what you think. Please mark whether you agree or disagree with each statement. The choices are strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Better to be safe than sorry by not drinking alcohol					
Partying and getting drunk is better than focusing on school					
Getting drunk is better than being bored					
Driving after drinking is never a good idea					
It only takes ONE time of drinking too much to die from alcohol poisoning					
Better to have fun getting drunk now while you can					
Better to drink and be social than be alone					
More is better when it comes to alcohol					
Better to not regret things that I have said or done from drinking alcohol					
Driving with a buzz is a risk worth taking					
Better to be drunk than face reality					
It only takes ONCE to get alcohol poisoning and end up in the hospital					
Better to not hurt my friends and relationships from drinking alcohol					

What do you think?

Here are several statements about sex. There are no right or wrong answers. We want to know what you think. Please mark whether you agree or disagree with each statement. The choices are strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Having sex is taking a calculated risk					
Better to have fun (sex) while you can					
It only takes ONCE to get pregnant or get an STD from having sex					
Sometimes having sex is worth risking pregnancy					
Better to have sex than regret a missed opportunity					
Better to wait to have sex if you are not ready					
Better to enjoy sex in the moment than worry about the future consequences					
When in doubt about having sex, go for it					
More partners mean more risk					
It only takes ONE time of unprotected sex when drunk to get an STD					
Having a sexual relationship is better than not taking a risk					
Sometimes having sex is worth risking an STD					
Better to not have sex than risk getting pregnant or getting someone else pregnant					

ARQ

Below are a list of behaviors which some people engage in. Please mark your level of experience with each behavior. The choices are never done, hardly ever done, done sometimes, done often, and done very often.

	Never Done	**Hardly Ever Done**	**Done Sometimes**	**Done Often**	**Done Very Often**
Smoking (tobacco)					
Roller blading					
Drinking and driving					
Parachuting					
Speeding					
Stealing cars and going for joy rides					
Tae Kwon Do fighting					
Underage drinking					
Staying out late					
Driving without a license					
Talking to strangers					
Flying in a plane					
Cheating					
Getting drunk					
Sniffing gas or glue					
Having unprotected sex					
Leaving school					
Teasing and picking on people					
Snow skiing					
Taking drugs (including marijuana)					
Overeating					
Entering a competition					

You will be asked to make a series of decisions about hypothetical monetary alternatives. One monetary choice will be available immediately (now), while the other monetary alternative will be available after a certain time delay. Please keep in mind, that there are no "correct" answers. We are only interested in which option you would prefer. Please answer every question as truthfully as possible.

What would you prefer?
- $54 now
- $75, 117 days from now

What would you prefer?
- $55 now
- $75, 61 days from now

What would you prefer?
- $19 now
- $25, 53 days from now

What would you prefer?
- $31 now
- $85, 7 days from now

What would you prefer?
- $14 now
- $25, 19 days from now

What would you prefer?
- $47 now
- $50, 160 days from now

What would you prefer?
- $15 now
- $35, 13 days from now

What would you prefer?
- $25 now
- $60, 14 days from now

What would you prefer?
- $78 now
- $80, 162 days from now

What would you prefer?
- $40 now
- $55, 62 days from now

What would you prefer?
- $11 now
- $30, 7 days from now

What would you prefer?
- $67 now
- $75, 119 days from now

What would you prefer?
- $34 now
- $35, 186 days from now

What would you prefer?
- $27 now
- $50, 21 days from now

What would you prefer?
- $69 now
- $85, 91 days from now

What would you prefer?
- $49 now
- $60, 89 days from now

What would you prefer?
- $80 now
- $85, 157 days from now

What would you prefer?
- $24 now
- $35, 29 days from now

What would you prefer?
- $33 now
- $80, 14 days from now

What would you prefer?
- $28 now
- $30, 179 days from now

What would you prefer?
- $34 now
- $50, 30 days from now

What would you prefer?
- $25 now
- $30, 80 days from now

What would you prefer?
- $41 now
- $75, 20 days from now

What would you prefer?
- $54 now
- $60, 111 days from now

What would you prefer?
- $54 now
- $80, 30 days from now

What would you prefer?
- $22 now
- $25, 136 days from now

What would you prefer?
- $20 now
- $55, 7 days from now

UPPS

After each statement, please select which response best reflects your opinion by selecting one of the following options: strongly disagree, disagree, neither agree nor disagree, agree or strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I have a reserved and cautious attitude					
I have trouble controlling my impulses					
I generally like to see things through to the end					
My thinking is usually careful and purposeful					
I have trouble resisting my cravings (for food, cigarettes,etc)					
I tend to give up easily					
I am not one of those people who blurt out things without thinking					
I often get involved in things I later wish I could get out of					
Unfinished tasks really bother me					
I like to stop and think things over before I do them					
When I feel bad, I will often do things I later regret in order to make myself feel better now					
Once I get going on something, I hate to stop					
I don’t like to start a project unitl I know exactly how to proceed					
Sometimes when I feel bad, I can’t seem to stop what I am doing even though it makes me feel worse					
I concentrate easily					
I tend to value and follow a rational, “sensible” approach to things					
When I am upset, I often act without thinking					
I finish what I start					

I usually make up my mind through careful reasoning

When I feel rejected, I will often say things I later regret

I'm pretty good about pacing myself so as to get things done on time

I am a cautious person

It is hard for me to resist acting on my feelings

I am a productive person who always gets the job done

Before I get into a new situation I like to find out what to expect from it

I often make matters worse because I act without thinking when I am upset

Once I start a project, I almost always finish it

I usually think carefully before doing anything

In the heat of an argument, I will often say things that I later regret

There are so many little jobs that need to be done that I sometimes just ignore them all

Before making up my mind, I consider all the advantages and disadvantages

I am always able to keep my feelings under control

Sometimes I do things on impulse that I later regret

BSSS

After each statement, please select which response best reflects your opinion by selecting one of the following options: strongly disagree, disagree, neither agree nor disagree, agree or strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					
I would love to have new and exciting experiences, even if they are illegal					

BIS/BAS

After each statement, please select which response best reflects your opinion by selecting one of the following options: strongly disagree, disagree, neither agree nor disagree, agree or strongly agree.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Even if something bad is about to happen to me, I rarely experience fear or nervousness					
I go out of my way to get things I want					
When I'm doing well at something, I love to keep at it					
I'm always willing to try something new if I think it will be fun					
When I get something I want, I feel excited and energized					
Criticism or scolding hurts me quite a bit					
When I want something, I usually go all-out to get it					
I will often do things for no other reason than that they might be fun					
If I see a chance to get something I want, I move on it right away					
I feel pretty worried or upset when I think or know somebody is angry at me					
When I see an opportunity for something I like, I get excited right away					
I often act on the spur of the moment					
If I think something unpleasant is going to happen, I usually get pretty "worked up"					
When good things happen to me, it affects me strongly					
I feel worried when I think I have done poorly at something					
I crave excitement and new sensations					
When I go after something, I use a no "no holds barred" approach					

I have very few fears compared to my friends

It would excite me to wine a contest

I worry about making mistakes

About You

Are you male or females?
- Male
- Female

Select the group that best describes you:
- Caucasian/White
- African-American or Black
- Mexican-American or Chicano
- Central-American or South-American or Puerto Rican or Cuban
- Asian-American or Asian
- Native American or Alaska Native
- Native Hawaiian or Other Pacific Islander
- Biracial or Multiracial
- Other (please fill in):

How old are you?

What kinds of grades do you usually get in school?
- A's
- B's
- C's
- D's
- F's

What is the highest level of education you father completed in school?
- He completed less than 12th grade (less than high school)
- He graduated from high school (has his GED)
- He completed some college (associate's degree)
- He graduated from a 4-year college (bachelor's degree)
- He attended some post-graduate institution

What is the highest level of education your mother completed in school?
- She completed less than 12th grade (less than high school)
- She graduated from high school (has his GED)
- She completed some college (associate's degree)
- She graduated from a 4-year college (bachelor's degree)
- She attended some post-graduate institution

What is your religious affiliation?
- Catholic
- Protestant (Methodist, Lutheran, Baptist, etc.)
- Jewish
- Buddhist
- Hindu
- Atheist/Agnostic (no religion)
- Other (please fill in):

Varimax Rotated Principal Axis Factor Analysis of All Items.

Rotated Factor Matrix-UPPS

	Factor						
	1	2	3	4	5	6	7
I have a reserved and cautious attitude							.653
I have trouble controlling my impulses							
I generally like to see things through to the end			.658				
My thinking is usually careful and purposeful		.588					
I have trouble resisting my cravings (for food, cigarettes, etc.)							
I tend to give up easily			-.457				
I am not one of those people who blurt out things without thinking							
I often get involved in things I later wish I could get out of							
Unfinished tasks really bother me			.628				
I like to stop and think things over before I do them		.622					
When I feel bad, I will often do things I later regret in order to make myself feel better now						.596	
Once I get going on something, I hate to stop			.562				
I don't like to start a project until I know exactly how to proceed		.462					
Sometimes when I feel bad, I can't seem to stop what I am doing even though it makes me feel worse						.485	

I concentrate easily				.607		
I tend to value and follow a rational, "sensible" approach to things		.521				
When I am upset, I often act without thinking	.667					
I finish what I start			.777			
I usually make up my mind through careful reasoning		.640				
When I feel rejected, I will often say things that I later regret	.689					
I'm pretty good about pacing myself so as to get things done on time				.590		
I am a cautious person		.443				.531
It is hard for me to resist acting on my feelings	.557					
I am a productive person who always gets the job done			.490	.492		
Before I get into a new situation I like to find out what to expect from it		.499				
I often make matters worse because I act without thinking when I am upset	.703					
Once I start a project, I almost always finish it			.697			
I usually think carefully before doing anything		.730				
In the heat of an argument, I will often say things that I later regret	.682					
There are so many little jobs that need to be done that I sometimes just ignore them all			-.421			

Before making up my mind, I consider all the advantages and disadvantages		.637					
I am always able to keep my feelings under control	-.481						
Sometimes I do things on impulse that I later regret	.601						
I would like to explore strange places				.636			
I get restless when I spend too much time at home							
I like to do frightening things				.658			
I like wild parties				.471			
I would like to take off on a trip with no pre-planned routes or timetables				.606			
I prefer friends who are excitingly unpredictable				.648			
I would like to try bungee jumping				.503			
I would love to have new and exciting experiences, even if they are illegal				.569			

Rotated Factor Matrix-BIS/BAS

	Factor			
	1	2	3	4
Even if something bad is about to happen to me, I rarely experience fear or nervousness	-.548			
I go out of my way to get things I want				.670
When I'm doing well at something, I love to keep at it		.693		

I'm always willing to try something new if I think it will be fun		.498	.405	
When I get something I want, I feel excited and energized		.672		
Criticism or scolding hurts me quite a bit	.575			
When I want something, I usually go all-out to get it				.739
I will often do things for no other reason than that they might be fun			.601	
If I see a chance to get something I want, I move on it right away				.580
I feel pretty worried or upset when I think or know somebody is angry at me	.597			
When I see an opportunity for something I like, I get excited right away		.409		
I often act on the spur of the moment			.596	
If I think something unpleasant is going to happen, I usually get pretty "worked up"	.666			
When good things happen to me, it affects me strongly		.440		
I feel worried when I think I have done poorly at something	.553			
I crave excitement and new sensations			.614	
When I go after something, I use a "no holds barred" approach			.452	.437
I have very few fears compared to my friends	-.437			

It would excite me to win a contest		.531		
I worry about making mistakes	.620			

Rotated Factor Matrix-Alchol Scenarios (Risks and Benefits)

	Factor			
	1	2	3	4
Getting drunk is fun			.498	
I don't like the way I act when I?m drunk			-.536	
I want to celebrate by getting drunk			.558	
I want to forget my problems by getting drunk				.499
I don't want to make a fool of myself by saying or doing something I would not normally say or do if...	.479			
I want to feel more confident by getting drunk		.567		
I don't want to risk getting in trouble with the police or campus officials	.594			
I don't want to have a hangover	.526			
Getting drunk will make me more fun to be around		.658		
Getting drunk is a great way to meet new people		.544		
I want to have fun without getting drunk				
I don't want to make choices I will regret later	.705			
I want to fit in with my peers by getting drunk				

I want to relieve stress by getting drunk				.680
I don't want to feel sick or vomit from drinking too much	.649			
Getting drunk is a great way to meet potential sexual partners				
I like to be in control over what I say and do	.542			
I don't want to risk getting alcohol poisoning or going to the hospital for alcohol-related injuries...	.708			

Rotated Factor Matrix-Sex Scenarios (Risks and Benefits)

	Factor					
	1	2	3	4	5	6
I could get an STD			.442			
I could get pregnant or get my partner pregnant						.777
I want to have sex because it is fun					-.408	
I don't know how many sexual partners this boy/girl has						
I want to enjoy the moment and not worry about the consequences						
I don't feel comfortable having sex with someone I barely know	.702					
I don't want to regret a missed opportunity				.428		
I don't want to rush into a sexual relationship with this person	.791					
All of my friends are having sex, so I should too				.536		
If I use protection, the likelihood that I will get an STD is minimal		.774				

If I use protection, the likelihood that I will get pregnant or get my partner pregnant is minimal		.883				
I don't want to have sex until I am married					.532	
I don't want to have sex until I am in a monogamous relationship	.502				.424	
I don't want to look like a prude				.487		
Even if I use protection, there is still a chance that I may get an STD			.948			
Even if I use birth control (the pill, condom, etc.), I could still get pregnant or get my partner p...			.580			
I want to have unprotected sex; using protection ruins the moment						
I don't want others to find out that I had sex						
I don't want to disappoint this boy/girl by saying no				.558		
Having sex with someone you don?t know well means there are "no strings attached"						

Rotated Factor Matrix-Alcohol Gist Statements (Positive and Negative)

	Factor		
	1	2	3
Better to be safe than sorry by not drinking alcohol	-.666		
Partying and getting drunk is better than focusing on school	.467		.405
Getting drunk is better than being bored	.780		

Driving after drinking is never a good idea			-.466
It only takes ONE time of drinking too much to die from alcohol poisoning		.810	
Better to have fun getting drunk now while you can	.820		
Better to drink and be social than be alone	.757		
More is better when it comes to alcohol	.571		
Better to not regret things that I have said or done from drinking alcohol			
Driving with a buzz is a risk worth taking			.529
Better to be drunk than face reality			.496
It only takes ONCE to get alcohol poisoning and end up in the hospital		.839	
Better to not hurt my friends and relationships from drinking alcohol	-.413		

Rotated Factor Matrix-Sex Gist Statements (Positive and Negative)

	Factor		
	1	2	3
Having sex is taking a calculated risk			
Better to have fun (sex) while you can	.689		
It only takes ONCE to get pregnant or get an STD from having sex		.801	
Sometimes having sex is worth risking pregnancy			.620

Better to have sex than regret a missed opportunity	.750		
Better to wait to have sex if you are not ready	-.440	.408	
Better to enjoy sex in the moment than worry about the future consequences	.645		
When in doubt about having sex, go for it	.673		
More partners mean more risk		.467	
It only takes ONE time of unprotected sex when drunk to get an STD		.846	
Having a sexual relationship is better than not taking a risk	.619		
Sometimes having sex is worth risking an STD			.731
Better to not have sex than risk getting pregnant or getting someone else pregnant			-.475

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
age_r	910	18.00	25.00	19.6516	1.18413
Are you male or female?	927	0	1	.28	.449
Select the one group that best describes you:	925	1	9	2.64	2.366
positive gist for alcohol	928	1.00	4.33	2.2412	.64000
negative gist for alcohol	928	1.00	5.00	4.2888	.80392
positive gist for sex	928	1.00	4.33	2.0589	.66872
negative gist for sex	928	1.00	5.00	4.4962	.65379
AlcVerbatimS	925	.00	2.00	1.1700	.31500
AlcVerbatimD	925	-1.00	1.00	-.2634	.43920
SexVerbatimS	927	.10	2.00	1.1331	.31238
SexVerbatimD	923	-1.00	1.00	-.3330	.40617
composite of all SS items	923	1.00	5.00	3.2279	.71792
Urgency	927	1.00	4.75	2.7439	.63903
Premeditation	927	1.09	5.00	3.6705	.55462
Perseverance	927	1.50	5.00	3.6286	.57490
BIS	924	1.14	5.00	3.7898	.60211
BAS_Reward	924	2.20	5.00	4.1007	.46487
BAS_Drive	924	1.00	5.00	3.2896	.66212
BAS_Fun	924	1.25	5.00	3.4249	.64737
ave_Kirby	928	-8.60	-1.39	-5.1210	1.68969
underage drinking and getting drunk	928	1.00	5.00	3.2909	1.27478
ARQ_sex	928	.00	1.00	.3556	.47895
ARQ_total	928	1.00	3.55	2.2253	.38828
Valid N (listwise)	892				

Are you male or female?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	668	71.9	72.1	72.1
	Male	259	27.9	27.9	100.0
	Total	927	99.8	100.0	
Missing	-99	2	.2		
Total		929	100.0		

Select the one group that best describes you:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasian/White	555	59.7	60.0	60.0
	African-American or Black	54	5.8	5.8	65.8
	Mexican-American or Chicano	7	.8	.8	66.6
	Central-American or South-American or Puerto Rican or Cuban	29	3.1	3.1	69.7
	Asian-American or Asian	210	22.6	22.7	92.4
	Native American or Alaska Native	3	.3	.3	92.8
	Native Hawaiian or Other Pacific Islander	3	.3	.3	93.1
	Other (please fill in:)	21	2.3	2.3	95.4
	Biracial or Multiracial	43	4.6	4.6	100.0
	Total	925	99.6	100.0	
Missing	-99	4	.4		
Total		929	100.0		

age_r

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18.00	167	18.0	18.4	18.4
	19.00	262	28.2	28.8	47.1
	20.00	262	28.2	28.8	75.9
	21.00	177	19.1	19.5	95.4
	22.00	31	3.3	3.4	98.8
	23.00	7	.8	.8	99.6
	24.00	1	.1	.1	99.7
	25.00	3	.3	.3	100.0
	Total	910	98.0	100.0	
Missing	-99.00	10	1.1		
	System	9	1.0		
	Total	19	2.0		
Total		929	100.0		

Varimax Rotated Principal Axis Factor Analysis for All Scales.

Rotated Factor Matrix[a]

	Factor					
	1	2	3	4	5	6
Alc_Gist_Pos	.738					
Alc_Gist_Neg				.630		
Sex_Gist_Pos	.660					
Sex_Gist_Neg				.739		
verbatim_sum						.573
verbatim_diff	.718					
Sverbatim_sum						.567
Sverbatim_diff	.722					
composite of all SS items		.578				
premeditation composite			.673			
urgency composite			-.603			
perseverance composite			.683			
BISBAS_BIS					.730	
BISBAS_Reward		.460			.416	
BISBAS_Drive		.794				
BISBAS_Fun		.600				
ave_Kirby						

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Regression Analyses

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.450[a]	.202	.195	1.14566

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	295.086	8	36.886	28.103	.000[a]
	Residual	1162.904	886	1.313		
	Total	1457.990	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: underage drinking and getting drunk

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.871	.656		2.850	.004
	age_r	.112	.032	.104	3.440	.001
	male	.021	.086	.007	.240	.810
	black	-.860	.169	-.156	-5.078	.000
	asian	-.786	.095	-.257	-8.294	.000
	other	-.660	.148	-.137	-4.460	.000
	REGR factor 1_SS	.359	.042	.258	8.490	.000
	REGR factor 3_UPPImpulse	.138	.045	.094	3.054	.002
	ave_Kirby	.098	.023	.129	4.193	.000

a. Dependent Variable: underage drinking and getting drunk

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.708[a]	.501	.496	.90688

a. Predictors: (Constant), negative gist for alcohol, black, REGR factor 1_SS, other, male, age_r, REGR factor 3_UPPImpulse, ave_Kirby, asian, positive gist for alcohol

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	730.960	10	73.096	88.878	.000[a]
	Residual	727.030	884	.822		
	Total	1457.990	894			

a. Predictors: (Constant), negative gist for alcohol, black, REGR factor 1_SS, other, male, age_r, REGR factor 3_UPPImpulse, ave_Kirby, asian, positive gist for alcohol

b. Dependent Variable: underage drinking and getting drunk

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.378	.584		-.648	.517
	age_r	.049	.026	.046	1.897	.058
	male	-.206	.069	-.072	-2.991	.003
	black	-.489	.135	-.089	-3.622	.000
	asian	-.555	.077	-.182	-7.246	.000
	other	-.378	.118	-.078	-3.208	.001
	REGR factor 1_SS	.185	.034	.133	5.393	.000
	REGR factor 3_UPPImpulse	-.100	.037	-.068	-2.689	.007
	ave_Kirby	.041	.019	.054	2.172	.030
	positive gist for alcohol	1.240	.055	.624	22.717	.000
	negative gist for alcohol	.087	.041	.054	2.132	.033

a. Dependent Variable: underage drinking and getting drunk

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.742[a]	.551	.545	.86140

a. Predictors: (Constant), AlcVerbatimD, AlcVerbatimS, ave_Kirby, other, age_r, male, REGR factor 1_SS, black, negative gist for alcohol, REGR factor 3_UPPImpulse, asian, positive gist for alcohol

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	803.534	12	66.961	90.243	.000[a]
	Residual	654.456	882	.742		
	Total	1457.990	894			

a. Predictors: (Constant), AlcVerbatimD, AlcVerbatimS, ave_Kirby, other, age_r, male, REGR factor 1_SS, black, negative gist for alcohol, REGR factor 3_UPPImpulse, asian, positive gist for alcohol

b. Dependent Variable: underage drinking and getting drunk

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.990	.576		1.721	.086
	age_r	.032	.025	.030	1.306	.192
	male	-.217	.065	-.076	-3.312	.001
	black	-.389	.129	-.071	-3.019	.003
	asian	-.441	.074	-.145	-5.984	.000
	other	-.310	.112	-.064	-2.767	.006
	REGR factor 1_SS	.185	.033	.133	5.673	.000
	REGR factor 3_UPPImpulse	-.124	.035	-.084	-3.487	.001
	ave_Kirby	.048	.018	.063	2.684	.007
	positive gist for alcohol	.869	.065	.437	13.287	.000
	negative gist for alcohol	.082	.039	.051	2.084	.037
	AlcVerbatimS	.046	.096	.011	.476	.634
	AlcVerbatimD	.872	.088	.300	9.879	.000

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.990	.576		1.721	.086
	age_r	.032	.025	.030	1.306	.192
	male	-.217	.065	-.076	-3.312	.001
	black	-.389	.129	-.071	-3.019	.003
	asian	-.441	.074	-.145	-5.984	.000
	other	-.310	.112	-.064	-2.767	.006
	REGR factor 1_SS	.185	.033	.133	5.673	.000
	REGR factor 3_UPPImpulse	-.124	.035	-.084	-3.487	.001
	ave_Kirby	.048	.018	.063	2.684	.007
	positive gist for alcohol	.869	.065	.437	13.287	.000
	negative gist for alcohol	.082	.039	.051	2.084	.037
	AlcVerbatimS	.046	.096	.011	.476	.634
	AlcVerbatimD	.872	.088	.300	9.879	.000

a. Dependent Variable: underage drinking and getting drunk

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.286[a]	.082	.073	.944

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.182	8	8.773	9.851	.000[a]
	Residual	789.013	886	.891		
	Total	859.196	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: Having unprotected sex

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.515	.541		-2.803	.005
	age_r	.166	.027	.201	6.191	.000
	male	.094	.071	.043	1.328	.184
	black	.010	.140	.002	.074	.941
	asian	-.228	.078	-.097	-2.925	.004
	other	.040	.122	.011	.331	.741
	REGR factor 1_SS	.136	.035	.127	3.896	.000
	REGR factor 3_UPPImpulse	.113	.037	.100	3.027	.003
	ave_Kirby	.024	.019	.042	1.253	.210

a. Dependent Variable: Having unprotected sex

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.353[a]	.124	.114	.923

a. Predictors: (Constant), negative gist for sex, black, REGR factor 1_SS, other, age_r, REGR factor 3_UPPImpulse, male, ave_Kirby, asian, positive gist for sex

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	106.804	10	10.680	12.549	.000[a]
	Residual	752.392	884	.851		
	Total	859.196	894			

a. Predictors: (Constant), negative gist for sex, black, REGR factor 1_SS, other, age_r, REGR factor 3_UPPImpulse, male, ave_Kirby, asian, positive gist for sex

b. Dependent Variable: Having unprotected sex

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.350	.614		-3.824	.000
	age_r	.152	.026	.184	5.796	.000
	male	-.136	.078	-.062	-1.743	.082
	black	.070	.137	.017	.515	.607
	asian	-.166	.078	-.071	-2.137	.033
	other	.083	.119	.022	.694	.488
	REGR factor 1_SS	.105	.034	.099	3.056	.002
	REGR factor 3_UPPImpulse	.065	.037	.057	1.748	.081
	ave_Kirby	.018	.019	.031	.946	.344
	positive gist for sex	.376	.058	.256	6.448	.000
	negative gist for sex	.074	.055	.048	1.365	.173

a. Dependent Variable: Having unprotected sex

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.376[a]	.141	.130	.915

a. Predictors: (Constant), SexVerbatimD, black, other, age_r, REGR factor 3_UPPImpulse, REGR factor 1_SS, ave_Kirby, negative gist for sex, asian, SexVerbatimS, male, positive gist for sex

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.334	12	10.111	12.086	.000[a]
	Residual	737.862	882	.837		
	Total	859.196	894			

a. Predictors: (Constant), SexVerbatimD, black, other, age_r, REGR factor 3_UPPImpulse, REGR factor 1_SS, ave_Kirby, negative gist for sex, asian, SexVerbatimS, male, positive gist for sex

b. Dependent Variable: Having unprotected sex

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.580	.638		-2.478	.013
	age_r	.144	.026	.175	5.521	.000
	male	-.219	.080	-.100	-2.748	.006
	black	.079	.136	.019	.579	.563
	asian	-.122	.078	-.052	-1.563	.118
	other	.093	.119	.025	.784	.433
	REGR factor 1_SS	.102	.034	.095	2.971	.003
	REGR factor 3_UPPImpulse	.060	.037	.053	1.619	.106
	ave_Kirby	.016	.019	.027	.852	.394
	positive gist for sex	.223	.070	.152	3.187	.001
	negative gist for sex	.064	.054	.042	1.187	.235
	SexVerbatimS	-.100	.106	-.031	-.942	.346
	SexVerbatimD	.415	.111	.172	3.740	.000

a. Dependent Variable: Having unprotected sex

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.448[a]	.200	.193	.57675

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.802	8	9.225	27.733	.000[a]
	Residual	294.720	886	.333		
	Total	368.522	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: positive gist for alcohol

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.407	.330		4.257	.000
	age_r	.056	.016	.103	3.414	.001
	male	.194	.043	.135	4.475	.000
	black	-.296	.085	-.107	-3.475	.001
	asian	-.169	.048	-.110	-3.541	.000
	other	-.230	.074	-.095	-3.082	.002
	REGR factor 1_SS	.141	.021	.201	6.612	.000
	REGR factor 3_UPPImpulse	.199	.023	.269	8.749	.000
	ave_Kirby	.048	.012	.127	4.104	.000

a. Dependent Variable: positive gist for alcohol

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511[a]	.261	.254	.57602

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103.799	8	12.975	39.105	.000[a]
	Residual	293.970	886	.332		
	Total	397.770	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: positive gist for sex

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	1.205	.330		3.652	.000
	age_r	.042	.016	.075	2.587	.010
	male	.656	.043	.441	15.171	.000
	black	-.167	.085	-.058	-1.964	.050
	asian	-.126	.048	-.079	-2.651	.008
	other	-.134	.074	-.053	-1.800	.072
	REGR factor 1_SS	.080	.021	.110	3.757	.000
	REGR factor 3_UPPImpulse	.138	.023	.180	6.086	.000
	ave_Kirby	.022	.012	.055	1.857	.064

a. Dependent Variable: positive gist for sex

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.383[a]	.146	.139	.40811

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.298	8	3.162	18.986	.000[a]
	Residual	147.567	886	.167		
	Total	172.865	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: AlcVerbatimD

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.000	.234		-4.279	.000
	age_r	.043	.012	.116	3.708	.000

	male	.092	.031	.094	3.010	.003
	black	-.237	.060	-.125	-3.922	.000
	asian	-.204	.034	-.194	-6.056	.000
	other	-.174	.053	-.105	-3.295	.001
	REGR factor 1_SS	.060	.015	.124	3.953	.000
	REGR factor 3_UPPImpulse	.110	.016	.217	6.848	.000
	ave_Kirby	.012	.008	.046	1.429	.153

a. Dependent Variable: AlcVerbatimD

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.521[a]	.272	.265	.34825

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.136	8	5.017	41.368	.000[a]
	Residual	107.454	886	.121		
	Total	147.590	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: SexVerbatimD

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.983	.200		-4.926	.000
	age_r	.033	.010	.097	3.353	.001
	male	.403	.026	.445	15.406	.000
	black	-.105	.051	-.060	-2.038	.042
	asian	-.153	.029	-.157	-5.298	.000

	other	-.080	.045	-.052	-1.771	.077
	REGR factor 1_SS	.043	.013	.097	3.337	.001
	REGR factor 3_UPPImpulse	.069	.014	.147	5.016	.000
	ave_Kirby	.013	.007	.053	1.786	.074

a. Dependent Variable: SexVerbatimD

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.239[a]	.057	.049	.77127

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.940	8	3.992	6.712	.000[a]
	Residual	527.050	886	.595		
	Total	558.990	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: negative gist for alcohol

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.793	.442		13.111	.000
	age_r	-.078	.022	-.118	-3.586	.000
	male	-.154	.058	-.087	-2.662	.008
	black	-.038	.114	-.011	-.334	.738
	asian	-.248	.064	-.131	-3.891	.000
	other	.030	.100	.010	.300	.764
	REGR factor 1_SS	-.008	.028	-.009	-.278	.781
	REGR factor 3_UPPImpulse	-.098	.030	-.107	-3.216	.001

	ave_Kirby	-.028	.016	-.060	-1.798	.072

a. Dependent Variable: negative gist for alcohol

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.255[a]	.065	.057	.61584

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.418	8	2.927	7.718	.000[a]
	Residual	336.027	886	.379		
	Total	359.445	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: negative gist for sex

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.129	.353		14.538	.000
	age_r	-.033	.017	-.063	-1.913	.056
	male	-.226	.046	-.160	-4.895	.000
	black	.037	.091	.013	.404	.687
	asian	-.196	.051	-.129	-3.846	.000
	other	.105	.080	.044	1.320	.187
	REGR factor 1_SS	.008	.023	.011	.340	.734
	REGR factor 3_UPPImpulse	-.057	.024	-.078	-2.340	.020
	ave_Kirby	-.026	.013	-.069	-2.066	.039

a. Dependent Variable: negative gist for sex

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.108[a]	.012	.003	.31222

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.021	8	.128	1.310	.235[a]
	Residual	86.370	886	.097		
	Total	87.391	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: AlcVerbatimS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.262	.179		7.053	.000
	age_r	-.003	.009	-.013	-.376	.707
	male	.031	.023	.044	1.302	.193
	black	-.092	.046	-.068	-1.987	.047
	asian	.014	.026	.019	.547	.585
	other	-.026	.040	-.022	-.650	.516
	REGR factor 1_SS	.007	.012	.020	.580	.562
	REGR factor 3_UPPImpulse	.016	.012	.044	1.284	.200
	ave_Kirby	.006	.006	.035	1.006	.315

a. Dependent Variable: AlcVerbatimS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	.061	.29907

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	.061	.29907

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.904	8	.738	8.251	.000[a]
	Residual	79.247	886	.089		
	Total	85.151	894			

a. Predictors: (Constant), ave_Kirby, REGR factor 1_SS, male, age_r, other, black, REGR factor 3_UPPImpulse, asian

b. Dependent Variable: SexVerbatimS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.265	.171		7.385	.000
	age_r	-.004	.008	-.016	-.479	.632
	male	-.143	.022	-.208	-6.367	.000
	black	-.099	.044	-.075	-2.243	.025
	asian	.024	.025	.032	.962	.336
	other	-.036	.039	-.031	-.927	.354
	REGR factor 1_SS	.022	.011	.066	2.009	.045
	REGR factor 3_UPPImpulse	.033	.012	.093	2.803	.005
	ave_Kirby	.003	.006	.016	.493	.622

a. Dependent Variable: SexVerbatimS

Mediation Analyses

```
. sgmediation arq_alc_, iv(fac1_1) mv( Alc_Gi09) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   29.82
       Model |  244.994772     6  40.8324619           Prob > F      =  0.0000
    Residual |  1229.49307   898  1.36914596           R-squared     =  0.1662
-------------+------------------------------           Adj R-squared =  0.1606
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.1701

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .3560354   .0428047     8.32   0.000     .2720264    .4400443
       age_r |   .0038117   .0031275     1.22   0.223    -.0023264    .0099498
        male |   .0490965   .0867398     0.57   0.572    -.1211399    .2193329
       black |  -.8310278    .169708    -4.90   0.000    -1.164098   -.4979573
       asian |  -.7809887   .0956484    -8.17   0.000    -.9687091   -.5932682
       other |  -.6242107   .1501658    -4.16   0.000    -.9189275   -.3294939
       _cons |   3.479886   .0800543    43.47   0.000     3.322771    3.637001
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   15.30
       Model |  34.4071875     6  5.73453124           Prob > F      =  0.0000
    Residual |  336.519818   898  .374743672           R-squared     =  0.0928
-------------+------------------------------           Adj R-squared =  0.0867
       Total |  370.927005   904  .410317484           Root MSE      =  .61216

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .1496368   .0223941     6.68   0.000     .1056859    .1935877
       age_r |   .0007494   .0016362     0.46   0.647    -.0024619    .0039607
        male |   .1948397   .0453796     4.29   0.000     .1057772    .2839021
       black |  -.3035133    .088786    -3.42   0.001    -.4777656    -.129261
       asian |  -.1362283   .0500403    -2.72   0.007    -.2344379   -.0380187
       other |  -.2203043   .0785622    -2.80   0.005    -.3744911   -.0661175
       _cons |   2.235392   .0418819    53.37   0.000     2.153194     2.31759
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =  123.03
       Model |  722.232267     7  103.176038           Prob > F      =  0.0000
    Residual |  752.255578   897  .838634981           R-squared     =  0.4898
-------------+------------------------------           Adj R-squared =  0.4858
       Total |  1474.48785   904  1.63107063           Root MSE      =  .91577

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Alc_Gi09 |   1.190863   .0499208    23.86   0.000     1.092888    1.288839
      fac1_1 |   .1778384   .0343234     5.18   0.000     .1104749    .2452018
       age_r |   .0029192    .002448     1.19   0.233    -.0018853    .0077237
        male |  -.1829309   .0685792    -2.67   0.008    -.3175254   -.0483365
       black |  -.4695849   .1336816    -3.51   0.000      -.73195   -.2072198
       asian |  -.6187594   .0751665    -8.23   0.000     -.766282   -.4712367
       other |  -.3618584   .1180391    -3.07   0.002    -.5935234   -.1301934
       _cons |    .817839   .1279779     6.39   0.000     .5666679     1.06901
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef         Std Err     Z           P>|Z|
```

```
Sobel       .17819699    .02769477   6.434      1.240e-10
Goodman-1   .17819699    .02771732   6.429      1.284e-10
Goodman-2   .17819699    .0276722    6.44      1.198e-10

Indirect effect = .17819699
  Direct effect = .17783837
   Total effect = .35603536

Proportion of total effect that is mediated:  .50050364
Ratio of indirect to direct effect:      1.0020166

. sgmediation arq_alc_, iv(fac3_1) mv( Alc_Gi09) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   20.32
       Model |  176.242724     6  29.3737874           Prob > F      =  0.0000
    Residual |  1298.24512   898  1.44570726           R-squared     =  0.1195
-------------+------------------------------           Adj R-squared =  0.1136
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.2024

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1969539   .0464692     4.24   0.000      .105753    .2881548
       age_r |   .0031723   .0032135     0.99   0.324    -.0031346    .0094793
        male |     .07118   .0892859     0.80   0.426    -.1040533    .2464133
       black |  -.8693364   .1743562    -4.99   0.000    -1.211529   -.5271434
       asian |  -.8934821   .0977919    -9.14   0.000    -1.085409   -.7015548
       other |  -.6327427   .1543329    -4.10   0.000     -.935638   -.3298474
       _cons |   3.514923   .0821423    42.79   0.000      3.35371    3.676136
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   24.03
       Model |  51.3130856     6  8.55218094           Prob > F      =  0.0000
    Residual |   319.61392   898  .355917505           R-squared     =  0.1383
-------------+------------------------------           Adj R-squared =  0.1326
       Total |  370.927005   904  .410317484           Root MSE      =  .59659

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .2241499   .0230568     9.72   0.000     .1788983    .2694015
       age_r |   .0003527   .0015945     0.22   0.825    -.0027766     .003482
        male |   .2200601   .0443014     4.97   0.000     .1331138    .3070064
       black |  -.2934157   .0865111    -3.39   0.001    -.4632032   -.1236282
       asian |  -.1994498   .0485219    -4.11   0.000    -.2946792   -.1042204
       other |  -.2105982   .0765761    -2.75   0.006    -.3608872   -.0603093
       _cons |   2.249451   .0407569    55.19   0.000     2.169461    2.329441
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =  117.33
       Model |  704.766772     7  100.680967           Prob > F      =  0.0000
    Residual |  769.721074   897  .858105991           R-squared     =  0.4780
-------------+------------------------------           Adj R-squared =  0.4739
       Total |  1474.48785   904  1.63107063           Root MSE      =  .92634

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Alc_Gi09 |   1.285937   .0518153    24.82   0.000     1.184243     1.38763
      fac3_1 |  -.0912886   .0376379    -2.43   0.015    -.1651572   -.0174201
       age_r |   .0027188   .0024759     1.10   0.272    -.0021404     .007578
        male |  -.2118033   .0697267    -3.04   0.002    -.3486498   -.0749568
       black |  -.4920225    .135186    -3.64   0.000    -.7573401   -.2267049
```

```
       asian |  -.6370023   .0760468    -8.38   0.000    -.7862527   -.4877519
       other |  -.3619267   .1194016    -3.03   0.003    -.5962658   -.1275877
       _cons |   .6222715    .132628     4.69   0.000     .3619741    .8825689
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef         Std Err     Z           P>|Z|
Sobel       .28824254    .03184329   9.052       0
Goodman-1   .28824254    .03186569   9.046       0
Goodman-2   .28824254    .03182087   9.058       0

Indirect effect = .28824254
  Direct effect = -.09128863
   Total effect = .19695392

Proportion of total effect that is mediated:  1.4635025
Ratio of indirect to direct effect:      -3.1574858

. sgmediation arq_alc_, iv( ave_Kirb) mv( Alc_Gi09) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     920
-------------+------------------------------           F(  6,   913) =   21.24
       Model |  183.158451     6  30.5264086           Prob > F      =  0.0000
    Residual |  1312.37823   913  1.43743509           R-squared     =  0.1225
-------------+------------------------------           Adj R-squared =  0.1167
       Total |  1495.53668   919  1.62735221           Root MSE      =  1.1989

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ave_Kirb |   .1057738   .0237675     4.45   0.000     .0591285    .1524191
       age_r |    .003571   .0032042     1.11   0.265    -.0027175    .0098594
        male |   .0164942   .0884536     0.19   0.852    -.1571019    .1900902
       black |  -1.006381   .1718935    -5.85   0.000    -1.343733   -.6690286
       asian |  -.8921431   .0970858    -9.19   0.000     -1.08268   -.7016057
       other |  -.7495444   .1523637    -4.92   0.000    -1.048568   -.4505206
       _cons |   4.083773   .1500864    27.21   0.000     3.789219    4.378328
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     920
-------------+------------------------------           F(  6,   913) =   12.77
       Model |  29.117115     6   4.8528525           Prob > F      =  0.0000
    Residual |  347.034962   913  .380104011           R-squared     =  0.0774
-------------+------------------------------           Adj R-squared =  0.0713
       Total |  376.152077   919  .409305851           Root MSE      =  .61653

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ave_Kirb |    .064558    .012222     5.28   0.000     .0405717    .0885444
       age_r |     .00069   .0016477     0.42   0.675    -.0025437    .0039237
        male |   .1790094   .0454855     3.94   0.000     .0897412    .2682777
       black |  -.4062072   .0883928    -4.60   0.000    -.5796838   -.2327306
       asian |  -.1857905   .0499244    -3.72   0.000    -.2837704   -.0878105
       other |  -.2683508     .07835    -3.43   0.001    -.4221178   -.1145839
       _cons |   2.595503   .0771789    33.63   0.000     2.444034    2.746971
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     920
-------------+------------------------------           F(  7,   912) =  116.66
       Model |  706.506309     7  100.929473           Prob > F      =  0.0000
    Residual |  789.030376   912  .865164886           R-squared     =  0.4724
-------------+------------------------------           Adj R-squared =  0.4684
       Total |  1495.53668   919  1.62735221           Root MSE      =  .93014
```

arq_alc_	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Alc_Gi09	1.228029	.0499301	24.59	0.000	1.130038	1.32602
ave_Kirb	.0264947	.0187187	1.42	0.157	-.010242	.0632314
age_r	.0027236	.0024861	1.10	0.274	-.0021555	.0076027
male	-.2033346	.0692028	-2.94	0.003	-.3391499	-.0675193
black	-.5075468	.1348902	-3.76	0.000	-.7722781	-.2428155
asian	-.663987	.0758893	-8.75	0.000	-.8129249	-.5150491
other	-.4200018	.1189623	-3.53	0.000	-.6534734	-.1865302
_cons	.8964207	.1742197	5.15	0.000	.5545027	1.238339

Sobel-Goodman Mediation Tests

	Coef	Std Err	Z	P>|Z|
Sobel	**.07927914**	**.01535115**	**5.164**	**2.412e-07**
Goodman-1	.07927914	.01536327	5.16	2.465e-07
Goodman-2	.07927914	.01533901	5.168	2.360e-07

Indirect effect = .07927914
Direct effect = .02649466
Total effect = .1057738

Proportion of total effect that is mediated: .74951585
Ratio of indirect to direct effect: 2.9922686

. sgmediation arq_16, iv(fac1_1) mv(Sex_Gi06) cv(age_r male black asian other)

Model with dv regressed on iv (path c)

Source	SS	df	MS		
Model	26.9486644	6	4.49144406	Number of obs	= 905
Residual	845.433656	898	.941462869	F(6, 898)	= 4.77
Total	872.38232	904	.965024691	Prob > F	= 0.0001
				R-squared	= 0.0309
				Adj R-squared	= 0.0244
				Root MSE	= .97029

arq_16	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fac1_1	.1227718	.0354951	3.46	0.001	.0531088	.1924348
age_r	-.0038792	.0025934	-1.50	0.135	-.0089691	.0012108
male	.1044252	.0719275	1.45	0.147	-.0367404	.2455909
black	-.0146365	.1407275	-0.10	0.917	-.2908297	.2615567
asian	-.2422807	.0793149	-3.05	0.002	-.3979448	-.0866167
other	.029696	.1245225	0.24	0.812	-.214693	.274085
_cons	1.699952	.0663837	25.61	0.000	1.569667	1.830237

Model with mediator regressed on iv (path a)

Source	SS	df	MS		
Model	88.9206697	6	14.8201116	Number of obs	= 905
Residual	315.051112	898	.350836428	F(6, 898)	= 42.24
Total	403.971782	904	.44687144	Prob > F	= 0.0000
				R-squared	= 0.2201
				Adj R-squared	= 0.2149
				Root MSE	= .59231

Sex_Gi06	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fac1_1	.0862415	.021668	3.98	0.000	.0437157	.1287673
age_r	-.0005432	.0015832	-0.34	0.732	-.0036503	.0025639
male	.6549924	.0439082	14.92	0.000	.5688177	.7411671
black	-.1975759	.0859073	-2.30	0.022	-.3661783	-.0289736
asian	-.1062704	.0484178	-2.19	0.028	-.2012957	-.0112451
other	-.1358532	.0760149	-1.79	0.074	-.2850406	.0133343
_cons	1.932955	.040524	47.70	0.000	1.853423	2.012488

```
Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =   12.43
       Model |  77.1138665     7  11.0162666           Prob > F      =  0.0000
    Residual |  795.268454   897  .886586905           R-squared     =  0.0884
-------------+------------------------------           Adj R-squared =  0.0813
       Total |   872.38232   904  .965024691           Root MSE      =  .94159

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Sex_Gi06 |   .3990348   .0530481     7.52   0.000     .2949219    .5031477
      fac1_1 |   .0883584   .0347476     2.54   0.011     .0201624    .1565544
       age_r |  -.0036624   .0025169    -1.46   0.146    -.0086021    .0012773
        male |  -.1569395   .0779699    -2.01   0.044    -.3099643   -.0039148
       black |   .0642032   .1369662     0.47   0.639    -.2046084    .3330148
       asian |  -.1998751   .0771748    -2.59   0.010    -.3513393    -.048411
       other |   .0839062   .1210536     0.69   0.488    -.1536752    .3214875
       _cons |   .9286357   .1210963     7.67   0.000     .6909706    1.166301
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .03441336     .00978205   3.518      .00043479
Goodman-1   .03441336     .00984935   3.494      .00047589
Goodman-2   .03441336     .00971428   3.543      .00039627

Indirect effect = .03441336
  Direct effect = .08835842
   Total effect = .12277177

Proportion of total effect that is mediated:  .2803035
Ratio of indirect to direct effect:      .38947458

. sgmediation arq_16, iv(fac3_1) mv( Sex_Gi06) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =    4.90
       Model |  27.6344594     6  4.60574323           Prob > F      =  0.0001
    Residual |  844.747861   898  .940699177           R-squared     =  0.0317
-------------+------------------------------           Adj R-squared =  0.0252
       Total |   872.38232   904  .965024691           Root MSE      =   .9699

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1335955   .0374844     3.56   0.000     .0600283    .2071627
       age_r |  -.0041591   .0025922    -1.60   0.109    -.0092466    .0009284
        male |   .1194453   .0720225     1.66   0.098    -.0219066    .2607973
       black |  -.0156751   .1406444    -0.11   0.911    -.2917052    .2603549
       asian |  -.2884783   .0788838    -3.66   0.000    -.4432965   -.1336602
       other |   .0329292   .1244927     0.26   0.791    -.2114013    .2772597
       _cons |   1.711724   .0662601    25.83   0.000     1.581681    1.841767
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   48.52
       Model |  98.9045293     6  16.4840882           Prob > F      =  0.0000
    Residual |  305.067252   898  .339718544           R-squared     =  0.2448
-------------+------------------------------           Adj R-squared =  0.2398
       Total |  403.971782   904   .44687144           Root MSE      =  .58285

------------------------------------------------------------------------------
    Sex_Gi06 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1523608    .022526     6.76   0.000      .108151    .1965706
```

```
       age_r |  -.0007928   .0015578    -0.51   0.611    -.0038501    .0022645
        male |   .6721407   .0432815    15.53   0.000     .5871961    .7570854
       black |  -.1874617   .0845195    -2.22   0.027    -.3533404   -.0215831
       asian |  -.1453207   .0474048    -3.07   0.002    -.2383578   -.0522836
       other |  -.1280803   .0748132    -1.71   0.087    -.2749093    .0187487
       _cons |   1.940949   .0398186    48.74   0.000       1.8628    2.019097
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =   12.02
       Model |  74.8378105     7  10.6911158           Prob > F      =  0.0000
    Residual |   797.54451   897  .889124314           R-squared     =  0.0858
-------------+------------------------------           Adj R-squared =  0.0787
       Total |   872.38232   904  .965024691           Root MSE      =  .94293

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Sex_Gi06 |   .3933586   .0539863     7.29   0.000     .2874044    .4993127
      fac3_1 |   .0736631   .0373591     1.97   0.049     .0003416    .1469845
       age_r |  -.0038472   .0025205    -1.53   0.127     -.008794    .0010996
        male |   -.144947   .0788641    -1.84   0.066    -.2997266    .0098326
       black |   .0580646   .1371086     0.42   0.672    -.2110265    .3271556
       asian |  -.2313152   .0770912    -3.00   0.003    -.3826152   -.0800151
       other |   .0833107   .1212292     0.69   0.492    -.1546153    .3212366
       _cons |   .9482353    .123002     7.71   0.000       .70683    1.189641
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .05993243     .01209012   4.957      7.154e-07
Goodman-1   .05993243     .01215113   4.932      8.129e-07
Goodman-2   .05993243     .01202881   4.982      6.280e-07

Indirect effect = .05993243
  Direct effect = .07366307
   Total effect = .1335955

Proportion of total effect that is mediated:  .44861113
Ratio of indirect to direct effect:      .81360208

. sgmediation arq_alc_, iv(fac1_1) mv( AlcVerb0) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   29.82
       Model |  244.994772     6  40.8324619           Prob > F      =  0.0000
    Residual |  1229.49307   898  1.36914596           R-squared     =  0.1662
-------------+------------------------------           Adj R-squared =  0.1606
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.1701

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .3560354   .0428047     8.32   0.000     .2720264    .4400443
       age_r |   .0038117   .0031275     1.22   0.223    -.0023264    .0099498
        male |   .0490965   .0867398     0.57   0.572    -.1211399    .2193329
       black |  -.8310278    .169708    -4.90   0.000    -1.164098   -.4979573
       asian |  -.7809887   .0956484    -8.17   0.000    -.9687091   -.5932682
       other |  -.6242107   .1501658    -4.16   0.000    -.9189275   -.3294939
       _cons |   3.479886   .0800543    43.47   0.000     3.322771    3.637001
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   13.25
       Model |  14.1886943     6  2.36478239           Prob > F      =  0.0000
```

```
    Residual |  160.313076   898  .178522357           R-squared     =  0.0813
-------------+----------------------------           Adj R-squared =  0.0752
       Total |  174.501771   904  .193032932           Root MSE      =  .42252

------------------------------------------------------------------------------
    AlcVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |    .062664   .0154566     4.05   0.000     .0323288    .0929992
       age_r |  -.0012121   .0011293    -1.07   0.283    -.0034285    .0010043
        male |   .0888349   .0313213     2.84   0.005     .0273634    .1503064
       black |  -.2534111   .0612807    -4.14   0.000    -.3736812    -.133141
       asian |  -.1921493   .0345382    -5.56   0.000    -.2599343   -.1243644
       other |  -.1790587   .0542241    -3.30   0.001    -.2854795    -.072638
       _cons |  -.1937548   .0289072    -6.70   0.000    -.2504883   -.1370213
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =  101.33
       Model |  651.087565     7  93.0125093           Prob > F      =  0.0000
    Residual |   823.40028   897   .91794903           R-squared     =  0.4416
-------------+------------------------------           Adj R-squared =  0.4372
       Total |  1474.48785   904  1.63107063           Root MSE      =   .9581

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    AlcVerb0 |   1.591579   .0756702    21.03   0.000     1.443068     1.74009
      fac1_1 |   .2563006   .0353683     7.25   0.000     .1868863    .3257149
       age_r |   .0057408   .0025625     2.24   0.025     .0007117      .01077
        male |  -.0922913    .071341    -1.29   0.196    -.2323061    .0477235
       black |  -.4277041   .1402759    -3.05   0.002    -.7030112    -.152397
       asian |  -.4751678   .0796564    -5.97   0.000    -.6315024   -.3188332
       other |  -.3392246   .1237019    -2.74   0.006    -.5820035   -.0964457
       _cons |   3.788262   .0671691    56.40   0.000     3.656435    3.920089
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .09973473     .02505317   3.981      .00006865
Goodman-1   .09973473     .02508046   3.977      .00006991
Goodman-2   .09973473     .02502586   3.985      .0000674

Indirect effect = .09973473
  Direct effect = .25630063
   Total effect = .35603536

Proportion of total effect that is mediated:  .28012591
Ratio of indirect to direct effect:      .38913182


. sgmediation arq_alc_, iv(fac3_1) mv( AlcVerb0) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   20.32
       Model |  176.242724     6  29.3737874           Prob > F      =  0.0000
    Residual |  1298.24512   898  1.44570726           R-squared     =  0.1195
-------------+------------------------------           Adj R-squared =  0.1136
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.2024

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1969539   .0464692     4.24   0.000      .105753    .2881548
       age_r |   .0031723   .0032135     0.99   0.324    -.0031346    .0094793
        male |     .07118   .0892859     0.80   0.426    -.1040533    .2464133
       black |  -.8693364   .1743562    -4.99   0.000    -1.211529   -.5271434
       asian |  -.8934821   .0977919    -9.14   0.000    -1.085409   -.7015548
```

```
       other |  -.6327427   .1543329    -4.10   0.000     -.935638   -.3298474
       _cons |   3.514923   .0821423    42.79   0.000      3.35371    3.676136
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   20.20
       Model |  20.7532465     6  3.45887442           Prob > F      =  0.0000
    Residual |  153.748524   898  .171212165           R-squared     =  0.1189
-------------+------------------------------           Adj R-squared =  0.1130
       Total |  174.501771   904  .193032932           Root MSE      =  .41378

------------------------------------------------------------------------------
    AlcVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1191134   .0159916     7.45   0.000     .0877281    .1504987
       age_r |  -.0014011   .0011059    -1.27   0.206    -.0035715    .0007693
        male |   .1022428   .0307263     3.33   0.001     .0419392    .1625465
       black |  -.2445042   .0600018    -4.07   0.000    -.3622643    -.126744
       asian |  -.2214717   .0336535    -6.58   0.000    -.2875203   -.1554231
       other |  -.1726205   .0531112    -3.25   0.001     -.276857   -.0683841
       _cons |  -.1879864   .0282679    -6.65   0.000    -.2434653   -.1325075
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =   88.64
       Model |  602.884286     7  86.1263265           Prob > F      =  0.0000
    Residual |   871.60356   897  .971687357           R-squared     =  0.4089
-------------+------------------------------           Adj R-squared =  0.4043
       Total |  1474.48785   904  1.63107063           Root MSE      =  .98574

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    AlcVerb0 |   1.665812   .0794983    20.95   0.000     1.509788    1.821837
      fac3_1 |  -.0014666    .039256    -0.04   0.970     -.078511    .0755777
       age_r |   .0055063   .0026369     2.09   0.037     .0003311    .0106815
        male |  -.0991374    .073649    -1.35   0.179    -.2436818    .0454071
       black |  -.4620383   .1442577    -3.20   0.001    -.7451603   -.1789164
       asian |  -.5245518   .0820831    -6.39   0.000    -.6856491   -.3634545
       other |  -.3451893   .1272686    -2.71   0.007    -.5949682   -.0954104
       _cons |   3.828073   .0689809    55.49   0.000      3.69269    3.963456
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef         Std Err     Z          P>|Z|
Sobel       .19842056    .02827201   7.018      2.246e-12
Goodman-1   .19842056    .02830058   7.011      2.363e-12
Goodman-2   .19842056    .02824341   7.025      2.135e-12

Indirect effect = .19842056
  Direct effect = -.00146664
   Total effect = .19695392

Proportion of total effect that is mediated:  1.0074466
Ratio of indirect to direct effect:      -135.28902

. sgmediation arq_alc_, iv(ave_Kirb) mv( AlcVerb0) cv( age_r male black asian other)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     917
-------------+------------------------------           F(  6,   910) =   21.09
       Model |  182.155513     6  30.3592521           Prob > F      =  0.0000
    Residual |  1309.89029   910  1.43943988           R-squared     =  0.1221
-------------+------------------------------           Adj R-squared =  0.1163
       Total |   1492.0458   916  1.62887096           Root MSE      =  1.1998
```

```
------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ave_Kirb |   .1058326   .0238074     4.45   0.000     .0591089    .1525564
       age_r |   .0035634   .0032064     1.11   0.267    -.0027294    .0098563
        male |   .0178876   .0885829     0.20   0.840     -.155963    .1917381
       black |  -1.004926   .1720658    -5.84   0.000    -1.342618   -.6672342
       asian |  -.8905906   .0972252    -9.16   0.000    -1.081402   -.6997789
       other |  -.7479318   .1525291    -4.90   0.000    -1.047281   -.4485822
       _cons |   4.082266   .1504967    27.13   0.000     3.786905    4.377626
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     917
-------------+------------------------------           F(  6,   910) =   11.68
       Model |  12.6450416     6  2.10750694            Prob > F      =  0.0000
    Residual |  164.203614   910  .180443532           R-squared     =  0.0715
-------------+------------------------------           Adj R-squared =  0.0654
       Total |  176.848656   916  .193066218           Root MSE      =  .42479

------------------------------------------------------------------------------
    AlcVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ave_Kirb |   .0214046   .0084292     2.54   0.011     .0048617    .0379475
       age_r |  -.0012572   .0011353    -1.11   0.268    -.0034852    .0009709
        male |   .0824484   .0313635     2.63   0.009     .0208953    .1440015
       black |  -.2885776   .0609212    -4.74   0.000      -.40814   -.1690153
       asian |  -.2079363   .0344233    -6.04   0.000    -.2754946   -.140378
       other |  -.2106816   .0540041    -3.90   0.000    -.3166686   -.1046946
       _cons |  -.0735542   .0532845    -1.38   0.168     -.178129    .0310205
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     917
-------------+------------------------------           F(  7,   909) =   93.76
       Model |  625.593281     7  89.3704687            Prob > F      =  0.0000
    Residual |   866.45252   909  .953193092           R-squared     =  0.4193
-------------+------------------------------           Adj R-squared =  0.4148
       Total |   1492.0458   916  1.62887096           Root MSE      =  .97632

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    AlcVerb0 |   1.643331   .0761902    21.57   0.000     1.493802     1.79286
    ave_Kirb |   .0706577   .0194419     3.63   0.000     .0325015    .1088139
       age_r |   .0056293    .002611     2.16   0.031      .000505    .0107537
        male |  -.1176024    .072358    -1.63   0.104    -.2596105    .0244057
       black |  -.5306976   .1417351    -3.74   0.000    -.8088637   -.2525314
       asian |  -.5488825   .0806881    -6.80   0.000    -.7072391   -.3905259
       other |  -.4017123   .1251549    -3.21   0.001    -.6473385   -.1560861
       _cons |   4.203139   .1225956    34.28   0.000     3.962536    4.443743
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef         Std Err     Z          P>|Z|
Sobel       .03517489    .01394761   2.522      .01167128
Goodman-1   .03517489    .01396238   2.519      .01176014
Goodman-2   .03517489    .01393281   2.525      .01158274

Indirect effect = .03517489
  Direct effect = .07065772
   Total effect = .10583261

Proportion of total effect that is mediated:  .33236347
Ratio of indirect to direct effect:      .49782097

. sgmediation arq_16, iv(fac1_1) mv( SexVerb0) cv( age_r male black asian other)

Model with dv regressed on iv (path c)
```

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =    4.77
       Model |  26.9486644     6  4.49144406           Prob > F      =  0.0001
    Residual |  845.433656   898  .941462869           R-squared     =  0.0309
-------------+------------------------------           Adj R-squared =  0.0244
       Total |   872.38232   904  .965024691           Root MSE      =  .97029

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .1227718   .0354951     3.46   0.001     .0531088    .1924348
       age_r |  -.0038792   .0025934    -1.50   0.135    -.0089691    .0012108
        male |   .1044252   .0719275     1.45   0.147    -.0367404    .2455909
       black |  -.0146365   .1407275    -0.10   0.917    -.2908297    .2615567
       asian |  -.2422807   .0793149    -3.05   0.002    -.3979448   -.0866167
       other |    .029696   .1245225     0.24   0.812     -.214693     .274085
       _cons |   1.699952   .0663837    25.61   0.000     1.569667    1.830237
------------------------------------------------------------------------------
```

Model with mediator regressed on iv (path a)

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  6,   898) =   46.29
       Model |  35.2160373     6  5.86933955           Prob > F      =  0.0000
    Residual |  113.851086   898  .126782947           R-squared     =  0.2362
-------------+------------------------------           Adj R-squared =  0.2311
       Total |  149.067124   904  .164897261           Root MSE      =  .35607

------------------------------------------------------------------------------
    SexVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .0442103   .0130256     3.39   0.001     .0186462    .0697744
       age_r |   .0000955   .0009517     0.10   0.920    -.0017723    .0019633
        male |   .4028012   .0263951    15.26   0.000     .3509978    .4546045
       black |  -.1183911   .0516426    -2.29   0.022    -.2197453   -.0170369
       asian |  -.1411625   .0291061    -4.85   0.000    -.1982863   -.0840387
       other |  -.0796844   .0456958    -1.74   0.082    -.1693675    .0099987
       _cons |  -.3999125   .0243607   -16.42   0.000    -.4477231   -.3521019
------------------------------------------------------------------------------
```

Model with dv regressed on mediator and iv (paths b and c')

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  7,   897) =   13.71
       Model |  84.3197283     7  12.0456755           Prob > F      =  0.0000
    Residual |  788.062592   897  .878553614           R-squared     =  0.0967
-------------+------------------------------           Adj R-squared =  0.0896
       Total |   872.38232   904  .965024691           Root MSE      =  .93731

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    SexVerb0 |   .7098684   .0878447     8.08   0.000     .5374634    .8822735
      fac1_1 |   .0913883   .0345079     2.65   0.008     .0236626    .1591139
       age_r |  -.0039469   .0025053    -1.58   0.116    -.0088639     .00097
        male |  -.1815106   .0779737    -2.33   0.020    -.3345427   -.0284786
       black |   .0694056   .1363417     0.51   0.611    -.1981803    .3369916
       asian |  -.1420739   .0776161    -1.83   0.068    -.2944042    .0102564
       other |   .0862615   .1204937     0.72   0.474     -.150221    .3227439
       _cons |   1.983837   .0731195    27.13   0.000     1.840332    2.127342
------------------------------------------------------------------------------
```

Sobel-Goodman Mediation Tests

	Coef	Std Err	Z	P>|Z|
Sobel	**.03138349**	**.01002893**	**3.129**	**.00175226**
Goodman-1	.03138349	.01009399	3.109	.00187642
Goodman-2	.03138349	.00996344	3.15	.00163346

Indirect effect = .03138349
Direct effect = .09138828

Total effect = .12277177

Proportion of total effect that is mediated: .25562465
Ratio of indirect to direct effect: .34340827

. sgmediation arq_16, iv(fac3_1) mv(SexVerb0) cv(age_r male black asian other)

Model with dv regressed on iv (path c)

Source	SS	df	MS		
Model	27.6344594	6	4.60574323	Number of obs	905
Residual	844.747861	898	.940699177	F(6, 898)	4.90
Total	872.38232	904	.965024691	Prob > F	0.0001
				R-squared	0.0317
				Adj R-squared	0.0252
				Root MSE	.9699

arq_16	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fac3_1	.1335955	.0374844	3.56	0.000	.0600283	.2071627
age_r	-.0041591	.0025922	-1.60	0.109	-.0092466	.0009284
male	.1194453	.0720225	1.66	0.098	-.0219066	.2607973
black	-.0156751	.1406444	-0.11	0.911	-.2917052	.2603549
asian	-.2884783	.0788838	-3.66	0.000	-.4432965	-.1336602
other	.0329292	.1244927	0.26	0.791	-.2114013	.2772597
_cons	1.711724	.0662601	25.83	0.000	1.581681	1.841767

Model with mediator regressed on iv (path a)

Source	SS	df	MS		
Model	37.6606458	6	6.2767743	Number of obs	905
Residual	111.406478	898	.124060666	F(6, 898)	50.59
Total	149.067124	904	.164897261	Prob > F	0.0000
				R-squared	0.2526
				Adj R-squared	0.2476
				Root MSE	.35222

SexVerb0	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fac3_1	.0763737	.0136126	5.61	0.000	.0496574	.10309
age_r	-.0000309	.0009414	-0.03	0.974	-.0018784	.0018166
male	.4113968	.0261553	15.73	0.000	.3600641	.4627294
black	-.1135271	.0510757	-2.22	0.026	-.2137687	-.0132855
asian	-.1609858	.028647	-5.62	0.000	-.2172087	-.1047628
other	-.0758626	.0452101	-1.68	0.094	-.1645923	.0128672
_cons	-.3958067	.0240627	-16.45	0.000	-.4430323	-.3485811

Model with dv regressed on mediator and iv (paths b and c')

Source	SS	df	MS		
Model	82.3071796	7	11.7581685	Number of obs	905
Residual	790.075141	897	.880797259	F(7, 897)	13.35
Total	872.38232	904	.965024691	Prob > F	0.0000
				R-squared	0.0943
				Adj R-squared	0.0873
				Root MSE	.93851

arq_16	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
SexVerb0	.7005355	.0889166	7.88	0.000	.5260267	.8750442
fac3_1	.080093	.0369015	2.17	0.030	.0076696	.1525164
age_r	-.0041374	.0025083	-1.65	0.099	-.0090603	.0007854
male	-.1687527	.0787084	-2.14	0.032	-.3232268	-.0142786
black	.0638546	.1364666	0.47	0.640	-.2039765	.3316857
asian	-.1757021	.0776615	-2.26	0.024	-.3281216	-.0232826
other	.0860736	.1206525	0.71	0.476	-.1507204	.3228676
_cons	1.989001	.0731398	27.19	0.000	1.845456	2.132546

Sobel-Goodman Mediation Tests

```
            Coef          Std Err      Z          P>|Z|
Sobel       .0535025     .01170701    4.57      4.874e-06
Goodman-1   .0535025     .01176941   4.546      5.470e-06
Goodman-2   .0535025     .01164427   4.595      4.333e-06

Indirect effect = .0535025
  Direct effect = .08009299
   Total effect = .1335955

Proportion of total effect that is mediated:  .40048134
Ratio of indirect to direct effect:      .6680048
```

. sgmediation arq_alc_, iv(fac1_1) mv(Alc_Gi09) cv(age_r male black asian other fac3_1 ave_Kirb AlcVerb0)

Model with dv regressed on iv (path c)

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   81.66
       Model |  664.837945     9  73.8708828           Prob > F      =  0.0000
    Residual |    809.6499   895   .90463676           R-squared     =  0.4509
-------------+------------------------------           Adj R-squared =  0.4454
       Total |  1474.48785   904  1.63107063           Root MSE      =  .95112

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .2584136   .0351382     7.35   0.000     .1894508    .3273764
       age_r |    .005919   .0025449     2.33   0.020     .0009244    .0109136
        male |  -.1184308   .0713406    -1.66   0.097     -.258445    .0215835
       black |  -.5030051   .1405885    -3.58   0.000    -.7789267   -.2270835
       asian |  -.4882613   .0796221    -6.13   0.000    -.6445292   -.3319935
       other |  -.3912352   .1235277    -3.17   0.002     -.633673   -.1487974
      fac3_1 |  -.0346466   .0383567    -0.90   0.367    -.1099263     .040633
    ave_Kirb |   .0749349   .0192821     3.89   0.000     .0370915    .1127783
    AlcVerb0 |   1.581708   .0773818    20.44   0.000     1.429837    1.733578
       _cons |   4.184189   .1215784    34.42   0.000     3.945577    4.422801
------------------------------------------------------------------------------
```

Model with mediator regressed on iv (path a)

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   91.57
       Model |  177.821633     9  19.7579593           Prob > F      =  0.0000
    Residual |  193.105372   895  .215760192           R-squared     =  0.4794
-------------+------------------------------           Adj R-squared =  0.4742
       Total |  370.927005   904  .410317484           Root MSE      =   .4645

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .0897547   .0171604     5.23   0.000     .0560754    .1234341
       age_r |   .0017447   .0012428     1.40   0.161    -.0006945    .0041839
        male |   .1201656   .0348406     3.45   0.001     .0517869    .1885443
       black |  -.1063001   .0686592    -1.55   0.122    -.2410518    .0284516
       asian |   .0039085    .038885     0.10   0.920    -.0724079     .080225
       other |  -.0842977   .0603272    -1.40   0.163    -.2026969    .0341015
      fac3_1 |   .1049575   .0187323     5.60   0.000     .0681932    .1417218
    ave_Kirb |   .0381388   .0094168     4.05   0.000     .0196572    .0566203
    AlcVerb0 |   .8413654   .0377909    22.26   0.000     .7671963    .9155345
       _cons |   2.601117   .0593752    43.81   0.000     2.484586    2.717648
------------------------------------------------------------------------------
```

Model with dv regressed on mediator and iv (paths b and c')

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F( 10,   894) =  107.11
       Model |  803.670888    10  80.3670888           Prob > F      =  0.0000
    Residual |  670.816958   894  .750354539           R-squared     =  0.5451
-------------+------------------------------           Adj R-squared =  0.5400
       Total |  1474.48785   904  1.63107063           Root MSE      =  .86623
```

```
------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Alc_Gi09 |   .8479087   .0623356    13.60   0.000     .7255675    .9702498
      fac1_1 |   .1823098   .0324873     5.61   0.000     .1185496      .24607
       age_r |   .0044396   .0023203     1.91   0.056    -.0001142    .0089934
        male |  -.2203202   .0654033    -3.37   0.001    -.3486821   -.0919583
       black |  -.4128723   .1282115    -3.22   0.001    -.6645028   -.1612418
       asian |  -.4915754   .0725158    -6.78   0.000    -.6338964   -.3492544
       other |  -.3197585   .1126248    -2.84   0.005    -.5407982   -.0987187
      fac3_1 |   -.123641   .0355406    -3.48   0.001    -.1933937   -.0538884
    ave_Kirb |   .0425967   .0177213     2.40   0.016     .0078166    .0773768
    AlcVerb0 |   .8683066   .0878488     9.88   0.000     .6958927     1.04072
       _cons |    1.97868   .1963428    10.08   0.000     1.593333    2.364026
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .07610382     .01558907    4.882      1.051e-06
Goodman-1   .07610382     .01562572     4.87      1.114e-06
Goodman-2   .07610382     .01555232    4.893      9.911e-07

Indirect effect = .07610382
  Direct effect = .18230979
   Total effect = .25841362

Proportion of total effect that is mediated:  .29450392
Ratio of indirect to direct effect:      .41744232

. sgmediation arq_alc_, iv(fac3_1) mv( Alc_Gi09) cv( age_r male black asian other
fac1_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   27.05
       Model |  286.874933     8  35.8593667           Prob > F      =  0.0000
    Residual |  1187.61291   896  1.32546084           R-squared     =  0.1946
-------------+------------------------------           Adj R-squared =  0.1874
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.1513

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1407721   .0452518     3.11   0.002     .0519602     .229584
       age_r |   .0038706    .003078     1.26   0.209    -.0021705    .0099116
        male |   .0355797   .0858711     0.41   0.679    -.1329522    .2041117
       black |  -.8918486   .1686101    -5.29   0.000    -1.222765   -.5609319
       asian |  -.8190946   .0943662    -8.68   0.000    -1.004299     -.63389
       other |  -.6716233   .1485992    -4.52   0.000    -.9632663   -.3799802
      fac1_1 |   .3459959   .0422155     8.20   0.000     .2631431    .4288488
    ave_Kirb |   .0952777   .0233089     4.09   0.000     .0495313    .1410241
       _cons |   3.986063   .1466959    27.17   0.000     3.698155     4.27397
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   26.46
       Model |  70.8752249     8  8.85940311           Prob > F      =  0.0000
    Residual |   300.05178   896  .334879219           R-squared     =  0.1911
-------------+------------------------------           Adj R-squared =  0.1839
       Total |  370.927005   904  .410317484           Root MSE      =  .57869

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1982688   .0227456     8.72   0.000      .153628    .2429096
       age_r |   .0006551   .0015472     0.42   0.672    -.0023814    .0036916
        male |   .2020891   .0431626     4.68   0.000     .1173775    .2868007
```

```
       black |  -.3131396   .0847509    -3.69   0.000    -.4794729   -.1468062
       asian |  -.1720732   .0474326    -3.63   0.000    -.2651652   -.0789812
       other |  -.2334459   .0746925    -3.13   0.002    -.3800385   -.0868532
      fac1_1 |   .1363428   .0212194     6.43   0.000     .0946973    .1779883
   ave_Kirb  |   .0489598   .0117161     4.18   0.000     .0259657     .071954
       _cons |   2.495726   .0737359    33.85   0.000     2.351011    2.640441
-------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   97.61
       Model |  730.364603     9  81.1516226           Prob > F      =  0.0000
    Residual |  744.123242   895  .831422617           R-squared     =  0.4953
-------------+------------------------------           Adj R-squared =  0.4903
       Total |  1474.48785   904  1.63107063           Root MSE      =  .91182

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Alc_Gi09 |   1.215748   .0526396    23.10   0.000     1.112437     1.31906
      fac3_1 |  -.1002729   .0373284    -2.69   0.007    -.1735342   -.0270116
       age_r |   .0030741   .0024381     1.26   0.208    -.0017109    .0078591
        male |  -.2101098   .0688372    -3.05   0.002    -.3452109   -.0750086
       black |  -.5111498   .1345534    -3.80   0.000    -.7752267   -.2470729
       asian |  -.6098969   .0752853    -8.10   0.000    -.7576532   -.4621405
       other |  -.3878118    .118331    -3.28   0.001    -.6200504   -.1555733
      fac1_1 |   .1802374   .0341965     5.27   0.000     .1131227    .2473521
   ave_Kirb  |   .0357549   .0186398     1.92   0.055    -.0008278    .0723376
       _cons |   .9518878   .1753791     5.43   0.000     .6076856     1.29609
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .24104499     .02955687   8.155      4.441e-16
Goodman-1   .24104499     .02958111   8.149      4.441e-16
Goodman-2   .24104499     .02953261   8.162      2.220e-16

Indirect effect = .24104499
  Direct effect = -.1002729
   Total effect = .14077209

Proportion of total effect that is mediated:  1.7123067
Ratio of indirect to direct effect:      -2.4038897

. sgmediation arq_alc_, iv( ave_Kirb) mv( Alc_Gi09) cv( age_r male black asian other
fac1_1 fac3_1 AlcVerb0)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   81.66
       Model |  664.837945     9  73.8708828           Prob > F      =  0.0000
    Residual |    809.6499   895   .90463676           R-squared     =  0.4509
-------------+------------------------------           Adj R-squared =  0.4454
       Total |  1474.48785   904  1.63107063           Root MSE      =  .95112

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   ave_Kirb  |   .0749349   .0192821     3.89   0.000     .0370915    .1127783
       age_r |    .005919   .0025449     2.33   0.020     .0009244    .0109136
        male |  -.1184308   .0713406    -1.66   0.097     -.258445    .0215835
       black |  -.5030051   .1405885    -3.58   0.000    -.7789267   -.2270835
       asian |  -.4882613   .0796221    -6.13   0.000    -.6445292   -.3319935
       other |  -.3912352   .1235277    -3.17   0.002     -.633673   -.1487974
      fac1_1 |   .2584136   .0351382     7.35   0.000     .1894508    .3273764
      fac3_1 |  -.0346466   .0383567    -0.90   0.367    -.1099263     .040633
    AlcVerb0 |   1.581708   .0773818    20.44   0.000     1.429837    1.733578
       _cons |   4.184189   .1215784    34.42   0.000     3.945577    4.422801
------------------------------------------------------------------------------
```

```
Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   91.57
       Model |  177.821633     9  19.7579593           Prob > F      =  0.0000
    Residual |  193.105372   895  .215760192           R-squared     =  0.4794
-------------+------------------------------           Adj R-squared =  0.4742
       Total |  370.927005   904  .410317484           Root MSE      =   .4645

------------------------------------------------------------------------------
    Alc_Gi09 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ave_Kirb |   .0381388   .0094168     4.05   0.000     .0196572    .0566203
       age_r |   .0017447   .0012428     1.40   0.161    -.0006945    .0041839
        male |   .1201656   .0348406     3.45   0.001     .0517869    .1885443
       black |  -.1063001   .0686592    -1.55   0.122    -.2410518    .0284516
       asian |   .0039085    .038885     0.10   0.920    -.0724079     .080225
       other |  -.0842977   .0603272    -1.40   0.163    -.2026969    .0341015
      fac1_1 |   .0897547   .0171604     5.23   0.000     .0560754    .1234341
      fac3_1 |   .1049575   .0187323     5.60   0.000     .0681932    .1417218
    AlcVerb0 |   .8413654   .0377909    22.26   0.000     .7671963    .9155345
       _cons |   2.601117   .0593752    43.81   0.000     2.484586    2.717648
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F( 10,   894) =  107.11
       Model |  803.670888    10  80.3670888           Prob > F      =  0.0000
    Residual |  670.816958   894  .750354539           R-squared     =  0.5451
-------------+------------------------------           Adj R-squared =  0.5400
       Total |  1474.48785   904  1.63107063           Root MSE      =  .86623

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Alc_Gi09 |   .8479087   .0623356    13.60   0.000     .7255675    .9702498
    ave_Kirb |   .0425967   .0177213     2.40   0.016     .0078166    .0773768
       age_r |   .0044396   .0023203     1.91   0.056    -.0001142    .0089934
        male |  -.2203202   .0654033    -3.37   0.001    -.3486821   -.0919583
       black |  -.4128723   .1282115    -3.22   0.001    -.6645028   -.1612418
       asian |  -.4915754   .0725158    -6.78   0.000    -.6338964   -.3492544
       other |  -.3197585   .1126248    -2.84   0.005    -.5407982   -.0987187
      fac1_1 |   .1823098   .0324873     5.61   0.000     .1185496      .24607
      fac3_1 |   -.123641   .0355406    -3.48   0.001    -.1933937   -.0538884
    AlcVerb0 |   .8683066   .0878488     9.88   0.000     .6958927    1.04072
       _cons |    1.97868   .1963428    10.08   0.000     1.593333    2.364026
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .0323382     .008331    3.882      .00010374
Goodman-1   .0323382     .00835166   3.872       .00010792
Goodman-2   .0323382     .0083103    3.891      .00009969

Indirect effect = .0323382
  Direct effect = .04259672
   Total effect = .07493492

Proportion of total effect that is mediated:  .43155044
Ratio of indirect to direct effect:      .75917103

. sgmediation arq_16, iv(fac1_1) mv( Sex_Gi06) cv( age_r male black asian other
> fac3_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =    5.25
       Model |  39.0622752     8   4.8827844           Prob > F      =  0.0000
```

```
    Residual |  833.320045   896  .930044693           R-squared     =  0.0448
-------------+----------------------------           Adj R-squared =  0.0362
       Total |   872.38232   904  .965024691           Root MSE      =  .96439

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .1149694   .0353623     3.25   0.001     .0455668    .1843721
       age_r |  -.0039407   .0025784    -1.53   0.127     -.009001    .0011197
        male |   .1095769   .0719309     1.52   0.128    -.0315958    .2507496
       black |  -.0177573   .1412382    -0.13   0.900    -.2949534    .2594389
       asian |  -.2627972    .079047    -3.32   0.001     -.417936   -.1076585
       other |   .0237535   .1244758     0.19   0.849    -.2205446    .2680516
      fac3_1 |   .1167885   .0379057     3.08   0.002     .0423942    .1911828
    ave_Kirb |   .0259815    .019525     1.33   0.184    -.0123385    .0643015
       _cons |   1.838124   .1228815    14.96   0.000     1.596955    2.079294
------------------------------------------------------------------------------
```

Model with mediator regressed on iv (path a)

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   39.02
       Model |  104.367141     8  13.0458927           Prob > F      =  0.0000
    Residual |   299.60464   896  .334380179           R-squared     =  0.2584
-------------+------------------------------           Adj R-squared =  0.2517
       Total |  403.971782   904   .44687144           Root MSE      =  .57826

------------------------------------------------------------------------------
    Sex_Gi06 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .0769945   .0212036     3.63   0.000     .0353801     .118609
       age_r |  -.0006378    .001546    -0.41   0.680     -.003672    .0023964
        male |   .6642724   .0431304    15.40   0.000      .579624    .7489209
       black |  -.1923233   .0846877    -2.27   0.023    -.3585326   -.0261139
       asian |  -.1287408   .0473973    -2.72   0.007    -.2217635   -.0357182
       other |  -.1366297   .0746368    -1.83   0.067    -.2831131    .0098537
      fac3_1 |   .1399097   .0227286     6.16   0.000     .0953022    .1845172
    ave_Kirb |   .0210464   .0117073     1.80   0.073    -.0019307    .0440234
       _cons |   2.044964   .0736809    27.75   0.000     1.900357    2.189571
------------------------------------------------------------------------------
```

Model with dv regressed on mediator and iv (paths b and c')

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   10.18
       Model |  81.0205773     9  9.00228636           Prob > F      =  0.0000
    Residual |  791.361743   895  .884203065           R-squared     =  0.0929
-------------+------------------------------           Adj R-squared =  0.0838
       Total |   872.38232   904  .965024691           Root MSE      =  .94032

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Sex_Gi06 |   .3742266   .0543253     6.89   0.000     .2676069    .4808463
      fac1_1 |    .086156   .0347326     2.48   0.013     .0179892    .1543228
       age_r |  -.003702   .0025143    -1.47   0.141    -.0086365    .0012326
        male |  -.1390116   .0788751    -1.76   0.078    -.2938133    .0157901
       black |   .0542152   .1381091     0.39   0.695    -.2168403    .3252707
       asian |   -.214619   .0773909    -2.77   0.006    -.3665078   -.0627302
       other |   .0748839   .1215961     0.62   0.538    -.1637627    .3135306
      fac3_1 |   .0644305   .0377331     1.71   0.088    -.0096252    .1384863
    ave_Kirb |   .0181054    .019072     0.95   0.343    -.0193256    .0555364
       _cons |   1.072845   .1633931     6.57   0.000     .7521664    1.393523
------------------------------------------------------------------------------
```

Sobel-Goodman Mediation Tests

	Coef	Std Err	Z	P>|Z|
Sobel	**.0288134**	**.00896988**	**3.212**	**.00131704**
Goodman-1	.0288134	.00904354	3.186	.00144216
Goodman-2	.0288134	.00889561	3.239	.00119925

```
Indirect effect = .0288134
  Direct effect = .08615604
   Total effect = .11496944

Proportion of total effect that is mediated:  .25061791
Ratio of indirect to direct effect:      .33443275

. sgmediation arq_alc_, iv(fac1_1) mv( AlcVerb0) cv( age_r male black asian other
fac3_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   27.05
       Model |  286.874933     8  35.8593667           Prob > F      =  0.0000
    Residual |  1187.61291   896  1.32546084           R-squared     =  0.1946
-------------+------------------------------           Adj R-squared =  0.1874
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.1513

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .3459959   .0422155     8.20   0.000     .2631431    .4288488
       age_r |   .0038706    .003078     1.26   0.209    -.0021705    .0099116
        male |   .0355797   .0858711     0.41   0.679    -.1329522    .2041117
       black |  -.8918486   .1686101    -5.29   0.000    -1.222765   -.5609319
       asian |  -.8190946   .0943662    -8.68   0.000    -1.004299     -.63389
       other |  -.6716233   .1485992    -4.52   0.000    -.9632663   -.3799802
      fac3_1 |   .1407721   .0452518     3.11   0.002     .0519602    .229584
    ave_Kirb |   .0952777   .0233089     4.09   0.000     .0495313    .1410241
       _cons |   3.986063   .1466959    27.17   0.000     3.698155    4.27397
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   17.37
       Model |  23.4252757     8  2.92815946           Prob > F      =  0.0000
    Residual |  151.076495   896   .16861216           R-squared     =  0.1342
-------------+------------------------------           Adj R-squared =  0.1265
       Total |  174.501771   904  .193032932           Root MSE      =  .41062

------------------------------------------------------------------------------
    AlcVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |    .055372   .0150568     3.68   0.000     .0258213    .0849227
       age_r |  -.0012951   .0010978    -1.18   0.238    -.0034497    .0008596
        male |   .0973698   .0306273     3.18   0.002     .0372603    .1574793
       black |  -.2458378   .0601374    -4.09   0.000    -.3638644   -.1278113
       asian |  -.2091621   .0336572    -6.21   0.000    -.2752182    -.143106
       other |  -.1772692   .0530002    -3.34   0.001    -.2812882   -.0732502
      fac3_1 |   .1109046   .0161398     6.87   0.000     .0792285    .1425808
    ave_Kirb |   .0128613   .0083135     1.55   0.122    -.0034549    .0291774
       _cons |  -.1252611   .0523214    -2.39   0.017    -.2279478   -.0225744
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   81.66
       Model |  664.837945     9  73.8708828           Prob > F      =  0.0000
    Residual |    809.6499   895   .90463676           R-squared     =  0.4509
-------------+------------------------------           Adj R-squared =  0.4454
       Total |  1474.48785   904  1.63107063           Root MSE      =  .95112

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    AlcVerb0 |   1.581708   .0773818    20.44   0.000     1.429837    1.733578
      fac1_1 |   .2584136   .0351382     7.35   0.000     .1894508    .3273764
       age_r |    .005919   .0025449     2.33   0.020     .0009244    .0109136
        male |  -.1184308   .0713406    -1.66   0.097     -.258445    .0215835
```

```
       black |  -.5030051   .1405885    -3.58   0.000    -.7789267   -.2270835
       asian |  -.4882613   .0796221    -6.13   0.000    -.6445292   -.3319935
       other |  -.3912352   .1235277    -3.17   0.002     -.633673   -.1487974
      fac3_1 |  -.0346466   .0383567    -0.90   0.367    -.1099263    .040633
    ave_Kirb |   .0749349   .0192821     3.89   0.000     .0370915    .1127783
       _cons |   4.184189   .1215784    34.42   0.000     3.945577    4.422801
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef         Std Err     Z           P>|Z|
Sobel       .08758231    .02419787   3.619       .00029526
Goodman-1   .08758231    .0242259    3.615       .00030008
Goodman-2   .08758231    .0241698    3.624       .0002905

Indirect effect = .08758231
  Direct effect = .25841362
   Total effect = .34599593

Proportion of total effect that is mediated:  .25313104
Ratio of indirect to direct effect:      .33892297

. sgmediation arq_alc_, iv(fac3_1) mv( AlcVerb0) cv( age_r male black asian other
fac1_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   27.05
       Model |  286.874933     8  35.8593667           Prob > F      =  0.0000
    Residual |  1187.61291   896  1.32546084           R-squared     =  0.1946
-------------+------------------------------           Adj R-squared =  0.1874
       Total |  1474.48785   904  1.63107063           Root MSE      =  1.1513

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1407721   .0452518     3.11   0.002     .0519602     .229584
       age_r |   .0038706    .003078     1.26   0.209    -.0021705    .0099116
        male |   .0355797   .0858711     0.41   0.679    -.1329522    .2041117
       black |  -.8918486   .1686101    -5.29   0.000    -1.222765   -.5609319
       asian |  -.8190946   .0943662    -8.68   0.000    -1.004299     -.63389
       other |  -.6716233   .1485992    -4.52   0.000    -.9632663   -.3799802
      fac1_1 |   .3459959   .0422155     8.20   0.000     .2631431    .4288488
    ave_Kirb |   .0952777   .0233089     4.09   0.000     .0495313    .1410241
       _cons |   3.986063   .1466959    27.17   0.000     3.698155     4.27397
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   17.37
       Model |  23.4252757     8  2.92815946           Prob > F      =  0.0000
    Residual |  151.076495   896   .16861216           R-squared     =  0.1342
-------------+------------------------------           Adj R-squared =  0.1265
       Total |  174.501771   904  .193032932           Root MSE      =  .41062

------------------------------------------------------------------------------
    AlcVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1109046   .0161398     6.87   0.000     .0792285    .1425808
       age_r |  -.0012951   .0010978    -1.18   0.238    -.0034497    .0008596
        male |   .0973698   .0306273     3.18   0.002     .0372603    .1574793
       black |  -.2458378   .0601374    -4.09   0.000    -.3638644   -.1278113
       asian |  -.2091621   .0336572    -6.21   0.000    -.2752182    -.143106
       other |  -.1772692   .0530002    -3.34   0.001    -.2812882   -.0732502
      fac1_1 |    .055372   .0150568     3.68   0.000     .0258213    .0849227
    ave_Kirb |   .0128613   .0083135     1.55   0.122    -.0034549    .0291774
       _cons |  -.1252611   .0523214    -2.39   0.017    -.2279478   -.0225744
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')
```

```
      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   81.66
       Model |  664.837945     9  73.8708828           Prob > F      =  0.0000
    Residual |    809.6499   895   .90463676           R-squared     =  0.4509
-------------+------------------------------           Adj R-squared =  0.4454
       Total |  1474.48785   904  1.63107063           Root MSE      =  .95112

------------------------------------------------------------------------------
    arq_alc_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    AlcVerb0 |   1.581708   .0773818    20.44   0.000     1.429837    1.733578
      fac3_1 |  -.0346466   .0383567    -0.90   0.367    -.1099263     .040633
       age_r |    .005919   .0025449     2.33   0.020     .0009244    .0109136
        male |  -.1184308   .0713406    -1.66   0.097     -.258445    .0215835
       black |  -.5030051   .1405885    -3.58   0.000    -.7789267   -.2270835
       asian |  -.4882613   .0796221    -6.13   0.000    -.6445292   -.3319935
       other |  -.3912352   .1235277    -3.17   0.002     -.633673   -.1487974
      fac1_1 |   .2584136   .0351382     7.35   0.000     .1894508    .3273764
    ave_Kirb |   .0749349   .0192821     3.89   0.000     .0370915    .1127783
       _cons |   4.184189   .1215784    34.42   0.000     3.945577    4.422801
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .17541873     .0269323   6.513      7.351e-11
Goodman-1   .17541873     .02696124   6.506      7.701e-11
Goodman-2   .17541873     .02690333    6.52      7.015e-11

Indirect effect = .17541873
  Direct effect = -.03464664
   Total effect = .14077209

Proportion of total effect that is mediated:  1.2461187
Ratio of indirect to direct effect:      -5.0630807

. sgmediation arq_16, iv(fac1_1) mv( SexVerb0) cv( age_r male black asian other
> fac3_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =    5.25
       Model |  39.0622752     8   4.8827844           Prob > F      =  0.0000
    Residual |  833.320045   896  .930044693           R-squared     =  0.0448
-------------+------------------------------           Adj R-squared =  0.0362
       Total |   872.38232   904  .965024691           Root MSE      =  .96439

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .1149694   .0353623     3.25   0.001     .0455668    .1843721
       age_r |  -.0039407   .0025784    -1.53   0.127     -.009001    .0011197
        male |   .1095769   .0719309     1.52   0.128    -.0315958    .2507496
       black |  -.0177573   .1412382    -0.13   0.900    -.2949534    .2594389
       asian |  -.2627972    .079047    -3.32   0.001     -.417936   -.1076585
       other |   .0237535   .1244758     0.19   0.849    -.2205446    .2680516
      fac3_1 |   .1167885   .0379057     3.08   0.002     .0423942    .1911828
    ave_Kirb |   .0259815    .019525     1.33   0.184    -.0123385    .0643015
       _cons |   1.838124   .1228815    14.96   0.000     1.596955    2.079294
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   40.00
       Model |  39.2251487     8  4.90314358           Prob > F      =  0.0000
    Residual |  109.841975   896   .12259149           R-squared     =  0.2631
-------------+------------------------------           Adj R-squared =  0.2566
       Total |  149.067124   904  .164897261           Root MSE      =  .35013
```

```
------------------------------------------------------------------------------
    SexVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac1_1 |   .0396063   .0128386     3.08   0.002      .014409    .0648036
       age_r |   .0000538   .0009361     0.06   0.954    -.0017834     .001891
        male |    .406631   .0261152    15.57   0.000     .3553769    .4578851
       black |  -.1180052   .0512779    -2.30   0.022     -.218644   -.0173664
       asian |  -.1528098   .0286988    -5.32   0.000    -.2091345   -.0964852
       other |  -.0816317   .0451922    -1.81   0.071    -.1703265    .0070631
      fac3_1 |    .069287    .013762     5.03   0.000     .0422775    .0962966
    ave_Kirb |   .0129061   .0070887     1.82   0.069    -.0010064    .0268185
       _cons |  -.3312563   .0446133    -7.43   0.000    -.4188151   -.2436974
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   11.26
       Model |  88.7278749     9  9.85865277           Prob > F      =  0.0000
    Residual |  783.654446   895  .875591559           R-squared     =  0.1017
-------------+------------------------------           Adj R-squared =  0.0927
       Total |   872.38232   904  .965024691           Root MSE      =  .93573

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    SexVerb0 |   .6724247   .0892826     7.53   0.000     .4971972    .8476523
      fac1_1 |   .0883372   .0344932     2.56   0.011     .0206401    .1560342
       age_r |  -.0039768   .0025017    -1.59   0.112    -.0088868    .0009331
        male |  -.1638519   .0786713    -2.08   0.038    -.3182536   -.0094501
       black |   .0615924   .1374455     0.45   0.654    -.2081607    .3313454
       asian |  -.1600441    .077902    -2.05   0.040     -.312936   -.0071522
       other |   .0786447   .1209966     0.65   0.516    -.1588254    .3161147
      fac3_1 |   .0701982   .0372959     1.88   0.060    -.0029995    .1433958
    ave_Kirb |   .0173031   .0189798     0.91   0.362    -.0199469    .0545532
       _cons |   2.060869   .1228433    16.78   0.000     1.819775    2.301964
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

              Coef          Std Err      Z          P>|Z|
Sobel       .02663225     .00932917   2.855       .00430735
Goodman-1   .02663225     .00939933   2.833       .00460526
Goodman-2   .02663225     .00925848   2.877       .0040208

Indirect effect = .02663225
  Direct effect = .08833719
   Total effect = .11496944

Proportion of total effect that is mediated:  .23164638
Ratio of indirect to direct effect:      .30148407

. sgmediation arq_16, iv(fac3_1) mv( SexVerb0) cv( age_r male black asian other
> fac1_1 ave_Kirb)

Model with dv regressed on iv (path c)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =    5.25
       Model |  39.0622752     8   4.8827844           Prob > F      =  0.0000
    Residual |  833.320045   896  .930044693           R-squared     =  0.0448
-------------+------------------------------           Adj R-squared =  0.0362
       Total |   872.38232   904  .965024691           Root MSE      =  .96439

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |   .1167885   .0379057     3.08   0.002     .0423942    .1911828
       age_r |  -.0039407   .0025784    -1.53   0.127     -.009001    .0011197
        male |   .1095769   .0719309     1.52   0.128    -.0315958    .2507496
       black |  -.0177573   .1412382    -0.13   0.900    -.2949534    .2594389
       asian |  -.2627972    .079047    -3.32   0.001     -.417936   -.1076585
```

```
       other |   .0237535   .1244758     0.19   0.849    -.2205446    .2680516
      fac1_1 |   .1149694   .0353623     3.25   0.001     .0455668    .1843721
    ave_Kirb |   .0259815    .019525     1.33   0.184    -.0123385    .0643015
       _cons |   1.838124   .1228815    14.96   0.000     1.596955    2.079294
------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  8,   896) =   40.00
       Model |  39.2251487     8  4.90314358           Prob > F      =  0.0000
    Residual |  109.841975   896   .12259149           R-squared     =  0.2631
-------------+------------------------------           Adj R-squared =  0.2566
       Total |  149.067124   904  .164897261           Root MSE      =  .35013

------------------------------------------------------------------------------
    SexVerb0 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fac3_1 |    .069287    .013762     5.03   0.000     .0422775    .0962966
       age_r |   .0000538   .0009361     0.06   0.954    -.0017834     .001891
        male |    .406631   .0261152    15.57   0.000     .3553769    .4578851
       black |  -.1180052   .0512779    -2.30   0.022     -.218644   -.0173664
       asian |  -.1528098   .0286988    -5.32   0.000    -.2091345   -.0964852
       other |  -.0816317   .0451922    -1.81   0.071    -.1703265    .0070631
      fac1_1 |   .0396063   .0128386     3.08   0.002      .014409    .0648036
    ave_Kirb |   .0129061   .0070887     1.82   0.069    -.0010064    .0268185
       _cons |  -.3312563   .0446133    -7.43   0.000    -.4188151   -.2436974
------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')

      Source |       SS       df       MS              Number of obs =     905
-------------+------------------------------           F(  9,   895) =   11.26
       Model |  88.7278749     9  9.85865277           Prob > F      =  0.0000
    Residual |  783.654446   895  .875591559           R-squared     =  0.1017
-------------+------------------------------           Adj R-squared =  0.0927
       Total |   872.38232   904  .965024691           Root MSE      =  .93573

------------------------------------------------------------------------------
      arq_16 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    SexVerb0 |   .6724247   .0892826     7.53   0.000     .4971972    .8476523
      fac3_1 |   .0701982   .0372959     1.88   0.060    -.0029995    .1433958
       age_r |  -.0039768   .0025017    -1.59   0.112    -.0088868    .0009331
        male |  -.1638519   .0786713    -2.08   0.038    -.3182536   -.0094501
       black |   .0615924   .1374455     0.45   0.654    -.2081607    .3313454
       asian |  -.1600441    .077902    -2.05   0.040     -.312936   -.0071522
       other |   .0786447   .1209966     0.65   0.516    -.1588254    .3161147
      fac1_1 |   .0883372   .0344932     2.56   0.011     .0206401    .1560342
    ave_Kirb |   .0173031   .0189798     0.91   0.362    -.0199469    .0545532
       _cons |   2.060869   .1228433    16.78   0.000     1.819775    2.301964
------------------------------------------------------------------------------

Sobel-Goodman Mediation Tests

             Coef          Std Err      Z          P>|Z|
Sobel       .04659032     .01113119    4.186      .00002845
Goodman-1   .04659032     .0111988     4.16      .00003178
Goodman-2   .04659032     .01106317    4.211      .00002539

Indirect effect = .04659032
  Direct effect = .07019815
   Total effect = .11678847

Proportion of total effect that is mediated:  .3989291
Ratio of indirect to direct effect:      .66369724
```