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The influence of alcohol advertising on associative memory and consideration sets

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THE INFLUENCE OF ALCOHOL ADVERTISING ON
ASSOCIATIVE MEMORY AND CONSIDERATION SETS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by
James C. Smith
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Dedication

This dissertation is dedicated to my loving and devoted wife, Claudia. Completing this project and the doctoral degree would not have been possible without the support, confidence, faith, encouragement, and patient understanding freely given by Claudia throughout my education. Working in the field of psychology and holding a master's degree in psychology, Claudia understands the importance and value of learning, and the great sacrifice in family, church, and personal time required to complete a graduate degree. Claudia understands that love is the action of sacrifice benefiting another. She has sacrificed greatly for my benefit. Thank you Claudia, I love you.

This dissertation is also dedicated to my dear parents, Steve and Jean Smith. Their eternal love, pride, encouragement, and confidence in me provided the determination to follow my dreams. When I struggled to find meaning and direction during the first half of my adult life, their unconditional love and patient support was the foundation that enabled me to make life changing decisions and set a new course for my life. Thanks mom and dad.

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Abstract

Survey studies suggest that alcohol advertising influences attitudes and beliefs that promote alcohol use. Strategies from memory research and marketing were used to test the influence of beer advertising found in popular magazines. Effects on preference for alcohol and memory associations between alcohol and the positive outcomes of drinking were measured. One hundred eighty undergraduate women and men viewed 5 ads. A $2 \times 2 + 1$ (control group) factorial design simultaneously varied ad type (arousing or sedating messages) with processing type (selective attention or elaborative processing). Preferences for alcohol and memory associations did not differ between the control group and those who viewed alcohol advertising ($p > .10$). Null effects are consistent with previous experiments showing limited influence of alcohol advertising on cognitions and behavior.

Introduction

Over \$1.6 billion dollars is spent annually on alcohol advertising (Williams, 1995). Survey studies suggest that alcohol advertising has a significant but poorly understood influence on alcohol use (e.g., Grube, 1995). It remains an open question as to how this influence is exerted. An overview of the literature suggests both affective and cognitive mechanisms of influence. One possible explanation is that exposure to alcohol advertising creates an affective or evaluative bias (e.g., liking) for alcohol products. An affective bias is plausible when considering basic research on mere exposure effects and evaluative conditioning. Mere exposure effects refer to an increase in liking for a stimulus that results from repeated exposure to that same stimulus (Zajonc 1980; 2001). Evaluative conditioning refers to changes in liking for a stimulus that are due to pairing that stimulus with other positive or liked stimuli (DeHouwer, Thomas, & Baeyens, 2001). Mere exposure and evaluative conditioning have been successfully applied in the general advertising literature (e.g., Grossman & Till, 1998; Perfect & Askew, 1994). It was predicted that alcohol advertising would create an affective bias for alcohol products. To examine this prediction, preferences for alcohol products in a control group were compared to preferences in an experimental group exposed to a series of five beer ads taken from popular magazines.

A second plausible explanation is that alcohol advertising makes the positive outcomes of drinking highly accessible in memory. Alcohol advertising contains specific product-concept associations that link alcohol with various subjective benefits, such as relaxation or excitement (Cohen, 1995; Thorson, 1995). Research has repeatedly shown that the positive outcomes of drinking are more accessible in the memories of heavy drinkers compared to light drinkers (McCusker, 2001). Similar to actual drinking experience, exposure to media-based associative

learning experiences may create an accessibility bias for the positive outcomes of drinking. The effect of this accessibility bias is now sufficiently documented (for a review see McCusker, 2001) to justify investigation of specific learning experiences, such as exposure to alcohol advertising, that might change alcohol-related memory associations. A primary prediction of this study is that the accessibility of alcohol use as a potential behavioral option, and the outcomes of this behavior (e.g., relaxation) become more strongly associated in memory following exposure to alcohol advertising. If these associations are strengthened by advertising, then the activation of memories or thoughts regarding either member of this alcohol-outcome pair should make the other member more accessible from memory. To examine this prediction, experimental and control groups completed a word association task in which they produced the first behaviors that came to mind in response to the positive outcomes of drinking (e.g., relaxation). Participants also listed the positive outcomes that came to mind in response to an alcohol cue.

Literature Review

Evaluative Conditioning and Mere Exposure

A primary prediction of the current study is that alcohol advertising will increase preferences for alcohol products. Preferences play a significant role in motivating human behavior and decisions. For instance, we tend to approach situations and objects we like but avoid those we dislike. Likes and dislikes influence many areas of our lives, including consumption of goods. A response of increased liking is plausible when considering the common advertising practice of pairing products with appealing visual images. Pairing pictures of alcohol with other liked pictures (e.g., happy people socializing, a funny little dog named Spuds McKenzie) may lead to conditioned liking for alcohol, or lead to a positive shift in liking for those with neutral attitudes toward alcohol. General support for this prediction comes from studies on evaluative conditioning. In a typical evaluative conditioning study, an unconditioned stimulus that is liked by participants (e.g., smiling faces, a fuzzy kitten) is repeatedly paired with a neutral, conditioned stimulus, resulting in increased liking for the initially neutral stimulus (DeHouwer et al., 2001). Evaluative conditioning is often explained as a direct transfer of affective valence from a liked stimulus to a neutral stimulus. Studies by Baeyens and colleagues (Baeyens, Crombez, De Houwer, Eelen, 1996; Baeyens, Eelen, Crombez, DeHouwer, 2001) indicate that alcohol advertising may also involve observational learning of associative contingencies. Baeyens and colleagues indirectly exposed participant to contingencies by means of observing another individual who was consuming neutral colored drinks (the conditioned stimulus) and reacting with positive or negative facial expressions (the unconditioned stimulus). Participants who observed positive reactions subsequently rated the drinks more positively than

those who observed negative reactions. Likewise, demonstrably happy people are commonly paired with alcohol products in advertising.

Of course, the role of conditioned liking in alcohol advertising may be limited by the strong possibility that alcohol (the conditioned stimulus) is not a neutral stimulus for many, thus creating a ceiling effect for further liking of the alcohol stimulus. Evaluative conditioning studies typically use emotionally neutral stimuli (e.g., geometric shapes, abstract paintings, pictures of a pen) that are selected prior to study so as to avoid confounds associated with existing attitudes toward the stimulus (DeHouwer et al., 2001). There are apparently no studies examining if conditioned liking adds to existing positive attitudes or whether the effect generalizes to co-occurring stimuli (i.e., alcohol and pleasant scenes) present in the “natural” environment. However, there is evidence from evaluative conditioning studies that previously learned dislikes can be made more positive through counter conditioning procedures. Evaluative conditioning is considered a robust and general phenomenon, with significant effects obtained using a variety of stimuli and procedures (DeHouwer et al.). The vast majority of evaluative conditioning studies have used relatively complex pictures of meaningful stimuli, including paintings, sculptures, and faces.

Additional support for increased preferences comes from research on the effects of mere exposure (Zajonc, 1968). In a typical mere exposure study, repeated exposure to a neural stimulus (e.g., nonsense syllables, geometric figures) increases liking for that same stimulus (Bornstein, 1989). Research investigating a variety of meaningful stimuli that occur in the natural environment, including advertising (e.g., Sawyer, 1981), names of public figures (Stang, 1994), food preferences (Pliner, 1982) and pictures of faces and people (e.g., Williams, 2003;

Crandal, 1984) have reported mere exposure effects for meaningful stimuli. Several studies reported increased liking regardless of initial preferences (e.g., Hamm, Baum, & Nickels, 1975; Pheterson & Horai, 1976; Williams, 2003), suggesting the mere exposure effect is not restricted to neutral stimuli and can add to existing preferences.

Both mere exposure and evaluative conditioning methods applied to advertising stimuli consistently show increased liking for the ad itself and increased preferences for target brands (e.g., Grossman & Till, 1998; Janizewski, 1990; 1993; Perfect & Askew, 1994; Stuart, Shimp, & Engle, 1987). However, from an alcohol advertising and public health perspective, the important question is not ad-level or brand-level effects, but rather the effect on preferences for alcohol beverages as a product class or product category (Stewart & Rice, 1995; Saffer, 1995). In marketing research, this is the difference between primary demand (the effects of alcohol promotion in general) and selective demand (the effects of promoting a specific brand) (Williams, 1995). Effects at the level of product category have the potential to increase aggregate consumption levels (Stewart & Rice). Few experimental studies have addressed the general effect of alcohol advertising or its influence on particular mechanisms that are potentially linked to aggregate consumption levels. Results of econometric studies on alcohol advertising expenditures are mixed on the issue of aggregate consumption. Some econometric studies suggest that alcohol advertising does not increase aggregate consumption levels (Stewart & Rice), while other studies provide evidence that bans on alcohol advertising reduce alcohol consumption (Saffer).

In a typical mere exposure or evaluative conditioning study, liking increases for that same (identical) target stimulus when evaluated sometime later. In contrast, to observe an effect at the

product category level, liking must generalize to a new set of stimuli which are conceptually related to the exposed stimulus items. Survey studies indicate that exposure to alcohol advertising is related to liking ads, and liking ads, in turn, is related to alcohol use (Unger, Johnson, Rohrback, 1995; Unger, Schuster, Zogg, Dent, Stacy, 2003). However, it is not clear how liking alcohol ads generalizes to alcohol use unless it generates a generic positive affect toward the concept of alcohol which is not restricted to the specific advertising stimulus. A generalized effect suggests the possibility of a significant conceptual processing component. Research supports some degree of conceptual generalization. For example, Gordon and Holyoak (1983) demonstrated that the mere exposure effect can generalize to previously unseen stimuli that are conceptually similar to the exposed stimuli. Zajonc's (1980, 2001) theoretical explanation for mere exposure effects suggests the possibility of generalized effects. Zajonc proposed that affective judgments are based on gross or global perceptions of a stimulus rather than specific elements. Consistent with Zajonc's account, mere exposure effects have been shown for new or unseen stimuli that are related but not identical to the studied stimuli (e.g., Manza, Zizak, & Reber, 1998; Rhodes, Halberstadt, Brajkovich, 2001; Monahan, Murphy, Zajonc, 2000). Zajonc's (1968) initial work showed an exposure-affect relationship between frequency of exposure to words and evaluative preferences for the meaning of those words. Taken together, these results suggest attitude enhancement toward conceptually-based stimuli that are not restricted to the perceptual or physical features of a stimulus.

Both marketing studies (e.g., Janiszewski, 1990; 1993; Shapiro, 1999) and mere exposure studies (e.g., Kunst-Wilson & Zajonc, 1980; Seamon, McKenna, Binder, 1998) typically use a relative preference judgment that involves a comparison between a studied target stimulus and

non-studied stimuli. Relative measures that assess both preference for alcohol and preference for competing responses have advantages over absolute measures (e.g., strength of preferences as measured by a rating scale) of media effects. A competitive model is inherent in most current conceptualizations of advertising effects and alcohol use itself occurs in an environment saturated with alternatives. A favorable response to the product itself or to situational cues relevant to product purchase or use is often undermined by the availability of alternative or competing responses. Modern learning theory suggests that the probability of a given response is a function of the strength of both the desired response and competing responses (Mazur & Hastie, 1978).

Relative measures have uncovered effects from basic learning studies (Hernstein, 1970; 1974) and marketing studies (Geiger, 1971; Stewart, 1989) that were not observed with absolute measures. Relative measures, therefore, provide more information by capturing competitive effects and reducing type II errors.

Although there is little evidence that alcohol advertising increases absolute consumption levels on any single drinking occasion (for reviews, see Atkin, 1995; Grube, 1995; Smart, 1988), it may increase aggregate consumption levels by developing a preference for alcohol relative to alternative products in the environment. Relative preference measures commonly used in advertising research (e.g., Janiszewski, 1990; 1993; MacInnis Moorman & Jawarski, 1991; Shapiro, 1999) are referred to as consideration sets. A consideration set is list of brands or products that are considered for purchase following exposure to advertising. The proportion of advertised and non-advertised products selected in a consideration set is one of the strongest predictors of actual purchase on later choice occasions (Roberts & Lattin, 1997). Consideration

sets are used within and across product categories to assess preference and predict choice (e.g., Ratneshuar, Pechmann, & Shocker, 1996; Roberts & Lattin). The current study attempted to show that alcohol advertising has a more general effect that goes beyond selective demand (i.e., brand-level effects); a general effect that can be conceptually linked with aggregate consumption levels by creating preference within the broader product category of “beverages.” The current study used a product class or product category consideration set to determine if alcohol advertising increased preference for alcohol relative to alternative beverages.

Alcohol Advertising and Memory

Increasing evidence over the past 20 years indicates that associative memory serves as a common pathway through which a variety of antecedent variables influence alcohol use (for review, see Goldman, Del Boca, & Darkes, 1999; Stacy, Ames, & Knowlton, 2004). Likewise, alcohol advertising is designed to influence a number of intervening variables, including associative memory. Alcohol advertising contains specific product-concept associations that link alcohol with various subjective benefits, such as relaxation or excitement (Cohen, 1995; Thorson, 1995). The subjective benefits of alcohol use have been studied extensively as outcome expectancies, operationally defined as beliefs about the effects of alcohol as reported on questionnaires (Leigh, 1989). Using measures adapted from basic memory research, several studies have shown that associations in memory between alcohol and the positive outcomes of alcohol use (e.g., relaxation, having fun with friends) are one of the strongest correlates and predictors of alcohol use (Stacy, 1997; Stacy, Leigh, & Weingardt, 1994; Weingardt, Stacy, & Leigh, 1996). The alcohol-outcome associations portrayed in alcohol advertising have not been sufficiently investigated from a memory and information processing perspective, even though

changes in such associations are known to influence alcohol use (e.g., Roehrich & Goldman, 1995; Darkes & Goldman, 1993). A second prediction of the current study is that alcohol advertising will strengthen the association between positive outcomes and alcohol use in memory. To this end, the following section reviews the application of associative memory theories to substance use.

Associative Measures

A variety of measures adapted from basic research on memory have been applied to associative memory processes in substance use (Stacy & Wiers, 2005). Many of these measures fall into the category of indirect measures of memory. Indirect measures make no reference to previous events or experiences, refer only to the task at hand, and do not give instructions to remember (Richardson-Klavehn & Bjork, 1988). With regard to alcohol, indirect measures do not refer directly to alcohol or previous experience with alcohol. Measures adapted from basic research include reaction time tests, such as lexical decision tasks and the Implicit Association Test (Greenwald & Banaji, 1995). The advantage of reaction time tests is that they generate large and reliable effects; however, the interpretation of reaction time effects is a topic of debate (see DeHouwer et al., 2001; Fazio & Olson, 2003), and may not be consistent with the goals of advertising.

In contrast, alcohol advertising is designed to convey a specific conceptual message (e.g., having fun with friends). The conceptual information contained in complex advertising stimuli (e.g., visual, verbal, spatial, and social) may require the use of meaning-based measures sensitive to the various elements of advertising that together define a specific concept. There are a number of indirect tasks based on conceptual knowledge. Tests used in the investigation of conceptual

associations typically use words or sentences, such as generating associations to stimulus words (e.g., Schacter, 1987; Shimamura & Squire, 1984), answering general knowledge questions (Blaxton, 1989), generating examples of a semantic category (e.g., Graf & Schacter, 1985), or classifying stimuli according to category membership (e.g., Balota & Chumbley, 1984). Such tests are consistent with both the content and goals of alcohol advertising. Marketing and alcohol advertising researchers claim that specific conceptual or semantic associations are derived from alcohol advertising exposure, yet they do not test for the occurrence of these associations. “Image” or “lifestyle” ads (i.e., those showing characters, settings, and potential use) contain specific product-concept associations that attempt to link alcohol with relaxation or excitement (alcohol-emotionality association), with a rugged individualist or “macho” image (alcohol-social identity associations) or with various other subjective benefits such as social facilitation, romance, or adventure (Cohen 1995; Finn & Strickland, 1982; Thorson, 1995). The content of alcohol advertising found in print media often contains a combination of words and pictures. The conceptual content of the verbal and pictorial material are usually consistent with each other (e.g., the word “relax” paired with a beach scene). Moreover, there is general agreement among basic researchers (e.g., Nelson, Read, & McEvoy, 1977; Smith & McGee, 1980; Snodgrass, 1984) that pictures are first processed semantically, as opposed to a physical or feature analysis. There is also general agreement that changes in the format of stimuli from study to test (i.e., pictures to words or vice versa) rarely affects performance on conceptual indirect tests (e.g., Roediger & McDermott, 1993). The present study used a conceptual indirect task first used by Stacy et al. (1994). The task requires participants to provide the first and second behavior or action that comes to mind in response to positive outcome words (e.g., feeling good).

This controlled word association task (i.e., limiting responses to behavior) does not refer directly to alcohol or previous experience with alcohol, but instead relies on the degree of semantic relatedness between alcohol as a potential behavioral option and outcome expectancy cues (Stacy et al., 1994). Word associations are the latest addition to the range of cue-elicited responses found to predict or correlate with drug use, receiving support from work in cognitive neuroscience (e.g., Rolls, 2000), models of addiction (Franken, 2003), substance use etiology (Stacy, 1997), and prevention research (Weirs, DeJonj, Havermans, & Jelicic, 2004).

If alcohol advertising strengthens alcohol-outcome associations, either member of this pair should make the other member more accessible, regardless of presentation order (i.e., the relationship should be symmetrical). The present study also used a self-generated outcome expectancy task that required participants to provide a list of drinking outcomes (e.g., relaxation) in response to an alcohol cue. The general prediction is that advertising will create a memory retrieval bias for positive information about drinking when expectancies are directly elicited by a relevant alcohol cue. This type of open-ended survey response departs from indirect tests by referring directly to alcohol and encouraging recollection of alcohol-related events in the participant's personal learning history. As such, self-generated expectancy tasks share some characteristics of direct memory tests in basic memory research. Direct tests, such as recall and recognition, are those in which instructions at the time of test make explicit reference to previous events or experiences (Richardson-Klavehn & Bjork, 1988) and give explicit instructions to remember. Such events are typically a list of words or pictures, but can also include an event in the participants' pre-experimental personal history (Richardson-Klavehn & Bjork). Self-generated expectancies can be conceptualized, in part, as a cued recall test, requiring participants

to produce information that formed part of alcohol-related events in their personal history. However, such tests do not give instructions to remember or inform participants that their memory is being tested. With regard to alcohol then, direct tests of associative memory make explicit reference to alcohol or previous experience with alcohol. It is assumed that self-generated expectancy and word association tasks access a common memory representation derived from associative memory processes.

Associative Strength

Open-ended expectancy tests may be useful in alcohol advertising research because they take advantage of concepts such as top-of-mind awareness. Top-of-mind awareness measures have been used in advertising research for decades and allow for the assessment of relative and spontaneous memory for different scenes or themes within a single study session (Stewart, 1989). Open-ended responses to qualitatively different ads can then be matched to known features of the ad itself. “Spontaneous” here implies that information is highly accessible and self generated with minimal use of deliberate or controlled retrieval processes. The distinction between accessible and available information in memory (Tulving, 1983) is particularly relevant to alcohol advertising. The availability of alcohol-outcomes in memory is necessary but not sufficient for the retrieval of this information. Research (e.g., Stacy, 1997) suggests that availability may be influenced more by individual difference in previous drinking experience, representing a more permanent source of information in long-term memory. For retrieval to occur, outcome information must also be accessible from memory. Accessibility is highly cue and stimulus dependent (e.g., Tulving). The concept of accessibility seems more relevant to advertising because of its emphasis on activation by immediate cues, representing a temporary

source of accessibility. While the retrieval of positive outcome expectancies indicates availability, the speed at which positive expectancies are generated would indicate accessibility in memory. Such an argument is consistent with long standing methods of evaluating “distance” between concepts in semantic memory (e.g., Meyer & Schaneveldt, 1971; Yaniv & Meyer, 1987).

Accessibility biases for positive information have been observed in smokers, heavy drinkers, and gamblers (Armstrong, 1997; Leung & McCusker, 1999; McCusker & Gettings, 1997). For instance, although light and heavy drinkers both endorse more positive than negative expectancies, heavy drinkers endorse positive expectancies more rapidly than light drinkers who are quicker to endorse negative expectancies (Armstrong, 1997). Leung and McCusker used a self-generated expectancy task with smokers and non-smokers. Both groups generated more negative than positive expectancies to a smoking cue. However, compared to non-smokers, smokers generated proportionately more of their positive expectancies in the early time interval and proportionately more of their negative expectancies in the later time interval. In summary, research over the last twenty years has consistently shown that heavy drinkers, compared to light drinkers, exhibit memory retrieval and accessibility biases for positive information about alcohol. A central argument of the current study is that alcohol advertising will produce or enhance some of these same memory biases.

Expectancy and Alcohol-outcome Associations

Associative memory and associative strength play crucial roles in the activation and retrieval of alcohol-related learning experiences (for reviews, see McCusker, 2001; Stacy & Wiers, 2005). With increasing alcohol use, a variety of co-varying stimuli, including the positive

outcomes of use, become more strongly associated in memory with alcohol (e.g., Stacy, et al., 1994). Research shows that alcohol-outcome associations are sensitive to semantic priming effects (Hill & Paynter, 1992; Weingardt et al., 1996; Weirs et al., 2002; Zack, Toneatto, & MacLeod, 1999). Semantic priming is said to occur when a response to a stimulus is affected by the presentation of a related stimulus (pictures or words) prior to test (Richardson-Klaven & Bjork, 1988). Several studies showed that the processing of alcohol concepts can be facilitated by presenting semantically related primes. For example, when participants were asked to decide if letter strings such as “bottle” or “alcohol” were real words (a lexical decision task), decisions were faster when letter strings were preceded by outcome expectancy words (e.g., more outgoing) compared to neutral primes (Hill & Paynter, 1992; Weingardt et al., 1996; Zack et al., 1999). In another priming study, participants recalled significantly more expectancy words from a list containing both expectancy and food items when they saw “beer” as the first word on the list compared to “milk” as the first word (Wiers et al., 2002). These results suggest that immediate environmental cues increase the accessibility of alcohol-related information. Also, the semantic relationship appears symmetrical, with either member of the alcohol-outcome pair capable of activating the corresponding member. Further, in the majority of priming studies, the effect was significantly more pronounced for those participants reporting the highest drinking levels.

The results of expectancy priming studies are commonly explained in terms of semantic network theory (Collins & Loftus, 1975). Outcome expectancies are believed to operate within a network of semantically interconnected concepts, the central concept being alcohol, with surrounding concepts depicting various effects of alcohol. If relaxation and alcohol are strongly

associated in memory, when the concept of relaxation is contemplated or otherwise activated, activation will spread to alcohol, and vice versa. For example, heavier drinking individuals readily respond with thoughts of alcohol use when the positive effects of alcohol (e.g., relaxation, more outgoing) are presented as cues in a word association task (e.g., Stacy, 1997; Stacy et al., 1994; Weingardt et al., 1996). Thus, an accessibility bias for alcohol use, or the positive effects of use, occurs when semantically related cues are encountered. Many of the concepts, words, and pictures contained in alcohol advertisements are semantically related to outcome expectancy concepts. It was anticipated that alcohol advertising would prime the alcohol expectancy network, creating a memory retrieval bias for alcohol related information.

Processing New and Existing Associations

Standard priming methods typically present two stimuli sequentially. The initial or prime stimulus creates a particular context that affects responses given to a second or target stimulus. In contrast, the alcohol-outcome stimuli in advertising are presented together in a manner that resembles paired-associate learning. Theory and research indicate that semantic priming relies on the activation of existing associations in memory (e.g., Graf & Mandler, 1984). However, alcohol advertising might also create new associations that bind alcohol and outcome expectancy concepts to each other, particularly for less experienced drinkers. In addition to priming, alcohol advertising can be conceptualized as exposure to associative stimuli or associative learning experiences. Such a formulation rests on the human ability to detect and use the relations between adjacent elements. In considering studies on implicit, non-intentional forms of learning (e.g., Frensch, Buchner, & Lin, 1994) and paired associate learning (e.g., Postman, 1978), the items to be associated are displayed in close temporal or spatial proximity. Research on implicit

learning and evaluative conditioning support the idea that the joint processing of two events, given a minimal level of attention, is sufficient for learning the relation between elements (e.g., Frensch et al.; Jimenez and Mendez, 1999). For example, Wicker and Bernstein (1969) showed that searching for a meaningful association between two members of a word pair produced incidental learning on an indirect word association task.

By and large, the basic research on associative learning has occurred in studies using novel stimuli, such as artificial language acquisition and serial pattern learning; stimuli that rely heavily on a perceptual or physical feature analysis (e.g., Tulving & Schacter, 1990). It remains an open question whether advertising stimuli can be encompassed within a general theory of associative learning (as opposed to associative priming), or whether the conditions required for learning relations is qualitatively different for complex and applied domains. However, there is evidence from marketing research (Shapiro, 1999) that perceptual encoding of complex stimuli can facilitate conceptual memory. Shapiro demonstrated that exposure to products presented in context (i.e., pictures of potential use), as opposed to products in isolation, facilitated performance on several conceptual indirect measures. The effect occurred for test stimuli presented in both written and pictorial form, suggesting that effects occurred even with a change in stimulus format from study to test. Thus, the processing of complex advertising stimuli can include semantic analysis when the stimulus is present in context. Such a context facilitation effect is also found in the scene perception literature (e.g., Biederman, Tietelbaum, & Mazzanotte, 1983; Boyce, Pollatsek, Rayner, 1989), whereby object-to-object and object-to-background information is thought to activate a schema for the gist of the scene. Schema

activation in advertising may facilitate the link between conceptual information (i.e., expectancy concepts portrayed in ads) and alcohol products.

Evidence from paired-associate learning studies suggests that the formation of new associations (on both direct and indirect tests) depends on the level or type of processing at study. For instance, several studies examining implicit memory in paired associate learning paradigms showed that elaborative processing was necessary for the formation of new associations between previously unrelated word pairs, such as window-reason (Schacter & McGllynn, 1989; Schacter, 1987). Elaborative processing, such as reading the two words in a meaningful sentence, is necessary for establishing semantic links. To date, alcohol advertising studies have not examined the level or type of processing, as attention to the stimulus is assumed.

From an ecological validity perspective, the distinction between elaborative and non-elaborative processing is an important variable to consider in alcohol advertising research. The processing of ad stimuli in natural ad exposure situations requires selective attention, as the individuals attention is often drawn to a primary task or activity. Such selective attention is likely when exposure occurs during leisure time, while driving, or while reading an article in a magazine. Ad information processed secondary to a primary task may prevent the elaboration of semantic links necessary for new associations. However, such nonelaborative processing may benefit from an activation processes thought to occur in tests of paired-associate memory, and this process may be sufficient to affect performance on indirect tests of alcohol-outcome associations. Theoretical support for this prediction comes from activation theories of priming (e.g., Graf & Mandler, 1984; Schacter & Graf, 1986). Activation theories hold that the effects of priming on indirect tests are due to the temporary and automatic activation of existing semantic

associations and memory structures (e.g., Graf & Mandler). The term “automatic” suggests that activation occurs quickly and unintentionally, even if one is simultaneously engaged in other activities that prevent elaborative processing. Activation of existing associations strengthens relations among its components and increases accessibility (Graf & Mandler). The repeated activation of associated or covarying stimuli may be one mechanism by which alcohol advertising exerts its influence. The data reported from paired-associate priming studies (e.g., Schacter & McGllynn, 1989) showed that non-elaborative study (e.g., letter counting) of highly related word pairs (e.g., table-chair) can strengthen existing semantic associations. Shimamura and Squire (1984) found that the study of related word pairs, such table-chair, more than doubled the probability (relative to baseline) that the studied response (chair) would be given as a response to the stimulus (table) in a free association task with incidental test instructions (i.e., no instructions to remember items as a pair). Paired associate studies suggest that the study of pre-existing conceptual associations, even those that are highly related, can further strengthen existing associations. These studies suggest that alcohol-outcome associations can be enhanced and the strengthening of existing associations may occur independent of elaborative processing in natural ad exposure situations. However, compared to elaborative processing, recent studies showed that the magnitude of priming effects on conceptual indirect tasks is reduced by non-elaborative processing (Mulligan, Guyer, & Beland, 1999) and reduced by divided attention (Mulligan & Stone, 1999).

The activation of existing associations is central to memory processes in substance use. Free association studies of alcohol-outcome associations, as well as priming studies applied to substance use, clearly indicate that effects are pronounced at higher levels of drinking, and even

eliminated at low levels of participant drinking. Existing associations address the issue of baseline performance or the degree of semantic relatedness from free association norms and tasks. Contrary to the above discussion, basic research also suggests the possibility of a ceiling effect. Ceiling effects occur when priming is constrained by a high-level of baseline performance. Priming effects on indirect memory tasks are generally larger when baseline level of performance is low and effects are constrained when baseline performance is high (Reder, Park, & Kieffaber, 2009). Priming and memory effects in alcohol advertising may be observed only as a function of participant level of drinking. The current study addressed this issue by examining alcohol use as a covariate and then conducting supplementary analyses to explore the interaction between participant level of drinking and alcohol advertising exposure.

Alcohol Advertising Research

Much of the experimental research has focused on a direct link between advertising and alcohol use. However, this question is biased in favor of null effects because it fails to examine the goals of advertising (Atkin, 1995, Cohen, 1995). Instead, marketing specialists rely on intermediate effects on memory and attitude, which in turn influence consumer decisions (Cohen, 1995; McGuire, 1985; Wells, 1989). There are apparently no experimental studies examining the influence of alcohol advertising on attitudes (liking, preference) toward alcohol itself. Survey research shows that exposure to alcohol advertising is significantly related to liking alcohol ads (Wyllie, Zhang, & Casswell, 1998; Unger et al., 1995), positive outcome expectancies (Grube, 1995) intentions to drink in children (Grube), and alcohol use (Connolly, Caswell, Zhang, & Silva, 1994; Grube; Unger et al., 1995; Stacy, Zogg, Unger, & Dent, 2004).

Liking alcohol ads, in turn, is associated with positive outcome expectancies (Wyllie et al, 1998) and alcohol use (Austin & Nach-Ferguson, 1995; Caswell & Zhang, 1998; Unger et al., 1995).

There are only a few experiments examining cognitive responses to alcohol advertising. Two experiments found no advertising effect on outcome expectancy questionnaires (Lipsitz, Brake, Vincent, & Winter, 1993; Slater et al., 1996). Standardized questionnaires may not be sensitive enough to detect subtle changes in the underlying associative memory process by which expectancies and alcohol use are associated, particularly after limited exposure to advertising in an experimental context and non-elaborative processing in natural ad exposure situations. However, on a standardized expectancy questionnaire, cigarette smokers exposed to a body image prime (pictures of fashion models) endorsed stronger outcome expectancies for weight control compared to smokers exposed to neutral primes (McKee, Nhean, Hinson, & Mase, 2006). Thus, pictures similar to those used in tobacco advertising influenced a specific positive expectancy for smoking. Dunn and Yniquez (1999) assessed children's responses on a self-generated expectancy task (How do people feel when they drink?). Children viewing beer commercials reported positive and arousing expectancies more like heavier drinking individuals. However, the methodology of the Dunn Study (statistical modeling with multidimensional scaling) did not allow for hypotheses testing. The Dunn study and the McKee study are important steps toward conceptualizing the effects of advertising in terms of memory activation and semantic network theory. Another study examined the influence of alcohol advertising on physiological responses in a cue reactivity paradigm; the effect of alcohol advertising on heart rate and skin conductance was inconsistent (Cassisi, Delehant, Tsoutsouris, & Levin, 1998). A larger literature examining cue-reactivity to visual stimuli (e.g., pictures of alcohol beverages) in

alcohol dependent participants was also inconclusive (Erikson & Gotesom, 1984; Laberg, Hugdahl, Stormark, Nordby, & Aas, 1992; Stormark Laberg, Bjerland, & Hugdahl, 1993).

A lack of careful attention to stimulus selection may account for some null effects in previous research (Grube, 1995; Thorson, 1995; Williams, 1995). Because ads are strategically designed to target a particular demographic group, it is important to consider the study sample in relation to qualitative difference in advertising content (Thorson). First, content that is appropriate to the study sample may influence attention and relevance of the ads message. Second, exposure to qualitatively different combinations of ads that contain different concepts may reduce frequency or repetition effects. Frequency or repetition effects are inherent in most theories of associative memory and major types of associative effects (Nelson & McEvoy, 2000). Repeated activation of the same semantic association may be one mechanism by which alcohol advertising exerts its influence. Third, marketing and alcohol advertising theory predicts that specific conceptual associations are derived from alcohol advertising. Exposure to ads containing themes of adventure or excitement versus ads containing themes of relaxation or escape, may differentially activate specific emotional associations along the arousal-sedation dimension of the expectancy network. The present study categorized alcohol advertising content for specific alcohol emotionality associations and then tested for the occurrence of these associations. A stimulus study also verified that the content and style of the ads were geared specifically for those who served as participants.

With regard to frequency effects, a number of studies from basic memory research have found enhanced performance on indirect tests when the stimulus is presented multiple times (e.g., Salasoo, Shiffrin, & Feustel, 1985; Schacter & McGlynn, 1989). In general, priming effects

are enhanced for unfamiliar stimuli, such as pseudo words (Salasoo, et al.) and unrelated word pairs (Schacter & McGlynn) after only four or five repetitions with elaborative processing. Priming for familiar or related items occurs after one presentation. In a total of ten experimental tests of alcohol advertising, including six tests of alcohol use (Brown, 1978; Kohn, Smart, & Ogborne, 1984; McCarty & Ewing, 1983; Sobel et al., 1986), the average number of ad exposures was 8 (range 3 to 15), with a mode of 5 (three studies). Of two studies that varied the number of ads (9 ads and 3 ads), one study found a significant dose-response effect on alcohol use (Kohn and Smart, 1987), and the other found no effect on use (Kohn and Smart, 1984). However, there is no compelling theoretical reason to expect that exposure to eight or ten ads would yield significant benefit over fewer ads. For example, it is assumed that associative strength increases according to a power law with diminishing returns for additional presentations. Further, the alcohol-outcome pair will likely possess some degree of pre-experimental association. Additional presentations will matter only if they increase new learning. If fewer presentations are sufficient to reach an activation threshold, additional presentations will not help further. Thus, basic memory research and prior alcohol advertising studies suggest that five ads are sufficient.

Overview

The two major purposes of this experiment were to compare preferences for alcohol and memory for alcohol-outcome associations with and without exposure to alcohol advertising. The primary question is whether preference and memory differ between those who view and those who do not view alcohol advertising. Alcohol advertising was represented by beer advertising found in popular magazines. Beer ads were used in this experiment because beer is the most commonly used form of alcohol by college students and perhaps the most generic form of alcohol on the market. Beer ads also offer a wide variety of “life-style” ads that contain actors, situation, scenes, and other attributes likely to appeal to the youthful participants in this study. Alcohol preference was operationalized as the proportion of alcohol and non-alcohol beverages selected in a consideration set. A consideration set was used in this experiment because marketing studies found them sensitive to preferences and behavioral choices across product categories (Ratneshwar et al., 1996). Alcohol-outcome associations were used because multiple operational definitions of this construct (i.e., memory associations, expectancy questionnaires, and self-generated expectancies) converge to support its importance in substance use. Alcohol-outcome associations are also predicted by the product-concept hypothesis in marketing theory.

A second purpose was to examine these effects as a function of variations in type processing and variations in type of ad. To examine alcohol preference and associative memory for alcohol-outcome pairs under different conditions, this experiment used two different study tasks, one that encouraged associative elaboration of the pairs and one that limited associative elaboration. In the elaborative condition, participants were given the task of rating the semantic relationship between the alcohol product and the scene or models in the ad. The elaborative

condition was intended to encourage participants to elaborate on the meaning of each pair. By contrast, the selective attention condition was constructed to reduce the level of associative elaboration. In the selective attention condition, participants were instructed to read brief articles in a mock magazine that appeared adjacent to the ads. Thus, they engaged in a task that permitted relatively unrestricted formations of semantic relations. The two processing tasks were intended to contrast an effect that approximates a natural ad exposure with an effect that can be “produced” under ideal processing conditions. The goal was to enhance external validity and sensitivity in a single study.

Following the presentation of alcohol ads, preference and memory associations were tested. Memory associations were tested with a word association test and a self-generated outcome expectancy task. On the word association test, 16 phrases describing the positive outcomes of alcohol use were presented, and participants were required to write down the first and second behaviors that came to mind. Half of the stimulus phrases were arousing outcomes (e.g., having fun with friends, acting more outgoing) and half were sedating outcomes (e.g., feeling more relaxed, forgetting problems). On the outcome expectancy task, an alcohol cue was presented (“How do people feel when they drink alcohol?”), and participants were required to list as many words that came to mind in 2 minutes. Response time was assessed at 30 second intervals during the expectancy task. It was anticipated that participants viewing alcohol advertising would produce proportionately more of their positive expectancy associations in the early time interval and proportionately more of their negative expectancies in the later time interval compared to controls.

A secondary question concerns the effect of the processing manipulation on memory associations and preference. If pre-existing associations can be activated independently of type of processing, as found in basic memory research on semantically related word pairs, there should be significant priming of alcohol-outcome associations in all experimental conditions relative to the control condition. However, the magnitude of priming effects should be reduced in the selective attention condition relative to the elaborative condition. It was anticipated that the processing manipulation would have the same pattern of effect on preference.

To examine associative memory for alcohol-outcome pairs as a function of ad type, this experiment used two types of ads, one containing sedating themes (e.g., relaxation, tension reduction) and one containing arousing themes (e.g., fun with friends, more outgoing). The ad types were intended to test the product-concept hypothesis that qualitatively different concepts portrayed in ads become conceptually associated in memory with alcohol products. The word association and outcome expectancy tasks were intended to assess these associations. Likewise, the arousing outcome stimulus cues and the sedating outcome stimulus cues were intended to assess specific conceptual associations. Thus, another secondary question concerns the effect of ad type on the word-association and outcome expectancy tasks. For example, it was anticipated that participants exposed to sedating ads would generate more alcohol associations to sedating outcome cues (e.g., feeling more relaxed). Such an effect should also occur on the outcome expectancy task. For example, participants exposed to arousing ads should generate more arousing outcome expectancy words.

Hypotheses

- 1) The proportion of beer products selected in the consideration set will be highest in the elaborative processing condition, lower in the selective attention condition, and still lower in the control group.
- 2) Alcohol associations to expectancy cues and positive expectancy associations to an alcohol cue will be highest in the elaborative processing condition, lower in the selective attention condition, and still lower in the control condition.
- 3) Alcohol associations to arousing expectancy cues will be highest in the condition exposed to arousing ads; and alcohol associations to sedating expectancy cues will be highest in the condition exposed to sedating ads.
- 4) Arousing and sedating expectancy associations to an alcohol cue will be highest in the conditions exposed to advertising compared to the control condition.
- 5) Positive outcome expectancies will be generated earlier in the outcome expectancy task in the experimental conditions compared to the control group.

Method

Participants were assigned to one cell of a 2 (ad type: arousing or sedating messages) x 2 (processing type: selective attention or elaborative processing) + 1 (control) design. Half of the experimental group viewed ads containing messages of arousal/excitement and half viewed ads containing messages of sedation/relaxation. Within each of these conditions, half of the participants engaged in a selective attention task and half engaged in an elaborative processing task. A between-participant design was used because a within-participant design requires a pretest involving alcohol-related cognitions. Exposure to alcohol-related cognitions before viewing the ads may cause participants to attend to aspects of the ads that may have otherwise gone unnoticed, making it impossible to assess the typical influence of alcohol advertising.

Power Analysis

Effect size estimates for the power analysis were derived from two studies examining the influence of advertising (Dunn & Yniquez, 1999; $d = .89$) and imagery (Stacy, et. al, 1994; $d = .54$) on outcome expectancies. With an average effect size of .69, alpha was set at 0.05 and power was set at 0.80. With five groups and the above specifications, estimated sample size for each group was determined following the procedures recommended by Cohen (1988). This provided an estimated sample size of 225 ($N = 45$ per group).

Participants

Two hundred twenty five undergraduate students at Louisiana State University in Baton Rouge, Louisiana participated in this study in exchange for extra credit. Forty-five participants were assigned to each of the four experimental conditions and the control condition. Participants were tested in small groups of 5 in a classroom setting, and each group was randomly assigned to

one of the five conditions. Participants were assured of confidentiality and given informed consent before participation. The majority of the sample (78%) fell between the ages of 18 and 21-years-old. The sample was 81% Caucasian and 16% African American, with the remaining 3% reporting other ethnic backgrounds.

Norming Study

A preliminary study was conducted to determine the ads used in the main study. Forty undergraduate participants, none of whom participated in the main study, examined an initial pool of 23 full-page, full-color beer ads compiled from popular magazines. The initial ad pool contained primarily image or lifestyle ads (i.e., those showing characters, settings, activities, and potential use) as opposed to product-oriented ads (i.e., ads that promote product attributes, such as taste and ingredients, while showing only the brand with little or no context). The norming study had three goals: (1) to categorize individual ad content for specific alcohol-emotionality associations; (2) to verify that the alcohol-emotionality associations can be interpreted or easily understood from the ads; and (3) to verify that the ads are marketed or targeted at the general population (youthful males and females) who served as participants in the main study.

To ensure that participants understood the purpose of their task, they were instructed on the general goals of advertising, including a discussion of target audience and what constitutes the various product-concept associations in alcohol advertising, including alcohol-emotionality associations. Participants were individually tested in groups of five. For each of the 23 ads, participants responded to four questions. The first, an open-ended question, was intended to assess perceptions of alcohol-emotionality associations: “What is the main theme or message in the advertisement that is linked with alcohol?” Participants were instructed to limit their

responses to one theme and instructed to write one short phrase rather than a narrative response. The second question was intended to assess ease of comprehension; “How easy was it to understand the main theme or message of the advertisement?” Response options included “easy, somewhat easy, or not at all easy.” The final two questions were intended to assess target population or target audience: “Based on the content and style, who does the advertisement suggest drinks the beer?” Response options to the third question included “male, female, or both male and female.” Response options to fourth question included consumers “age 18 to 23, age 24 to 29, or age 30 and over.”

Responses to the open-ended question were independently coded by two coders for mention of sedating-related words, arousing-related words, or other (neither sedating nor arousing-related words). Coders were two masters level psychology professionals. Prior to coding participant responses, coders were instructed on the domain of affective words and discussed what constitutes positive, negative, arousing, and sedating-related responses. Cohen’s Kappa Statistic (k) was used to assess inter-rater agreement between the coders. The kappa value was 0.78, which represents “substantial” agreement (Landis & Koch, 1977). Ads with less than 80% agreement between coders, for mention of either sedating or arousing related themes were eliminated from the initial ad pool. This resulted in 8 ads perceived by participants as arousing and 7 ads perceived as sedating. Three arousing and two sedating ads were eliminated from the remaining ads due to low participant agreement on the two target population questions (age and gender). Averaged across age and gender questions, the eliminated ads had less than 60% agreement between participants. On the ease of comprehension measure, 89% of the participants agreed that the remaining ads were either easy or somewhat easy to understand. Thus, all

advertising stimuli used in the main study were rated as either arousing or sedating, as easy to understand, and as targeting 18-to-23 year old males and females.

Dependent Measures

Consideration Set

The consideration set included a checklist of product-brand names based on the product category of beverages. The checklist contained product and brand names of ten beverage alternatives, including 2 beer products. All ten brand names were fictitious to remove the effect of prior brand exposure or attitude toward existing brands. The products were presented in three different random orders and no information other than the type of beverage (e.g., beer, sport drink, energy drink, and juice drink) and brand name was provided. Participants were told “Check the names of the products that you would like to try. Please, checkmark as many or as few products as you wish.” Similar checklists have been used in previous research investigating stimulus-based consideration sets (e.g., MacInnis et al., 1991; MacInnis & Jawarski, 1989; Shapiro, 1999; Parkinson & Reilly, 1979). The consideration set size (the number of alternatives checked) and the number of target beer products checked (range 0 to 2) were recorded. Market simulation and market share studies have shown that the proportion of advertised and non-advertised products selected in a consideration set is one of the strongest predictors of actual purchase on later choice occasions (Roberts & Lattin, 1997). Depending on the product category and the number of variables considered, consideration sets explain between 22% and 78% of the variance in consumer purchase and choice behaviors (Roberts & Lattin; Wu & Rangaswamy, 2003). A brand or product that enters the consideration set of a consumer increases the probability that the consumer will choose that product even when it is not the most preferred

product (Andrews & Srinivagen, 1995). Advertising also produces a stabilizing effect on consideration sets over time, both increasing and decreasing set size (Mitra, 1995).

Alcohol-outcome Associations

The second dependent measure was an outcome association task based on the controlled word association measure of Stacy et al. (1994, study 1). The outcome association task measures the accessibility or strength of associations between outcomes (e.g., relaxation) and behavior (i.e., alcohol use). Thirty-one short phrases describing potential outcomes of various behaviors were listed. Sixteen of the outcome stimulus phrases included adjectives drawn from previous studies (Goldman & Rather, 1993; Stacy, et al., 1994; Rather & Goldman, 1994; Rather, Goldman, Roehrich, & Brannick, 1992) that modeled a memory network for alcohol expectancies along a two dimensional solution (positive-negative and arousing-sedating). Stimulus phrase included 8 positive outcomes associated with arousing expectancies (having fun with friends, laughing more, acting more outgoing, being more talkative, feeling more confident, acting wild, feeling happy, and feeling good) and 8 positive outcomes associated with sedating expectancies (feeling more relaxed, forgetting problems, feeling calm, feeling mellow, reducing stress, reducing tension, escaping from problems, feeling carefree). The remaining outcomes in the outcome association task were filler items, which could be the result of a variety of behaviors not related to alcohol use (e.g., being thrifty, feeling interested, mastering a skill, becoming a scholar, getting good grades, feeling satisfied, being overweight, feeling healthy, earning respect, earning money) and not previously listed as drinking outcomes (as in Stacy, et al., 1994 study 1). Stimulus phrases were presented in 3 different random orders, with no alcohol outcomes appearing consecutively on the list. Participants were informed that the phrases are the result or

consequences of doing some behavior or activity and were instructed to “write the first and second behavior or activity that simply pops to mind when you read the phrases.” Participants then completed a follow-up questionnaire to clarify the meaning of their responses (as in Stacy, et al., 1994 study 2). Participants were instructed to write a short narrative description of their responses given to the 16 outcome stimulus phrases. The follow-up questionnaire was intended to clarify ambiguous responses as either alcohol-related or not alcohol-related. Responses were coded for mention of alcohol (or drinking synonyms) as either the first or second response (Stacy et al., 1994). Two coders, unaware of the intent of the study, reached a consensus on each of the responses by coding responses as 1 for alcohol-related and 0 for not alcohol-related. In the event of a disagreement, a third judge broke the tie. Cohen’s Kappa Statistic (k) was used to assess inter-rater agreement between the coders. The kappa value was 0.81, which represents “almost perfect agreement” (Landis & Koch, 1977). Two supplementary coding systems were also used in order to lessen any potential ambiguity in the meaning of responses: (1) responses falling into the above coding system, plus those responses that referred to drugs other than alcohol and getting “high;” (2) responses covered by both of the above coding systems, plus those responses that referred to “party,” “parties,” or “bars” without specific reference to alcohol.

Outcome Expectancies

The expectancy association measure was an open-ended or self-generated outcome expectancy task based on the self-generated measure used by Dunn and Yniguez (1999) intended to assess the accessibility or strength of positive outcome associations in response to an alcohol cue. The directions read as follows: “On the next page, you will be asked to respond to a question. Write down as many single words or short phrases that you can think of when you read

the question. For example, if the question was ‘name as many fruits as you can,’ you might write apple, orange, banana, strawberry, peach, pear, and so on. Now turn the page and write down as many single words or short phrases as you can think of. (Next page) “How do people feel when they drink alcohol?” (Dunn and Yniguez). The page with the alcohol prompt was blank other than the prompt at the top. The sample responses on the front page appeared in a column format to encourage participants to list their responses so the first and second responses were obvious and to encourage single words rather than narrative responses (Dunn and Yniguez, 1999).

Two coders, unaware of the studies purpose, independently coded responses for valence (positive versus negative) and for arousal (arousing, sedating, or other). In the event of a disagreement, a third judge broke the tie. Coders were two masters level psychology professionals. Prior to coding participant responses, coders were instructed on the domain of affective words and discussed what constitutes positive, negative, arousing, and sedating-related responses. Coders were then trained to a 90% agreement level on a variety of “practice” adjectives and phrases commonly used to describe the effects of alcohol. Cohen’s Kappa Statistic (k) was used to assess inter-rater agreement between the coders. The kappa value was 0.71, which represents “substantial agreement” (Landis & Koch, 1977).

Support for the above coding scheme comes from mathematical models of basic affect that include two, independent, bipolar dimensions: (1) affective valence, ranging from unpleasant to pleasant, and (2) arousal, ranging from low activation to high activation (Russel, 1980; Larsen & Diener, 1992). These two dimensions closely match the results of various grouping procedures (i.e., multidimensional scaling, cluster analysis, confirmatory factor analysis) for categorizing basic expectancy factors (see Goldman et al., 1999 for a review).

Alcohol Use

Alcohol use was assessed with a subset of 10 items from the Composite Quantity Frequency Index (Polich & Orvis, 1979). Participants reported their frequency of consumption during the last 60 days for beer, wine, wine coolers, and hard liquor, as well as the usual number of drinks per occasion for each category of alcohol. A single quantity-frequency measure was calculated by summing the 10 responses. Cronbach's alpha for the quantity-frequency measure was .81 for the current sample.

Manipulation Check

Three measures, recall of article content, ad recall, and ad recognition were used as manipulation checks for the processing manipulations. To ensure that the manipulation of processing was successful, ad recall and ad recognition rates for participants in the selective attention condition should be significantly lower than recall and recognition for the elaborative processing condition.

Article Recall

Ten multiple-choice questions based on the content of the five articles (two questions per article) were used to assess how well participants in the selective attention condition attended to the primary task. Cronbach's alpha for this measure was .92 .

Ad Recall

Ad recall was measured by a free recall procedure. Participant listed all of the brand names from the ads to which they were exposed during the experiment. The presence or absence of a brand name from the target ads were coded dichotomously (Yes = 1 and No = 0).

Ad Recognition

A standard yes/no recognition test compared recognition scores of the selective attention condition with recognition scores of the elaborative processing group. Fifteen color photo copies of print ads including the five target ads and ten distracter ads were presented one at a time, and participants indicated whether they remembered seeing the ads during the experiment. Half of the filler ads were beer ads and half neutral ads. Ad recognition was coded dichotomously.

Procedure

Half of the experimental group ($n = 90$) was assigned to the selective attention condition. Participants in the selective attention condition were told the study purpose was to examine factors that make magazine articles readable. Magazines were then placed in front of participants and they were given the titles and page numbers of 10 articles to which to turn. Participants in the selective attention condition read five brief magazine articles that appeared adjacent to the five target beer ads and five filler articles that appeared adjacent to five neutral ads. Five neutral ads (e.g., Campbells chunky soup) were included in an attempt to conceal the alcohol focus of the study. Participants were told there would be a test to see how well they understood the articles. The articles averaged 200 words and most completed the task in about 15 minutes. Participants were instructed to turn the magazines face down upon completing the articles. The left-right position of the target beer ads was counterbalanced. There was no explicit mention of the beer ads. These instructions are consistent with traditional incidental learning tasks, where participants complete an orienting task and processing of the target stimuli is secondary. Half of the participants in the selective attention condition were exposed to five beer ads containing arousing themes and half exposed to five beer ads containing sedating themes.

Half of the experimental group ($n = 90$) was assigned to the elaborative processing condition and directly exposed the same ads and mock magazine used in the selective attention condition. Participants in the elaborative condition were told that the purpose of the study was to examine factors that make the layout of magazine ads appealing and readable. Participants were given 10 page numbers and told that each page is a full-page advertisement. To induce semantic processing, participants indicated on a 4-point scale how much the product and the models (or the scene) in the ad are related or a good fit for the ad. This instruction is consistent with traditional elaborative processing tasks, where participants are encouraged to elaborate on the meaning of the stimulus.

Upon completing the experimental task, participants in both conditions completed the dependent measures (consideration set, alcohol-outcome associations, and expectancy task; see appendix), the manipulation check measures (article recall, ad recall, ad recognition), and the alcohol use measure. Participants in the control group did not view the ads or magazine but completed the dependent measures and alcohol use measure. The control group provided a baseline level for alcohol-related cognitions that are independent of the effects due to the experimental ad exposure. Participants were debriefed and thanked.

Plan of Analyses

Statistical analyses followed the recommendations of Tabacknick and Fidell (2001) for a factorial design with a single control (i.e., a dangling group design). Inclusion of a single control group means that the present design is not fully factorial. As such, the first step was to turn the design into a one-way analysis with five levels. Planned comparisons linked directly to the hypotheses would follow a significant omnibus test (Tabacknick & Fidell).

Results

Preliminary Analyses

All dependent variables and alcohol use (covariate) were assessed for within-cell outliers, normality, and homogeneity of variance. Violations of assumption for Analyses of Variance (ANOVA) were limited to the consideration set dependent variable. Logarithmic transformations were made for the consideration set to correct for the non-normal distribution. One outlier remained after transformation. The outlying case, found in the experimental condition, was assigned a raw score equal to that of the next most extreme score in the distribution. Homogeneity of variance for the consideration set and all other dependent variables was satisfactory.

Participant Characteristics

One-way ANOVAs indicated no significant differences across the five conditions for alcohol use, $F(4, 220) = 0.67, p = .61$, and age of participants, $F(4,220) = 0.93, p = .53$. The covariate, alcohol use, was significantly associated with the three dependent variables. However, alcohol use provided no adjustment to the three dependent variables. Therefore, analyses are reported without the use of alcohol as a covariate. Males made up 35% of the control group and 34% of the experimental groups.

Manipulation Checks

Results indicated that participants in the selective attention group read and paid close attention to the magazine articles. On average, participants in the selective attention group responded correctly to 90% of multiple choice questions based on the magazine articles. The selective attention and elaborative processing instructions differentially affected ad recall and ad

recognition. The elaborative group recalled significantly more ads ($M = 3.27, SD = 1.23$) compared to the selective attention group ($M = 1.89, SD = 1.34$), $t(178) = 7.16, p < .001$. The elaborative group also recognized significantly more ads ($M = 4.62, SD = 0.71$) compared to the selective attention group ($M = 3.61, SD = 1.34$), $t(178) = 6.30, p < .001$. Post experimental questions indicated that 86% of the participants ($n = 154$) in the experimental group either did not correctly determine the purpose of the study or determined the purpose of the study only after the alcohol expectancy measure.

Primary Dependent Variables

Consideration Set

An alpha level of .05 was used for all statistical tests. To examine preference for alcohol products, the mean proportion of beer products selected (range 0 to 1.00) was tested as a function of exposure to alcohol advertising. A one-way Analysis of Variance (ANOVA) showed no significant difference among the five conditions, $F(4, 220) = 1.11, p = .35$. Table 1 lists the means and standard deviations by condition for the three primary dependent variables.

Alcohol-outcome Associations

The mean number of alcohol associations produced (range 0-13) in response to outcome expectancy cues was tested. A one-way ANOVA showed no significant difference among the five conditions, $F(4, 220) = 0.53, p = .71$. Additional analyses were performed on the two supplementary coding systems. The results of these analyses, essentially replicated the preceding analysis. To examine the product-concept hypotheses, the number of alcohol associations produced in response to sedating outcome cues (range 0 to 6) and arousing outcome cues (range 0 to 7) was determined. One-way ANOVAs showed no significant difference among the five

conditions for sedating cues, $F(4, 220) = 1.36, p = .25$, and no significant difference for arousing cues, $F(4, 220) = 1.03, p = .39$.

Table 1

Alcohol preference, alcohol association, and positive outcome expectancies as a function of processing type and ad type compared to control.

Measure	Condition				
	Selective Sedating	Selective Arousing	Elaborative Sedating	Elaborative Arousing	Control
Beer Preference	.21 (.42)	.20 (.31)	.14 (.22)	.13 (.16)	.12 (.18)
Alcohol Association	3.47 (2.46)	2.71 (3.19)	3.24 (2.74)	3.29 (3.13)	3.56 (3.50)
Positive Expectancy	5.71 (2.33)	5.58 (2.38)	5.29 (2.00)	5.89 (2.28)	6.50 (2.52)

Notes:

1. Standard deviations in parentheses
2. Means in the same row do not differ at $p < .10$

Outcome Expectancies

The mean number of positive outcome expectancies listed (range 2 to 13) in response to an alcohol cue was tested as a function of alcohol advertising exposure. A one-way ANOVA showed no significant difference among the five conditions $F(4, 220) = 1.69, p = .15$. To examine the product-concept hypothesis, the number of arousing and sedating outcome expectancies listed was examined as a function of ad type (arousing, sedating, control). One-way ANOVAs showed no significant difference among the three conditions for arousing outcomes,

$F(2, 222) = 0.07, p = .99$, and sedating outcomes, $F(2, 222) = 1.90, p = .12$. Next, the most highly associated or accessible outcome expectancies were examined as function of ad exposure and as a function of ad type. First, the proportion of total positive outcome expectancies listed in the first 30 second time interval was determined. A one-way ANOVA showed no significant difference among the five conditions, $F(4, 220) = 1.25, p = .29$. Also, the proportion of total negative outcome expectancies listed in the final time interval did not differ, $F(4, 220) = 0.86, p = .49$. Accessibility was also assessed with the type of first associate produced on the outcome expectancy task. Both response valence (negative or positive) and response type (arousing, sedating, or other) were tested as first associates. A Chi-Square test was performed to examine the relation between alcohol advertising and response valence. The relation between these two variables was not significant, $\chi^2(2, N = 225) = 3.63, p = .16$. The highest frequency of positive associates occurred in the control condition. A second Chi-Square was performed to examine the relation between ad type (sedating, arousing, or control) and response type. The relation between these two variables was not significant, $\chi^2(4, N = 225) = 1.15, p = .56$.

Supplementary Analyses

To examine alcohol advertising effects as a function of participant level of alcohol use, participants were categorized into high and low levels of use based on median splits. The 3 primary dependent variables (preference, alcohol association, and outcome expectancy) were analyzed in separate 3 (condition: elaborative processing, selective attention, or control) x 2 (alcohol use level: high or low) factorial ANOVAs. The main effect for alcohol use level was significant for the three dependent variables (all p 's < .00). More importantly, there were no significant interactions between alcohol use level and exposure to advertising (all p 's > .31).

Discussion

There was no support for the hypothesis that alcohol advertising increases preference for alcohol products relative to alternative products. There was also no support for the hypotheses that alcohol advertising activates alcohol-outcome associations in memory. Alcohol advertising had no influence on positive, arousing, or sedating expectancies in memory. Contrary to the product-concept hypothesis, there was no correspondence between the type of ad viewed and the type of expectancy or memory association retrieved. Participant level of alcohol use did not interact with alcohol advertising to influence preference or memory associations.

Advertising did not create preference for alcohol at the product class or product category level. From a public health perspective, this observation is important because category preference is associated with primary demand (aggregate demand for a product category) in the general advertising literature (e.g., Ehrenberg, 1972; 1974; Fisher, 1993). By contrast, both marketing and alcohol advertising studies show large and consistent effects on brand preference and ad preference. A difference between product category preference and brand preference indicates that affective responses do not go beyond the ad stimulus itself to include conceptually similar products capable of influencing aggregate consumption. A lack of generalization suggests that advertising does not create a generic liking for alcohol products that could potentially influence primary demand. Preference did not generalize from an exposed stimulus to an unseen but conceptually similar alcohol stimulus. Such differences can be accounted for by the distinction between conceptual and perceptual process. Ad and brand preference, as typically defined in the literature, can be considered a test of perceptual processes, given that the identical ads and brand pictures are repeated at study and test. Repeated exposure to the same stimulus is

one mechanism thought to contribute to increased liking for a stimulus (e.g., Bornstein & D'Agostino, 1994). Lack of support for the product category hypothesis is consistent with results from the general advertising literature. Summarizing the data on primary demand, Stewart and Rice (1995) concluded that advertising has a limited effect on aggregate category demand. As with most products, including alcohol, preference originating from advertising exposure appears to be limited to selective demand (brand preference, brand switching).

A particular point of focus was a postulate advanced by marketing theory (Cohen, 1995; Thorson, 1995) that alcohol advertising stimulates use through relatively short-term effects on associative memory. The associative memory hypothesis was not supported. Alcohol advertising did not increase the association between alcohol and positive emotional outcomes in memory. These results suggest that when positive emotional outcomes are desired or otherwise contemplated, alcohol advertising does not activate or increase the accessibility of alcohol use as a potential behavioral option for achieving those outcomes. In terms of Anderson's (1983) association theory, alcohol advertising did not facilitate the transfer of positive information from long-term memory to short-term memory. In terms of priming, alcohol advertising did not prime subsequent associations to alcohol-related words, even for the heaviest drinking participants. Previous expectancy priming studies showed the greatest amount of priming for the heaviest drinking participants.

Expectancy priming studies rely almost exclusively on word priming procedures. The current results suggest that activation of the expectancy network did not extend to complex pictorial stimuli that are primarily nonverbal in content. Priming is likely limited by the high number of elements capable of capturing attention or the high number of possible associations

present. For example, the majority of picture priming studies use relatively simple line drawings of single items (e.g., Lupker, 1988; Nelson et al., 1977). Moreover, the nonverbal content of ads may not be completely accessible through tests requiring verbal responses. For example, there is evidence for a reduction, but not an elimination, of priming effects when the format of the stimuli changes from study to test (Roediger & McDermott, 2000). Future studies can address these issues with instructions to generate words to describe the nonverbal content of ads rather than evaluate semantic links. Such “generation” tasks have proven useful in basic memory research (e.g., Bornstein & D’Agostino, 1994).

Relation to Other Alcohol Advertising Research

There is a growing body of research relating alcohol advertising to drinking, outcome expectancies, and attitudes. However, significant results are largely limited to correlations between retrospective recall of ad exposure (or proxy measures of ad exposure) and dependent variables. The present study, which used well-established memory research strategies, attempted to address some of the methodological and conceptual limitations of existing experiments. First, this study addressed the issue of experimental sensitivity by examining intermediate or short-term facilitative goals of advertising (i.e., memory and attitude) that are also known to influence alcohol use. Null effects occurred despite the use of dependent variables thought to be sensitive and appropriate to limited exposure in an experimental context. Methodology incorporated marketing strategies to ensure that advertising was appropriate to the study sample and addressed qualitative variations in ad content, also considered more sensitive to experimental designs (Atkin, 1995). The present study accounted for forced exposure to a large number of ads, which may create confounds associated with stimulus satiation and psychological reactance.

Results are consistent with null effects found in previous experiments. Because of concerns with experimental sensitivity, many in the field (Atkin, 1995; Cohen, 1995; Thorsen, 1995) consider it crucial to identify effects associated with qualitative variations in ad content, and identify intervening variables associated with alcohol use that are influenced by alcohol advertising. The present study, which accounted for attentional processing variables and included memory and attitude measures, offers additional support for the limited influence of alcohol advertising. These findings are consistent with prior experimental demonstrations showing limited effects on consumption, alcohol expectancies, and physiological responses. Taken together, alcohol advertising appears to have little effect across systems supporting emotional, physiological, conceptual, attitudinal, attentional, and memory based processes capable of supporting substance use. Assuming distinct systems among processes, these results provide converging evidence for the limited influence of alcohol advertising.

Possible Alternative Explanations

One alternative explanation is that print ads (as opposed to television ads and television programming portrayals of alcohol use) have less effect because they lack television's audiovisual capacity. However, this is unlikely given that three previous print studies showed significant brand-level and ad-level effects on ratings of intent to purchase the product and liking of the ads (Atkin & Block, 1983; Friedman, Termini, & Washington, 1977). Thus, print media alcohol ads, as with other types of print media advertising, are capable of influencing emotions and interests, but apparently not at a level associated with increased use.

Another alternative explanation is that exposure to the five advertisements was a weak manipulation relative to typical priming procedures. For example, expectancy priming studies

use up to 50 word primes and the body image primes in the McKee et al. (2006) study used 30 pictures of fashion models. Although the current study emphasized qualitative variations in ad content, there is some support for a frequency effect. For example, seven of fourteen experimental studies (including 2 studies examining brand level effects and the McKee smoking study) reported at least one significant effect on a primary dependent variable. The seven studies reporting significant effects averaged 12 prime exposures. The seven studies reporting no effects averaged five exposures. However, significant effects ranging from increased alcohol use to brand preference were observed after only three exposures. Reports of significant effects are generally small and often with mixed results on multiple dependent variables. Over all, the evidence indicates that advertising does not exert a powerful influence.

Results of the post experimental questionnaires indicated that participants did not determine the general alcohol-related purpose of the study. Therefore, the possibility that participants responded in a socially desirable fashion can be ruled out as an alternative explanation for the null findings.

The present study had several limitations. First, no attempt was made to measure past exposure to alcohol advertising or past exposure to the specific ad stimuli. Given that advertising effects are believed to be cumulative in nature, prior exposure may moderate effects. However, it was assumed that prior exposure to advertising is indistinguishable from other types of associative learning in terms of memory storage and activation processes. Second, undergraduate students served as participants. Advertising effects may differ for other populations, such as alcohol naive children, and dependent or problem drinkers. Nonetheless, the importance of college samples is evident given that alcohol advertising is directed at college campuses and

highly prevalent in college newspapers. Third, the current study had no overt measure of behavior, such as purchasing or drinking alcohol; reports of preference may not be a valid measure of effects. Fourth, the self-generated outcome expectancy measure occurred after participants were exposed to outcome expectancy phrases. This sequence likely primed the outcome expectancy network, essentially masking any potential advertising effect. This is a significant limitation and conclusions regarding the influence of advertising on self-generated expectancies requires additional study.

References

- Anderson, J. R. (1983). *The Architecture of Cognition*. Cambridge, MA: Harvard University.
- Andrews, R. L. & Srinivasan (1995). Study consideration effects in empirical choice models using scanner panel data. *Journal of Marketing Research*, 32, 30-41.
- Armstrong, C. (1997). Automatic and non-automatic processing of alcohol-associations in heavy vs. light drinkers. *British Journal of Clinical Psychology*, 36, 555-565.
- Atkin, C. K., & Block, M.(1983). Effectiveness of celebrity endorsers. *Journal of Advertising Research*, 23, 57-61.
- Atkin, C.K. (1995). Survey and experimental research on effects of alcohol advertising. In S.E. martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 39-67). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Austin, E. W., & Nach-Ferguson, B. (1995). Sources and influences of young school-age children's knowledge about alcohol. *Health Communication*, 7, 1-20.
- Baeyens, F., Crombez, G., De Houwer, J., & Eelen, P. (1996). No evidence for modulation of evaluative flavor-flavor associations in humans. *Learning and Motivation*, 27, 200-241.
- Baeyens, F., Eelen, P., Crombez, G., & De Houwer, J. (2001). On the role of beliefs in observational flavor conditioning. *Current Psychology*, 20, 183-203.
- Balota, D. A., & Chumbley, J. I. (1984). Are lexical decisions a good measure of lexical access? The role of word frequency in the neglected decision stage. *Journal of Experimental Psychology: Human Perception and performance*, 10, 340-357.
- Biederman, I., Teitelbaum, R. C., & Mezzanotte, R. (1983). Scene perception: A failure to find a benefit from prior expectancy or familiarity. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 9, 411-429.
- Blaxton, T.A. (1989). Investigating dissociations among memory measures: Support for a transfer appropriate processing framework. *Journal of Experimental Psychology: Learning, memory, and Cognition*, 15, 657-668.
- Bornstein, R.F., & D'Agostino, P.R. (1994). The attribution and discounting of perceptual fluency: Preliminary tests of a perceptual fluency/attributional model of the mere exposure effect. *Social Cognition*, 12, 103-128.

- Boyce, S. J., Pollatsek, A., Rayner, K. (1989). Effect of background information on object identification. *Journal of Experimental Psychology: Human Perception and Performance*, 15, 556-566.
- Brown, R. A. (1978). Educating young people about alcohol use in New Zealand: Whose side are we on? *British Journal of Alcohol and Alcoholism*, 13, 199-204.
- Cassisi, J. E., Delehant, M., Tsoutsouris, J. S., Levin, J. (1998). Psychophysiological reactivity to alcohol advertising in light and moderate social drinkers. *Addictive Behaviors*, 23(2), 276-274.
- Casswell, S., Zhang, J. F. (1998). Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: a longitudinal study. *Addiction*, 93(8), 1209-1217.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J. B. (1995). Reconceptualizing alcohol advertising effects: A consumer psychology perspective. In S.E. Martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 245-251). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, 82, 407-428.
- Connolly, G. M., Casswell, S., Zhang, J. F., Silva, P. A. (1994). Alcohol in the mass media and drinking by adolescents: a longitudinal study. *Addiction*, 89(10), 1255-1263.
- Crandall, C. S. (1984). The liking of foods as a result of exposure: Eating doughnuts in Alaska. *Journal of Social Psychology*, 125, 187-194.
- Darkes, J., & Goldman, M. S. (1993). Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*, 61, 344-353.
- De Houwer, J., Thomas, S., & Baeyens, F. (2001). Associative Learning of Likes and Dislikes: A review of 25 Years of Research on Human Evaluative Conditioning. *Psychological Bulletin*, 127(6), 853-869.
- Dunn, M. E. & Yniguez, R. M. (1999). Experimental demonstration of the influence of alcohol advertising on the activation of alcohol expectancies in memory among fourth and fifth-grade children. *Experimental and Clinical Psychopharmacology*, 7(4), 473-483.

- Ehrenberg, A.S.C. (1972). *Repeat-Buying: Theory and Applications*. New York: American Elsevier
- Ehrenberg, A.S.C. (1974). Repetitive advertising and the consumer. *Journal of Advertising Research* 23, 25-34.
- Eriksen, L. M. & Gotesom, K. G. (1984). Conditioned abstinence in alcoholics: A controlled experiment. *International Journal of the Addictions*, 18, 287-294.
- Fazio, R. H. & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and uses. *Annual Review of Psychology*, 54, 297-327.
- Finn, T. A. & Strickland, D. E. (1982). A content analysis of beverage alcohol advertising. *Journal of Studies on Alcohol*, 43, 964-989.
- Fisher, J. (1993). *Advertising, Alcohol Consumption, and Abuse. A Worldwide Survey*. Westport, CT: Greenwood Press.
- Franken, I. H. A. (2003). Drug craving and addiction: Integrating psychological and neuropsychopharmacological approaches. *Progress in Neuropsychopharmacology and Biological Psychiatry*, 27, 563-579.
- Frensch, P. A., Buchner, A., & Lin, J. (1994). Implicit Learning of unique and ambiguous serial transitions in the presence and absence of a distractor task. *Journal of Experimental Psychology, Learning, Memory, and Cognition*, 20, 567-584.
- Friedman, H., Termini, S., & Washington, R. (1977). The effectiveness of advertisements utilizing four types of endorsers. *Journal of Advertising*, 6, 22-24.
- Geiger, J. A. (1971). Seven brands in seven days. *Journal of Advertising Research*, 11(5), 15-22.
- Goldman, M. S., & Rather, B. C. (1993). Substance use disorders: cognitive models and architectures. In P. Kendall & K. S. Dobson (Eds.), *Psychopathology and Cognition* (pp. 245-291). Orlando FL: Academic Press.
- Goldman, M. S., Del Boca, F. K., & Darkes, J. (1999). Alcohol expectancy theory: The application of cognitive neuroscience. In K. E. Leonard & H. T. Blane (Eds.), *Psychological Theories of Drinking and Alcoholism* (2nd ed., pp. 203-246). New York: Guilford.
- Gordon, P. C., & Holyoak, K. J. (1983). Implicit learning and generalization of the mere exposure effect. *Journal of Personality and Social Psychology*, 45, 492-500.

- Graf, P., & Mandler, G. (1984). Activation makes a word more accessible, but not more retrieval. *Journal of Verbal Learning and Verbal Behavior*, 23, 553-568.
- Graf, P., & Schacter, D. L. (1985). Implicit and explicit memory for new associations in normal and amnesic subjects. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11, 501-518.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological review*, 102(1), 4-27.
- Grossman, R. P., & Till, B. D. (1998). The persistence of classically conditioned brand attitudes. *Journal of Advertising*, 27, 23-31.
- Grube, J. W. (1995). Television alcohol portrayals, alcohol advertising, and alcohol expectancies among children and adolescents. In S.E. martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 105-121). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Hamm, N., Baum, M., & Nikels, K. (1975). Effects of race and exposure on judgments of interpersonal favorability. *Journal of Experimental Social Psychology*, 11, 14-24.
- Herrnstein, R. J. (1970). On the law of effect. *Journal of the Experimental Analysis of Behavior*, 13(2), 243-266.
- Herrnstein, R. J. (1974). Formal properties of the matching law. *Journal of the Experimental Analysis of Behavior*, 21(1), 159-164.
- Hill, A. B., & Paynter, S. (1992). Alcohol dependence and semantic priming of alcohol related words. *Personality & Individual Differences*, 13(6), 745-750.
- Janiszewski C. (1993). Preconscious encoding effects: The independence of attitude formation and conscious thought. *Journal of Consumer Research*, 20, 199-209.
- Janiszewski, C. (1990). The influence of print advertisement organization on affect toward a brand name. *Journal of Consumer Research*, 17, 53-65.
- Jimenez, L., & Mendez, C. (1999). Which attention is needed for implicit sequence learning? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 25, 236-259.
- Kohn, P. M., & Smart, R. G. (1987). Wine, women, suspiciousness, and advertising. *Journal of Studies on Alcoholism*, 48, 161-166.
- Kohn, P. M., & Smart, R. G. (1984). The impact of television advertising on alcohol consumption: An experiment. *Journal of Studies on Alcoholism*, 45, 295-301.

- Kohn, P. M., Smart, R. G., & Ogborne, A. C. (1984). Effects of two kinds of alcohol advertising on subsequent consumption. *Journal on Advertising, 13*, 34-41.
- Kunst-Wilson, W.R., & Zajonc, R.B. (1980). Affective discrimination of stimuli that cannot be recognized. *Science, 207*, 557-558.
- Laberg, J. C., Hugdahl, K., Stormark, K. M., Nordby, H., & Aas, H. (1992). Effects of visual alcohol cues on alcoholics' autonomic arousal. *Psychology of Addictive Behaviors, 6*, 181-187.
- Landis, J. R., & Koch, C. G., (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.
- Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. In M. S. Clark (Ed.), *Emotion* (pp. 25-59). Newbury Park, CA: Sage.
- Leigh, B. C. (1989). In search of the seven dwarves: Issues of measurement and meaning in alcohol expectancy research. *Psychological Bulletin, 105*, 361-373.
- Leung, K. S. & McCusker, C. G. (1999). Accessibility and availability of smoking-related associations in smokers. *Addiction Research, 7*, 213-226.
- Lipsitz, A., Brake, G., Vincent, E. J., & Winters, M. (1993). Another round for the brewers: Television ads and children's alcohol expectancies. *Journal of Applied Social Psychology, 23*, 439-450.
- Lupker, S. J. (1988). Picture Naming: An Investigation of the Nature of Categorical Priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 14*(3), 444-455.
- MacInnis, D. J. & Jawarski, B. J. (1989). Information processing from advertisements: Toward an integrative framework. *Journal of Marketing, 53*, 1-22.
- MacInnis, D. J., Moorman, C., Jawarski, J. (1991). Enhancing and measuring consumer motivation, opportunity, and ability to process brand information from ads. *Journal of Marketing, 55*, 32-53.
- Manza, L., Zizak, D., & Reber, A. S. (1998). Artificial grammar learning and the mere exposure effect: Emotional preference tasks and the implicit learning process. In Mazur, J. E. & Hastie, R. (1978). Learning as accumulation: A reexamination of the learning curve. *Psychological Bulletin, 65*(6), 1256-1274.
- McCarty, D., & Ewing, J. A. (1983). Alcohol consumption while viewing alcoholic beverage advertising. *International Journal on Addictions, 18*, 1011-1018.

- McCusker, C. G. (2001). Cognitive biases and addiction: An evolution in theory and method. *Addiction, 96*, 47-56.
- McCusker, C. G., & Gettings, B. (1997). Automaticity of cognitive biases in addictive behaviors: Further evidence with gamblers. *British Journal of Clinical Psychology, 36*, 543-554.
- McGuire, W. J. (1985). Attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *Handbook of Social Psychology* (pp. 233-346). New York, NY: Random House.
- McKee, S. A., Nhean, S., Hinson, R. D., & Mase, T. (2006). Smoking for weight control: Effect of priming for body image in female restrained eaters. *Addictive Behaviors, 31*(12), 2319-2323.
- Meyer, D. E., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology, 90*, 227-234.
- Mitra, A. (1995). Advertising and the stability of consideration sets over multiple purchase occasions. *International Journal of Research in Marketing, 12*, 81-94.
- Monahan, J. L., Murphy, S. T., & Zajonc, R. B. (2000). Subliminal mere exposure: Specific, general, and diffuse effects. *Psychological Science, 11*, 462-466.
- Mulligan, N. W., & Stone, M. (1999). Attention and conceptual priming: Limits on the effects of divided attention in the category-exemplar production task. *Journal of Memory and Language, 41*, 253-280.
- Mulligan, N. W., Guyer, P. S., & Beland, A. (1999). The effects of levels-of-processing and organization on conceptual implicit memory in the category exemplar production test. *Memory and Cognition, 27*, 633-647.
- Nelson, D. L., & McEvoy, C. L. (2000). What is this thing called frequency? *Memory & cognition, 28*(4), 509-522.
- Nelson, D.L., Reed, V. S., & McEvoy, C. L. (1977). Learning to order pictures and words: A model of sensory and semantic encoding. *Journal of Experimental Psychology. Human Learning and Memory, 3*, 485-497.
- Parkinson, T. L. & Reilly, M. (1979). An information processing approach to evoked set formation. *Advances in Consumer Research, 6*, 227-231.
- Perfect, T. J., & Askew, C. (1994). Print Adverts: Not Remembered but Memorable. *Applied Cognitive Psychology, 8*, 693-703.

- Pheterson, M., & Horai, J. (1976). The effects of sensation seeking, physical attractiveness of stimuli, and exposure frequency on liking. *Social Behavior and Personality*, 4, 241-247.
- Pliner, P. (1982). The effects of mere exposure on liking for edible substances. *Appetite*, 3, 283-290.
- Polich, J.M. & Orvis, B.R. (1979). Alcohol problems: Patterns and prevalence in the U. S. Air Force. *Report Prepared for the United States Air Force*. Santimonica, CA: Rand
- Postman, L. (1978). Picture Word Differences in the Acquisition and Retention of Paired Associates. *Journal of Experimental Psychology: Human Learning and Memory*, 4(2), 146-157.
- Rather, B. C., & Goldman, M. S. (1994). Drinking-related differences in the memory organization of alcohol expectancies. *Experimental and Clinical Psychopharmacology*, 2, 167-183.
- Rather, B. C., Goldman, M. S., Roehrich, L., & Brannick, M. (1992). Empirical modeling of an alcohol expectancy memory network using multidimensional scaling. *Journal of Abnormal Psychology*, 101(1), 174-183.
- Ratneshwar, S., Pechmann, C., & Shocker, A. D. (1996). Goal-Derived Categories and the Antecedents of Across-Category Consideration,” *Journal of Consumer Research*, 23, 240-250.
- Reder, L. M., Park, H., & Kieffaber, P. D. (2009). Memory Systems Do Not Divide on Consciousness: Reinterpreting Memory in Terms of Activation and Binding. *Psychological Bulletin*, 135(1), 23-49.
- Rhodes, G., Halberstadt, J., & Brajkovich, G. (2001). Generalization of mere exposure effects to averaged composite faces. *Social Cognition*, 19, 57-70.
- Richardson-Klavehn, A. & Bjork, R. A. (1988). Measures of memory. *Annual Review of Psychology*, 39, 475-543.
- Roberts, J. H. & Lattin, J. M. (1997). Consideration: Review of research and prospects for future insights. *Journal of Marketing Research*, 34, 406-410.
- Roediger, H. L. & McDermott, K. B. (2000). Distortions of memory. In E. Tulving & F. I. M. Craik (Eds.), *The Oxford Handbook of Memory* (pp. 149-162). New York: Oxford University.
- Roediger, H.L., & McDermott, K.B. (1993). Implicit memory in normal human subjects. In F. Botter & J. Grafman (Eds), *Handbook of neuropsychology* (Vol. 8, pp. 63-161).

- Roehrich, L., & Goldman, M. S. (1995). Implicit Priming of Alcohol Expectancy Memory processes and Subsequent Drinking Behavior. *Experimental and Clinical Psychopharmacology*, 3(4), 402-410.
- Rolls, E.T. (2000). Memory systems in the brain. *Annual Review of Psychology*, 51, 599-630.
- Russell, J. A. (1980). A circumplex model of emotion. *Journal of Personality and Social Psychology*, 39, 1161-1178.
- Saffer, H. (1995). Advertising and Alcohol Consumption: Econometric Studies. In S.E. Martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 83-99). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Salasoo, A., Shiffrin, R. M., & Feustel, T. (1985). Building permanent memory codes: Codification and repetition effects in word identification. *Journal of Experimental Psychology: General*, 114, 50-77.
- Sawyer, A. (1981). Repetition, cognitive responses and persuasion. In R. E. Petty, T.M. Ostrom, & T. C. Brock (Eds), *Cognitive responses in persuasion* (pp. 237-261). Hillsdale, NJ: Erlbaum.
- Schacter, D. (1987). Implicit memory: History and current status. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13, 501-518.
- Schacter, D. L., & Graf, P. (1986). Effects of elaborative processing on implicit and explicit memory for new associations. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12, 432-444.
- Schacter, D. L., & McGlynn, S. M. (1989). Implicit memory: Effects of elaboration depend on unitization. *American Journal of Psychology*, 102(2), 151-181.
- Seamon, J.G., McKenna, P.A., & Binder, N. (1998). The mere exposure effect is differentially sensitive to different judgment tasks. *Consciousness and Cognition*, 17, 85-105.
- Shapiro, S. (1999). When an ad's influence is beyond our conscious control: Perceptual and conceptual fluency effects caused by incidental ad exposure. *Journal of Consumer Research*, 26, 16-36.
- Shimamura, A. P., & Squire, L. R. (1984). Paired-Associate Learning and Priming Effects in Amnesia: A Neuropsychological Study. *Journal of Experimental Psychology: General*, 113(4), 556-570.

- Slater, M. D., Rouner, D., Murphy, K., Beauvais, F., Van Leuven, J., & Domenech-Rodrigues, M. M. (1996). Male adolescents' reaction to TV beer advertisements: The effects of sports content and programming context. *Journal of Alcohol Studies*, 57, 425-433.
- Smart, R. J. (1988). Does alcohol advertising affect overall consumption? A review of empirical studies. *Journal of Studies on Alcohol*, 49, 314-323.
- Smith, M. C., & Magee, L. E. (1980). Tracing the time course of picture-word processing. *Journal of Experimental Psychology; General*, 109, 373-392.
- Snodgrass, J. G. (1984). Concepts and their surface representations. *Journal of Verbal Learning and Verbal Behavior*, 23, 3-22.
- Sobell, L. C., Sobell, M. B., Riley, D. M., Klajner, F., Leo, G. I., Pavan, D. C., and Cancilla, A. (1986). Effect of television programming and advertising on alcohol consumption in normal drinkers. *Journal of Studies on Alcoholism*, 47, 333-340.
- Stacy, A. W. (1997). Memory activation and expectancy as prospective predictors of alcohol and marijuana use. *Journal of Abnormal Psychology*, 106(1), 61-73.
- Stacy, A. W., & Wiers, R. W. (2005). An implicit cognition, associative memory framework for addiction. In A. W. Stacy & R. W. Wiers (Ed.), *Handbook of implicit cognition and addiction* (pp.497-505). Thousand Oaks, CA: US: Sage Publications, Inc.
- Stacy, A. W., Ames, S. L., & Knowlton, B. J. (2004). Neurologically Plausible Distinctions in Cognition Relevant to Drug Use Etiology and Prevention. *Substance Use & Misuse*, 39(10-12), 1571-1623.
- Stacy, A. W., Leigh, B. C., & Weingardt, K. R. (1994). Memory accessibility and association of alcohol use and its positive outcomes. *Experimental and Clinical Psychopharmacology*, 2(3), 269-282.
- Stacy, A. W., Zogg, J. B., Unger, J. B., & Dent, C. W. (2004). Exposure to Televised Alcohol Ads and Subsequent Adolescent Alcohol Use. *American Journal of Health Behavior*, 28(6), 498-509.
- Stang, D. J. (1974b). Methodological factors in mere exposure research. *Psychological Bulletin*, 81, 1014-1025.
- Stewart D. W. (1989). Measures, methods, and models in advertising research. *Journal of Advertising Research*, 29, 54-60.

- Stewart, D. W., & Rice, R. (1995). Nontraditional Media and Promotions in the Marketing of Alcoholic Beverages. In S.E. Martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 209-238). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Stormark, K. M., Laberg, J. C., Bjerland, T., & Hugdahl, K. (1993). Habituation of electrodermal reactivity to visual alcohol stimuli in alcoholics. *Addictive Behaviors, 18*, 473-443.
- Stuart, E. W., Shimp, T. A., & Engle, R. W. (1987). Classical conditioning of consumer attitudes: Four experiments in an advertising context. *Journal of Consumer Research, 14*, 334-351.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Computer-Assisted Research Design and Analysis*. Needham heights, MA: Allyn & Bacon.
- Thorson, E. (1995). Studies of the effects of alcohol advertising: Two unexplored aspects. In S.E. martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 159-195). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), *Organization and memory* (pp. 381-403) New York: Academic Press.
- Tulving, E. (1983). *Elements of episodic memory*. Oxford: The Clarendon Press.
- Tulving, E., & Schacter, D. L. (1990). Priming and human memory systems. *Science, 247*, 301-306.
- Unger, J. B., Johnson, C. A., Rohrbach, L. A. (1995). Recognition and Liking of Tobacco and Alcohol Advertisements among Adolescents: Relationships with Susceptibility to Substance Use. *Preventive medicine, 24*, 461-466.
- Unger, J. B., Schuster, D., Zogg, J., Dent, C. W., & Stacy, A. W. (2003). Alcohol Advertising Exposure and Adolescent Alcohol Use: A Comparison of Exposure Measures. *Addiction Research and Theory, 11*(3), 177-193.
- Weingardt, K. R., Stacy, A. W., Leigh, B. C. (1996). Automatic activation of alcohol concepts in response to positive outcomes of alcohol use. *Alcoholism: Clinical and Experimental Research, 20*(1), 25-30.
- Wells, W. D. (1989). *Planning for R.O.I.: Effective Advertising Strategy*. Englewood Cliffs, NJ: Prentice-Hall.

- Wicker, F. W., & Bernstein, A. L. (1969). Association Value and Orienting Task in Incidental and Intentional paired Associate Learning. *Journal of Experimental Psychology*, 81(2), 308-311.
- Wiers, R. W., de Jong, P. J., Havermans, R., & Jelicic, M. (2004). How to Change Implicit Drug Use-Related Cognitions in Prevention: A Transdisciplinary Integration of Findings from Experimental Psychopathology, Social Cognition, Memory, and Experimental Learning Psychology. *Substance Use & Misuse* 39(10-12), 1625-1684.
- Wiers, R. W., Stacy, A. W., Ames, S. L., Noll, J. A., Sayette, M. A., Zack, M., et al. (2002). Implicit and Explicit Alcohol-Related Cognitions. *Alcoholism: Clinical and Experimental Research*, 26(1), 129-137.
- William, C. T. (2003). Mere exposure effects for affectively valenced stimuli (Doctoral dissertation, Emory University, 2003). *Dissertation Abstracts International*, 63, 5547.
- Williams, J. D. (1995). Advertising principles, practices, and outcomes: Applicability to alcohol advertising. In S.E. martin (Ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 197-207). (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 28). Bethesda, MD: NIH
- Wu, J., & Rangaswamy, A. (2003). A Fuzzy Set Model of Search and Consideration with an Application to an Online Market. *Marketing Science*, 22(3), 411-434.
- Wyllie, A., Zhang, J., Casswell, S. (1998). Positive responses to televised beer advertisements associated with drinking and problems reported by 18 to 29-year-olds. *Addiction*, 93(5), 749-754.
- Yaniv, I., & Meyer, D. E. (1987). Activation and metacognition of inaccessible stored information: Potential bases for incubation effects in problem solving. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13, 187-205.
- Zack, M., Toneatoo, T., & MacLeod, C. M. (1999). Implicit activation of alcohol concepts by negative affective cues distinguishes between problem drinkers with high and low psychiatric distress. *Journal of abnormal psychology*, 108(3), 518-531.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monographs*, 9 (2, Pt. 2), 1-27.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35, 151-175.
- Zajonc, R. B. (2001). Mere exposure: A gateway to the subliminal. *Current Directions in Psychological Science*, 10, 224-229.

Appendix A

Norming Study Questions

Instructions: In the binder are 23 advertisements. We would like you to answer four questions for each ad. For the first two questions to each ad, please write only a single short phrase using two or three words that best describes the ad. Please give only one main theme or message that best captures the ad.

Ad 1

(1) What is the main theme or message in the advertisement that is linked with alcohol?

(2) How easy was it to understand the main theme, message, or meaning of the advertisement?

(a) Easy to understand (b) Somewhat easy to understand (c) Not at all easy to understand

(3) Based on the content and style, who does the advertisement suggest drinks the beer?

(a) Male consumers (b) Female consumers (c) Both male and female consumers

(4) Based on the content and style, who does the advertisement suggest drinks the beer?

(a) Consumers age 18 to 23 (b) Consumers age 24 to 29 (c) Consumers age 30 and over
(d) Both a and b (e) Both b and c

Appendix B

Consideration Set Task

Directions: Below is a list of products. Check the names of the products that you would like to try. Please, checkmark as many or as few products as you wish.

- Fresco Spring Water
- Peak Performance Sport Drink
- Gold Label Beer
- Pinnacle Energy Drink
- Very Berry 100% Juice
- Aqua Pearl Spring Water
- Gold Medal Sport Drink
- Steinhaus Beer
- Island Tropical Juice
- Jumbo Java Energy Drink

Appendix C

Alcohol-outcome Association Task

Directions: During the next task you will see short phrases on the screen in front of you. Each phrase is the result or consequence of doing some behavior or activity. Each phrase will appear on the screen for 15 seconds. Please write down the first and second behavior or activity that simply pops to mind when you read the phrase. Don't spend too much time on each phrase because you will need to go on to the next phrase presented on the screen. Try to limit your responses to a behavior or activity. Now turn the page and write down the first and second behavior or activity that comes to mind.

Phrase ----- Behavior or Activity

Phrase 1: 1st _____
 2nd _____

Phrase 2: 1st _____
 2nd _____

Phrase 3: 1st _____
 2nd _____

Phrase 4: 1st _____
 2nd _____

Phrase 5: 1st _____
 2nd _____

Phrase 6: 1st _____
 2nd _____

Phrase 7: 1st _____

2nd _____

Phrase 8: 1st _____

2nd _____

Phrase 9: 1st _____

2nd _____

Phrase 10: 1st _____

2nd _____

Phrase 11: 1st _____

2nd _____

Phrase 12: 1st _____

2nd _____

Phrase 13: 1st _____

2nd _____

Phrase 14: 1st _____

2nd _____

Phrase 15: 1st _____

2nd _____

Phrase 16: 1st _____

Phrase 17: 1st _____

	2 nd	_____
Phrase 18:	1st	_____
	2 nd	_____
Phrase 19:	1st	_____
	2 nd	_____
Phrase 20:	1st	_____
	2 nd	_____
Phrase 21:	1st	_____
	2 nd	_____
Phrase 22:	1st	_____
	2 nd	_____
Phrase 23:	1st	_____
	2 nd	_____
Phrase 24:	1st	_____
	2 nd	_____
Phrase 25:	1st	_____
	2 nd	_____
Phrase 26:	1st	_____
Phrase 27:	1st	_____

Phrase 28:

2nd _____

1st _____

2nd _____

Phrase 29:

1st _____

2nd _____

Phrase 30:

1st _____

2nd _____

Phrase 31:

1st _____

2nd _____

Appendix D

Follow-up Outcome Association Task

Directions: Next we would like you to clarify some of your responses. Please go back and look at the two responses you gave for the odd numbered phrases above and write an expanded description of your responses. For example, if your response was “hanging out with friends,” then expand on your response by describing the specific behaviors you might be doing during that activity.

Phrase 1:

1st _____

2nd _____

Phrase 3:

1st _____

2nd _____

Phrase 5:

1st _____

2nd _____

Phrase 7:

1st _____

2nd _____

Phrase 9:

1st _____

2nd _____

Phrase 11:

1st _____

2nd _____

Phrase 13:

1st _____

2nd _____

Phrase 15:

1st _____

2nd _____

Phrase 17:

1st _____

2nd _____

Phrase 19:

1st _____

2nd _____

Phrase 21:

1st _____

2nd _____

Phrase 23:

1st _____

2nd _____

Phrase 25:

1st _____

2nd _____

Phrase 27:

1st _____

2nd _____

Phrase 29:

1st _____

2nd _____

Phrase 31:

1st _____

2nd _____

Appendix E

Outcome Expectancy Task

Directions: On the next page, you will be asked to respond to a question. Write down as many single words or short phrases that you can think of when you read the question. For example, if the question was “name as many fruits as you can,” you might write:

apple
orange
banana
strawberry
peach
pear
and so on.

Stop! Do not turn the page

Appendix F

Multiple Choice Questions for Articles

Directions: Remember the articles you read earlier? I would like to see how well you remember the articles. Below are 10 multiple choice questions taken from the articles. Please complete the multiple choice questions.

- (1) According to the article on Ironman competition, what does the author recommend competitors do to cut their time?
- Take vitamins
 - Strength training
 - Shave their legs
 - All of the above
- (2) According to the article on Ironman competition, which of the following dangers should athletes protect against.
- Over training
 - Skin chaffing
 - Dehydration
 - All of the above
- (3) From the article on early retirement, the author and his wife saved a quarter of a million dollars by choosing to do which of the following?
- Drive inexpensive used cars
 - Live on half their salary
 - Not have children
 - Skip =vacations each year
 - All of the above
- (4) According to the article on early retirement at what age did the author retire?
- 40
 - 56
 - 60
 - 48
- (5) According to the article “Earners Keepers,” what type of company did the two business men own?
- A medical supply company
 - An automobile parts company
 - A marketing and communications company
 - A natural foods company

(6) According to the article “Earners Keepers,” the two business men increased their profits by doing which of the following?

- a. Hiring a marketing specialist
- b. Reducing packaging costs
- c. Cutting health insurance for employees
- d. Moving their headquarters to Puerto Rico

(7) According to the article “Rising Tide,” hurricanes Katrina and Rita made many people aware of what problem?

- a. Weaknesses in the levy system
- b. Limitations of standard home owners insurance
- c. Loss of Louisiana’s coast land
- d. FEMA’s limitations in response to disasters

(8) According to the article “Rising Tide,” what should we do in response to the hurricanes?

- a. Rebuild in low risk flood areas
- b. Conserve coastal lands and begin coastal restoration
- c. Purchase flood insurance
- d. Design and build a better levy system

(9) According to the article “Prince of Glides,” what is Maxwell Mackenzie one of the best in the country at doing?

- ☞ Hang gliding
- ☞ Crop dusting
- ☞ Experimental aircraft design
- ☞ Agricultural photography

(10) According to the article “Prince of Glides,” Maxwell Mackenzie was born and spend his summers in what Minnesota county?

- a. Otter Tail county
- b. Olmsted county
- c. Hennepin county
- d. Lake county

Appendix G

Ad Recall

Directions: Earlier you read 10 short magazine articles. On the opposite page next to the articles were 10 advertisements. Please list all of the brand names from the advertisements. List only brand names that you can remember, not the product names. If you saw a brand more than once, be sure to include it more than once.

Appendix H

Ad Recognition

Directions: In the binder in front of you are 15 advertisements represented below by the numbers 1 through 15. Please look at each ad and circle “Yes” if you remember seeing the advertisements during the experiment or circle “No” if you do not remember seeing the advertisement. Please look at the ads only once and do not go back to change your answers.

1. YES NO
2. YES NO
3. YES NO
4. YES NO
5. YES NO
6. YES NO
7. YES NO
8. YES NO
9. YES NO
10. YES NO
11. YES NO
12. YES NO
13. YES NO
14. YES NO
15. YES NO

Appendix I

Post Experimental Questionnaire

Next we would like to know if and when you may have determined the purpose of this experiment. Please answer the following questions.

1. What do you think was the purpose of the experiment?

2. Please describe the best that you can the point in the experiment that you determined the purpose of the experiment?

3. At what point in the experiment did you figure out the purpose of the experiment?

a. When I was looking at the ads.

b. When I was responding to the question that read “How do people feel when they drink alcohol.”

c. Not until near the end when I answered the questions on alcohol use.

d. I did not figure out the purpose of the experiment.

Thank you for your participation.

Appendix J

Experimental Protocol

1. Welcome to experiment # 13 on media use. We are conducting research on the use of television, radio, internet and print media. You all have been assigned to the print media group.
2. The specific purpose of the study is to examine factors that make magazine articles readable and the type of information taken from the articles.
3. Please read the following informed consent, sign at the bottom of each form, and return one copy to me.
4. **Hand out test magazines.** So let's get started. These are test magazines that were put together for the specific purpose of this study. Don't open them just yet. I'll let you know when to start.
5. On each page in the magazine you will find a short article that appears on either the left or the right side. There are a total of 10 articles. **Hand out article titles.** Here is a list of the 10 articles. Please read each article once. *Later there will be a test on the articles to see how well you understood the articles.* When you finish reading the articles please close the magazine and turn it face down. We will continue when everyone is done reading. *I want o keep =the magazines in god condition, to avoid bending or damaging, please keep =the magazine on the table as you work through it.* Do you have any questions?
6. **Collect test magazines and titles.**
7. **Handout test packet.** Next I'll give you a packet containing the tasks you will be doing today. Please write the last 4 digits of your SS# and gender at the top. Please do not work ahead or look ahead in the packet. When you complete a task just stop =and I'll tell you when it's time to go on.
8. **Product checklist.** For the next task, please read the instructions at the top =and complete the checklist below. When you finish the task wait. I'll let you know when to go on to the next page.
9. **Phrase association task: Please turn the page.** For the next task I will read the directions aloud. During the next task you will see short phrases on the screen in front of you. Each phrase is the result or consequence of doing some behavior or activity. Each phrase will appear on the screen for 15 seconds. Please write down the first and second behavior or activity that simply pops to mind when you read the phrase. Don't spend too much time on each phrase because you will need to go on to the next phrase presented on the screen. Try to limit your responses to a behavior or activity. There are a total of 31 phrases. Do you have

any questions? Now turn the page and write down the first and second behavior or activity that comes to mind.

10. **Follow-up =to phrase association task. Please turn the page.** Next I would like you to clarify some of your responses. Please go back and look at the two responses you gave for the odd numbered phrases above and write an expanded description of your responses, *particularly those responses that are not real clear or may involve a wide variety of behaviors or activities.* For example, if your response was “hanging out with friends,” then clarify your response by including specific behaviors and actions you might be doing during that activity. When you finish the task wait. I’ll let you know when to go on to the next page. We will continue when everyone is done. Do you have any questions?
11. **Outcome expectancy task: Please read the instructions.** Don’t turn the page just yet. When everyone is ready I’ll let you know when to start. When you finish the task wait and I’ll let you know when to go on to the next page.
12. **Give line drawing instruction:** While you are working on this next task I’m going to ask you to draw a line from left to right across the page every 30 seconds. I’ll simply state “draw a line.” Please draw a line and continue with the task. **Please turn the page.**
13. **Multiple choices questions. Please turn the page.** Remember the articles you read earlier? I would like to see how well you remember the articles. I have 10 multiple choice questions taken from the articles. Please complete the multiple choice questions.
14. **Brand recall task. Please turn the page.** On the page opposite from the short articles you read earlier were 10 full page advertisements. Please write down the *brand names* from those advertisements. For example, if the ad were for Wrigley’s chewing gum, you would write the brand name “Wrigley’s” *not* the product “gum.” If you saw a brand more than once, be sure to include it more than once.
15. **Ad Recognition: Hand out binders.** Next I would like to see if you recognize the 10 advertisements that appeared on the pages opposite from the short articles you read. Don’t open these binders just yet. I’ll let you know when to start. The binders I’m passing out contain 15 advertisements. Some of the ads were in the magazine and some were not. On the response sheet you will see the numbers 1 through 15 that correspond to the 15 ads in the binder. Please page through the ads one at a time and circle YES if you remember seeing the ad earlier and NO if you do not remember seeing the ad. Please look at the ad only once and do not go back to change your answers.
16. **Post-experiment questionnaire.** Please to the last page n the packet and answer the following questions about the experiment itself. When you are done please turn the packet over and stay seated.

17. **Hand out 2nd consent form.** Next I'd like you to fill out a short questionnaire that asks about your alcohol use. Remember you are free to withdraw at anytime without penalty. Please read the following informed consent, sign at the bottom, and return one copy to me. Remember, all of your responses are anonymous and cannot be linked with you personally.
18. **Hand out alcohol use questionnaire. Please write the last 4 digits of your SS#**
19. Ok, before you go I need to explain to you what the study was about. If you didn't already figure it out the experiment was not about factors that make magazine articles readable. The study was looking at the effects of alcohol advertising on memory and product preferences. Any questions?
20. **Please do not discuss what you did today with others who may participate. Please do not tell your friends and classmates what the experiment is actually about.**
21. **Reset Behavior Association Task on Computer**

Appendix K

Consent Forms

Study Title: Media Use

Performance Sites: The study is being conducted in the Psychology department of Louisiana State University.

Contacts: The study is being conducted by Dr. Amy Copeland and James Smith of the Psychology Department of LSU. Dr. Copeland can be reached at 578-4117 Monday-Friday between 9:00 a.m. and 5:00 p.m. or at copelan@lsu.edu. Mr. Smith can be reached at 362-2593 Monday-Saturday between 8:00 a.m. and 5:00 p.m. or at jamescsmith@cox.net.

Study Purpose: We are conducting research to explore individual factors that relate to media use.

Participants: Participants must be at least 18 years of age and an undergraduate student at LSU.

Number of Participants: The Maximum number of participants we plan to enroll is 225.

Study Procedures: You will be asked to view a magazine and then complete several questionnaires regarding elements that make the layout of the magazine appealing and a questionnaire regarding product use. The study will be completed during one session and the required time will be approximately one hour.

Benefits: All undergraduate students participating will receive extra credit for completion of the study. In addition, the information collected may lead to a better understanding of the factors contributing to media use.

Risk/Discomforts: There are no known risks or discomfort to participating in this study. Some participants may be concerned about the loss of privacy because of the personal nature of information. However, this is extremely unlikely given that no identifying information will be collected that can be personally linked in anyway to your responses.

Right to Refuse: Participation in this study is voluntary. You may change your mind and withdraw from the study at any time without penalty or loss of any benefit to which you may otherwise be entitled.

Privacy: Participation in this study is anonymous. Results of this study may be published, but no names or identifying information will be included in the publication because this study is anonymous.

Financial Information: There is no financial compensation for participation. You will earn extra credit points for participating in this study.

Withdrawal: Participants may withdraw from the study at any time.

Removal: Aside from obvious disruption, harm or threat of harm to other study participants or members of the research team, participants will not be dropped from this study.

Certificate of Confidentiality: To help us protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, the researchers cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. The researchers will use the Certificate to resist any demands for information that would identify you, except as explained below.

The Certificate cannot be used to resist a demand for information from personnel of the United States Government that is used for auditing or evaluation of federally funded projects or for information that must be disclosed in order to meet the requirements of the federal Food and Drug Administration (FDA).

You should understand that a Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. If an insurer, employer, or other person obtains your written consent to receive research information, then the researchers may not use the Certificate to withhold that information.

The Certificate of Confidentiality does not prevent the researchers from disclosing voluntarily, without your consent, information that would identify you as a participant in the research project under the following circumstances: reporting of child abuse and intent to hurt self or others.

Signatures: ‘The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects’ rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb. I agree to participate in the study described above and acknowledge the researchers obligation to provide me with a copy of this consent form if signed by me.’

Participant name (print) _____

Participant Signature: _____ Date: _____

Consent Form II

Study Title: The Influence of Alcohol Advertising on Associative Memory and Consideration Sets.

Performance Sites: The study is being conducted in the Psychology department of Louisiana State University.

Contacts: The study is being conducted by Dr. Amy Copeland and James Smith of the Psychology Department of LSU. Dr. Copeland can be reached at 578-4117 Monday-Friday between 9:00 a.m. and 5:00 p.m. or at copelan@lsu.edu. Mr. Smith can be reached at 362-2593 Monday-Saturday between 8:00 a.m. and 5:00 p.m. or at jamescsmith@cox.net.

Study Purpose: We are conducting research on how alcohol advertising influences memory.

Participants: Participants must be at least 18 years of age and an undergraduate student at LSU.

Number of Participants: The Maximum number of participants we plan to enroll is 225.

Study Procedures: You were asked to view a magazine and advertising during the first part of the study.

The second part of the study requires that you complete a brief survey on your use of alcohol. The required time will be 5 minutes or less.

Benefits: All undergraduate students participating will receive extra credit for completion of the study. In addition, the information collected may lead to a better understanding of the factors contributing to alcohol use.

Risk/Discomforts: There are no known risks or discomfort to participating in this study. Some participants may be concerned about the loss of privacy because of the personal nature of information. However, this is extremely unlikely given that no identifying information will be collected that can be personally linked in anyway to your responses.

Right to Refuse: Participation in this study is voluntary. You may change your mind and withdraw from the study at any time without penalty or loss of any benefit to which you may otherwise be entitled.

Privacy: Participation in this study is anonymous. Results of this study may be published, but no names or identifying information will be included in the publication because this study is anonymous.

Financial Information: There is no financial compensation for participation. You will earn extra credit points for participating in this study.

Withdrawal: Participants may withdraw from the study at any time.

Removal: Aside from obvious disruption, harm or threat of harm to other study participants or members of the research team, participants will not be dropped from this study.

Certificate of Confidentiality: To help us protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, the researchers cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. The researchers will use the Certificate to resist any demands for information that would identify you, except as explained below.

The Certificate cannot be used to resist a demand for information from personnel of the United States Government that is used for auditing or evaluation of federally funded projects or for information that must be disclosed in order to meet the requirements of the federal Food and Drug Administration (FDA).

You should understand that a Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. If an insurer, employer, or other person obtains your written consent to receive research information, then the researchers may not use the Certificate to withhold that information.

The Certificate of Confidentiality does not prevent the researchers from disclosing voluntarily, without your consent, information that would identify you as a participant in the research project under the following circumstances: reporting of child abuse and intent to hurt self or others.

Signatures: ‘The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects’ rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb. I agree to participate in the study described above and acknowledge the researchers obligation to provide me with a copy of this consent form if signed by me.’

Participant name (print) _____

Participant Signature: _____ Date: _____

VITA

James C. Smith completed his Bachelor of Arts degree in psychology at Winona State University in 2000. He received a Master of Arts in psychology from Southeastern Louisiana University in 2002 under the direction of Dr. James Worthen. He completed internship requirements for a doctorate in psychology at the Louisiana State University Health Sciences Center, New Orleans, in 2007. Currently, he is providing clinical services at Louisiana State University Health Sciences Center Juvenile Justice Program and will receive the degree of Doctor of Philosophy from Louisiana State University in December 2009 under the direction of Dr. Amy L. Copeland.