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Abstract

Although previous research has indicated that children’s affective responses to the odor of alcohol differ as a function of parental escape drinking (i.e., drinking to avoid dysphoric emotion), little has been done to test this finding with visual cues. Moreover, research with adults indicates that those who are dependent on alcohol show attentional biases toward alcohol-related cues, but little has been done to determine whether exposure to parental drinking behavior affects attentional biases of the child. Thus the goal of the present experiment was to determine whether young children whose parents engage in problem drinking behavior also show an attentional bias towards alcohol-related cues. To measure these differences, 149 children’s implicit affective and attentional responses to pictures of alcohol were measured using the Affective Misattribution Procedure (AMP) and the dot-probe task, respectively. Although there were no significant differences as a function of parental alcohol dependency or escape drinking on children’s implicit affective responses, children who had an escape drinking parent demonstrated an implicit attentional bias towards alcohol when the pictures were presented for 2000 ms, but not 500 ms, whereas those whose parents were not escape drinkers did not demonstrate an attentional bias. These findings suggest that the emotional context in which the parent consumes alcohol has an effect on their child’s maintained attention towards alcohol.
Effect of Parental Dependence and Escape Drinking on Affect and Attentional Bias to Alcohol-Related cues in Pre-Adolescents

Alcohol is the most common substance of abuse in the United States with 87% of individuals 18 years and older consuming alcohol in the past year (National Institute on Alcohol Abuse and Alcoholism, 2014). Excessive consumption and abuse of alcohol is prevalent among adults within every age bracket (Johnston, O’Malley, Miech, Bachman & Schulenberg, 2014; National Institute on Alcohol Abuse, 2014). If left untreated, alcohol abuse can negatively affect one’s quality of life, health, and interpersonal relationships (Leonard & Rothbard, 1999; National Institute on Alcohol Abuse and Alcoholism, 2010). In many cases, those who are most negatively affected by an alcohol dependent adult are the children in their care (Moos & Billings, 1982; Schuckit & Chiles, 1978).

Previous research indicates that parental alcohol dependence can have detrimental effects on family members. More than 10.5% of all children in the United States live with a parent who regularly abuses alcohol (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012). Children of adults who abuse alcohol are at higher risk for mental health problems, such as depression (Anda et al., 2002). Compared to children of parents who were not alcohol dependent, children of adults who abuse alcohol are four times as likely to abuse alcohol or become alcohol dependent as adults (Brook et al., 2003; SAMHSA, 2004). Alcohol dependence has been shown to be influenced by the interaction of genetic influences (Edwards & Kendler, 2013) and environmental factors. A study conducted by Miranda and colleagues (2013) revealed that children who had a genetic predisposition for alcoholism were more likely to demonstrate an alcohol use disorder if they lived in a household with low levels of peer monitoring, and high levels of deviant peer affiliations. Additionally, children of parents who abuse alcohol are more likely to develop asocial drinking behaviors including: drinking alone,
drinking to forget worries, and drinking to feel intoxicated (Chalder, Elgar, & Bennett, 2005).

However, certain environments have also been shown to protect children from engaging in these asocial drinking behaviors. Jacob et al. (2003) revealed that family environments that did not contain parental alcoholism mitigated genetic effects in children with a high genetic risk for developing alcohol dependency. Because genetic and environmental factors interact to affect one’s predisposition towards alcoholism, it is important to consider the effects of parental drinking behaviors on their children.

Because dependent drinkers have been found to consume more drinks in a single drinking occasion and crave alcohol more frequently (e.g., Dickter, Forestell, Hammett & Young, 2014), the presence of alcohol may be more apparent in the home of dependent drinkers when compared to nondependent drinkers. As such, children of dependent drinkers may be exposed to the sensory attributes of alcohol from a very early age. In a study conducted by Mennella and Beauchamp (1998), children’s preference for the scent of alcohol was investigated as a function of parental alcohol dependence. Findings from their study revealed that infants who lived in a household in which one or both parents were alcohol dependent put alcohol-scented toys in their mouths more than infants of nondependent parents, whereas the proportion of time spent mouthing other toys that were unscented or scented with vanilla was similar to that of children of nondependent drinkers. These results suggest that the presence of alcohol in households has an early effect on children’s responses to the sensory properties of alcohol long before they can ascribe explicit meaning to alcohol itself.

Similarly, children were also found to be sensitive to the odor of substances in their environment as a function of their parent’s motivation to use these substances to avoid negative emotional states (Forestell & Mennella, 2005; Mennella & Garcia, 2000). Adults who drink alcohol in order to cope with or avoid negative emotional states are classified as escape drinkers.
(Cahalan, Cisin, & Crossley, 1969). In a study conducted by Mennella and Garcia (2000) in which children were asked to identify and rate four scents, including alcohol, using a game-like task, a higher proportion of children who had mothers who drank to escape rated the odor of beer as unpleasant compared to children of non-escape drinkers. A more recent study by Mennella and Forestell (2008) found that children of escape drinkers also took longer to decide whether or not they liked the scent of beer when compared to an unpleasant scent and were less likely to choose it over the scent of a neutral odor, suggesting that children of escape drinkers may feel conflicted when asked to evaluate the odor of beer. These findings are consistent with other work that investigated children’s responses to the odor of other addictive substances (Forestell & Mennella, 2005) and suggest that the emotional context in which their parents drink can influence children’s hedonic responses to the odor of this addictive substance. Less work has examined differences in the processing of visual alcohol-related cues between children of problem drinkers and non-problem drinkers. In the present study, we will attempt to fill this dearth in the literature by examining whether children’s implicit affective responses to visual presentations of alcohol-related cues differ as a function of parental drinking behaviors.

Affect reflects a pleasant or unpleasant emotional response to a given stimulus and can occur consciously or unconsciously (Russell, 2003). Conscious affective responses towards alcohol-related stimuli can be recorded through explicit measures while unconscious affective responses must be recorded through implicit measures. Explicit measures of affect in regards to alcohol consumption have previously been shown to accurately predict overt problem drinking behaviors (Larsen et al., 2012). While explicit affective responses are beneficial for collecting information regarding behavior, they measure processes that are more deliberate as opposed to automatic and are thought to inhibit automatic cognitions (Greenwald & Banaji, 1995; Wiers, Woerden, Smulders, & Jong, 2002). Because of this, they cannot be used to gain information
about the level of emotional affect towards alcohol at the unconscious level. The findings of several studies have indicated that the constructs underlying explicit and implicit measures of alcohol consumption are not always congruent and indeed tend to be weakly correlated (Jajodia & Earleywine, 2003; Wiers et al., 2002). They also tend to predict different types of behaviors. In adults, implicit affect toward alcohol-related stimuli has been found to predict and influence drinking preferences and behaviors (Houben, Havermans, & Wiers, 2010). Increased negative implicit affect towards alcohol-related stimuli is associated with decreased alcohol consumption (Houben, Nederkoorn, Wiers, & Jansen, 2011). This decrease in consumption is attributed to a devaluation of alcohol-related stimuli rather than an increase in inhibitory control over responses to alcohol-related stimuli (Houben, Havermans, Nederkoorn & Jansen, 2012).

Likewise, implicit affective responses have been shown to influence memory and behavior without introspection (Wiers et al., 2002). With consideration to alcohol consumption behaviors, using implicit measures of affect to record information has been thought to reduce the self-presentation influences that affect explicit reporting (Greenwald et al., 2002) and more accurately reflect automatic covert cognitions (Greenwald, McGhee, & Schwartz, 1998). Thus, implicit measures are preferred over explicit for understanding true emotional responses of participants because they mitigate the tendency towards self-presentation bias caused by the stigma associated with drinking. Likewise, Wiers et al. (2002) found that positive implicit affective measures more accurately predicted drinking behaviors as opposed to negative explicit measures. These findings further suggest that implicit and explicit measures may focus on different facets of affect that may be differentially related to drinking behavior and that implicit measures allow access to unconscious responses.

In recent years the Affect Misattribution Procedure (Payne et al., 2005; AMP) has allowed for the measurement of implicit affective responses to various visual stimuli. During the
AMP, participants rate neutral stimuli as pleasant or unpleasant. These neutral stimuli are preceded by cues presented for a short amount of time that are related to the construct of interest (e.g., alcohol). Because the neutral stimulus does not elicit any affect, participants are thought to misattribute affect from the stimulus of interest, thus allowing for a measure of implicit affect beyond the level of the participant’s awareness. The AMP has been used to record implicit affect from several varying categories including political leaning, racial bias, attention to smoking-related stimuli and attention to alcohol-related stimuli (Payne et al., 2005; Payne, McClernon, & Dobbins, 2007; Payne, Govorun, & Arbuckle, 2007). In a study by Payne, Govorun and Arbuckle (2008), participants with implicit positive affect for pictures of beer were more likely to select beer over water when presented with the option to consume either. Because implicit affect is thought to be indicative of drinking behaviors it is an important factor to consider in children of problem drinkers. Therefore, in the present study, the AMP was used to determine whether implicit affective responses to visual alcohol cues varied as a function of parental drinking behaviors (i.e., alcohol dependency and escape drinking).

In addition to assessing children’s implicit affective responses to alcohol, the current study measured implicit cognitive processing biases related to attention. Attentional bias, a predisposition to process certain stimuli more than others, is an important factor to consider due to its role in the facilitation of addictive behaviors for a range of substances (Cox, Hogan, Kristian, & Race, 2002; Dickter & Forestell, 2012; Field & Cox, 2008; Field, Mogg, & Bradley, 2004). With respect to alcohol, previous research has indicated that heavy drinkers and alcohol dependent drinkers have a tendency to exhibit attentional bias towards alcohol-related stimuli (Cox et al., 2002; Sharma, Albery, & Cook, 2001). Other research revealed that alcohol dependence is associated with stronger attentional biases during earlier stages of implicit processing and that alcohol dependent individuals show more attentional bias towards alcohol-
related visual cues in which another human is interacting with the stimuli (Dickter et al., 2014). In addition, for alcohol dependent individuals, attentional biases are thought to be an important predictor of treatment success in that individuals who succeed in treatment show less attentional bias towards alcohol-related stimuli compared to those who do not succeed (Cox et al., 2002). This suggests that for alcohol dependent individuals, attentional bias when processing alcohol in the environment may be an automatic sensory response. Because enhanced attention to substance-related cues has previously been thought to affect future behavior in children of substance users (Forestell, Dickter, Wright, & Young, 2012), it is important to discover whether or not this has any bearing on children’s attention to alcohol-related stimuli and eventual behavior.

Similarly, attentional biases are thought to be indicative of problem drinking behaviors in adults who drink to escape. Specifically, escape drinking is associated with stronger attentional bias towards alcohol-related stimuli (Dickter et al., 2014; Forestell, Dickter, & Young, 2012). Dickter et al. (2014) also found that escape drinkers showed greater attentional biases to alcohol-related cues in which humans were interacting with the alcohol. Because of the previously documented relationship between drinking behaviors and attentional bias in adults, it is possible that children of parents who engage in problem drinking behaviors implicitly process alcohol-related visual cues differently than children of parents who are not problem drinkers (Forestell, Dickter, & Young, 2012).

In previous research, the dot-probe task has been administered to measure implicit attentional bias towards certain stimuli. To date there have been no experimental investigations conducted to determine whether children of problem drinkers show implicit attentional biases to alcohol-related cues. In a recent retrospective study, young adult nonsmokers who had parents who smoked during their childhood demonstrated attentional biases for smoking-related cues
(Forestell, Dickter, Wright, & Young, 2012). These findings suggest that early exposure to addictive substances may predict attentional biases in children. In the current study, implicit attention towards alcohol-related stimuli was examined. Likewise, because escape drinkers were previously found to prefer stimuli depicting a human interacting with the object of interest more than the stimuli presented alone, signaling that human interaction with the stimuli may garner a certain type of attention (Dickter et al., 2014) we investigated whether children’s implicit attention would differ as a function of whether or not a human was interacting with an alcohol-related or non-alcohol-related beverage. The presentation duration of the stimuli will also be considered because time is an important aspect of cognitive processing. That is, while attention at shorter time durations suggests a more automatic response, attention at longer time durations has been shown to be a function of more complex cognitive responses (Dickter et al., 2014).

Therefore in the present study, the dot probe will be used to assess attentional bias in children. While the task has been deemed to be useful when collecting substance-related implicit attential responses from adult participants (e.g., Forestell, Dickter & Young, 2012; Forestell, Dickter, Wright & Young 2012) few studies have considered the usefulness of the task when administered to child participants. Findings from Legerstee et al. (2010) indicate that children exhibit increased attentional bias towards severely threatening stimuli as recorded through the dot-probe task. Because of previous research citing success with children completing the dot-probe, this study sought to examine the role of children’s attention to alcohol-related stimuli in the context of parental drinking using this measure of attention.

While previous research has shown that children of problem drinkers are more vulnerable to becoming problem drinkers themselves, it is not clear how early exposure to alcohol may cause this to occur. Likewise, while previous research has suggested that early learning regarding stimuli (e.g., odors) may play some role, it is unknown whether implicit responses to the visual
characteristics of alcohol may also play a role. Therefore, the goal of the present study was to assess the degree to which implicit affect and implicit attentional bias in 8-12 year old children differs as a function of the alcohol dependence and/or escape drinking of the participating parent. It was predicted that children who had parents who engaged in problem drinking would show less positive implicit affect and more implicit attentional bias toward alcohol-related cues relative to neutral cues when compared to children of parents who did not engage in problem drinking behavior.

Method

Participants

One hundred sixty two children between the ages of 8 and 12 years old and their parents were recruited from south-eastern Virginia to participate in a study about “understanding children’s and adults’ perceptions of images of nicotine- and alcohol-related items” through online advertisements, letters to local schools and flyers. Of the 162 children (94 female) 78.4% were White, 8.0% were Black or of African descent, 3.1% were Asian and 9.3% identified as being two or more races. Of these racial categories, 9.3% of participants identified themselves as being Hispanic or Latino. Written informed consent was obtained from each parent and informed assent was obtained from each child. All testing procedures were approved by and in accordance with the ethical standards of the Human Subjects Committee at The College of William and Mary.

Materials

Stimuli. Experimental stimuli for both behavioral tasks consisted of 40 color photographs depicting alcohol-related and non-alcohol-related beverages. Alcohol photographs depicted pictures of liquor, wine and beer while non-alcohol photographs depicted pictures of water,
coffee, juice, milk and tea. In half of these photographs (active pictures) a person was shown interacting with the stimulus, while in the remaining photographs (non-active pictures) the stimulus was presented alone (See Appendices A-G).

**Affect Misattribution Procedure Task.** In order to ascertain the degree to which participants find stimuli implicitly pleasant, the Affect Misattribution Procedure (Payne, Cheng, Govorun, & Stewart, 2005; AMP) was administered to child participants. Each trial began with the presentation of a prime slide which displayed a picture of an alcoholic beverage or non-alcoholic beverage in the center of the screen for 75 ms which was then replaced by a blank screen for 125 ms. This screen was followed by a Chinese pictograph, which appeared for 100 ms followed by a black and white pattern mask. The mask remained on the screen until the participant selected a response. Participants were told to ignore the presence of the prime picture and to merely indicate the attractiveness of the Chinese pictographs by selecting one of two designated keys. In total, participants completed 80 trials in which the 20 alcoholic and 20 non-alcoholic photographs were presented twice. Forty Chinese pictographs were paired with each of the 40 beverage photographs. Keys indicating a pleasant response and an unpleasant response to the target were counterbalanced. The ratio of their pleasant responses for each condition was calculated by adding the number of times the stimulus was rated pleasant and dividing that sum by the total number of trials. A higher proportion of pleasant responses was indicative of expressing more positive implicit affect for stimuli of that particular condition (see Figure 1).

**Dot-Probe Task.** The dot-probe task (MacLeod, Mathews, & Tata, 1986) consisted of two blocks, which contained 60 trials each. At the beginning of each trial, a fixation cross appeared in the center of the screen for 1000 ms. Subsequently, stimulus picture pairs were presented, with one picture on each side of the fixation cross for either 500 ms or 2000 ms for the entire block. For each trial, one pictorial stimulus was alcohol-related and the other one was not
related to alcohol. The stimuli were presented in a randomized order with equal likelihood of apparition. The order of the blocks was counterbalanced across participants. Following the presentation of the paired stimuli, a visual mask replaced the images for 433 ms after which a black dot appeared where one of the pictures was previously located and remained there until the participant pressed a key to indicate which side of the screen (left or right) the dot had appeared. The inter-trial interval (ITI) varied randomly between 1000 ms and 2000 ms to avoid the potential effect of expectation (see Figure 2).

**Measures of Parental Alcohol Consumption.** Parents were also asked several questions about their smoking habits, drinking behaviors and demographic information. Questions inquired about whether or not they were current smokers during the time of the study, the time of day they drank, whether they drank on weekends or weekdays, if they had forgotten events after drinking, whether or not they were able to stop drinking once they started, how often they had six or more drinks in one sitting, if they felt guilty about drinking, if they had ever failed to complete responsibilities due to drinking, whether or not anyone in their lives were concerned about their drinking and several demographic questions (see Appendix H). In addition, they were asked to complete a time-line follow back procedure to determine how much alcohol they had consumed in the three weeks prior to the study (Sobell & Sobell, 1995; see Appendix I). Parents were asked several questions about their alcohol consumption behaviors (i.e., the amount, size and how frequently they consumed alcoholic beverages). From these questions, a standard amount of drinks per month was estimated. Parents were also asked to complete a brief Family Interview for Genetic Studies (FIGS) sheet in order to gather information about the genetic aspect of problem drinking. During the FIGS, parents were asked to provide the gender, first initial and birth year of grandparents, parents, aunts, uncles and siblings of the child participant and to indicate whether any of the family members listed had ever had problems with alcohol that
interfered with their health, job, family, or the police (see Appendix J). In addition, participants completed several electronically-based questionnaires to further assess the parent’s drinking behaviors and their child’s alcohol experiences which are described below.

The Michigan Alcohol Screening Test (Seltzer, 1971; MAST) was used to determine the level of parental alcohol dependence by considering alcohol-related events and problems throughout the parents’ lifetime. The MAST contained 25 questions that examined the parents’ problem drinking behavior. They were asked whether or not they had gotten into trouble at work or lost their job due to their alcohol use, if they had been arrested for their behavior while using alcohol, whether or not anyone close to them had complained about their alcohol use, and whether or not they considered themselves to be a normal drinker. Participants who scored 5 or above (range, 0-53) were considered to be problem drinkers (see Appendix K).

The Escape Drinking Questionnaire (Cahalan, Cisin, & Corssley, 1969) is a 20 item questionnaire that examines the extent to which alcohol is consumed to reduce stress and avoid negative emotional states or situations. Participating parents received one point for agreeing with any of the five relevant reasons for escape drinking. These reasons included: drinking to forget their problems or worries, to help them relax, to forget everything, to cheer themselves up when they are in a bad mood, or when they are tense or nervous (range, 0-5). In addition to these questions, several questions that were not related to escape drinking were asked. Examples of these unrelated questions included: “I drink because the people I know drink” or “I drink because I like the taste.” A score of two or higher on the five relevant escape questions indicated that the participant engaged in a pattern of escape drinking (see Appendix L).

**Child Questionnaires.** Children were asked several questions about their previous experiences with alcohol. In addition to being asked about their history, they were also asked
several questions that regarding their risk taking behaviors as recorded through the measures below.

The SIPS and TASTES questionnaire (Donovan & Molina, 2008) asked several questions related to the child’s previous experience with alcohol. Participants were asked whether or not they had ever had a sip or taste of alcohol, what kind of alcohol it was, the context in which alcohol was consumed (e.g., religious or non-religious), and whether or not they had ever consumed more than a sip or taste of alcohol. In addition, the child was asked several questions about how their parents would feel if the participant engaged in alcohol use. These questions included asking: how their parents would feel about someone their age having a sip of alcohol, how often their parents talked to them about not drinking, how often their parents talk to them about the dangers of drinking, how often their parents talk about what would happen if they were caught drinking, and how often their parents talk to them about how alcohol makes people act. (see Appendix M).

Several questions were also asked to gauge the level of risk-taking behavior of the child using the Sensation Seeking Questionnaire for Children (Russo et al., 1991). Participants were asked 26 questions in which they were to select which option out of two choices best described them on three subscales. These subscales included Thrill/Adventure Seeking, Drug and Alcohol Seeking and Social Disinhibition. In each set of two choices, one option would be a risk-taking option while the other would be a non-risk-taking option. One example included choosing between “You’d like to try mountain climbing” and “You think people who do dangerous things like mountain climbing are foolish.” Participants received one point for each answer designated to be a risk-taking response (range, 0-16). Higher scores were indicative of a higher sensation seeking orientation (see Appendix N).
Procedure

Following the completion of informed consent and assent, parents were asked several preliminary questions to determine whether the child had any pre-existing conditions or tendencies that would affect participation in this study. Questions were asked regarding the health of the child at the time of the study and about their previous experience with Asian languages in order to determine that the child’s implicit affective responses to visual cues during the AMP would not be due to interpreting the meaning of the Chinese symbol. The child’s height and weight were also recorded. The parent and child were then separated into different rooms to maintain confidentiality of answers and to elicit honest responses. While the child completed the AMP and dot-probe under the supervision of a research assistant, the parent was interviewed by another research assistant and was then asked to complete the FIGS. Following this, the parent completed the MAST and Escape Drinking Questionnaire online in addition to several demographic questions. After both the parent and child had completed their respective tasks, the child was interviewed. The child’s interview consisted of completing the SIPS and TASTES and the Sensation Seeking Scale for Children. After all questionnaires and tasks were completed parents and children were debriefed and compensated for their participation in the study. Parents received $30 per child that participated and children received a toy.

Results

Of the 162 children who participated in the study, there were 25 sibling pairs and 4 sibling triads. In total, 13 children were excluded from analysis because their parents did not complete all of the questionnaires. The remaining 149 children (57% female) were approximately 10.05 (SD = 1.43) years of age. The racial demographics of the included child participants were: 79.2% White, 6.0% Black, 0.7% Asian, and 14.1% mixed or other. Of these
racial groups 9.4% of the children were Hispanic or Latino. Almost all of the children (99%) were reported as feeling “Very Healthy” or “Healthy” at the time of the study by their parents.

The 121 participating parents (88% female) were approximately 39.78 (SD = 6.57) years of age with 54.5% of families making less than $75,000 a year. All of the participating parents had completed high school and more than half (52.1%) had at least a Bachelor’s degree. Sixty-nine percent of the participating parents reported consuming an alcoholic beverage during the three weeks prior to the study with an average of 6.48 (SD = 12.72) drinks being consumed during that time period. Twenty-eight of the participating parents were alcohol dependent and 45 were escape drinkers. In order to determine the differences between these groups on a range of demographic drinking-related variables, Analyses of Variance (ANOVA) and Chi-Square analyses were conducted.

As shown in Table 1, these analyses demonstrated that in comparison to nondependent drinkers, dependent drinkers were more likely to be escape drinkers, be current smokers, report being drunk in the past year, forget events after drinking, and engage in binge drink; however, they were less likely to restrict drinking to weekends only. Dependent drinkers were also more likely to feel guilty about drinking, more likely to be unable to stop once they started drinking, more likely to indicate that others were concerned about their drinking, and were more likely to avoid responsibilities due to drinking when compared to nondependent drinkers. They also consumed more total alcohol and reported more drinking occasions during the three week period prior to the study than nondependent drinkers. Children of dependent drinkers also differed from children of nondependent drinkers on certain facets as shown in Table 2. Children of dependent drinkers were less likely to have ever sipped or tasted alcohol and were less likely to express interest in substance use compared to children of nondependent drinkers. These children were
also more likely to report that their parents had talked to them about how alcohol makes people act compared to the children of nondependent drinkers.

As shown in Table 3, similar differences were observed between escape and non-escape drinkers. In comparison to non-escape drinkers, escape drinkers were more likely to be current smokers, be alcohol dependent, have been drunk in the past year, drink during the afternoon and were less likely to constrict drinking to weekends only. They were also more likely to forget events after alcohol consumption, feel guilty about drinking, have others express concern related to their drinking, more likely to avoid responsibilities because of drinking and were less likely to be able to stop drinking once they started compared to non-escape drinkers. During the three week period prior to the study, escape drinkers were more likely to have consumed alcohol, drank more frequently and drank more alcohol (specifically wine) compared to non-escape drinkers. There were also marginal differences between children of escape drinkers and children of non-escape drinkers as shown in Table 4. Children of escape drinkers were less likely to believe that their parents would approve of someone their age drinking alcohol and were more likely to report that their parents talked to them often about how alcohol makes people act compared to children of non-escape drinkers.

To determine the relationship between children’s implicit responses and parental alcohol dependency and escape drinking, children were classified into two groups. The “dependent” group included children of parents that were alcohol dependent as defined by the MAST (n = 34), whereas the “nondependent” group included children of parents that were not alcohol dependent (n = 115). Similarly, children were grouped according to their participating parent’s score on the Escape Drinking Questionnaire. The “escape” group consisted of children of parents that were escape drinkers (n = 57) whereas the “non-escape” group included children of parents that were not escape drinkers (n = 92).
AMP

Fourteen children were excluded from analyses on this task because they were familiar with Asian languages (n = 6) or they failed to comply with task instructions (n = 8). In order to determine the differences in implicit affect between children of alcohol dependent parents (n = 32) and children of parents who are not alcohol dependent (n = 103), the proportion of pleasant responses for each beverage type (i.e., alcohol or non-alcohol) and stimulus type (active or inactive) was calculated separately for each participant. The higher the proportion, the more pleasant the participant rated the stimulus category.

A repeated measures ANOVA was conducted to determine differences in implicit affect between children of dependent and nondependent drinkers. In this 2 (Parental MAST dependency: MAST dependent versus non-MAST dependent) x 2 (Stimulus Type: active versus inactive) x 2 (Beverage Type: alcohol versus non-alcohol) mixed model ANOVA, Parental MAST dependency was used as the between subjects variable while stimulus type and beverage type were used as within subjects variables. Although this analysis revealed no significant main effect of parental alcohol dependency on the children’s affective response there was a two-way interaction between beverage type and stimulus type; \( F (1,133) = 4.46, p = .037, \eta^2 = .037 \). To better understand this interaction, simple main effect analyses were conducted to discover whether the pattern of responses to active versus inactive stimuli differed between alcohol-related and non-alcohol-related stimuli. As demonstrated in Figure 3, these analyses revealed a significant effect of beverage type; \( t(134) = 7.60, p > .01 \). Children preferred non-alcohol-related cues (\( M =0.53, SD=0.19 \)) over alcohol-related cues (\( M =0.34, SD =0.26 \)). Additional analyses revealed a marginal simple main effect of stimulus type for alcohol-related stimuli; \( t(134) = 1.84, p < .07 \). Children slightly preferred active stimuli (\( M =0.35, SD =0.25 \)) to inactive stimuli (\( M =0.30, SD =0.27 \)) for alcohol-related stimuli but not for non-alcohol-related stimuli.
=0.33, SD =0.26) for alcohol-related visual cues. There was no significant difference of stimulus type between groups for the non-alcohol-related stimuli.

Differences in implicit affect towards alcohol-related stimuli of children of escape (n = 51) and non-escape (n = 84) drinkers were investigated using a mixed-model Analysis of Covariance (ANCOVA). Parental Escape (escape versus non-escape) was used as the between-subjects variable, and Stimulus Type (active versus inactive) and Beverage Type (alcohol vs. non-alcohol) were within subjects variables. The total MAST score was used as a covariate. The analyses revealed there were no significant effects of parental escape drinking on children’s implicit affect.

Dot-Probe

Ten children were excluded from analysis on this task either due to their mean reaction times being two standard deviations above the grand mean, thus making them outliers (n = 5), or because they failed to comply with the instructions of the task (n = 5). To quantify attentional bias to alcohol-related cues when compared to non-alcohol-related cues in children of problem drinkers and non-problem drinkers, difference scores were calculated based on reaction times to respective stimuli during the dot-probe task. The reaction time for trials in which the dot appeared on the side of the screen containing the alcohol-related stimuli was subtracted from the reaction time for trials in which the dot appeared on the side of the screen containing the non-alcohol-related stimuli. Positive difference scores indicated greater attention to the alcohol-related stimuli relative to the non-alcohol-related stimuli. All children correctly identified the location of the dot for all trials during this task.

Differences between attentional biases towards alcohol-related stimuli of children of alcohol dependent (n = 30) and nondependent (n = 109) drinkers were examined using an ANOVA. Parental alcohol dependence (alcohol dependent versus nondependent) was used as the
between subjects variable, and Stimulus Type (active versus inactive) and Time (500 ms versus
2000 ms) were within subject variables. The analysis revealed that there was no significant effect
of parental alcohol dependency on children’s attentional biases towards alcohol-related stimuli.

Differences between attentional biases towards alcohol-related stimuli of children of
escape (n = 51) and non-escape (n = 88) drinkers were calculated using a mixed-model
ANCOVA. Parental Escape (escape versus non-escape) was used as the between-subjects
variable, and Stimulus Type (active versus inactive) and Time (500 ms versus 2000 ms) were
within subjects variables. The total MAST score was used as a covariate.

This analysis revealed a marginal two-way interaction between parental escape drinking
and the time interval of the trial; \( F(1,137) = 0.89, p < .06, \quad \bar{\eta}^2 = .026 \). To better understand this
interaction, simple main effects analyses were conducted for children of escape drinkers and
children of non-escape drinkers. A significant effect of the time duration was revealed for
children of escape drinkers; \( F(1,50) = 4.46, p = .049, \quad \bar{\eta}^2 = .077 \). As shown in Figure 4, these
children displayed a greater bias towards alcohol-related stimuli displayed for 2000 ms \( (M =
43.59, SD = 27.60) \) compared to the 500 ms \( (M = -23.98, SD = 14.85); t(50) = .26, p < .70 \). Non-
escape drinkers did not show a significant bias between 500 ms and 2000 ms.

**Discussion**

Substantial research has considered the role of implicit affect and attention in adults’
drinking behaviors (Houben, et al., 2010; Houben, et al., 2011; Houben, et al., 2012), but few
studies have considered these factors in the context of preadolescent children. In the current
study children’s implicit affect and attentional bias were measured through responses to visual
cues of alcohol-related stimuli. While there was no difference in implicit affect between groups
as a function of parental alcohol dependence or escape drinking, children of escape drinkers were
found to have more attentional bias toward alcohol-related relative to non-alcohol-related cues at
2000 ms than at 500 ms. In contrast there was no difference in attentional bias for children of non-escape drinkers.

Because children of escape drinkers initially directed less implicit attention towards alcohol presented for the shorter time duration, more attention toward the alcohol-related stimuli at the longer time interval, the current findings suggest that parental escape drinking may cause maintained attention rather than initial attentional capture to alcohol-related cues. The difference in attention that occurs between 500 ms and 2000 ms in implicit attention of children of escape drinkers may reflect internal conflict that occurs as a function of viewing stimuli that are considered to be “forbidden” on one hand and associated with their mother on the other hand. Previous research that has reported that children take longer to decide whether they like the odor of beer also may reflect similar conflict resolution (Mennella & Forestell, 2008). In addition, these findings expand upon previous research from our laboratory (Forestell, Dickter, Wright, & Young, 2012), which demonstrated that adults who retrospectively reported that their parents smoked while they were growing up showed a similar pattern of results at 2000 ms, but no attentional bias at 500 ms. This sustained attention to addictive substances, which appears to occur as a function of parental addiction, may make a child more vulnerable to using drugs themselves. Previous research has shown that attentional biases to alcohol are associated with dependence (Cox et al., 2002; Sharma et al., 2001) and escape drinking (Forestell, Dickter, & Young, 2013).

These findings are an important extension to the previous literature in that they show that the implicit attention children direct toward alcohol-related cues varies as a function of the escape drinking, but not dependence of the parent. These findings, like those reported in earlier studies with odors (Garcia & Mennella, 2000; Mennella & Forestell, 2008), suggest that the emotional context in which children experience parental drinking differentially affects their responses (i.e.,
attentional bias) to alcohol-related cues. Thus it appears that children’s attentional biases to alcohol are associated with the negative emotional context in which their parents drink, rather than their dependence or the amount that they drink. Consistent with previous research (Cahalan et al., 1969; Mennella & Forestell, 2008), we found that adults who drink to escape drink for different reasons than those who do not drink to escape (see Table 3). Consequently, their children experience alcohol-related beverages in the home within the emotional context of a mood-disturbed parent who drinks throughout the day and feels guilty and worried about their drinking. The finding that children who have a parent who is an escape drinker show sustained attention to alcohol-related stimuli extends this previous work and suggests that researchers should examine whether these attentional biases predict later drinking behavior.

Inconsistent with the hypotheses, children’s affective responses to alcohol did not differ as a function of parental escape drinking or parental alcohol dependency. These findings are not consistent with previous research showing that children’s affective responses to the odor of alcohol differed as a function of the escape drinking of the mother (Mennella & Garcia, 2000; Forestell & Mennella, 2008). Moreover, research conducted with animal models has consistently shown that early exposure to alcohol in the absence of negative consequences is associated with infantile appetitive responses to alcohol and increased the affinity for its orosensory properties (see Molina et al., 2007 for review). On the other hand, if the early exposure occurred with negative consequences, such as that which occurs when the dam is intoxicated and neglects the pups (Pepino et al., 2002), the hedonic value of alcohol odor became aversive (Molina et al., 2000; Pepino et al., 1999, 2001). This associative learning about alcohol odors has also been observed within the context of other social counterparts (Hunt et al., 2001). Thus it seems that the valence of early experiences serve as affective unconditioned stimuli for associative learning about odors. Our failure to find evidence of differential implicit affective responses to visual
cues may have occurred because memories evoked by odors are more emotionally charged than those evoked by other sensory stimuli (Herz, 2004; Herz & Cupchik, 1995; Herz, Eliassen, Beland, & Souza, 2004), possibly as a result of direct connections between the olfactory and limbic systems (Cahill, Babinsky, Markowitsch, & McGaugh, 1995), the latter of which is necessary for the expression and experience of emotion (Aggleton & Mishkin, 1986). Given that visual stimuli are not processed with the limbic system, the sight of alcoholic beverages may not have induced emotional memories to the same extent as the odor of alcohol. Therefore, the AMP used in the current experiment, which measures implicit affective responses to visual cues may not have been sensitive enough to detect differences in the children’s evaluative responses to the alcohol. In addition, it is possible that some alcohol-related visual cues may have been unfamiliar to children of this age group, whereas the alcohol odor may be more implicitly salient and familiar to them. Future research should consider including sensory stimuli in addition to visual stimuli when measuring affect in children.

Although children’s implicit affect towards alcohol-related stimuli was not found to be a function of parental dependency or escape drinking, a slightly higher proportion of children implicitly rated alcohol cues depicting humans interacting with the alcoholic beverages to be pleasant relative to alcohol cues without a human presence. This finding is consistent with previous research with adults from Dickter et al. (2014) which found that alcohol dependent drinkers and escape-drinkers showed a larger implicit response to active cues when compared with inactive cues. The finding from this study in the context of previous research suggests that human interaction, such as parental interaction, with alcoholic beverages has an effect on children’s implicit affective responses towards alcohol and may speak to the power that parents have in terms of modeling drinking behaviors for their children.
There are several important limitations of the study. First we were unable, for ethical reasons, to randomly assign participants to experimental groups which differ in terms of the context in which alcohol is experienced. This leads to two limitations for the interpretation of our results. Not only does the quasi-experimental nature of our research design preclude us from concluding that parental escape drinking causes attentional biases to alcohol-related cues in children, our group sizes were not equated. As a result, there were far fewer alcohol dependent adults compared to non-alcohol dependent adults participating. The differences in group size, leading to a lack of power, may have accounted for a lack of significance in the implicit affective measures. Second, different types of non-alcoholic beverages were presented for the active and inactive trials on the AMP. Presenting pictures of coffee and juice for inactive stimuli and pictures of milk and tea for active stimuli may have affected children’s responses to non-alcohol-related trials. Similarly on the AMP, pictures of mixed drinks may have been unrecognized as such by children as these beverages may be less likely to appear in the home environment. In addition, some of the mixed drink beverages from the AMP may not appear different from juice in a cup for children of this age group. Future studies should consider using pictures of alcohol-related stimuli that are more likely to be recognized by children in the home environment such as wine or beer.

Despite these limitations, the results of the current study demonstrate that children between the ages of 8 and 12 years can accurately and reliably complete the dot-probe task which indicates that the dot-probe can be used as an important tool for measuring developmental changes in attentional bias for children. Moreover, these results demonstrate that children’s implicit attentional biases toward alcohol may start early and differ as a function of the emotional context in which their parents consume alcohol as shown with previous research involving hedonic odors. Whether these children are more vulnerable to becoming problem
drinkers themselves is an important area for future research to consider. If children of escape drinkers who demonstrate attentional biases are more likely to become addicted, attentional bias in children may serve as early marker of risk. These findings could have important clinical implications, because research has shown that interventions that reduce implicit attentional biases toward addictive cues also reduce subsequent alcohol consumption (Houben et al., 2011).

The development of more effective educational and cognitive training strategies could provide an effective means for protecting these children from problem drinking in adulthood.
References


dependence, escape drinking, and early neural attention to alcohol-related cues.

*Psychopharmacology,* 231(9), 2031-40.


Table 1

Participant characteristics as a function of parental alcohol dependency

<table>
<thead>
<tr>
<th></th>
<th>Alcohol Dependent</th>
<th>NON-Alcohol Dependent</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age [in months]</td>
<td>124.7±2.7a</td>
<td>119.4±1.6</td>
<td>$F(1,148) = .002$</td>
</tr>
<tr>
<td>Child Gender [% Female]</td>
<td>50.0</td>
<td>59.1</td>
<td>$X^2(1) = .893$</td>
</tr>
<tr>
<td>Parental Education Level [%]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Certification</td>
<td>3.57</td>
<td>2.15</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>7.14</td>
<td>3.23</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>25.0</td>
<td>25.8</td>
<td></td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>3.57</td>
<td>9.68</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>42.9</td>
<td>24.7</td>
<td></td>
</tr>
<tr>
<td>Graduate/Professional</td>
<td>17.9</td>
<td>34.4</td>
<td>$X^2 (5) = 6.32$</td>
</tr>
<tr>
<td>Smoke cigarettes [%]</td>
<td>25.0</td>
<td>8.6</td>
<td>$X^2 (1) = 5.33*$</td>
</tr>
<tr>
<td>Escape Drinking Questionnaire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escape Drinkers [%]</td>
<td>64.3</td>
<td>29.0</td>
<td>$X^2 (1) = 11.5**$</td>
</tr>
<tr>
<td>Mean score</td>
<td>2.32±1.8</td>
<td>1.13±0.1</td>
<td>$F(1,121) = 16.2**$</td>
</tr>
<tr>
<td># Time drunk in past year [frequency]</td>
<td>4.33±0.3</td>
<td>0.87±0.2</td>
<td>$F(1,121) = 20.2**$</td>
</tr>
<tr>
<td>Drinks in the morning [%]</td>
<td>17.9</td>
<td>6.5</td>
<td>$X^2 (1) = 3.31+$</td>
</tr>
<tr>
<td>Drinks in the afternoon [%]</td>
<td>60.7</td>
<td>46.2</td>
<td>$X^2 (1) = 4.68+$</td>
</tr>
<tr>
<td>Drinks weekends only [%]</td>
<td>40.0</td>
<td>57.3</td>
<td>$X^2 (1) = 8.80*$</td>
</tr>
<tr>
<td>Forgets events after drinking [%]</td>
<td>43.5</td>
<td>4.8</td>
<td>$X^2 (1) = 24.6**$</td>
</tr>
<tr>
<td>Had six or more drinks at onceb [%]</td>
<td>34.8</td>
<td>6.0</td>
<td>$X^2 (1) = 13.8**$</td>
</tr>
<tr>
<td>Drinking behavior over previous three weeks:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% consumed alcohol</td>
<td>63.0</td>
<td>69.9</td>
<td>$X^2 (1) = 0.46$</td>
</tr>
<tr>
<td>Number of drinking occasions</td>
<td>4.32±1.25</td>
<td>2.60±0.4</td>
<td>$F(1,120) = 2.77*$</td>
</tr>
<tr>
<td>Mean number of drinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beer</td>
<td>9.74±1.8</td>
<td>1.02±0.4</td>
<td>$F(1,121) = 3.74*$</td>
</tr>
<tr>
<td>Wine</td>
<td>7.11±3.9</td>
<td>2.41±0.6</td>
<td>$F(1,120) = 3.62*$</td>
</tr>
<tr>
<td>Liquor</td>
<td>1.18±0.6</td>
<td>1.29±0.4</td>
<td>$F(1,120) = .021$</td>
</tr>
<tr>
<td>Total Drinks</td>
<td>12.0±4.2</td>
<td>4.78±0.8</td>
<td>$F(1,120) = 16.2*$</td>
</tr>
<tr>
<td>Perceptions about drinking behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feels guilty about drinking [%]</td>
<td>43.5</td>
<td>2.4</td>
<td>$X^2 (1) = 30.1**$</td>
</tr>
<tr>
<td>Others worry about drinking [%]</td>
<td>42.9</td>
<td>1.1</td>
<td>$X^2 (1) = 35.5**$</td>
</tr>
<tr>
<td>Not able to complete responsibilities [%]</td>
<td>21.7</td>
<td>1.2</td>
<td>$X^2 (1) = 14.2**$</td>
</tr>
<tr>
<td>Not able to stop once started [%]</td>
<td>26.1</td>
<td>1.2</td>
<td>$X^2 (1) = 23.1**$</td>
</tr>
<tr>
<td>Family history of alcoholism [%]</td>
<td>66.7</td>
<td>67.9</td>
<td>$X^2 (1) = 0.59$</td>
</tr>
</tbody>
</table>

\(a\) Denotes marginal effects $a p < 0.1$. \(\ast\)Denotes statistical significance at $p < 0.05$. **Denotes statistical significance at $p < 0.01$.

\(a\) Values are presented as mean ± standard error unless otherwise specified

\(b\) Refers to binge drinking episodes that occur at least monthly
### Table 2

Child characteristics as a function of parental alcohol dependency

<table>
<thead>
<tr>
<th></th>
<th>Alcohol Dependent (n= 34)</th>
<th>NON-Alcohol Dependent (n=115)</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age [in months]</td>
<td>124.7±2.7(^a)</td>
<td>119.4±1.6</td>
<td>(F(1,148) = .002)</td>
</tr>
<tr>
<td>Child Gender [% Female]</td>
<td>50.0</td>
<td>59.1</td>
<td>(X^2(1) = .893)</td>
</tr>
<tr>
<td>SIPS and TASTES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Sipped Alcohol [%]</td>
<td>14.7</td>
<td>41.7</td>
<td>(X^2(1) = 8.45^*)</td>
</tr>
<tr>
<td>How Often Parents Talk About(^b):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approve Child Having a Sipping [%]</td>
<td>9.6</td>
<td>2.9</td>
<td>(X^2(1) = 3.38)</td>
</tr>
<tr>
<td>Not Drinking [%]</td>
<td>58.8</td>
<td>53.0</td>
<td>(X^2(1) = 1.90)</td>
</tr>
<tr>
<td>Approve of Child Drinking [%]</td>
<td>32.0</td>
<td>32.4</td>
<td>(X^2(1) = 2.98)</td>
</tr>
<tr>
<td>Dangers of Drinking [%]</td>
<td>67.6</td>
<td>63.5</td>
<td>(X^2(1) = 1.72)</td>
</tr>
<tr>
<td>If Child Were Caught Drinking [%]</td>
<td>55.9</td>
<td>52.6</td>
<td>(X^2(1) = 3.78)</td>
</tr>
<tr>
<td>How Alcohol Makes People Act [%]</td>
<td>82.3</td>
<td>55.6</td>
<td>(X^2(1) = 9.97^*)</td>
</tr>
<tr>
<td>Child Sensation Seeking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrill Seeking</td>
<td>6.97±0.5</td>
<td>6.70±0.3</td>
<td>(F(1,146) = .209)</td>
</tr>
<tr>
<td>Drug Alcohol Seeking</td>
<td>0.4±0.1</td>
<td>0.7±0.1</td>
<td>(F(1,146) = 3.60^*)</td>
</tr>
<tr>
<td>Social Disinhibition</td>
<td>1.88±0.2</td>
<td>2.36±0.1</td>
<td>(F(1,146) = 2.64)</td>
</tr>
<tr>
<td>Total Score</td>
<td>9.26±0.6</td>
<td>9.92±0.6</td>
<td>(F(1,146) = 6.18)</td>
</tr>
</tbody>
</table>

\(^a\)Denotes marginal effects \(p < 0.1\). \(^*\)Denotes statistical significance at \(p < 0.05\).

\(^a\)Values are presented as mean ± standard error unless otherwise specified

\(^b\)Percents refer to child perceiving that the parent would do this 50% of the time or more
Table 3

Participant characteristics as a function of parental escape drinking behavior

<table>
<thead>
<tr>
<th></th>
<th>Escape Drinker (n=51)</th>
<th>NON-Escape drinker (n=94)</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age [in months]</td>
<td>120±2.2*</td>
<td>120±1.8</td>
<td>$F(1,144) = 0.002$</td>
</tr>
<tr>
<td>Child Gender [% Female]</td>
<td>50.9</td>
<td>60.9</td>
<td>$X^2(1) = 1.43$</td>
</tr>
<tr>
<td>Parental Education Level [%]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Certification</td>
<td>4.4</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>6.7</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>20</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>4.4</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>24.4</td>
<td>31.6</td>
<td></td>
</tr>
<tr>
<td>Graduate/Professional</td>
<td>40.0</td>
<td>25.0</td>
<td>$X^2 (5) = 7.0$</td>
</tr>
<tr>
<td>Smoke cigarettes [%]</td>
<td>20.0</td>
<td>7.0</td>
<td>$X^2 (1) = 3.81^*$</td>
</tr>
<tr>
<td>Michigan Alcohol Screening Test (MAST)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent [%]</td>
<td>40.0</td>
<td>13.2</td>
<td>$X^2 (1) = 11.5^{**}$</td>
</tr>
<tr>
<td>Mean score</td>
<td>5.91±1.1</td>
<td>2.30±0.3</td>
<td>$F(1, 120) = 13.7^{**}$</td>
</tr>
<tr>
<td># Times drunk in past year [frequency]</td>
<td>3.02±0.7</td>
<td>0.66±0.2</td>
<td>$F(1,107) = 12.5^{**}$</td>
</tr>
<tr>
<td>Drinks in the morning [%]</td>
<td>15.5</td>
<td>5.3</td>
<td>$X^2 (1) = 3.53+$</td>
</tr>
<tr>
<td>Drinks in the afternoon [%]</td>
<td>69.0</td>
<td>36.5</td>
<td>$X^2 (1) = 12.0^{**}$</td>
</tr>
<tr>
<td>Drinks weekends only [%]</td>
<td>44.4</td>
<td>59.4</td>
<td>$X^2 (1) = 3.85^*$</td>
</tr>
<tr>
<td>Forgets events after drinking [%]</td>
<td>26.0</td>
<td>4.8</td>
<td>$X^2 (1) = 10.1^*$</td>
</tr>
<tr>
<td>Had six or more drinks at once[b]\ [%]</td>
<td>18.6</td>
<td>7.9</td>
<td>$X^2 (1) = 2.70^*$</td>
</tr>
<tr>
<td>Drinking behavior over previous three weeks:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% consumed alcohol</td>
<td>80.0</td>
<td>56.0</td>
<td>$X^2 (1) = 7.12^*$</td>
</tr>
<tr>
<td>Number of drinking occasions</td>
<td>4.51±0.9</td>
<td>2.09±0.4</td>
<td>$F(1,119) = 7.43^*$</td>
</tr>
<tr>
<td>Mean number of drinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beer</td>
<td>2.35±1.0</td>
<td>1.12±0.6</td>
<td>$F(1,119) = 1.26$</td>
</tr>
<tr>
<td>Wine</td>
<td>6.34±2.6</td>
<td>1.81±0.6</td>
<td>$F(1,119) = 4.23^*$</td>
</tr>
<tr>
<td>Liquor</td>
<td>1.47±0.5</td>
<td>1.14±0.3</td>
<td>$F(1,119) = 0.25$</td>
</tr>
<tr>
<td>Total Drinks</td>
<td>10.4±2.6</td>
<td>4.15±0.9</td>
<td>$F(1,119) = 7.02^*$</td>
</tr>
<tr>
<td>Perceptions about drinking behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feels guilty about drinking [%]</td>
<td>26.0</td>
<td>1.5</td>
<td>$X^2 (1) = 14.8^*$</td>
</tr>
<tr>
<td>Others worry about drinking [%]</td>
<td>22.2</td>
<td>2.6</td>
<td>$X^2 (1) = 13.2^{**}$</td>
</tr>
<tr>
<td>Failed to complete responsibilities [%]</td>
<td>11.6</td>
<td>1.5</td>
<td>$X^2 (1) = 4.83^*$</td>
</tr>
<tr>
<td>Not able to stop drinking once started [%]</td>
<td>16.3</td>
<td>0.0</td>
<td>$X^2 (1) = 11.0^*$</td>
</tr>
<tr>
<td>Family history of alcoholism [%]</td>
<td>69.0</td>
<td>57.3</td>
<td>$X^2 (1) = 1.59$</td>
</tr>
</tbody>
</table>

\* Denotes marginal effects a p < 0.1. \*Denotes statistical significance at p < 0.05. \*\*Denotes statistical significance at p < 0.01.
\ a Values are presented as mean ± standard error unless otherwise specified
\ b Refers to binge drinking episodes that occur at least monthly.
Table 4
Child characteristics as a function of parental escape drinking behavior

<table>
<thead>
<tr>
<th></th>
<th>Escape Drinker (n= 57)</th>
<th>NON-Escape drinker (n=92)</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age [in months]</td>
<td>120±2.2a</td>
<td>120±1.8</td>
<td>F(1,144) =.002</td>
</tr>
<tr>
<td>Child Gender [% Female]</td>
<td>50.9</td>
<td>60.9</td>
<td>X²(1) = 1.43</td>
</tr>
<tr>
<td>SIPS and TASTES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Sipped Alcohol [%]</td>
<td>31.6</td>
<td>38.0</td>
<td>X²(1) = 1.85</td>
</tr>
<tr>
<td>How Often Parents Talk Aboutb:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approve Child Having a Sip [%]</td>
<td>7.0</td>
<td>9.0</td>
<td>X²(1) = 4.23</td>
</tr>
<tr>
<td>Not Drinking [%]</td>
<td>56.1</td>
<td>53.4</td>
<td>X²(1) = 3.71</td>
</tr>
<tr>
<td>Approve of Child Drinking [%]</td>
<td>24.6</td>
<td>34.8</td>
<td>X²(1) = 8.64*</td>
</tr>
<tr>
<td>Dangers of Drinking [%]</td>
<td>64.9</td>
<td>64.1</td>
<td>X²(1) = .589</td>
</tr>
<tr>
<td>If Child Were Caught Drinking [%]</td>
<td>49.1</td>
<td>56.0</td>
<td>X²(1) = 6.88</td>
</tr>
<tr>
<td>How Alcohol Makes People Act [%]</td>
<td>64.9</td>
<td>59.8</td>
<td>X²(1) = 9.04*</td>
</tr>
<tr>
<td>Child Sensation Seeking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrill Seeking</td>
<td>6.34±0.4</td>
<td>7.01±0.3</td>
<td>F(1,148) =1.64</td>
</tr>
<tr>
<td>Drug Alcohol Seeking</td>
<td>0.78±0.1</td>
<td>0.63±0.1</td>
<td>F(1,146) = .886</td>
</tr>
<tr>
<td>Social Disinhibition</td>
<td>2.11±0.2</td>
<td>2.34±0.2</td>
<td>F(1,146) =.772</td>
</tr>
<tr>
<td>Total Score</td>
<td>9.33±0.5</td>
<td>10.0±0.5</td>
<td>F(1,146) =.945</td>
</tr>
</tbody>
</table>

a Denotes marginal effects a p < 0.1.

a Values are presented as mean ± standard error unless otherwise specified

b Percents refer to child perceiving that the parent would do this 50% of the time or more
Figure 1. A schematic of the affect misattribution procedure. The screens are presented in chronological order. Duration is presented under each screen.
Figure 2. A schematic of the dot-probe task. The screens are presented in chronological order. Duration is presented under each screen.
Figure 3. Implicit affective responses to the stimuli as a function of type of stimulus. Asterisks denote statistical significance within the stimulus type grouping.
Figure 4. Implicit attentional bias to the stimuli as a function of stimulus duration and parental escape drinking. Asterisk denotes statistical significance within the escape drinker group.
Appendix A

Examples of Images of Active Alcohol Used in Affect Misattribution Procedure

Active Alcohol Beer

Active Alcohol Liquor
Appendix B

Examples of Images of Inactive Alcohol Used in Affect Misattribution Procedure

Inactive Alcohol Beer

Inactive Alcohol Liquor
Appendix C

Examples of Images of Active Non-Alcohol Used in Affect Misattribution Procedure

Active Non-Alcohol Milk and Tea

Active Non-Alcohol Water
Appendix D

Images of Inactive Non-Alcohol Used in Affect Misattribution Procedure

Inactive Non-Alcohol Milk and Tea

Inactive Non-Alcohol Water
Appendix E

Sample Images of Chinese Pictographs and Mask Used in Affect Misattribution Procedure
Appendix F

Examples of Images of Active Beverages Used in Dot-Probe-Task

Active Alcohol

Active Non-Alcohol
Appendix G

Examples of Images of Inactive Beverages Used in Dot-Probe-Task

Inactive Alcohol          Inactive Non-Alcohol
Appendix H

General Drinking Behavior and Demographics Questionnaire

Parent ID Number

Child ID Number

Does the parent have a child who previously participated?

- [ ] No
- [ ] Yes. Please insert Participant # below.

Now we are going to ask you some questions about your use of alcohol in the past year. Alcoholic beverages include wine, beer, wine coolers, hard liquor and mixed drinks.

How often do you have a drink containing alcohol?

- [ ] Never
- [ ] Monthly or less
- [ ] 2-4 times a month
- [ ] 2-3 times a week
- [ ] 4 or more times a week

How many drinks containing alcohol do you have on a typical day when you are drinking?

- [ ] 1 or 2
- [ ] 3 or 4
- [ ] 5 or 6
- [ ] 7, 8, or 9
- [ ] 10 or more

How often do you have six or more drinks on one occasion?
- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

How often during the last year have you found that you were not able to stop drinking once you started?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

How often during the last year have you failed to do what was normally expected from you because of drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

How often during the last year have you had a feeling of guilt or remorse after drinking?

- Never
• Less than monthly
• Monthly
• Weekly
• Daily or almost monthly

How often during the last year have you been unable to remember what happened the night before because you had been drinking?

• Never
• Less than monthly
• Monthly
• Weekly
• Daily or almost monthly

Have you or someone else been injured as a result of your drinking?

• No
• Yes, but not in the last year
• Yes, during the last year

Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

• No
• Yes, but not in the last year
• Yes, during the last year

The following questions ask about your drinking habits. All responses will be kept COMPLETELY CONFIDENTIAL and will not ever be connected with your name or your child's name. Please answer all questions as honestly as possible.

How often do you drink (or used to drink) wine?

• Three or more times a day
• Twice a day
• About once a day
• 3-4 times per week
• Once or twice a week
• 2-3 times per month
• About once a month
• Less than once a month, but at least once a year
• Less than once a year
• Never

How often do you drink (or used to drink) beer?

• Three or more times a day
• Twice a day
• About once a day
• 3-4 times per week
• Once or twice a week
• 2-3 times per month
• About once a month
• Less than once a month, but at least once a year
• Less than once a year
• Never

How often do you drink (or used to drink) liquor, such as whiskey, vodka, or mixed drinks?

• Three or more times a day
• Twice a day
• About once a day
• 3-4 times per week
• Once or twice a week
• 2-3 times per month
• About once a month
• Less than once a month, but at least once a year
• Less than once a year
• Never
How old were you when you started drinking regularly?

Has drinking ever had any effect on your health?

- ☐ Yes
- ☐ No

If yes, explain.

If you used to drink, but no longer drink liquor, wine, or beer, how long has it been since you quit?

- ☐ NA; I still consume alcoholic beverages
- ☐ I quit less than 1 year ago
- ☐ I quit more than one year ago, but since the birth of my child
- ☐ I quit before the birth of my child

Are you considering quitting drinking in the next six months?

- ☐ Yes
- ☐ No

Do you intend to stop drinking in the next six months?

- ☐ Yes
- ☐ No

Do you intend to stop drinking in the next 30 days?

- ☐ Yes
- ☐ No

Are you currently attempting to stop drinking?
• ☐ Yes
• ☐ No

Have you been drunk in the past year?

• ☐ Yes
• ☐ No

How often have you been drunk in the past year?


How many times in the past year did you attempt to stop drinking?

• ☐ 0
• ☐ 1
• ☐ 2
• ☐ 3
• ☐ 4 or more

If you stopped drinking, how long has it been since you last consumed alcohol (even just a taste)?


Do you ever drink in the morning?

• ☐ Often
• ☐ Sometimes
• ☐ Never

Do you ever drink in the afternoon?

• ☐ Often
• ☐ Sometimes
• ☐ Never
If you have a drink, how often is it with a meal?

- [ ] Often
- [ ] Sometimes
- [ ] Never

Do you usually drink on weekdays or only on weekends?

- [ ] Weekdays
- [ ] Weekends
- [ ] Both

The following questions ask you for some demographic information about you, your child's other parent, and your child. The responses to these questions are COMPLETELY CONFIDENTIAL and will not ever be connected to your name or your child's name. Please answer questions as honestly as possible.

What is your ethnic category?

- [ ] Hispanic or Latino
- [ ] Not Hispanic nor Latino

What is your racial background? (Check all that apply)

- [ ] White/Caucasian/European
- [ ] Black/African-American
- [ ] American Indian or Alaskan Native
- [ ] Asian Indian
- [ ] Chinese
- [ ] Filipino
- [ ] Japanese
- [ ] Korean
- [ ] Vietnamese
- [ ] Other Asian (please specify) [ ]
- [ ] Native Hawaiian
- [ ] Guamanian or Chamorro
• □ Samoan
• □ Other (please specify) 

How many years of schooling have you had? Please select the highest level of education you have completed.

• □ Some High School
• □ Graduated High School or completed GED
• □ Some College
• □ Associates Degree
• □ College Bachelors Degree
• □ Graduate or Professional Degree
• □ Please Indicate name of degree 

What is your occupation?


Please answer the following questions about the child's parent who is not participating in this study.

What is the age of your child's other parent?


How many years of schooling has your child's other parent had? Please select the highest level of education you have completed.

• □ Some High School
• □ Graduated High School or completed GED
• □ Some College
• □ Associates Degree
• □ College Bachelor’s Degree
• □ Graduate or Professional Degree
• □ Please Indicate name of degree 

What is your child's other parent's occupation?


What is your family's total yearly income?

- ☐ Under $10,000
- ☐ $10,000-$14,999
- ☐ $15,000-$24,999
- ☐ $25,000-$34,999
- ☐ $35,000-$49,999
- ☐ $50,000-$74,999
- ☐ $75,000-$99,999
- ☐ $100,000-$124,999
- ☐ $125,000-$149,000
- ☐ $150,000 or more

Was your child adopted?

- ☐ Yes
- ☐ No

What is your child's ethnic category?

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Latino

What is your child's racial background? (Check all that apply)

- ☐ White/Caucasian/European
- ☐ Black/African-American
- ☐ American Indian or Alaskan Native
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
Vietnamese  
Other Asian (please specify)  
Native Hawaiian  
Guamanian or Chamorro  
Samoan  
Other (please specify)  

What is your child's other biological parent's ethnic category?

- Hispanic or Latino  
- Not Hispanic nor Latino  

What is your child's other biological parent's racial background? (Check all that apply)

- White/Caucasian/European  
- Black/African-American  
- American Indian or Alaskan Native  
- Asian Indian  
- Chinese  
- Filipino  
- Japanese  
- Korean  
- Vietnamese  
- Other Asian (please specify)  
- Native Hawaiian  
- Guamanian or Chamorro  
- Samoan  
- Other (please specify)  

Has your child ever tasted or sipped any kind of alcohol?

- Yes  
- No
Appendix I

Timeline Follow Back Procedure

TIME-LINE FOLLOW BACK CHART FOR ALCOHOL CONSUMPTION

Instructions: Look at this calendar of the past three weeks, let's first mark the weekends, were there any special events you also want to mark?

<table>
<thead>
<tr>
<th>Date</th>
<th>Beer/size of can</th>
<th>Wine/ level of glass</th>
<th>Wine Coolers /size of bottle</th>
<th>HL/ #shots</th>
<th>Comments / Notes</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Interviewer: Before you begin, you need to generate or obtain a pedigree on which to record all of the responses to the following General Screening Questions. (See FIGS Manual for details).

Step 1: Let’s go over your family tree. Remember everything you say will be kept confidential. (Include parents, siblings, aunts, uncles, grandparents)

Step 2: Now I am asking you to keep in mind all those in your family tree as I go through this list of questions. (Note all positive responses on the pedigree.)

Was anyone adopted?  YES  NO  If so, who? ____________________

Did (or does) anyone:

- engage in alcohol use that caused problems (with health, family, job, or police)?

<table>
<thead>
<tr>
<th>Initials of Individual</th>
<th>Relationship to child</th>
<th>Average time spent with child</th>
<th>Did they seek treatment?</th>
<th>Describe treatment</th>
</tr>
</thead>
</table>
Appendix K

MAST Questionnaire

The following questions focus on your alcohol consumption. This includes current drinking as well as drinking in the past. We realize that some of these questions are personal and may be difficult to answer honestly, but please remember that all of your answers are completely confidential. No one but the researchers on this project will ever see your answers, so please be honest and accurate. We ask the SAME questions of ALL our subjects, regardless of their other answers. Your answers are identified by a subject number only and will not be connected to your name or your child’s name in any way.

*Please answer ALL questions.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>0   Do you enjoy a drink now and then?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1   Do you feel that you are a normal drinker (By normal, it is meant that you drink less than or as much as most other people)?</td>
<td></td>
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</tr>
<tr>
<td>2   Have you ever awakened the morning after some drinking the night before and found that you could not remember part of the evening before?</td>
<td></td>
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</tr>
<tr>
<td>3   Does your spouse/partner (or parents) ever worry or complain about your drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4   Can you stop drinking without a struggle after 1 or 2 drinks?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5   Do you ever feel bad or guilty about your drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6   Do your friends and relatives think you are a normal drinker?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7   Do you ever try to limit your drinking to certain times of the day or to certain places?</td>
<td></td>
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</tr>
<tr>
<td>8   Are you always able to stop drinking when you want to?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9   Have you ever attended a meeting of Alcoholics Anonymous (AA) for your own drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10  Have you ever gotten into fights when drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11  Has your drinking ever created problems between you and your spouse or partner?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12  Has your spouse/partner or other family member ever gone to anyone for help about your drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13  Have you ever lost friends, girl- or boy-friends because of drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14  Have you ever gotten into trouble at work because of drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15  Have you ever lost a job because of drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>16 Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 Do you ever drink before noon?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 Have you ever been told you have liver trouble or cirrhosis of the liver?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Have you ever had delirium tremens (DTs), severe shaking, heard voices, or seen things that weren’t there after heavy drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Have you ever gone to anyone for help about your drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 Have you ever been in a hospital because of drinking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 Have you ever been a patient in a psychiatric hospital or in a psychiatric ward of a general hospital with drinking as part of the problem?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Have you ever been seen at a psychiatric or mental health clinic or gone to a doctor, social worker, or clergyman for help with an emotional problem in which drinking had played a part?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Have you ever been arrested—even for a few hours—because of drunken behavior? ** If YES, how many times? __________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Have you ever been arrested for drunk driving or driving after drinking? ** If YES, how many times? __________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix L
Escape Questionnaire

**Instructions.** Here are some statements that other people have made about why they drink alcohol. Which of the following is true for you or important to you as a reason for drinking?

<table>
<thead>
<tr>
<th>Reason</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>It helps me to relax</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be sociable</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>I like the taste</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>I drink because the people I know drink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To forget everything</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>To celebrate special occasions</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>To forget my worries or problems</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>A small drink improves my appetite for food</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>It is the polite thing to do in certain situations</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>To cheer me up when I’m in a bad mood; makes me happier</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>When I’m tense and nervous</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>To alleviate pain</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>When having a meal</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Not getting ahead</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>After a day of hard work</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>When I feel lonely</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>When I feel tired</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>It helps me get along better with people</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>It makes me less shy</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>(If you are a smoker) When I have a cigarette.</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>
Appendix M
Sips and Tastes Items

SIPS and TASTES (Donovan & Molina, 2008)
The next few questions ask about your experiences with alcohol. Please remember that I will not share any of the answers that you tell me here with anyone, not even your mom or dad. Please be as honest as you can when you answer all of these questions, and remember that there are no right or wrong answers.

1. Have you ever had a sip or a taste of beer, wine, or liquor?
   a. No
   b. Yes, once
   c. Yes, two or three times
   d. Yes, more than three times

NOTE: If “NO” skip to question 5.

2. Where did you have a sip or taste of beer, wine, or liquor? Please select all that apply.
   a. With family at dinner
   b. As part of a church or religious ceremony or celebration
   c. As part of a family celebration or party
   d. With friends
   e. Alone
   f. Somewhere else

3. What kind of alcohol did you taste?
   a. Beer
   b. Wine
   c. Wine coolers
   d. Liquor
   e. I do not know

4. Have you ever had more than just a sip or a taste of someone else’s drink of alcohol?
   a. No
   b. Yes, once
   c. Yes, two or three times
   d. Yes, more than three times

5. How do you think your parents would feel about someone your age having a sip of alcohol?
   a. Definitely not approve
   b. Might not approve
   c. Would not care
   d. Might approve
   e. Definitely approve
6. How often do your parents talk to you about not drinking?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often
   e. Always

7. How often do your parents talk to you about whether or not they approve of someone your age drinking?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often
   e. Always

8. How often do your parents talk to you about the dangers of drinking?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often
   e. Always

9. How often do your parents talk to you about what would happen if you were caught drinking?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often
   e. Always

10. How often do your parents talk to you about how alcohol makes people act?
    a. Never
    b. Rarely
    c. Sometimes
    d. Often
    e. Always

11. Does your mother drink beer, wine, or liquor? (Check all that apply)
    a. Beer
    b. Wine
    c. Liquor
    d. My mother does not drink
    e. I do not know

12. Does your father drink beer, wine, or liquor? (Check all that apply)
    a. Beer
b. Wine
c. Liquor
d. My father does not drink
e. I do not know

13. Do any of your brothers and sisters drink beer, wine, or liquor? (Check all that apply)
   a. Beer
   b. Wine
   c. Liquor
   d. My brothers/sisters do not drink
   e. I do not know

14. Do any of your friends drink beer, wine, or liquor? (Check all that apply)
   a. Beer
   b. Wine
   c. Liquor
   d. None of my friends drink alcohol
   e. I do not know
Appendix N

Sensation Seeking Questionnaire Items

Directions: Each of the items in the next section has two choices, A and B. Please choose the statement that best describes what you like or how you feel. In some cases you may find it difficult to decide between the two choices. Please choose the one that is most like you are. **Do not choose both choices or leave any items without an answer.** It is important that you answer all items with only one choice, A or B. We are interested only in what you like or how you feel, not in how others feel or how one is supposed to feel. There are no right or wrong answers, so please be honest in your answers.

1. A. You’d like to try mountain climbing  
   B. You think people who do dangerous things like mountain climbing are foolish

2. A. Too many movies show people falling in love and kissing.  
   B. You enjoy watching movies which show people kissing each other.

3. A. You would like to try smoking marijuana.  
   B. You would never try smoking marijuana.

4. A. It’s more exciting to be around kids older than yourself.  
   B. You like to be with kids your own age or younger.

5. A. You’d never do anything that’s dangerous.  
   B. You sometimes like to do things that are a little scary.

6. A. You think riding fast on a skateboard is fun.  
   B. Some of the daring acts of skateboard riders seem very scary to you.

7. A. You like to be with large groups of kids with something exciting happening  
   B. You like quiet times with only 1 or 2 friends

8. A. You would not like to learn to fly an airplane  
   B. You think it would be fun to learn to fly an airplane

9. A. You don’t like to swim in water that is over your head  
   B. You like to swim in deep water

10. A. You would like to try jumping from a plane with a parachute  
    B. You would never try jumping from a plane with a parachute

11. A. People probably feel good after drinking alcoholic drinks  
    B. Something must be wrong with people who need a few drinks to feel good

12. A. You like kids who make jokes even if they sometimes hurt other kids’ feelings
B. You don’t like kids who think it’s fun to hurt other kids’ feelings

13. A. You don’t like it when people get drunk, talk loud and act silly
   B. When people get drunk, it seems like they are having fun

14. A. Sailing on the ocean in a small boat would be dangerous and foolish
   B. You think it would be fun to sail on the ocean in a small boat

15. A. You think skiing fast down a snowy mountain would be dangerous
   B. You think skiing fast down a snowy mountain would be exciting and fun

16. A. You’d never touch a bug or snake
   B. Bugs or snakes are fun to hold and play with

17. A. You think it would be exciting to go on a date
   B. You’re not interested in dating yet.

18. A. You enjoy the feeling of riding your bike fast down a big hill
   B. Riding your bike fast down a hill is too scary for you.

19. A. You think it’s too dangerous for people to take drugs
   B. You sometimes wonder what it would feel like to be high on drugs, even though you know it would be dangerous

20. A. You don’t like being around kids who act wild and crazy
   B. You enjoy being around kids that sometimes act wild and crazy.

21. A. You don’t think you’d like the feeling of getting drunk
   B. You think you might like to find out what it feels like to get drunk

22. A. You don’t do anything you think you might get in trouble for
   B. You like to do new and exciting things, even if you think you might get in trouble for doing them

23. A. Riding dirt-bikes or motorcycles seems like a lot of fun
   B. It seems scary and dangerous to ride dirt-bikes or motorcycles

24. A. You like to do “wheelies” on your bike
   B. Kids who do “wheelies” on their bikes will probably get hurt sometimes

25. A. The worst thing a kid can do is be rude to his/her friends
   B. The worst think a kid can do is be boring around his/her friends

26. A. If you could, you’d see a movie with an “R” rating
   B. You’re not interested in seeing movies for older people.