AN EXPLORATION OF EMOTIONAL SWITCHING AND MEMORY IN PUBLIC SERVICE ANNOUNCEMENTS

By

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To the Faculty of Washington State University:

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Abstract

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The purpose of this study was to examine how a mid-message switch in emotional tone would affect overall memory for message information. Participants listened to 12, 60-second radio advertisements that were positive, negative, mixed positive/negative, and mixed negative/positive in emotional tone. After exposure to each individual message subjects completed measures determining evaluations of arousal, attention, and message valence. After viewing the entire series of messages a distracter task was administered followed by free recall, cued recall, and recognition questionnaires. Results suggested that segments negative in emotional tone were more effective at garnering attention than were positive tone segments. Furthermore, messages that follow a mixed negative/positive emotional switch proved more effective for overall memory than any other format.

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Dedication

To Rich and Jude. They’re alright.

CHAPTER ONE

INTRODUCTION

There are many different ways in which media are used to communicate a message and one of the most often used techniques is an appeal to emotion. Television viewers are exposed to the whole spectrum of emotion within a one-hour period often experiencing fear, joy, sorrow, doubt, and love. In a study of public service announcements Dillard and Peck (2000) concluded that emotional responses, "figure quite prominently in judgements of perceived message effectiveness, which then shape attitudes toward the issue." It makes sense then, that there would be a large body of research examining the effects of these emotional appeals especially in the area of public health and service announcements (Bolls, Lang, & Potter, 2001; Lang, Newhagen, & Reeves, 1996; Lang, Dhillion, & Dong, 1995; Monahan, 1995; Newhagen & Reeves, 1992).

The media are besieged with advertising, marketing, and public service announcements to the extent that many of these messages slip through the cracks. In light of this media pollution, it has become one of the main goals of media practitioners to create a message that breaks through the clutter and stays in the memory of the target audience. Research has shown that when it comes to memory, emotional messages are more effective than non-emotional messages (Lang, Newhagen, & Reeves, 1996; Newhagen & Reeves, 1992).

Further research in the area of emotion and memory (Williams, & Aaker, 2002; Nabi, 1999; Caccioppo, Gardner, & Berntson, 1997) has uncovered that different emotions have different effects on memory, especially emotions that are positive and negative in tone.
In a review of the effects of discrete negative emotions on information processing, attitude change, and recall Nabi (1999) indicates that aside from emotion type, variables such as presence

of peripheral cues, emotional intensity, and emotional placement within a message may mediate information processing depth, acceptance or rejection, and information recall.

One study of particular interest is a pre-cursor to this research conducted by Bolls & Thomas et al (2004). The study explored the effects of mixed emotional tone in radio message on cognitive and emotional processing. Participants listened to twelve, 60-second radio advertisements that were positive, negative, mixed negative/positive, and mixed positive/negative. The radio messages for the mixed emotional tone dimensions of the study were pre-tested for relevance with the intended sample (undergraduate college students). The subjects found to be most important were unplanned pregnancy, drunk driving, sexually transmitted diseases, eating disorders, depression, and interactions between alcohol and medication. Messages for the entirely positive and entirely negative dimensions of the study were selected from award winning radio messages and pre-tested to ensure the valence for which they were selected.

While subjects were exposed to messages, heart rate, skin conductance data were measured. Heart rate serves as a physiological measure of attention and skin conductance is an indicator of arousal (Stern, Ray, & Quigley, 2001). In between each message self reported arousal, attention, and valence were measured as manipulation checks. Results for heart rate showed a significant tone x time interaction ($F(132, 4884) = 2.550$, $p<.000$, eta squared = .064) The results indicate that subjects did not allocate a significant amount of attention to positive toned messages while negative segments seemed to engage attention.

Self reported attention showed a significant effect of message tone on self-reported attention ($F(3,126) = 22.011$, $p<.000$, eta squared = .344) Messages with negative valence ($\underline{M}$ = 5.223) as well as messages that began as positive and switched to negative were rated as eliciting more attention than positive valence messages ($\underline{M}$ = 4.276) and messages that begin as negative and switch to positive ($\underline{M}$ = 4.246).

Self reported arousal was measured after exposure to each message on the arousal dimension of the SAM (self assessment mannequin, P.J. Lang & Greenwald, et al. 1993) scale. Data from the SAM scale was submitted to a 4 (tone) X 3 (message) repeated measures ANOVA. Results showed a significant main effect of message tone on self reported arousal. Messages that were negative tone (M = 3.915) and messages that began as positive and switched to negative tone (M = 3.518) were rated as more arousing than were messages that had positive tone (M = 2.152) and messages that began as negative and switched to positive tone (M = 2.152).

Self reported message valence was measured after exposure to each message on the valence dimension of the SAM scale. Data from the SAM scale was submitted to a 4 (tone) X 3(message) repeated measures ANOVA. Results showed a significant main effect of message tone on SAM self-reported valence ($F(3, 120) = 62.516$, $p<.000$, eta squared = .610). Negative valence messages (M = 3.469) and messages that began as positive valence and switched to negative valence (M = 3.590) were rated more negatively compared to positive valence messages (M = 6.341) and messages that began with a negative valence and switched to positive (M = 4.624).

The findings showed negative message tone is more arousing than positive tone and engages more attention. Results also illustrated that negative emotional tone segments were effective at gaining attention even when used in mixed emotional tone messages. Furthermore, researchers found that in mixed emotional tone messages, the negative segment locked subjects' attention in to the message while the positive segment calmed them down.

A review of the existing literature on arousal provides interesting insight into these findings. In a study on the effects of message valence and listener arousal on attention, memory, and facial muscular responses to radio advertisements Bolls, Lang, & Potter (2001) found that the level of arousal that a message evokes is a better predictor of memory than valence. Subjects listened to ten 60-second radio advertisements while heart rate, skin conductance, and facial electromyography (EMG) data were collected. After exposure, subjects completed free recall and

recognition memory tests. The results indicated that negative messages receive more attention than positive messages and that arousal was an indicator of memory.

The results of exploration of emotional switching is relevant both practically and theoretically in that it expands the current area of knowledge on mixed valence message processing as well as allows for application to the construction of effective health communication messages. Before this can be done though, this article will explore some of the existing literature and theory on emotion, memory, and cognitive processing of media messages.

IT'S JUST EMOTION . . .

Affect is often used as a general term to illustrate representations of positive and negative personal value like preferences, attitudes, emotions, and moods (Martin & Clore, 2001; Dillard & Peck, 2000). Emotions refer to affective temporary conditions or states in which appraisals include feelings, physiology, and facial expressions. Emotions are not just states of feeling but feeling towards something (Dillard & Peck, 2000). Moods are much the same as emotions but differ in that they are not object focused and tend to be more diffuse and unclear (Martin & Clore, 2001; Dillard & Peck, 2000). Emotion has been conceptualized as a type of cognition that provides a source of information to the individual (Chadhuri & Ross, 1995). It is important to isolate emotion from other forms of affect because of its analytical and cognitive properties. For the purposes of this study emotion will be used as a term to indicate affective and cognitive processes.

Yet another term often used in conjunction with emotion is valence. Valence refers to an affective judgement of how good or bad a certain message or stimulus is thought to be (Lang et al., 1993). Emotional valence will be used often in this study and simply refers to how positive or negative a subject feels upon being exposed to a message using an emotional appeal.

The Dimensional Theory of Emotion as conceptualized by P.J. Lang (1997) describes three main dimensions within emotion: valence, arousal, and dominance. Valence refers to the degree to which an emotional response is positive or negative. Arousal is a measure of the

amount of excitation or calmness that is evoked by an emotional message. Dominance points to the degree at which we feel in control during exposure to an emotional message or controlled by the emotion itself. Valence and arousal have proven to be the two dimensions that are most influential, while dominance remains somewhat peripheral. For the purpose of this study emotion will be operationalized using the dimensions of arousal and valence as was done with previous research on emotional switching (Bolls & Thomas et al., 2004).

NEGATIVE & POSITIVE AFFECT

Overall the research on emotion has indicated that messages using an affective appeal, whether positive or negative result in greater attention and arousal than any other message type (Bolls, & Thomas, et al., 2004; Lang, Newhagen, & Reeves, 1996; Newhagen & Reeves; 1992). This, though, is where the similarities in studies on positive and negative affect end. In fact, there is a significant conflict in findings on the effects of emotion and cognitive processing.

Antonio Damasio, a noted scholar in the area of emotion and cognition, states that human beings are hardwired to attend to negative stimuli in their environment (Damasio, 2003). Negative emotional tone in media messages has been found to garner uncontrolled attention (Witte 2000) and foster the use of more elaborate, detail oriented, and analytical processing strategies (Witte, 2000).

Conversely, messages using positive affect provide cues that the situation being discussed is not problematic or threatening and the viewer engages in a less effortful, heuristically based processing method (Witte, 2000;). The effects of messages that use positive emotional tone have also been found to be more short-lived than those of messages that use negative affect (CITE). Again, this is a result of depth of processing and attention allocated to processing the message.

Some research findings indicate that subjects will work to maintain a positive mood and will actively seek information that is congruent with their happy state (Bless et al., 1996; Mitchell, 2000). When used in media messages, positive affect was found to lower viewer's

resistance to attending to messages and facilitated a more heuristic, big picture assessment of the information (Fredrickson, 2003; Bless et al., 1996).

Oftentimes advertisements are interruptions and many viewers simply change the channel. This is less likely to happen if the message is positive in emotional valence and could increase the likelihood of storage. This may occur due to the cues provided by the message. If viewers are cued that the situation about to be addressed is not problematic or important then they may be less likely to exhibit avoidance behaviors. In essence a message using positive affect can convince people to watch something they otherwise may have avoided. Although, as usual when it comes to emotion, findings are conflicted.

Like Damasio many scholars have found that negative stimuli grab attention while others have asserted that negative emotional tone results in avoidance behaviors, poor encoding, and weak storage of salient information (Newhagen & Reeves, 1992; Witte, 2000). If the cues provided indicate that the message is negative, viewers may be less likely to attend, but if they are forced to attend their recognition will be greater than with positive emotional tone. When it comes to depth of processing negative affect was found to trigger more effortful processing while positive emotional tone resulted in less attention to inconsistencies and details and more attention to the overall big picture (Worth & Mackie, 1987). What then will be the result of both positive and negative affect in the same message?

In the end there seem to be benefits to both positive and negative affect. Positive affect can induce an audience member to watch a message that they otherwise may have avoided while negative affect can cause a viewer to more deeply process and store a message. In a study on the effects of negative and positive emotional valence when used in the same message (Bolls & Thomas et al., 2004), negative emotional tone was found to engage controlled attention even when used in mixed messages. Positive emotional tone was least arousing and was less effective in engaging attention although it was effective in dampening arousal.

MEMORY AND EMOTION

While it seems that much of the research on emotion and message processing is conflicted, the same is true for emotion and memory research. The cumulative finding from research on the interactions of memory and emotion have concluded that memory for emotional events is better than memory for non-emotional events and that emotion specific mechanisms underlie these events (Levine & Pizarro, 2004; Levine & Burgess, 1997; Johnson & Multhaup, 1991). The results of Bolls & Thomas et al. (2004) help to clear up questions concerning the effects of emotional switching on attention and arousal but they leave room for a closer look at how memory is effected.

Limited Capacity Theory of Mediated Message Processing

Research on memory has conceptualized three major subdivisions encoding, storage, and retrieval (Bower, 2000; Parrot & Spackman, 2000). Differences in emotional valence and in emotional arousal have been found to affect each of these three areas. A. Lang's Limited Capacity Model of Mediated Message Processing (LC3MP, A. Lang, 2000) supports these findings through an examination of resource allocation to each of these three tasks. LC3MP relies on the idea that resources are finite. As opposed to focusing on consciousness Lang focuses on the resources available solely for information processing. Encoding, storage and retrieval are the three main sub-processes of processing defined by A. Lang (2000) who further states that humans as information processors are limited in the resources that they have to allocate to each of these processes.

Encoding refers to the process of selecting bits of information from the sensory store and transforming them into mental representations. Once mental representations are formed they are then transferred to short term or working memory (Bower, 2000).

Storage is conceptualized using the associative network theory of memory (Bower, 1981). This theory simply states that objects or concepts are laid out as an interconnected network of nodes of varying salience. As each node is increasingly accessed its salience increases, more

links are formed to other concepts, and accessibility is increased (Garnham, 1997). Lang's conceptualization of storage refers to the linking of new information to previously encoded information. This usually happens when a person continually activates the new information. In other words, the more and more a person thinks about the new information, the stronger the associations between new and old information become.

Retrieval, the final step in message processing, is defined as an ongoing process during message exposure. As information receivers evaluate new information they are continually retrieving old information in attempts to understand and integrate that new stimuli.

In addition LC3MP states that there are certain message elements and cognitive triggers that cause changes in the allocation of these resources. Two of the most influential triggers are controlled and uncontrolled attention, both of which have effects on encoding. Controlled attention is consciously allocated based on goals while uncontrolled attention is more automatic (Witte, 2000; Lang, 200) and is influenced by the information that represents change or an unexpected occurrence in the environment.

During actual presentation of negative stimuli uncontrolled attention is enacted via an orienting response and cognitive capacity is overloaded. Only when capacity is freed following the negative stimuli can subjects attend to the information. In essence negative information forces subjects to orient, after that initial orientation their capacity is freed and they attend (Damasio, 2003, Witte, 2000; P.J. Lang, 1985). While subjects are blasted with all of this negative information all of their capacity is used but when that negative influence is gone they remain oriented and are able to attend to the information as an aggregate.

The implications of the LC3MP on the research question at the heart of this study are great. If the message cues provided cause attention to be allocated to message segments that employ negative emotional tone and incite greater arousal in the viewer, what will happen to memory? Does controlled attention and increased arousal lead to greater encoding storage and retrieval? Positive affect has been found to command less controlled attention and inspire less

arousal than it's counterpart but the verdict on how these message segments are remembered remains to be seen. This study will attempt to coax the answers into light.

Newhagen and Reeves (1992) found that memory for information preceding compelling negative images was less than it was without the negative presence. Semantic information was not remembered as much as aural information during the presentation of negative material, and memory for information following negative information was greater than it was when no negative information was presented. In essence the study supports the idea that negative emotional tone serves as a focal point of attention from which other message elements may be related.

Yet another model with significant implications for this experiment is the extended parallel process model (EPPM) as conceptualized by Witte (1992). The EPPM holds that negative emotional tone, or more specifically, a fear appeal results in two appraisals by the receiver. The first appraisal concerns the perceived threat (perceived susceptibility + perceived severity) of the hazard presented in the message. If the subject perceives the threat as insignificant, further processing of the message will be abandoned. If the perceived threat is high, then the subject will engage in the second appraisal, efficacy evaluation. The level at which the subject perceives the recommended response to be successful in solving the threat can determine efficacy.

If perceived efficacy is high, then the subject will engage in danger control process (adaptation), while in a low efficacy situation the subject will resort to fear control processes (avoidance). The central idea is that threat initiates and motivates message processing while efficacy determines which parallel process will dominate (Witte 1992).

According to the EPPM, messages that are negative in emotional tone will be attended to and if information that suggests how to control the threat is provided then the message will be thoroughly processed. Without the efficacy or positive tonal element, the message will be encoded, but storage and retrieval may suffer. In other words, according to the EPPM messages that start out negative in emotional tone and conclude with positive emotional tone should be

more adequately processed than messages that start out positive in tone and end with negative emotional tone.

In addition to providing theoretical support for the premises behind this experiment, the EPPM also provides practical support for the exploration not only of media message in general, but of public service messages and health communication. The goal of many health and public service campaigns is to provide the public with information and behaviors that are important for the improvement of the health of the individual as well as societal improvement but the information is often ignored due to various intervening variables. As illustrated by the EPPM, the use of emotion in messages may result in maladaptive behaviors and an overall rejection of the message. If arousal, emotion, and valence are properly controlled it seems that theses messages may have a greater chance of achieving their intended goal and therefore benefiting society as a whole.

H1: Messages entirely negative in emotional tone will result in greater overall memory than messages entirely positive in emotional tone.

Previous research on memory has concluded that attention is vital when it comes to constructing memory (Lang, 2000, Witte, 1992). At the same time the literature on emotion has shown that messages with an apparent emotional tone as well as message elements that produce arousal, especially negative emotional tone, facilitate greater attention than less arousing or emotional messages. With attention and arousal more evident in negative emotional tone messages it follows that memory should also be greater for negative emotional tone messages than positive emotional tone messages

H2: Memory for segments positive in emotional tone will be greater in messages that follow a negative to positive emotional switch than in messages that follow a positive to negative switch in emotional tone.

Messages that are negative in emotional tone have been found to inspire more arousal than messages with positive emotional tone. Arousal facilitates the focus of attention on stimuli which should then allow for encoding, storage, and retrieval of that arousing information.

H3: Messages that follow a negative to positive switch will result in greater overall memory than messages that follow a positive to negative switch.

Negative message segments have been found to garner more attention than positive emotional tone segments. A. Lang's LC3MP suggests that when attention is focused other resources for message processing are impeded. Once the positive segment of a mixed negative/positive emotional tone message kicks in attention has already been established and the positive tone should relax subjects and free up their messages processing resources for further encoding, storage, and retrieval of general message information.

H4: Memory for information at the moment of the switch in emotional tone will be less than memory for the preceding and following segments.

Once again, LC3MP suggest that as message processors, subjects have limited capacity and that when all of their resources are engaged in an orienting response they have no more capacity for further processing. The moment of switch from one valence of emotional tone to another presents a confusing change for the subject. In order to understand what is happening it seems likely that resources will be used up in the attempt to understand what has just happened in the message and there will be little left to convert and store the information into memory.

CHAPTER TWO

RESEARCH DESIGN AND METHODOLOGY

Design

For this experiment the design was a 4 (emotional tone) by 3 (message) by 3 (order) mixed model repeated measures design. Emotional tone was a within subjects measure while order will be a between subjects measure.

Independent Variable

Emotional tone was conceptualized as the emotional valence of a media message. Messages were either strictly positive, strictly negative, or a mixture of positive and negative emotional tone. Emotional tone was manipulated in two ways. Strictly positive and strictly negative messages have been drawn from a pool of public service messages that have already been pre-tested for emotional tone and used in previous experiments (Bolls, Lang, & Potter, 2000; Bolls & Thomas et al, 2004).Message content that tested positively for personal relevance with undergraduates students included unplanned pregnancy, drunk driving, STDs, depression, Gay, lesbian, bisexual and transgender centers on campus, and medicinal reactions with alcohol. Mixed emotional tone public service messages were written and produced by a team of professional radio producers. Mixed emotional tone messages include half-positive tone, half-negative tone. Messages that started negative, ended positive and messages that started positive ended negative were produced.

Dependent Variables

Memory was conceptualized as a process involving encoding, storage, and retrieval of information from message stimuli. Encoding was measured by a multiple choice recognition test administered via computer. Storage will be measured via cued recall measures in which participants will use paper and pencil to record their memory of the messages that they heard. Retrieval was measured with a pencil and paper free-recall assignment much the same as the cued recall exercise but excluding, of course, any message cues.

Stimuli

Stimulus messages were 12, 60-second radio messages dealing with topics relevant to participants in the experiment (undergraduate college students). Topics were pre-tested to ensure relevancy. Topics that tested for relevancy included unplanned pregnancy, sexually transmitted diseases, drunk driving, and alcohol consumption.

Participants and Procedure

Participants were 48 undergraduate students enrolled in communication courses at a large northwestern university. Participants completed the experiment one at a time in an experimental research lab. Informed consent was obtained. The researcher read a set of instructions that explained the procedure for the experiment and how to complete the self-report measures to the participants. After answering any questions the researcher played the stimulus messages. The researcher stopped the stimulus tape after each message while participants completed self-report attention, arousal, and message valence measures. The researcher re-started the stimulus material once the participants indicated that they were ready.

After completing self-report measures the participants engaged in a distracter task for five minutes and were then asked to complete free recall, cued recall and recognition tests respectively. The distracter task was administered in order to allow for full encoding and storage to be achieved (Free recall consisted of a paper and pencil assignment in which participants were asked to write as much as they could about the messages they had just heard (i.e., Please write down everything you remember about the first message that you heard). Cued recall measures were much the same except that subjects were handed a packet of twelve sheets of paper, each one reminding them the general area of information that the message was about and asking them to write what they remembered (i.e., you heard a message about forest fires. Please write down everything you remember about that message). Finally a multiple choice recognition test was administered. For each message there were three multiple choice questions. Information for these questions was selected from the first 20 seconds of the message, the actual moment of the switch

(approx. 30-sec. into the message), and from the last 20 seconds of the message. These specific segments were selected in order to document the recognition for each emotional tone segment and to chart the overall progression of memory throughout message structure.

Cued and free recall responses were coded for content and depth via four basic levels: 1) who, 2) what, 3) where, 4) why. Each level was assigned a number based on accuracy and depth of information reported. The number one was assigned to reported information that showed some sort of encoding or storage and the number five was assigned to information that was completely correct. If messages were not recalled whether during free or cued recall reports the number zero was assigned. Inter-coder reliability for both cued recall (*alpha* = .88) and free recall (*alpha* = .88) were achieved.

CHAPTER THREE

ANALYSIS

Self reported attention was measured after exposure to each message. Results showed a significant main effect of message tone on self reported attention ($F(1, 26) = 40.228$), $p < .027$.

Self reported arousal was measured after exposure to each message on the arousal dimension of the SAM (self-assessment mannequin) scale. Data from the SAM scale was submitted to a 4 (tone) X 3(message) repeated measures ANOVA. Results showed a significant main effect of message tone on self reported arousal. Messages that were entirely negative in tone ($\underline{M} = 6.012$) were rated as more arousing than were messages that were entirely positive in tone ($\underline{M} = 2.034$). Messages that were mixed negative/positive ($\underline{M} = 3.423$) and mixed positive/negative ($\underline{M} = 3.142$) were rated as similar in terms of arousal.

Self reported message valence was measured after exposure to each message on the valence dimension of the SAM (self-assessment mannequin) scale. Data from the SAM scale was submitted to a 4(tone) X 3 (message) repeated measures ANOVA. Results showed a significant main effect of message tone on SAM self reported valence ($F(1, 26) = 7.487$, $p < .029$. Negative valence messages ($\underline{M} = 3.185$) were rated more negatively compared to positive valence messages ($\underline{M} = 6.068$)

Self-report data for recognition was submitted to a 4 (emotional tone) X 3 (message) X 3 (segment) repeated measures ANOVA. Results showed a significant main effect on emotion ($F(1, 123) = .186$, $p < .000$.

RESULTS

Hypothesis One

Hypothesis one predicted that memory for messages entirely positive in emotional tone would result in greater overall memory than would messages entirely negative in emotional tone. This hypothesis was not supported.

Hypothesis Two

Hypothesis two predicted that recognition for segments positive in emotional tone will be greater in messages that follow a negative to positive switch in emotional tone than in messages that follow a positive to negative switch. This hypothesis was supported with a significant main effect in tone X message X segment in recognition data ($F(1, 41) = 20.654$, $p<.000$).

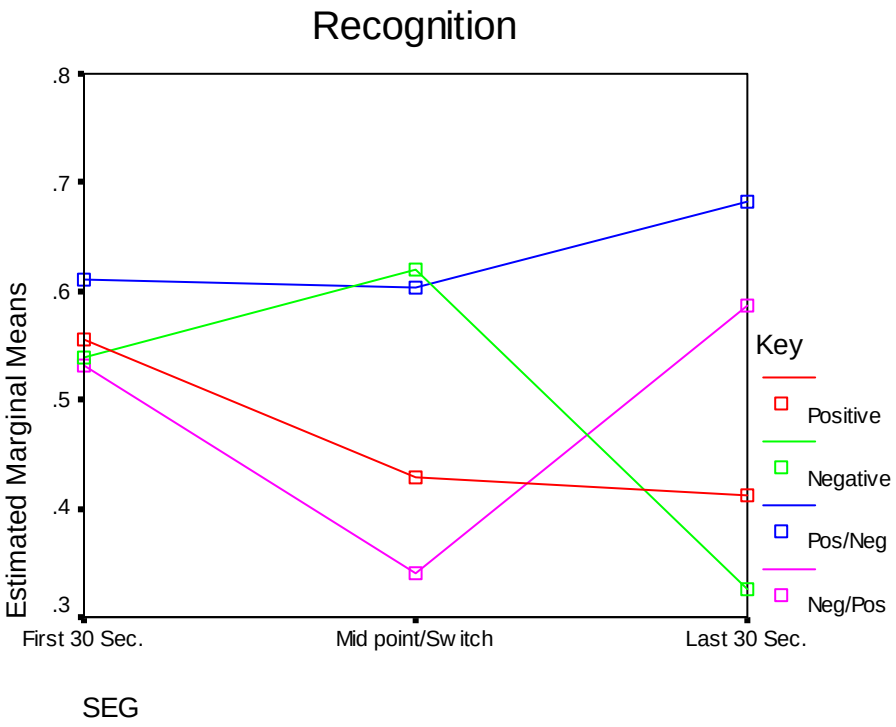
Hypothesis Three

Hypothesis three predicted that messages that follow a negative to positive emotional switch will result in greater overall memory than messages that follow a positive to negative switch. This hypothesis was supported with a significant main effect in emotion for recognition ($F(1, 41) = 20.654$, $p<.000$). Support for the hypothesis were partially supported with an approach to significance in free recall ($F(1, 35) = 3.721$, $p <.062$. The hypothesis was not supported for cued recall.

Hypothesis Four

Hypothesis four predicted that encoding for information at the moment of switch in mixed tone messages would be less than memory for the preceding and following segments. This Hypothesis was partially supported with a significant effect in emotion ($F(3, 123) = 11.74$, $p< .000$.

Figure 1


Recognition
Estimated Marginal Means
.8
.7
.6
.5
.4
.3
First 30 Sec.
Mid point/Switch
Last 30 Sec.
SEG
Key
Positive
Negative
Pos/Neg
Neg/Pos

DATA TABLE

Group 1 = Negative
Group 2 = Positive
Group 3 = Negative/Positive
Group 4 = Positive/Negative

Variable	df	F	Sig	Mean dif.	Std. Error	Eta Sqd.	*alpha*
Free Recall							.836
Group 1 v. 2	1,35	-	.052	.394	.196	-	
Group 3 v. 4	1, 35	3.721	.062	.352	.182	.096	
Cued Recall							.897
Group 1 v. 2	1, 37	-	.075	3.914	2.134	-	
Group 3 v. 4	1,37	.075	.786	.465	.786	.002	
Recognition							NA
Group 1 v. 2	1, 41	-	.259	2.910	.025	-	
Group 3 v. 4	1, 41	20.654	.000	.146	.032	.335	

Variable	df	F	Sig	Mean dif.	Std. Error	Eta Sqd.	*alpha*
Arousal							.7494
Group 1 v. 2	1, 26	-	.178	.519	.374	-	
Group 3 v. 4	1, 26	28.754	.000	1.519	.283	.525	
Attention							.9280
Group 1 v. 2	1, 26	-	.000	1.568	.137	-	
Group 3 v. 4	1, 26	40.228	.000	.642	.101	.607	
Valence							.6737
Group 1 v. 2	1, 26	-	.000	2.877	.366	-	
Group 3 v. 4	1, 26	5.350	.029	.593	.256	.171	

CHAPTER FOUR

DISCUSSION

The picture painted by the results of this study is supported by previous research and shows the same nuances that have been previously examined in studies concerning emotion and memory. As illustrated by previous researchers and hypothesized by this study, negative segments showed the strongest effects on encoding, storage, and retrieval. Even more interesting is the finding that the quality of memory was greater in messages that followed a negative to positive switch than in messages that followed a positive to negative switch or any other format for that matter.

This study is limited in that the entirely positive emotional tone public service messages proved somewhat challenging to obtain and as a result these messages were a mix of messages. Two of the messages were not radio messages but the audio track from two award wining public service video spots. The third entirely positive toned message was a bud light radio advertisement. These messages may present a confound in that while they were entirely positive in emotional tone, they were not radio public service messages as the other messages were for the other three emotional tones. Another limitation lies within the experimental design. Subject completed free recall and then were immediately asked to complete cued recall measures. This may have resulted in subjects feeling as though they had already recalled the information and need not be as thorough in their efforts. A replication of this study in which one group completed only free recall and a separate group completed cued recall may solve for this dilemma.

During analysis of cued and free recall data it became clear that the details recalled in the entirely negative messages were much clearer and more abundant than were those in the entirely positive messages. On the other hand the big picture was often lost in recollection of entirely negative toned messages while this was almost all that was remembered of positive toned messages. A secondary analysis of the data paying particular attention to details and big picture

memories of the mixed emotional tone messages would provide further information into the topic at hand.

Yet another interesting area for further research is that of imagery. Many of the messages that employed negative emotional tone were also strong in imagery. Previous research (Bolls, Lang, & Potter, 2001) has indicated that imagery contributes to arousal, which then in turn effects memory. It may be that imagery had just as strong an influence as valence.

In addition, a more thorough secondary analysis of cued and free recall with a team of coders could greatly help the accuracy of the findings. Another area that could benefit may be the measures of attention and arousal. The study that inspired this particular area of research (Bolls & Thomas et al, 2004) included psychophysiological measures for attention, arousal, and valence. Replication of these studies with both psychophysiological measures and memory measures in place would further enrich the findings for this study by time locking the arousal and attention dimensions of the study to specific message elements.

While the implications for message processing theory are interesting, the practical implications also present an interesting finding. It seems that message design practitioners should be wary of where they place emotional cues in a message. Negative information seems to lock the subject into attention but at the same time ties up all other message processing resources so that only that information which is most threatening is attended to by the viewer. The findings of this study indicate that a negative to positive switch in emotional tone with the most important information in the middle of the positive tone segment will result in the most effective encoding, storage and retrieval of that information.

Emotion serves as a highlighter for information but it does not in any way guarantee that the message intended by practitioners will be faithfully transmitted. Wise use of emotional valence in health messages will only result in a greater chance for certain parts of the message to be remembered more accurately. The previous experiences and personal differences inherent in every individual also come into play when it comes to getting the essence of a message across. It

is the researcher's hope that both media researchers and practitioners alike use emotion as only one tool amongst many in their supply of information for producing clearer and more effective health communication messages.

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APPENDIX 1

Bud Light

Please choose the phrase that you remember from the message that you heard about Bud Light.

1 – Now I realize I've got to get it
2 – I can't believe sh won't get me one
3 – I realize I might have to go into the kitchen
4 – I'm undecided for a moment

1 – Ordinary people become heroes to get their beer
2 – The sacrifices people will endure to make it a Bud Light
3 – The things people will conquer for a beer.
4 – The way people work for their Bud Light

1 – Going the distance no matter the obstacle
2 – Passing the test and winning the prize
3 – Becoming a hero when you started as a mere man
4 – Overcoming adversity and reaching your goal.

GLBT

1 – I found some help and a support group
2 – If you've ever felt like I did, you should check it out
3 – This group, they welcomed me, and they'll welcome you too.
4 – If you need a place to go, or just someone to talk to . . . .

1 – I found a group of people to be with who accepted me
2 – My friend introduced me to a group of people like me
3 – I saw this poster, it was a flyer . .
4 – I read about this group in the newspaper

1 – Somehow college ended up being the same as high school
2 – I thought after high school I would finally find some form of acceptance
3 – I hoped that college would be different
4 – I hated being at college, everyone made fun of me

Drinking/Medication

1 - Sonya went to get more beer and she never came back
2 – Sonya drove home without me and I was so mad
3 – Sonya talked to some guy the whole night
4 – The next thing I knew Sonya was gone and I couldn't find her

1 – Watch your medication when you drink, it could be deadly
2 – Medication and alcohol don't mix so know what you're doing
3 – Check with your doctor to make sure your medication mixes with alcohol
4 – If you're on medication don't drink if you haven't checked with your doctor

1 - None of the guys were interested in me
2 – She was getting lots of looks from the guys
3 – The guys were all over us and we loved it
4 – We were having a hard time talking to guys, so we drank

History

1 - And then he died, can you believe it?
2 – Hope you don't die like Lincoln did.
3 – So many of our presidents have died shortly after taking office
4 – Thirty-one days later, boom! Dead.

1- Ladies and gentlemen, Ed out company's new president
2- I'd like you all to welcome our new president on his first day
3- As your president, I'd like to thank you all for the warm welcome
4- Our new company president has arrived

1 – Knowing history is cool
2 – History makes you smarter
3 – It's fun to know history
4 – History can take you places

Forest Fires

1 – Smokey the Bear needs your help, give him a hand
2 – Don't become a hapless killer, be careful with matches
3 – Saving lives is easy, be careful with fire
4 – Be careful outside, a lot of innocent lives are counting on you

1 – We have a positive ID on the fire starter.
2 – We narrowed it down to a few, see that guy over there?
3 – I have the arsonist in custody
4 – We aren't really sure who the suspect is

1 – Looks like another mass homicide
2 – Looks like another arson to me
3 – Another out of control fire?
4 – Someone get a little out of control with matches?

Depression

1 – Last week I almost took too many pills
2 – Before I found a counselor I was so unhappy
3 – I hated everything about life; nothing mattered
4 – Next week I have this major project due and I don't even care

1 – I haven't been to class in three days; I just can't get out of bed
2 – I sleep all the time, but I never feel rested
3 – I just want to fade away and never come back
4 – Class is the last place I want to be right now

1 – I though there was no hope, but then I talked to Marcie
2 – I almost gave up, but talking to a counselor changed that
3 – I still don't know what to do, but I have an idea
4 – Group therapy helped me escape depression

Drunk Driving

1 – Feel free to party and let loose
2 – Having a good time isn't an excuse to drive drunk
3 – Good times are best when they aren't followed by a tragic accident
4 – Party all you want but get a designated driver

1 – Use a designated driver
2 – Drunk driving will get you nowhere
3 – Don't drink drive
4 – Please, think before you drink

1 – Where's the party at tonight girls?
2 – So what exactly are you girls up to tonight?
3 – You girls gonna come out with us tonight?
4 – Meet you girls at the movie later.

Eating Disorders

1 – The nurses whispered and the look on my Mom's face was so sad
2 – My Mom whispered to the nurses and cried at my bedside
3 – The look on my Mom's face was so disappointed
4 – The nurses wouldn't tell me what was going on

1 – I never thought it would lead to me having a heart attack at 23.
2 – My health has always suffered as a result of my battle with bulimia
3 – I'd been fighting my illness for so long that it became second nature to me
4 – Battling my weight has been a part of my life for so long now

1 – I overcame my eating disorder and you can too
2 – It's been a few months now and I'm still fighting bulimia
3 – I wish that I hadn't hidden my disorder for so long
4 – I'm a survivor, but It would've been ice not to feel so alone

Gun Safety

1 – As matt picked up the gun, he didn't realize it wasn't fake
2 – When Matt pulled the trigger, he didn't realize the safety wasn't on
3 – As Matt came back into the room, he didn't know that his little brother had . .
4 – Matt didn't realize that the gun he was holding wasn't a toy

1 – Matt was eager to get his brother drunk and hook him up.
2 – Matt was telling his brother Nathan all about the wild parties and hot girls
3 – Matt and Nathan partied together all the time
4 – Nathan looked to his brother as an example

1 - Never joke with a gun in your hand, it could end badly
2 – Guns aren't toys, don't play around
3 – Playing with guns could kill you, or someone you love
4 – Murder is no joke, neither is playing with guns

Unplanned pregnancy

1 – I can't afford this right now
2 – I can't believe this is happening
3 – There is no way I can handle this
4 – I wasn't in for this, I gotta finish college

1 – Condoms don't just protect against STDs, they protect your future
2 – Be smart when it comes to safe sex and you may save your dreams
3 – Using condoms won't make you any less popular, but it will save your life
4 – Condoms aren't a hassle, they're a life saver

1 – Damn that girls was fine
2 – Oh man this girl was such eye candy
3 – I saw this girl and she saw me.
4 – I hooked up with the finest girl in there

STDs

1 – I can't believe she's going to be my wife
2 – This is so right, I know we're meant to be together
3 – I want to be with her forever
4 – I hope she decides to stay with me

1 – I went for a check-up today remember? I tested positive for HIV.
2 – The doctor told me I have herpes. I'm sorry.
3 – Remember how I wasn't feeling well? Umm I have herpes.
4 – Today when I saw the doctor he told me I was HIV positive

1 – Don't be careless with your future, use a condom
2 – Practice safe sex, it could just keep you alive
3 – Safe sex is the best sex you can have
4 – Don't let an STD kill you or your dreams

Neighborhood watch

1 – Let's get a weekly meeting started
2 – Every week at the library
3 – Tuesday night at the high school
4 – I was actually hoping you would come to a meeting

1 – WOO! Dreams really do come true!
2 – I can't believe we won, this is amazing!
3 – How are we gonna spend all of this money?
4 – Where's the van and isn't there some big check or something?

1 – Hola to you too
2 – Ahh, ummmm – como estas?
3 – No tengo dinero – neighborhood watch
4 – Yes, yes/ Me gusta dinero too.

APPENDIX 2

RECOGNITION INSTRUMENT

Bud

Please choose the phrase that you remember from the message that you heard about Bud Light.

1 – Now I realize I've got to get it
2 – I can't believe she won't get me one
3 – I realize I might have to go into the kitchen
4 – I'm undecided for a moment

1 – Ordinary people become heroes to get their beer
2 – The sacrifices people will endure to make it a Bud Light
3 – The things people will conquer for a beer.
4 – The way people work for their Bud Light

1 – Going the distance no matter the obstacle
2 – Passing the test and winning the prize
3 – Becoming a hero when you started as a mere man
4 – Overcoming adversity and reaching your goal.

GLBT

Please choose the phrase that you remember from the message that you heard about Gay, Lesbian, Bisexual, & Transgender centers on campus.

1 – I found some help and a support group
2 – If you've ever felt like I did, you should check it out
3 – This group, they welcomed me, and they'll welcome you too.
4 – If you need a place to go, or just someone to talk to . . . .

1 – I found a group of people to be with who accepted me
2 – My friend introduced me to a group of people like me
3 – I saw this poster, it was a flyer . .
4 – I read about this group in the newspaper

1 – Somehow college ended up being the same as high school
2 – I thought after high school I would finally find some form of acceptance
3 – I hoped that college would be different
4 – I hated being at college, everyone made fun of me

Drinking/Medication

Please choose the phrase that you remember from the message that you heard about drinking while on medication.

1 - Sonya went to get more beer and she never came back
2 – Sonya drove home without me and I was so mad
3 – Sonya talked to some guy the whole night
4 – The next thing I knew Sonya was gone and I couldn't find her

1 – Watch your medication when you drink, it could be deadly
2 – Medication and alcohol don't mix so know what you're doing
3 – Check with your doctor to make sure your medication mixes with alcohol
4 – If you're on medication don't drink if you haven't checked with your doctor

1 - None of the guys were interested in me
2 – She was getting lots of looks from the guys
3 – The guys were all over us and we loved it
4 – We were having a hard time talking to guys, so we drank

History

Please choose the phrase that you remember from the message that you heard about government history.

1 - And then he died, can you believe it?
2 – Hope you don't die like Lincoln did.
3 – So many of our presidents have died shortly after taking office
4 – Thirty-one days later, boom! Dead.

1 - Ladies and gentlemen, Ed out company's new president
2 - I'd like you all to welcome our new president on his first day
3 - As your president, I'd like to thank you all for the warm welcome
4 - Our new company president has arrived

1 – Knowing history is cool
2 – History makes you smarter
3 – It's fun to know history
4 – History can take you places

Forest Fires

Please choose the phrase that you remember from the message that you heard about forest fires.

1 – Smokey the Bear needs your help, give him a hand
2 – Don't become a hapless killer, be careful with matches
3 – Saving lives is easy, be careful with fire
4 – Be careful outside, a lot of innocent lives are counting on you

1 – We have a positive ID on the fire starter.
2 – We narrowed it down to a few, see that guy over there?
3 – I have the arsonist in custody
4 – We aren't really sure who the suspect is

1 – Looks like another mass homicide
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3 – Another out of control fire?
4 – Someone get a little out of control with matches?

Depression

Please choose the phrase that you remember from the message that you heard about depression.

1 – Last week I almost took too many pills
2 – Before I found a counselor I was so unhappy
3 – I hated everything about life; nothing mattered
4 – Next week I have this major project due and I don't even care

1 – I haven't been to class in three days; I just can't get out of bed
2 – I sleep all the time, but I never feel rested
3 – I just want to fade away and never come back
4 – Class is the last place I want to be right now

1 – I though there was no hope, but then I talked to Marcie
2 – I almost gave up, but talking to a counselor changed that
3 – I still don't know what to do, but I have an idea
4 – Group therapy helped me escape depression

Drunk Driving

Please choose the phrase that you remember from the message that you heard about drunk driving.

1 – Feel free to party and let loose
2 – Having a good time isn't an excuse to drive drunk
3 – Good times are best when they aren't followed by a tragic accident
4 – Party all you want but get a designated driver

1 – Use a designated driver
2 – Drunk driving will get you nowhere
3 – Don't drink drive
4 – Please, think before you drink

1 – Where's the party at tonight girls?
2 – So what exactly are you girls up to tonight?
3 – You girls gonna come out with us tonight?
4 – Meet you girls at the movie later.

Eating Disorders

Please choose the phrase that you remember from the message that you heard about eating disorders.

1 – The nurses whispered and the look on my Mom's face was so sad
2 – My Mom whispered to the nurses and cried at my bedside

3 – The look on my Mom's face was so disappointed
4 – The nurses wouldn't tell me what was going on

1 – I never thought it would lead to me having a heart attack at 23.
2 – My health has always suffered as a result of my battle with bulimia
3 – I'd been fighting my illness for so long that it became second nature to me
4 – Battling my weight has been a part of my life for so long now

1 – I overcame my eating disorder and you can too
2 – It's been a few months now and I'm still fighting bulimia
3 – I wish that I hadn't hidden my disorder for so long
4 – I'm a survivor, but It would've been ice not to feel so alone

Gun Safety

Please choose the phrase that you remember from the message that you heard about gun safety.

1 – As matt picked up the gun, he didn't realize it wasn't fake
2 – When Matt pulled the trigger, he didn't realize the safety wasn't on
3 – As Matt came back into the room, he didn't know that his little brother had . .
4 – Matt didn't realize that the gun he was holding wasn't a toy

1 – Matt was eager to get his brother drunk and hook him up.
2 – Matt was telling his brother Nathan all about the wild parties and hot girls
3 – Matt and Nathan partied together all the time
4 – Nathan looked to his brother as an example

1 - Never joke with a gun in your hand, it could end badly
2 – Guns aren't toys, don't play around
3 – Playing with guns could kill you, or someone you love
4 – Murder is no joke, neither is playing with guns

Unplanned pregnancy

Please choose the phrase that you remember from the message that you heard about unplanned pregnancy.

1 – I can't afford this right now
2 – I can't believe this is happening
3 – There is no way I can handle this
4 – I wasn't in for this, I gotta finish college

1 – Condoms don't just protect against STDs, they protect your future
2 – Be smart when it comes to safe sex and you may save your dreams
3 – Using condoms won't make you any less popular, but it will save your life
4 – Condoms aren't a hassle, they're a life saver

1 – Damn that girls was fine
2 – Oh man this girl was such eye candy
3 – I saw this girl and she saw me.

4 – I hooked up with the finest girl in there

STDs

Please choose the phrase that you remember from the message that you heard about STDs.

1 – I can't believe she's going to be my wife
2 – This is so right, I know we're meant to be together
3 – I want to be with her forever
4 – I hope she decides to stay with me

1 – I went for a check-up today remember? I tested positive for HIV.
2 – The doctor told me I have herpes. I'm sorry.
3 – Remember how I wasn't feeling well? Umm I have herpes.
4 – Today when I saw the doctor he told me I was HIV positive

1 – Don't be careless with your future, use a condom
2 – Practice safe sex, it could just keep you alive
3 – Safe sex is the best sex you can have
4 – Don't let an STD kill you or your dreams

Neighborhood watch

Please choose the phrase that you remember from the message that you heard about starting a neighborhood watch.

1 – Let's get a weekly meeting started
2 – Every week at the library
3 – Tuesday night at the high school
4 – I was actually hoping you would come to a meeting

1 – WOO! Dreams really do come true!
2 – I can't believe we won, this is amazing!
3 – How are we gonna spend all of this money?
4 – Where's the van and isn't there some big check or something?

1 – Hola to you too
2 – Ahh, ummmm – como estas?
3 – No tengo dinero – neighborhood watch
4 – Yes, yes/ Me gusta dinero too.

APPENDIX 3

CROSSTAB OF MESSAGES BY CONDITION

POSITVE	**NEGATIVE**	**NEG/POS**	**POS/NEG**
Bud Light	Drunk Driving	Depression	Gun Safety
Neighborhood Watch	Forest Fires	GLBT	Drinking/medication
History	STDs	Eating Disorders	Unplanned Pregnancy