THE INFLUENCE OF INDIVIDUAL PREDISPOSITIONS ON MEASURES OF MESSAGE ENCODING

By

REBECCA VAN DE VORD

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Chair

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Abstract

by Rebecca Van de Vord M.A.
Washington State University
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Chair: Erica Weintraub Austin

This pilot study investigated the influence of predispositions on measures of message encoding. The purpose of the study was two-fold. First, to inform theories of behavior change by adding to the understanding of the mechanisms that mediate the cognitive and emotional processing of a mediated health message. Second, to employ a methodological component by exploring the influence of predispositions and priming on time locked physiological measures of attention and emotional response. Predispositions, for the purpose of this study, included expectancies, behavior, perceived norms, peer influence, and behavior intention. The findings indicate some influence on average measures of overall attention and emotional response to the message, as well as with recognition memory. Peer influence and perceived norms were associated with the above dependent variables. The findings indicate no influence of predisposition on psychophysiology measures of attention and valence. These findings, taken together, suggest that predispositions do not seem to influence initial processing of health information in a laboratory setting where subjects are asked to pay attention. They may, however, influence the way in which information is placed in working memory.

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Changing health behaviors is considered the ultimate goal of most health campaigns, although imparting knowledge and changing attitudes may actually be the more realistic outcomes. Influencing health behaviors raises significantly greater challenges than advertisers and marketers face in their attempts to sell products. "Changing a set of behaviors embedded in community and family norms, expectations, values, and beliefs, represents a change in one's social identity and relationship to the social environment" (Slater & Flora, 1994, p. 283).

The complexity and variety of health behavior theories is a testament to the challenges health campaign designers face. Health behavior theories guide campaign designers in understanding the variety of factors that may influence the ultimate outcome of the health campaign. Consistently health behavior theories indicate preexisting dispositions, such as attitudes, perceived expectations, perceived norms, knowledge, beliefs, values, involvement, and self efficacy as variables with the potential to influence ultimate behavior change.

The cornerstone of many health campaigns consists of thirty- to sixty-second "sound bites" or Public Service Announcements intended to provide information or motivation able to influence an individual's health related behavior. It is the objective of the health message designer to create a message that the viewer will listen to, remember, and act on. The foundation is laid when the message gains the attention of the viewer and is encoded into working memory. If this does not occur there will be no information to

remember or apply to later decision-making situations, as is the ultimate goal of health messages.

Considering that the effectiveness of many health campaigns depends, often times in there entirety, on mass media health messages, it is imperative to understand thoroughly how individuals respond to health messages and the extent to which preexisting dispositions, similar to those that ultimately predict behavior change, may influence the processing of the health message itself. "Each person evaluates the components of a message in relation to his or her prior experiences, culture, and personality characteristics" (Witte, 1992).

A variety of research has considered the influence of preexisting attitudes, and message-irrelevant affect, such as moods. There is, however, a paucity of research in regards to possible influences of prior behavior, perceived norms, beliefs, and values, and their potential to influence a respondent's attitude towards and ultimate processing of a health message. Understanding the mechanisms that mediate message persuasiveness can provide a starting point for understanding resistance to persuasion (Ahluwalia, 2000). Similarly, understanding the mechanisms that mediate the cognitive and emotional processing of a mediated health message can provide a starting point for the development of effective health messages.

It is important here to clarify a difference between processing style and cognitive and emotional information processing. Although many scholars have explored influences on processing style or degree of elaboration of a message, this current study focuses on processing style, relying on a limited capacity model of information processing (Lang, 2000). This model posits that individuals have a limited pool of resources to allocate to information processing and that two types of processing are at work, automatic and controlled. Automatic processes are those that occur involuntarily and are activated by

the stimulus either by its relevance to the viewer's goals and needs, or stimulus effects such as novelty (Lang, 2000). Controlled processes are voluntary, what an individual chooses to pay attention to and how much attention they pay (Ravaja, 2000). It would seem, therefore, that individuals would be less likely to voluntarily allocate limited resources to process information in conflict with one's current dispositions as evidenced by preexisting behaviors, attitudes, and beliefs. The current study employs the use of physiology data as a source of the objective measure of automatic and controlled responses of viewers to a mediated health message.

Psychophysiology has been defined as the "division of psychology that investigates changes in the activity of physiological systems caused by psychological input" (Ravaja, 2004, p. 193). Psychophysiology provides researchers with the ability to measure the cognitive and emotional processing involved in encoding a message into working memory. Processes measured include attention as an indication of resources allocated to encoding the message, while valence and level of arousal indicate emotional responses evoked by encoding the information into working memory. To date psychophysiology studies, employed extensively by Lang and colleagues, have primarily focused on message features rather than viewer characteristics. With the use of this research method increasing, however, it is important to understand factors that may mediate experimental results and their interpretation.

Therefore, the purpose of the current study is twofold. First, to make a theoretical contribution to the literature by exploring the possible influence of pre-existing dispositions on message encoding; and second, to add to the methodological understanding of psychophysiology measures and the use of this research method as a complement to self-report measures. This current investigation seeks to address two primary research questions. First, is there an association between self report of

preexisting behavior, attitude and beliefs regarding the message topic and measures of message encoding including controlled allocation of attentional resources, degree of negative emotional response, and recognition memory? Second, to what extent, if any, does priming a viewer with a pretest influence measures of message encoding?

LITERATURE REVIEW

Creating health messages that will foster positive health behaviors is a significant challenge with numerous extenuating factors to consider. Information, such as a health message, first must be encoded by the viewer and then must be stored in the memory in the form of a mental representation in order to be available for later recall. Unique personal experience customizes this process for every individual (Damasio, 1994). Individuals do not come as empty slates to hear such messages, but with preexisting knowledge, beliefs, attitudes, and prior experience (Shapiro, et al 2001, Witte, 1992) which then influence the way in which the message is processed and interpreted.

The focus of this research is on individual preexisting dispositions evidenced through behavior, attitude and beliefs, which have been shown to influence information selection, interpretation, and memory (Delli Carpini, 2004; Oliver, 2002). Two central concepts refer to the way individuals process and use information; cognition and affect (Delli Carpini, 2004). According to Delli Carpini (2004) cognitions produce the beliefs one holds while affect refers to how one feels about an object. Preexisting beliefs and affect are said to be linked in more elaborate cognitive structures through which new information is processed, thereby effecting what new information is attended to, how it is perceived or interpreted, how it is stored in long-term memory, and when and how it is recalled for later consideration (Dalgleish, 2003, Damasio, 1994, Delli Carpini, 2004).

Cognitive and emotional processing:

As information processors, humans notice stimuli that demand their attention. They form their impressions of these stimuli into mental representations and links within an associated network, and they later retrieve or reproduce these representations in some form. The Limited Capacity Model of information processing (Lang, 2000) postulates that humans have a limited pool of resources to use for these processing tasks (Dalgleish,

2003; Lang, 2000). A message first gains attention by engaging the sensory receptors (eyes, ears, nose, mouth, or skin) and is encoded into short-term stores. Which specific bits of information are then formed into mental representations and placed in working memory depends in part on what the viewer pays attention to and reflects either the viewer's goals, or priming of the viewer to select certain bits of information (Dalgleish, 2003, Lang, 2000). As a person thinks about the message this new information is linked with previously stored information, thus indicating that previously stored information will influence the extent to which new information is linked, or processed. The more a person thinks about the new information the more links they form and the better they store the information. The better the information is stored the more readily retrievable it is (Lang, 2000). "Memory for a message is, therefore, a composite of the outcome of all three subprocesses (encoding, storage, and retrieval)" (Lang, 2000, p. 50). The ability to measure each of these processes is a necessary precursor to the understanding of cognitive and emotional information processing and the ultimate potential for retrieval and use of message content.

In order for a message to be effective, therefore, it first must attract the viewer's attention and become encoded through engagement of the viewer's cognitive processes, in part through its personal relevance to the viewer. The act of exposure does not guarantee either initiation of automatic processes or controlled allocation of attentional resources on the part of the viewer. According to information processing theory individuals will selectively attend to information that is either salient with respect to the individual, or to which the individual has been primed to pay attention (Dalgleish, 2003). Individuals are more likely to attend to information they are willing to think about and to seek and process information considered personally relevant and related to their individual goals (Andsager, Austin, & Pinkleton, 2001; Nabi, 1999). Judgments about

goals precede message acceptance (Nabi, 1999). Roskos-Ewoldsen et al. (2002) suggest that attitudes can influence the processing of persuasive messages as well, by operating as information that these are, in fact, important messages. In other words; predispositions influence an individual's goals and perception of relevance, thereby affecting a viewer's attention to and processing of a message and ultimately evaluation of that message. It seems logical that individuals confronted with unwanted information are likely to pay less attention and engage in less careful message processing (Nabi, 1999).

Psychophysiology:

The initial step of encoding of information involves attention, emotion and arousal. Each of these individual processes has a corresponding physiological response (Ravaja, 2004). Psychophysiology involves the measurement of this physiological response to a psychological stimulus, such as a media message. Researchers cite several advantages to this method of investigation including primarily, the ability to objectively measure both automatic and controlled on line processing at the individual level. The continuous time-locked measurement allows for the study of both phasic (short-term) and tonic (long-term) shifts in attention and emotion while listening to or viewing a message. Other advantages of psychophysiology measures are that they are not dependent on language, do not require memory, (Ravaja, 2004) and are less prone to social response bias. Psychophysiology, therefore, allows for the measurement of the processes involved in the initial encoding step that serves as the foundation for any hope of message effectiveness.

The most common physiological measures, employed to study mediated communication behavior, include heart rate as an indication of both automatic and controlled allocation of attentional resources, facial electromyography (EMG) as an

indication of positive or negative emotional response, and electrodermal activity (skin conductance), which indicates level of arousal.

Facial EMG (electromyography) is considered a valid measure of the viewer's level of emotional response, and greater negative valence readings have been found to correlate with messages of greater negative emotional tone (Bolls, et. al. 2001). Emotion as a component of a message has been shown to increase attention and memory for the message (Lang, 2000; Bolls, et. al. 2001; Ravaja, 2004). A dimensional view of emotion conceptualizes emotions as points in a two-dimensional space involving valence and arousal (Ravaja, 2004; Bolls, et. al., 2001; Dillard & Wilson, 1993). This model proposes that valence reflects the degree to which an emotional response is positive or negative while arousal reflects the degree to which the emotional response is very excited to very calm (Bolls, et. al. 2001). Most scholars consider negative messages to be more arousing and therefore better remembered (Lang, et. al.1995; Bolls, et. al, 2001). The corrugator or frown muscle activity is used to measure responses of negative valence and the smile muscle, or zygomatic is used to measure positive valence. According to Ravaja (2004), a review of related research indicates that while corrugator EMG is a valid indicator of negative emotional response, some caution is warranted in using zygomatic EMG activity as indicative of positive emotional response.

Whereas many psychophysiology studies are interested in the phasic shifts in attention, this particular study is primarily interested in the influence of predispositions on the tonic measurements of heart rate response and valence as indications of long-term attention and response to a typical Public Service Announcement. Ravaja (2000) cites studies employing the use of tonic heart rate measures in determining attention paid to sixty-second radio and television advertisements.

Predispositions

As information processors humans are equipped with a "vast array of psychological mechanisms for resisting counter-attitudinal information" (Ahluwalia, 2000, p. 12). As an individual viewer watches or listens to a message, their physiological, emotional and cognitive responses are likely influenced, not purely by message content, but by prior dispositions as well (Delli Carpini, 2004; Oliver 2002). The Cognitive Functional Model of the effects of emotions on information processing (Nabi, 1999) posits that viewers' judgment about the message is related to their initial emotional reaction, which then stimulates either motivated attention or message rejection. If the receiver of the message believes the remainder of the message contains goal-relevant information they will be motivated to process the message. If the receiver believes that the remainder of the message will not contain goal-relevant information the message will be rejected. Similarly, the Extended Parallel Process Model (Witte, 1992) predicts that a fear appeal initiates two appraisals in a viewer. First the perceived threat is appraised. If this appraisal results in a moderate to high threat then fear is elicited and individuals are motivated to begin the second appraisal of the efficacy portion of the message. When the threat is perceived as low, however, there is no motivation to process the message and no response to the fear appeal (Witte, 1992).

Research suggests that the message must be personally relevant in order to gain the attention of the viewer and to elicit fear (Bolls et al. 2003), as "each person evaluates the components of a message in relation to his or her prior experiences, culture, and personality characteristics" (Witte, 1992, p. 338). Since physiological measures of heart rate and EMG indicate the extent to which a viewer is responding to a message, it would seem likely that there would be significant differences in the physiology measures between those viewers motivated to process a message perceived to be consistent with

the individual's goals, as reflected by their current dispositions, and those not motivated due to a perceived inconsistency with current dispositions.

Scholars suggest that direct experience with an issue mediates message influence as well (Shapiro, et al, 2001). Individuals are likely to call on instances from past behaviors that are most likely to support their desired conclusion (Ahluwalia, 2000). Prior experience, in the form of behavior, is also suggested to infer strong level of commitment toward an issue (Ahluwalia, 2000).

Most research in the area of predispositions has focused on preexisting attitudes. Attitudes have been described as prisms through which an individual views the environment (Houston & Fazio, 1989). Scholars consider an attitude to be an association, in memory, between an object and an evaluation of that object (Houston & Fazio, 1989; Roskos-Ewoldsen & Fazio, 1992). This association originates in social judgments, which in turn are influenced by preexisting attitudes (Forgas 2003). Functional theorists postulate that attitudes serve a variety of purposes within the individual, related to physical, social, and emotional needs (Shavitt & Nelson, 2002). They may serve both to orient an individual's attention to objects that may be beneficial to approach or avoid, and as evaluative tools eliminating the need to continue to reappraise familiar stimuli and therefore ease decision making (Roskos-Ewoldsen & Fazio, 1992). Considerable research indicates that attitudes influence the amount of controlled attention a viewer allocates to a message (Houston & Fazio, 1989; Roskos-Ewoldsen, Arpan-Ralstin, St. Pierre, 2002; Vargas, Hippel, & Petty, 2004). It appears, therefore, to be attitudes that drive controlled attention, and not mere exposure. It does not appear, however, as though all attitudes that an individual holds will influence information processing equally. Particularly influential are attitudes that are either strongly held, or more accessible.

In general the research suggests that individuals are more likely to "select, interpret, and remember portrayals that are consistent with or confirming of their existing attitudes and beliefs" (Oliver, 2002, p. 517). A viewer, therefore, should pay less attention to a message in conflict with their current dispositions irrespective of any message properties. Strongly held predispositions, as evidenced by behavior, beliefs and attitudes, in opposition of the message outcome, should therefore predict less attention paid to the message.

H1: Individuals whose predispositions are consistent with message outcomes will pay greater attention to the overall message than individuals whose predispositions are inconsistent with message outcomes.

Priming and Attitude Accessibility:

Equally influential in attracting an individual's controlled attention are viewers more-accessible attitudes. Attitude accessibility is a measure of how quickly one can retrieve an attitude from memory (Roskos-Ewoldsen, et. al. 2002), or how "top of the mind" it is at the time that an object evaluation is being made. Generally attitude accessibility is measured via reaction-time responses to an object. The more quickly an individual can indicate like, or dislike, for an object the more accessible the attitude is considered to be. Attitudes can become more accessible through four different processes; anticipation of a need to evaluate an object, elaborate processing of message content, recent activation, and frequent activation (Roskos-Ewoldsen, et. al. 2002).

An individuals selective attention is driven by either personal goals, or priming of the individual to seek out specific information (Dalgleish, 2003). Priming activates the associated network related to the prime, thereby increasing the accessibility of this information and cueing the viewer's attention. Researchers utilizing a pretest-posttest design may rely on a Solomon Four-Group Design to ensure that experimental effects are

not influenced by pretest sensitization, realizing that the pretest, acting as a prime, can sensitizes the viewer to attend to certain information. Pretest sensitization is a potential artifact that may limit the generalizability of research results. Implementation of the Solomon Four-Group Design institutes a control which increases the external validity of the research (Braver & Braver, 1990).

It seems possible therefore, that for subjects asked to complete a pretest inquiring as to dispositions towards a given issue, attitudes regarding the issue would be more accessible due to anticipation of the task, recency of the inquiry, and the possibility of the pretest serving as a prime to cue the individual's attention.

H2: Individuals completing a pretest will pay greater attention to the message than those in the posttest-only condition.

Attention & Emotion:

Attention appears to be under the control of not only the viewer, but characteristics of the message as well (Bolls, et al. 2001). "Attention can also be reflexively elicited from audience members by features of the message." (p. 634). Research suggests that the emotion, as a feature of message content, may serve to gain the viewer's attention. Emotional content has been shown to increase both automatic and controlled allocation of resources to encoding a message (Lang, Dillon & Dong, 1995; Lang, Potter & Grabe, 2003; Shapiro, et al 2001). Research has consistently shown viewers heart rate to decrease in response to messages with negative emotional tone indicating an increase in the level of attention being paid to the message (Bolls, et al, 2001).

Mental representations of an object are thought to include cognitions, attitudes, and an affective component attached to the issue. Preexisting issue-relevant affect is considered a factor in the effectiveness of persuasive appeals. It is suggested that

individuals turn to their emotions and emotional states as sources of information (DeSteno et. al. 2004). What the subject feels about what he knows, according to Zajonc (1980), may be an underlying element of memory. "When we try to recall, recognize, retrieve an episode, in fact anything at all, the affective quality of the original input is the first element to emerge" (p. 154).

While some prior research has suggested a possible relationship between measures of attention to a message and message valence (Bolls, et al, 2001), other scholars suggest that individual differences may mediate emotional response. Results from studies on frightening and sad films found that greater levels of empathy, on the part of the viewer, mediate emotional response (Oliver, 2002). Pfau (2001) has stated, "whether an aroused emotion is positive or negative depends on whether the appraiser perceives that the environment enhances or inhibits goal achievement" (p. 6). Therefore, predispositions may mediate emotional response, as well as attention, in which case the valence of the emotional response of a viewer will not necessarily be consistent with the emotional tone of the message. Those individuals paying less attention to the message may experience an emotional responses unrelated to the strength or valence of the emotional tone of the message.

H3: Individuals whose predispositions are consistent with message outcomes will experience an emotional response more consistent with the emotional tone of the message than individuals whose predispositions are inconsistent with message outcomes.

Encoding:

Attention to a message is the first step in the process of encoding information. Encoding of a message lays the foundation for later long-term storage and retrieval. Information processing theories postulate that, ultimately, controlled attention and

emotional involvement increase the likelihood that pieces of information will be encoded into mental representations and placed into working memory. Valence of a message is also considered to influence memory for the message (Bolls, et al 2001). Messages with negative emotional tone are generally more arousing and increased arousal has been shown to increase cognitive load and memory (Shapiro, et al 2001).

Encoding is considered to be a two-step process with the first step involving selecting information bits and the second, transforming the bits into mental representations (Lang, 2000). The act of constructing mental representations is affected by the goals, knowledge, and environment of the person receiving the message (Lang, 2000). Recognition memory, which involves providing the research subject with cues to aid retrieval of information is considered the most sensitive measure of memory and determines which specific bits of information were encoded into working memory (Lang, 2000). This would suggest that physiological measures of attention should positively associate with recognition memory measures, as both are considered measures of message encoding (Lang, 2000).

Hypothesis 4: Individuals whose predispositions are consistent with message outcomes will display better memory for the message than individuals whose predispositions are inconsistent with message outcomes.

It is possible, however, that predispositions do not mediate attention, but do influence the construction of mental models within working memory, in which case predispositions may not influence attention, but could influence recognition memory. If encoding is not influenced by predispositions then one must assume that the influence of predispositions on ultimate message outcome, as indicated by prior research, occurs later in either the storage or retrieval steps of information processing. This study also seeks to address the following research question:

RQ1: Do predispositions affect average measures of attention, and emotional response used to indicate an overall measure of response to the message, or recognition memory?

METHOD

This study employed the use of secondary analysis of data collected for an investigation of interactive media. Subjects (n = 162) were undergraduate students from a large Northwestern University, enrolled in an introductory communication class. Students received extra credit for their participation.

Procedure: Subjects were randomly assigned to pretest/posttest condition n = 87 or post-test only n = 75, total n = 162. They completed the study individually. Each subject was greeted by a researcher, asked to sit comfortably in the Communication Emotion and Cognition Lab, and given a consent form to read and sign. Subjects were told the study related to interactive media. Subjects in the pretest condition were given the instrument to complete and each subject was then prepped for physiology collection and asked to sit as relaxed, but still as possible. Five seconds of baseline heart rate was collected after which the researcher started both the stimulus and data collection.

Stimulus: The CD-Rom stimuli consist of nine related vignettes, of three-to five-minute duration, designed to educate adolescents as to the possible negative outcomes of alcohol and drug use. Each subject viewed only one story line.

Although the opening scene for all of the stimuli was identical, the rest of the story line differed. In order to control for the possibility that the story line itself would influence attention, valence, or memory, and that predispositions might have different effects depending on the story line, the three endings viewed by the greatest number of subjects were used for analysis.

Emotional tone of a message can be assessed using one of three primary methods, one of which is to define a message as emotional if it contains displays of emotion or content that is typically considered to be emotional (Bolls, et. al., 2001). The three ending outcomes used were pretested for level of fear. Endings "pregnancy" and "death

by over dose" were determined to be high in fear, and "trashed house" to contain a medium fear threat.

Independent Variables:

The pretest instrument incorporated constructs related to decision-making which include behavior, behavior intention, efficacy, involvement, perceived norms, expectancies, and peer influence. These constructs were conceptualized as providing an indication of preexisting dispositions, including issue-relevant affect, cognitions, and attitudes, and are operationalized as follows:

Behavioral intention: Respondents indicated the extent to which they agreed or disagreed with each of the following statements using a scale of 1-7 whereby 1 meant strongly disagree and 7 meant strongly agree. I am likely to speak out about the dangers of driving after alcohol or drug use. I am willing to speak out about the dangers of drinking and driving. I am going to speak out about drinking and driving to a family member or friend. With an alpha equal to .89

Peer Influence: Peer influence is an indication of one's social group identification or social interaction which is considered to be one of the functions of attitude (Shavitt & Nelson, 2002). If one of your best friends wanted to drive after drinking alcohol or using drugs, would you be a passenger? If one of your best friends wanted you to drive after drinking alcohol or using drugs, would you drive? ($r = .234$ $n = 87$ $p < .01$)

Expectancies: Respondents indicated the extent to which they agreed or disagreed with each of the following statements using a scale of 1-7 on which 1 meant strongly disagree and 7 meant strongly agree. Drinking alcohol makes you feel happy. Drinking alcohol makes a party more fun. Drinking alcohol helps you fit in. Drinking alcohol is a good way to relax. With an alpha equal to .79

Perceived norms: Respondents indicated the extent to which they agreed or disagreed with each of the following statements using a scale of 1-7 on which 1 meant strongly disagree and 7 meant strongly agree. Most teens never drive after drinking alcohol, (reverse code). Drinking and driving is common among teens. It's common for teens to ride with a friend who has been drinking. With an alpha equal to .68

Expectancies for driving: Respondents indicated the extent to which they agreed or disagreed with each of the following statements using a scale of 1-7 on which 1 meant strongly disagree and 7 meant strongly agree. I can drink and drive without hurting anyone. I can drink and drive without getting into any trouble. If I drive under the influence of alcohol or drugs, I am likely to get in an accident. With an alpha equal to .71.

Dependent Variables:

Psychophysiology measures:

Attention/Heart Rate: Significant research indicates that heart rate slows as attention is paid to an external message (Lang, Bolls, Potter, & Kawahara, 1999; Lang, Geiger, Strickwerda, & Sumner, 1993; Lang, Potter, & Grabe, 2003; Lang, Zhou, Schwartz, Bolls, & Potter, 2000) and that it is a valid measure of both short-term (phasic) and long-term (tonic) attention (Rajava, 2000). Collection of heart-rate data involved the placing of two Beckman electrodes, filled with electrode gel, on subjects' forearms just below the elbow joint after the skin was wiped with an alcohol swab. A ground electrode was then placed on the subject's right ear. All subjects were asked be as still as possible while viewing the message.

Valence: Negative emotional response is measured as changes in the corrugator (frown) muscles. Corrugator muscle activity was recorded using one pair of Beckman mini AG/AGCL electrodes, filled with electrode gel. The electrodes were placed on the

skin surface just before the center end of the right eyebrow after the site was cleansed with an alcohol swab.

Physiologic signals were passed from the electrodes through a Coulbourn bio-amplifier, with filters, to a computer running VPM experimental control software. Heart beats and valence measures were recorded as milliseconds between beats and then collapsed into three second intervals after which baseline measures were subtracted to obtain change scores. Following this, the first interval of the first portion of the stimuli and the last interval of the end of the stimuli were dropped to control for researcher error in starting and stopping data collection. The next ten intervals of the beginning segment were then analyzed for the purpose of interpreting attention to the opening scene, which was identical for all subjects. The last ten intervals (30 seconds) were analyzed for the subjects who completed either ending 1 (pregnant), ending 2 (overdose) or ending 3 (trashed). Heart rate and EMG change scores were also averaged over thirty seconds to provide a single discrete measure of tonic response to the message.

Recognition Memory: As the most sensitive measure of memory, recognition determines which specific bits of information were encoded (Lang, 2000). Following the viewing of the CD-Rom, each subject completed a posttest which served as a distractor followed by a memory recognition test which included four, two-second audio/visual clips from each segment the subject viewed and an equal number of foils. Subjects were asked to answer, yes or no, as quickly as possible, if they had seen the clip while viewing the CD-Rom. Number of clips per recognition test varied from sixteen to twenty-four. Percent of correct answers from the total viewed were then computed for a recognition memory score.

Analysis

With a goal of increasing the external validity of this current study by including data from a larger number of subjects,' means for pretest measures were compared to those of the posttest to determine if one viewing of the stimuli would cause a significant change in a viewer's dispositions. Prior research suggests that strongly held attitudes are unlikely to change radically based on one viewing of a message. In fact, inoculation theory seeks to strengthen existing attitudes, rendering them less susceptible to persuasion (Pfau, 1995). This does not imply that attitudes cannot be changed, but does suggest that such change requires repeated associations between an object and the state of affect or emotional arousal attached to the object (Breckler 1993). Therefore, it is possible that posttest results following a single viewing of a stimulus might accurately reflect predispositions. Analysis, however, indicated a significant difference between the pretest-posttest means for three of the predisposition constructs including norms, peer influence, and behavior. Therefore, except for hypothesis two regarding possible priming by the pretest, all other hypotheses and research questions had to be addressed by analyzing data from the pretest group, $n = 87$, excluding the posttest-only group.

Considering the two primary goals of this study, one methodological and the second theoretical, two primary forms of analysis had to be employed. Hypotheses and questions relating to the influence of predispositions on physiology data were tested using repeated measures ANOVA with construct variables converted into discrete variables using a median split.

Questions and hypotheses relating to theory regarding the influence of predispositions on attention, valence, and memory for a message were analyzed with linear regression with demographic control variables entered in the first block using stepwise approach and predictors then entered into the second block also using the

stepwise procedure. It was unlikely, due to small sample size, that more than one predictor would be found to be significant. Therefore stepwise was employed due to the small sample size of this research as well as its exploratory nature.

For the regression analysis heart rate and valence measures were each averaged separately for the opening and ending scenes into discrete variables while constructs were maintained as continuous variables. Arguably, this is exploratory research in that there is no foundation in the literature for treating repeated measures of attention and valence as discrete variables. It would seem, however, that since prior research has indicated attention can be measured through a sixty-second message, an average of the change from baseline score might indicate overall attention to the message. Clearly, individual intervals can be affected by outside influences such as movement or noise, but this effect may be mitigated with an average measure. Additionally, this practice is utilized by scholars in the assessment of other continuous variables, as in this current study for which use of repeated measures ANOVA required continuous measures of each of the predisposition constructs to be treated as discrete variables of high and low by creating median splits.

RESULTS

Of 87 subjects completing the pretest portion of this study, 63% were college freshman with an average age of 18.9, and 67.8% were female; 87.3% came from middle to high income socioeconomic status. Average college grades ranged from 18.47% with mostly A's, 44.8%, A's and B's, 18.4% mostly B's and 13.8% with B's and C's. Only 4.6% of subjects were receiving C's or below. Subjects completing the posttest only did not provide demographic information.

Hypothesis 1 predicted that individuals whose predispositions are inconsistent with message outcomes would pay less attention to the overall message than others. As stated previously, this hypothesis was tested utilizing both ANOVA and regression. While results indicate the opening thirty-second scene gained the attention of the viewer, as depicted by figure four, all viewers responded similarly. Neither repeated measures nor average measures of attention were found to be influenced by any measure of predispositions during the opening segment. Results differed slightly for the ending scenes analyzed. For ending number one (pregnant) ($n = 14$) a significant negative association was indicated between measures of peer influence and the average attention measure as tested by regression analysis ($\beta = -.68$, $p < .05$) (table 2). Therefore, there is little support for hypothesis one.

Hypothesis 2 predicted that individuals completing a pretest would pay greater attention to the message than those in the posttest only condition. There was no support for this hypothesis. Use of ANOVA indicated no apparent impact by priming on repeated measures of heart rate. Nor was there evidence of a significant difference between the means for average heart rate for either the beginning thirty-seconds or any of the three thirty-second ending segments. Figure five depicts attention patterns of viewers for the three ending scenes.

Hypothesis 3 predicted that individuals whose predispositions were consistent with message outcomes would experience an emotional response consistent with the emotional tone of the message while the emotional response of those individuals whose predispositions were inconsistent with message outcomes would vary from the emotional tone of the message. Again, both repeated-measures ANOVA and regression were used to test this hypothesis. Hypothesis 3 received mixed results. Generally valence response to the ending segment of the stimuli was small and did not vary significantly by outcome, as depicted by figure six. Peer influence did, however, significantly negatively associate with the average valence response measure for endings one ($\beta = -.88$, $p < .01$) and two ($\beta = -.48$, $p < .05$) (table 2).

Hypothesis 4 predicted that individuals whose predispositions were consistent with the message outcome would display better memory for the message than individuals whose predispositions were inconsistent with the message outcome. Regression analysis indicated that recognition scores associated negatively with behavior intention for ending one ($\beta = -.56$, $p < .05$), and positively with perceived norms for ending two ($\beta = .48$, $p < .01$) and three ($\beta = .60$, $p = .01$) (table 2). Application of repeated-measures ANOVA found no relationship between physiological measures of attention or valence and recognition memory. It is important to note, however, that in general recognition memory was high. Recognition test mean scores = 94.1, SD = 5.42.

Research question 1 asked if predispositions shape average measures of attention, and emotional response, which were used to imply an overall measure of response to the message, or recognition memory. Regression analysis was employed to answer this question, utilizing a discrete measure of average heart rate change score as indicative of attention, and of valence as indicative of negative emotional response. As noted for hypotheses 1 and 3, a significant negative association was found between measures of

peer influence and average attention measures for ending one ($\beta = -.68$, $p < .05$) as well as the average valence response measure for endings one ($\beta = -.88$, $p < .01$) and two ($\beta = -.48$, $p < .05$). Regarding recognition memory, recognition scores negatively associated with behavior intention for ending one ($\beta = -.56$, $p < .05$), and positively with perceived norm for ending two ($\beta = .48$, $p < .01$) and three ($\beta = .60$, $p = .01$). (See table 2.)

DISCUSSION

This pilot study investigated the influence of predispositions on measures of message encoding. The purpose of the study was two-fold. First, to inform theories of behavior change by adding to the understanding of the mechanisms that mediate the cognitive and emotional processing of a mediated health message. "Each person evaluates the components of a message in relation to his or her prior experiences, culture, and personality characteristics" (Witte, 1992). Second, the study explored the influence of predispositions and priming on time-locked physiological measures of attention and valence. Predispositions for the purpose of this study included expectancies, behavior, perceived norms, peer influence, and behavior intention. The study sought to address two primary questions; first, is there an association between self report of preexisting behavior, attitude and beliefs regarding the message topic and measures of message encoding including attention, degree of negative emotional response, and recognition memory? Second, to what extent, if any, does priming a viewer with a pretest influence measures of message encoding?

Stimuli used in this investigation were created with the intent of educating youth as to the dangers of alcohol and drug abuse, particularly as they relate to driving. The data from 87 subjects completing a pretest prior to viewing the stimuli was used for analysis. The original stimuli encompassed nine different story outcomes although analysis for ending scenes included data from viewers of only three endings; a young woman ends up pregnant (n = 14), a young man dies of a drug overdose (n = 34), and friends trash an adolescent's home during a party (n = 14). The other six endings were eliminated as they were selected by eight or fewer subjects. In the likelihood that storyline would influence attention, emotional response and memory as well as possible predisposition effects data was analyzed within group, by ending, not between groups.

Stimuli varied in length from three to five minutes though only the first and last 30 seconds were used for analysis.

Physiology studies, focused primarily on message effects, utilized time-locked continuous measures of heart rate and facial-muscle changes. Generally, for these studies, assessing phasic changes during one-to five-second intervals is necessary to understand the influence of various effects, such as cuts and edits, on viewers, though physiological responses also indicate tonic responses to messages. Either way, physiology data involves the analysis of a series of time-locked repeated measures of heart rate intervals and valence responses of the viewer. On the other hand, in terms of theoretical understanding of message processing, it is a more global attention and emotional response to a message that is significant. If an individual's attention varies from interval to interval, but overall more rather than less attention is paid, it is more likely that encoding of the information will occur. Therefore, in order to test the influence of predispositions on measures of message encoding, and the influence of attention and emotion on recognition memory, repeated measures ANOVA was employed. Analysis was then repeated utilizing linear regression in order to understand the influence of predispositions on the overall allocation of controlled attentional resources, valence of emotional response, and recognition memory of the viewer to the message as asked by research question one.

One finding of interest in this study is the relationship between peer influence and attention and valence. No other construct showed any consistent influence on the dependent variables. Peer influence was conceptualized as an indication of a person's willingness to ride with a friend who is under the influence, or drive while under the influence at the request of a friend. Peer influence negatively associated with attention for ending segment number one, and negatively associated with negative valence

measures for ending segments one and two. This would indicate that individuals more likely to be influenced by friends paid more attention, but had a smaller negative emotional response than those less likely to be influenced by peers. (As heart rate decreases, attention increases). It is also possible that peer-influence data is mediated by "third person effect" so that an individual is more likely to admit what their friends do where as their reporting of their own behavior is likely subject to social desirability.

Overall, negative valence response to all three endings was similar, and low, as depicted by figure six, despite the fact that both endings one and two were considered "high" fear and ending three as "medium" fear by pretest subjects. Figures one, two, and three, indicate low viewer response both in attention and negative emotion to ending segments. Previous research indicating that greater attention is paid to more emotional messages has been based primarily on stimuli lasting no longer than thirty to sixty seconds. It is likely that viewer's attention responses habituated due to the length of the stimuli, returning to baseline, while also possible that participants did not find the stimuli emotionally arousing enough to elicit strong negative responses. Prior research also indicates an association between emotional response, attention, and better memory for the message. Though neither valence response nor attention associated with memory for the message in this study, overall recognition memory was high indicating that the distractor employed may not have been sufficient, or that the recognition test was too simple to serve as a useful discriminator between those who paid attention and those who did not.

It is important to note that attention and valence are not the only significant contributors to information processing. Considered to be of greater significance, in fact, is arousal, which this study was not able to analyze because it was not measured for the original study. Previous research findings suggest that arousal is more strongly linked to memory for the message than is either attention or valence. Therefore, it is possible that

predispositions, reflecting an individual's goal, mediate arousal rather than attention or valence of the emotional response, accounting for the limited findings in this current study.

Findings indicate no influence of predispositions, or pretest priming on physiology measures as tested with repeated-measures ANOVA. It is possible, that although predispositions may influence message encoding, they do not do it in a continuously consistent manner. This result might also indicate that when researchers ask subjects to sit and pay attention to a message, subjects do in fact pay attention. Therefore, this study suggests researchers utilizing psychophysiology to measure attention and valence of emotional responses may not need to control for either priming, or predispositions in the analysis of their data. Again, however, it must be noted that there is no evidence relating to the relationship between predispositions and measures of arousal.

Lastly, the study explored the effects of predispositions, attention, and emotion, on memory for the message as measured by recognition memory. Recognition scores associated negatively with behavior intention for ending one and positively with perceived norms for endings two and three. Behavior intention was conceptualized as willingness to speak out about drinking and driving. Results indicate that those more likely to speak out indicated poorer memory for the message. It is possible that although the message was consistent with their predispositions, these individuals were not motivated to encode this information into memory stores because it was not new information.

Perceived norms indicated the extent to which individuals estimate how frequently teens are willing to drink and drive. Therefore, it would seem that for those who perceived the scenario in the vignette to be typical of teens, or realistic, the greater

their recognition score. Previous research indicates that viewers perceive messages more consistent with their view of reality to be more valid and that perceived realism is an important element in decision-making (Austin, et al., 2000). This current research suggests that perceived realism influences initial message encoding and memory for the message.

Overall results do indicate some impact of peer influence and norms on message encoding and recognition memory. Particularly, for ending two for which the subject pool was largest (n = 34) peer influence negatively associated with the average valence response and perceived norms positively associated with recognition scores

Limitations

Any interpretation of these results, however, must consider the limitations of this study. Primarily this study was significantly limited by the number of subjects for each vignette ending. In terms of experimental design this study did not include a large enough sample size to be generalizable to a larger population. Within each ending group a sample size of 40 to 50 would be more informative. With the small sample size of this study, one or two subjects, who may in reality be outliers, can significantly influence the results. Therefore it can be considered only as a pilot study.

A second major limitation of this study is the use of an average measure, across thirty seconds, to estimate overall attention and valence response to the message. There is no precedence for this in the literature, and use of physiology measures employed in this way requires further study for validation.

Third, the research subjects for this study were college students receiving extra credit for participation. Demographic data indicate subjects were primarily Caucasian, 87% were from households of high socioeconomic status and a total of 71.6% were

receiving B grades and above. Therefore results from this study are not generalizable to the general adolescent population.

Fourth, the recognition memory test included both audio and visual. Visual recognition memory is the considered the easiest to recall and results may indicate a "ceiling effect." Findings may be different if a more difficult audio recognition test were employed. Lastly, this study employed the use of secondary analysis, so that the study was not actually designed to answer the research questions or hypotheses tested.

Future Research

Theory strongly suggests that predispositions influence processing, storage, and interpretation of information. Though the findings of this study were limited that is not to suggest that theory is wrong. Instead further research, with a better designed study is called for. It may be that the laboratory setting is not appropriate to answer these research questions. A study employing valid constructs determining preexisting beliefs, attitudes, and behavior regarding a health topic followed by health messages embedded within programming, as is a more realistic situation, and employing both short-term, and long-term memory tests may help to determine at what point preexisiting dispositions influence information processing.

Psychophysiology, as an objective measure of attention and emotional response has the potential be helpful in unraveling the mysteries of message encoding and does not appear to be impacted by predispositions. It is necessary, however, to better understand the limitations of this type of research. To date one of the great advantages of psychophysiology is that it is time locked. The extent to which physiology measures can be collapsed to determine overall objective measures of response to a message, or whether this is an appropriate application of this type of data, is unclear.

Though much research has been done in the area of attitudes and their influence on message processing it would appear that different predispositions may affect information processes at different stages, and possibly that predispositions have different influences depending on the type of message viewed. This indicates a need for more research before the cognitive and emotional processing of mediated messages is fully understood. When a message gains the attention of the viewer and is encoded into working memory the foundation is laid for later retrieval of information in decision making situations, the ultimate goal of health messages.

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Table I

Measures and Indices

	n	*M*	*SD*	*a*
Behavior Intention index				.89
I am likely to speak out about the dangers of alcohol or drug use and driving	85	4.94	4.92	
I am willing to speak out about the dangers of drinking and driving	87	5.41	1.67	
I am going to speak out about the drinking and driving to a family member or friend.	86	5.22	1.86	
Expectancies index				.79
Drinking alcohol makes you feel happy.	87	4.20	1.78	
Drinking alcohol helps you fit in.	87	3.29	1.78	
Drinking alcohol makes a party more fun.	87	4.72	1.50	
Drinking alcohol is a good way to relax.	85	4.14	1.30	
Perceived Norms index				.68
**Most teenagers never drive after drinking alcohol.	84	3.36	1.57	
Drinking and driving is common among teens.	87	4.26	1.30	
It's common for teens to ride with a friend who has been drinking.	86	3.90	1.33	
Driving Expectancies index				.71
I can drink and drive without hurting anyone.	87	1.61	1.13	
I can drink and drive without getting into trouble.	86	2.43	1.66	
**If I drive under the influence of alcohol or drugs, I am likely to get in an accident.	86	5.57	1.45	
Peer Influence	$r = .234$	$n = 87$	$p < .01$	
If one of your best friends wanted to drive after drinking alcohol or using drugs, would you be a passenger?	87	1.66	1.07	
If one of your best friends wanted you to drive after drinking alcohol or using drugs, would you drive?	87	1.78	1.65	

*significant at $p < .05$
**Items recoded for inclusion in construct.

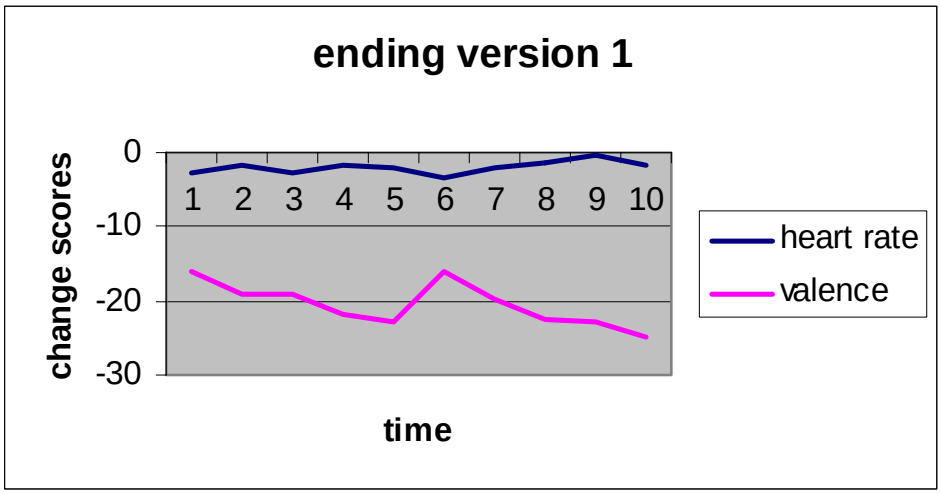
Table 2

Regression Testing Hypothesis

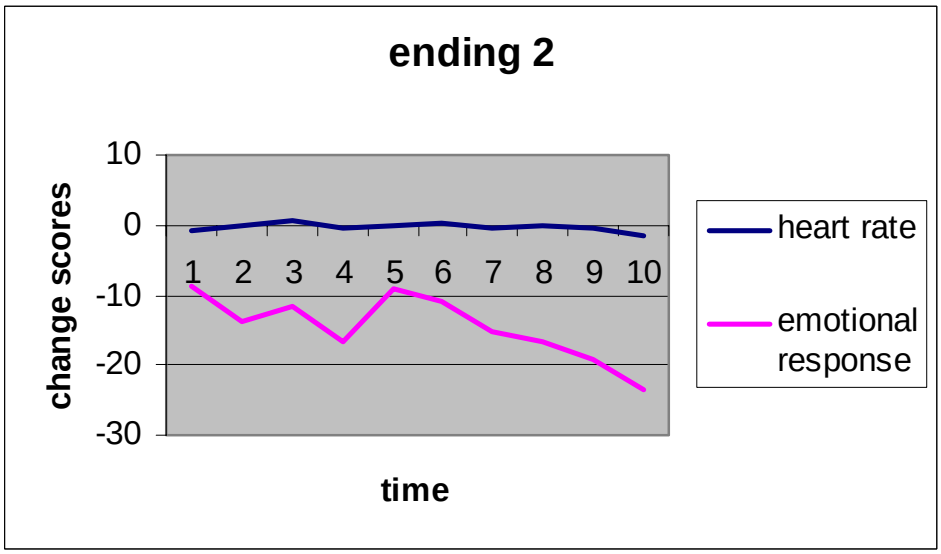
Dependent Variable	Independent Variable	B	r^2	*df*	*F*
H1: Heart Rate					
Equation one					
Ending One	Peer Influence	-.68*	.46	11	8.56*
H3: Negative Valence					
Equation two					
Ending One	Peer Influence	-.88**	.88	8	25.06**
Equation three					
Ending Two	Peer Influence	-.48*	.23	19	5.4*
H4: Recognition Memory					
Equation four					
Ending One	Behavior Intention	.562*	.316	12	5.08*
Equation five					
Ending Two	Perceived Norms	.476**	.227	27	7.63**
Equation six					
Ending Three	Perceived Norms	.601**	.632	15	.793**

* $p < .05$
** $p < .01$

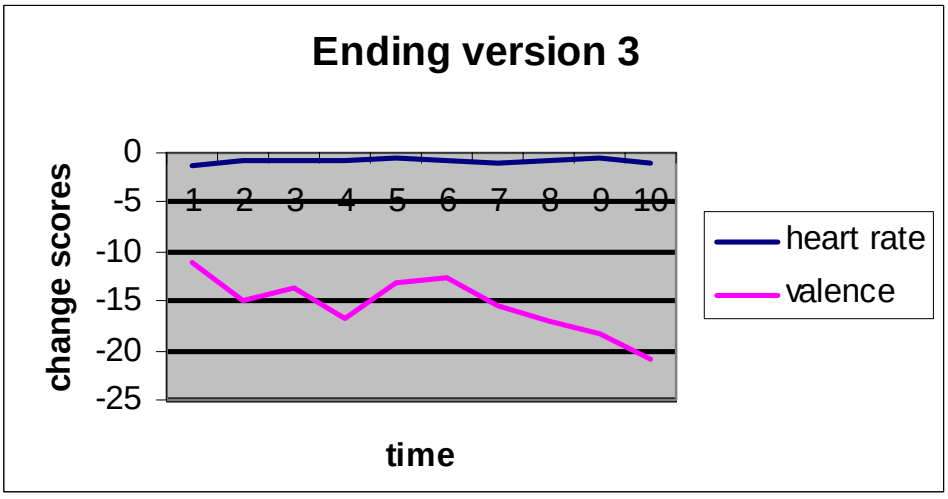
Figures: 1


ending version 1
change scores
0
-10
-20
-30
1 2 3 4 5 6 7 8 9 10
time
heart rate
valence

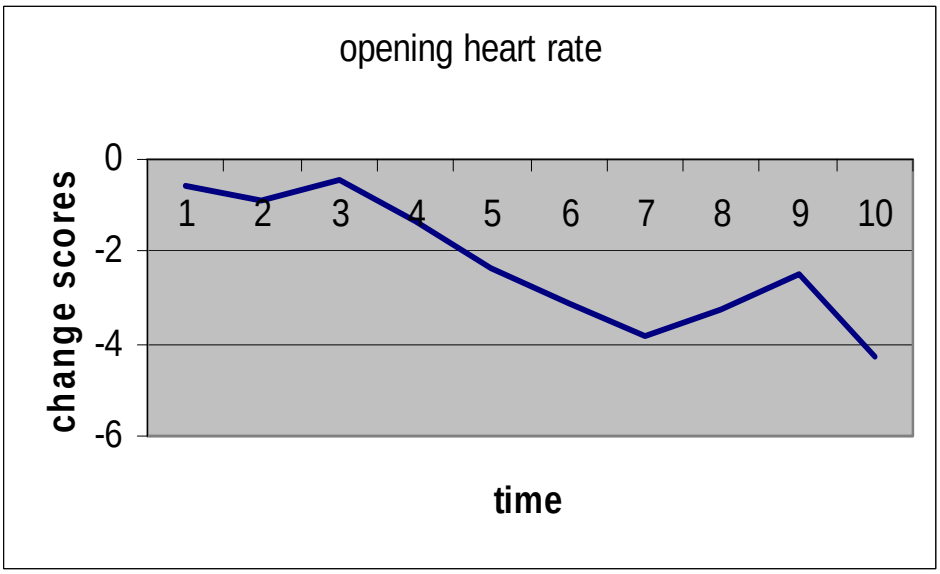
2.


ending 2
change scores
10
0
-10
-20
-30
1 2 3 4 5 6 7 8 9 10
time
heart rate
emotional response

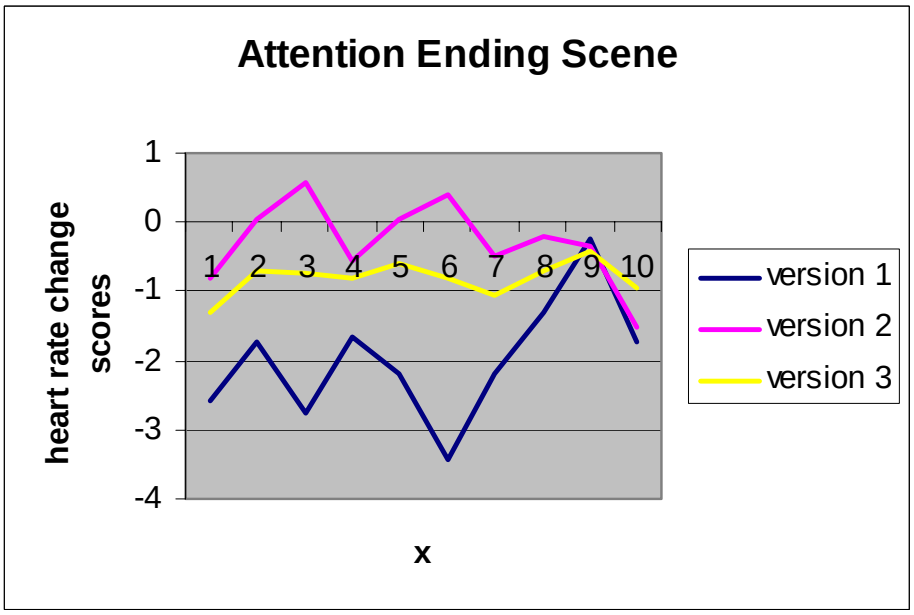
3.


Ending version 3
change scores
0
-5
-10
-15
-20
-25
1 2 3 4 5 6 7 8 9 10
time
heart rate
valence

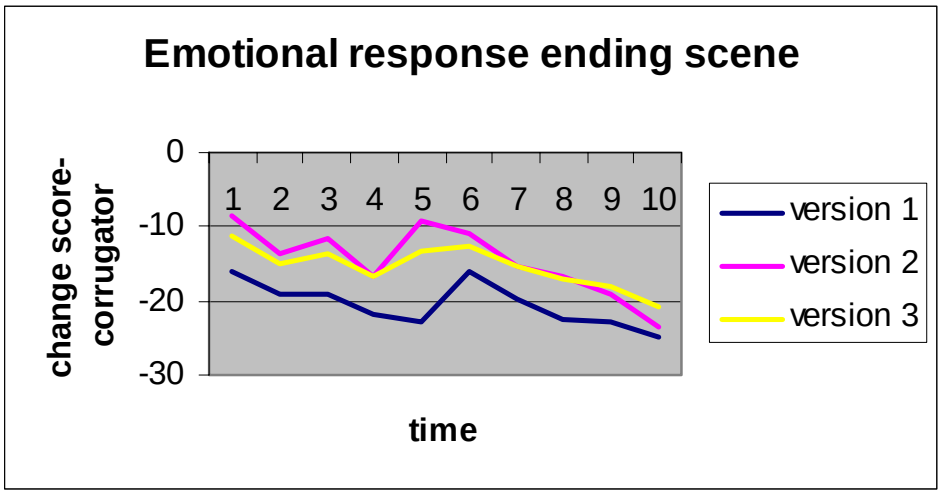
4.


opening heart rate
change scores
0
-2
-4
-6
1
2
3
4
5
6
7
8
9
10
time

5.


Attention Ending Scene
heart rate change scores
1
0
-1
-2
-3
-4
1
2
3
4
5
6
7
8
9
10
x
version 1
version 2
version 3

6.


Emotional response ending scene
change score-corrugator
0
-10
-20
-30
1
2
3
4
5
6
7
8
9
10
time
version 1
version 2
version 3

Detailed Description of Stimuli:

All vignettes began with the same scenario, a young man (Sam) left home with a friend (Jack) when his parents go away for the night. The friend then brings forth a bottle of alcohol and offers some to his friend.

Vignette 1:

Initially Sam does not drink, but does allow Jack to throw a party in his parents home. When Sam's "heart throb" enters he succumbs to pressure and begins drinking. Later the young couple engages sexually. The last scene is one of Sam on the phone, apparently with the young lady, learning that she is pregnant. The last screen then notes that Sam and the young lady must now make decisions that will impact their entire lives.

Vignette 2:

Sam does bow to Jack's pressure and drinks with him. The two young men throw a party during which drugs are introduced. Sam takes the drugs and dies of an overdose. The last scene is of Sam being taken away in an ambulance. The last screen tells the viewers that Sam has died and Jack later committed suicide, not being able to live with his guilt.

Vignette 3:

Sam does not bow to peer pressure, but does allow Jack to host a party in his parent's home. Eventually, after some individuals are sick, and furniture is destroyed Sam calls a halt to the party. He drives his drunk friends home, then returns to clean the house. The last screen tells the viewer Sam ends up "grounded for life" by his parents.

ID: _____

(LPRE)

Washington State Media and Alcohol Survey, 2004

This survey measures people's attitudes and opinions about the media and alcohol. It will take about 20 minutes to complete. Please put an "X" on the blank that best reflects your opinion. There is no right or wrong answer for these questions and we really need to know what you think, so please give us your true opinion. You do not have to answer any questions you don't want to, and you can stop answering questions at any time. In the survey, questions about "ads" refer to commercial advertisements selling a product unless the question says otherwise. Thanks for your help!

The following questions are about alcohol use and the media. Please place an "X" on the blank that best describes your opinion on a scale of 1-7, where 1 means "strongly disagree" and 7 means "strongly agree."

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
1. Drinking alcohol makes you feel happy.	___	___	___	___	___	___	___
2. Drinking alcohol makes a party more fun.	___	___	___	___	___	___	___
3. Drinking and driving is important to think about.	___	___	___	___	___	___	___
4. I can affect whether my friends drive under the influence of alcohol or drugs.	___	___	___	___	___	___	___
5. Drinking and driving is of no concern to me.	___	___	___	___	___	___	___
6. Most teenagers drink alcohol.	___	___	___	___	___	___	___

The following questions are about drinking. Please place an "X" on the blank that best describes your opinion on a scale of 1-7, where 1 means "strongly disagree" and 7 means "strongly agree."

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
7. Drinking alcohol helps you fit in.	___	___	___	___	___	___	___
8. I can/could drink and drive without hurting anyone.	___	___	___	___	___	___	___
9. I am likely to speak out about the dangers of driving after alcohol or drug use.	___	___	___	___	___	___	___
10. Most teens never drive after drinking alcohol.	___	___	___	___	___	___	___
11. I am willing to speak out about the dangers of drinking and driving.	___	___	___	___	___	___	___
12. Drinking and driving is common among teens.	___	___	___	___	___	___	___
13. I can avoid driving under the influence of alcohol or other drugs.	___	___	___	___	___	___	___

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
14. It's common for teens to ride with a friend who has been drinking.	___	___	___	___	___	___	___
15. I can/could drink and drive without getting into any trouble.	___	___	___	___	___	___	___

The following questions are about drinking and driving. Please place an "X" on the blank that best describes your opinion on a scale of 1-7, where 1 means "strongly disagree" and 7 means "strongly agree."

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
16. Drinking and driving matters to me.	___	___	___	___	___	___	___
17. I can affect whether other teenagers drive while impaired by alcohol or drugs.	___	___	___	___	___	___	___
18. If I drive under the influence of alcohol or drugs, I am likely to get in an accident.	___	___	___	___	___	___	___
19. I can avoid riding with someone who has been drinking or using drugs.	___	___	___	___	___	___	___
20. I am going to speak out about drinking and driving to a family member or friend.	___	___	___	___	___	___	___
21. It's realistic for me to choose not to drink and drive. ___	___	___	___	___	___	___	
22. Drinking and driving is a serious problem.	___	___	___	___	___	___	___
23. Drinking alcohol is a good way to relax.	___	___	___	___	___	___	___
24. I am willing to speak out about the dangers of drinking and driving. ___	___	___	___	___	___	___	
25. Drinking and driving is something I think about a lot.	___	___	___	___	___	___	___

The following statements concern how much you think about the media. Please place an "X" on the blank that best describes your opinion on a scale of 1-7, where 1 means "rarely" and 7 means "often."

Rarely						Often
1	2	3	4	5	6	7
26. I think about who created a message I see in the media. ___	___	___	___	___	___	___
27. I think about why someone created a message I see on TV. ___	___	___	___	___	___	___
28. I think about the purpose of an ad. ___	___	___	___	___	___	___
29. I think about what the creator of a message wants me to think. ___	___	___	___	___	___	___

The following questions are about your attitude toward others. Please place an "X" on the blank that best describes your opinion on a scale of 1-7, where 1 means "strongly disagree" and 7 means "strongly agree."

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
30. I never hesitate to go out of my way to help someone in trouble.	___	___	___	___	___	___	___
31. I am always courteous, even to people who are disagreeable.	___	___	___	___	___	___	___
32. When I don't know something I don't at all mind admitting it.	___	___	___	___	___	___	___

The following questions are about alcohol use. Please mark the blank that best describes your opinion.

33. How many of your four closest friends drink alcohol or use drugs?

_____ (I DON'T KNOW_____)
Number

34. How many of your four closest friends have driven after drinking alcohol or using drugs?

_____ (I DON'T KNOW_____)
Number

In this next section, please circle the answer that best describes you.

35. If one of your best friends wanted to drive after drinking alcohol or using drugs, would you be a passenger?

Definitely No 1 2 3 4 5 6 7 Definitely Yes

36. If one of your best friends wanted you to drive after drinking alcohol or using drugs, would you drive? (If you can't drive yet, please think about after you get your license.)

Definitely No 1 2 3 4 5 6 7 Definitely Yes

37. About how many items do you own that display alcohol logos or products (please circle your best estimate)?

None 1 2 3 4 5 6 7 or more Don't Know

How many times in the past 30 days have you:

	None	1-2 times	3-5 times	More than 5 times	Don't know
38. Attended a party where alcohol was served.	0	1	2	3	8
39. Drank an alcoholic beverage.	0	1	2	3	8
40 . Rode with a driver who had been drinking alcohol or using drugs.	0	1	2	3	8
41 . Got sick from drinking alcohol.	0	1	2	3	8

How many times in the past 30 days have you:

	None	1-2 times	3-5 times	More than 5 times	Don't know Or not yet driving
42. Been a designated driver.	0	1	2	3	8
43. Drove after drinking alcohol or using drugs	0	1	2	3	8

These questions are for statistical purposes only.

44. What is your age? _____

45. What grade in school or year in college are you? _____

46. What are your grades like in school?

____ Mostly As ____ Mostly As and Bs ____ Mostly Bs ____Mostly Bs and Cs
____ Mostly Cs ____ Mostly Cs and Ds ____ Mostly Ds ____ Mostly Ds and Fs
____ Mostly Fs

47. Please indicate your gender. _____ Male _____ Female

48. Do you consider your family:

_____ Very low income _____ Low income _____ Middle income
_____ High income _____ Very high income _____ Not sure

49. Please indicate your race or ethnicity (mark all that apply).

_____ African-American
_____ Asian/Pacific Islander
_____ Caucasian (white)
_____ Latino/Latina/Hispanic
_____ Native American/Alaskan Native
_____ Other (_____)

50. How truthfully did you answer the questions on this survey?

Totally Untruthfully						Totally Truthfully
1	2	3	4	5	6	7

Thank you for your help!