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Go with The Flow: Testing the Effects of Emotional Flow on Psychophysiological, Attitudinal, and Behavioral Changes

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Dedication

This project is dedicated to Kristen Noland who has provided patience, encouragement, and a shoulder to lean on when I needed it the most. It must be sore.

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Abstract

Emotions are important constructs that affect the lives of everyone. Emotions play a particularly strong role in persuasion. This study examines the concept of emotional flow, a sequencing of specific discrete emotions in a strategic manner to affect attitudes and behaviors. In an experiment to understand the functions and applicability of emotional flow, an experiment was conducted using a public service announcement about melanoma that contained a sequence that flowed from humor to sadness to hope. This dissertation used both self-report as well as biometric measures of the emotional responses valence and arousal. Using Affect Priming Theory, Mood Management Theory, and Excitation Transfer Theory as guides, results showed that participants who viewed the humor-sadness-hope emotional flow had higher levels of arousal compared to those who viewed humor-sadness or humor-sadness-neutral emotional flows. The humor-sadness-hope emotional flow resulted in higher levels of pleasure compared to those who viewed the humor-sadness emotional flow. Arousal was identified as a mediator between emotional flow and both message engagement and risk perceptions. Additionally, sadness was found to moderate the relationship between emotional flow and both attitude and message engagement.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Emotions are an important mechanism that affects innumerable aspects of people's lives. Izard (1977) argued that the entirety of human behavior is motivated by emotions. Subsequently, there is no shortage of emotions-based research on an array of different topics. The role that emotions play in persuasion is utilitarian in its applicability to many different facets of life from consumer behavior to health habits. Nabi (2002) outlines extensive evidence that emotions play a strong role in influencing decision-making processes as well as attitudes and behaviors.

Some research paths focus on discrete emotions such as fear and guilt and their effects on attitudes and behaviors. A great deal of research has used fear appeals to test the effect of threats on different behaviors. For example, Shen (2011) found that fear appeal messages can lead to stronger psychological reactance. Leshner et al. (2009) found that anti-tobacco advertising containing content that induced fear or disgust had positive effects on recognition and memory. Guilt is another emotion that has received singular attention. Chang (2014) illustrated that guilt-inducing advertising aimed at promoting monetary donations had a larger effect on donation intentions when the ad highlighted benefits for the donor as opposed to the recipient. An emerging area in emotions research is mixed emotions. These are multiple emotions found in messages, often with opposing valences. For example, Mukherjee and Dube' (2012) studied the mitigating effects that

humor has on defensive responses in fear appeals and thus increases the persuasiveness of fear advertising. In their review of mixed emotions, Larsen and McGraw (2014) discuss different cases of people feeling different emotions simultaneously such as feeling both happy and sad after watching a particularly compelling film. Horror films were found to elicit fear and happiness because the fear made people happy (Andrade & Cohen, 2007). A scene from the movie *Pink Flamingos* shows a character eating dog feces which elicits disgust however it was also found that the disgust was accompanied by feelings of amusement (Hewig et al., 2005; Hemenover & Schimmack, 2007). Although these studies are examining multiple emotions, from a broader viewpoint, the construct of mixed emotions is still an emerging field in mass communications and requires further attention.

1.2. SIGNIFICANCE OF STUDY

Existing studies that focus on mixed emotions measure these emotions in the aggregate, as an index of the felt emotions and their effect on attitudes and behavior. However, there is an overall lack of research that compares varied sequences of individual emotions within a single message. As a way to address this and focus more on the details of individual emotions within a single message, Nabi (2015) proposed the concept of emotional flow, a sequencing of specific discrete emotions in a strategic manner so that the flow of emotions affects certain behaviors.

This dissertation empirically tests emotional flow to understand how sequences of emotions organized into specific flows within a single message can affect emotional responses such as arousal and valence levels, as well as attitudes and behaviors. If different emotional flows affect these emotional responses in different ways, marketers

and advertisers can more strategically incorporate emotions into their messaging strategies. Likewise, if various emotional flows have an effect on attitudes and behaviors, content creators can tactically use emotions to affect specific attitudes and behaviors such as information seeking and message engagement. Additionally, this study integrates an exclusive biometric technology that measures emotions simultaneously as they are experienced during message exposure.

Studies that measure mixed emotions typically do so using self-reporting measures. Zoellner and Foa (2016) argue that self-reports can be considered valid measures of key constructs that cannot be measured other ways. While this study does use self-reporting to measure emotions, it further measures emotions by incorporating biometric measurement, using software to record the emotions simultaneously as they are experienced while viewing the message. Biometric technology can obtain measurements that can offer marketers and advertisers a tool that measures consumer response to advertising (Bellman et al. 2017). For example, because consumers sometimes show skepticism towards advertising and other types of messaging, marketers can face a strong challenge in being noticed. Research shows that low attention to messages result in poor metrics such as sales (Bellman et al., 2017). Biometric measures of attention provide a mechanism that can help marketers and advertisers create more effective message campaigns and discard those that are less successful (Bellman et al., 2019).

This dissertation focuses specifically on the emotional response measurements of arousal and valence. These measures can be useful in identifying what parts of a message are particularly effective (Bellman et al., 2017). In this case, identifying which emotional flow is causing the most arousal response and how different emotional flows affect

valence response can help researchers as well as marketers and advertisers implement different emotional flows within their messaging to influence persuasion. The most common biometric measure of psychophysiological arousal response is skin conductance, a measure of sweating, typically monitored via sensors placed on the fingers and is associated with sympathetic nervous system activation (Bailey, 2017). As the sympathetic nervous system is activated, the skin momentarily becomes a better conductor of electricity. In addition to skin conductance, facial expressions, such as zygomatic and corrugator muscle activity (smiling and frowning) as well as others are able to capture the valence of emotions (Lang et al., 1993). Facial expressions reflect affective states and can possibly predict associated behavior and attitude change (Friesen & Ekman, 1983). The connection between affective states and facial expressions has been robustly demonstrated in studies applying Ekman's (1972) neurocultural theory of emotion, which argues that facial expressions provide a universal schema for the appearance of basic emotions. For example, Ekman and Cordaro (2011) argue the universality of discrete emotions such as anger, fear, surprise, sadness, disgust, contempt, and happiness. This dissertation draws from the conceptual and methodological approaches delineated by this framework, as prior research based on this paradigm has found facial expressions of emotion as discrete, innate, and culturally independent (Ekman, 1972; Ekman & Cordano, 2011).

Along with biometric measurements, this dissertation also measures valence and arousal responses via self-report. Mehrabian and Russell (1977) developed a robust, three-dimensional self-reporting scale that has become one of the most widely accepted models for measuring emotional response. The scale measures three dimensions:

pleasure, arousal, and dominance (PAD). The pleasure dimension can range from very positive to very negative, arousal ranges from sluggishness to excitation, and empowerment ranges from weak to powerful (Morris, 2019). The scale is operationalized using AdSAM, the Advertisement Self-Assessment Manikin, which utilizes a series of graphic characters to measure each dimension (Morris et al., 1994). The scale provides a non-verbal, cross-cultural, visual measure of emotional responses along the pleasure, arousal, and dominance dimensions (Morris et al., 2009). AdSAM was formulated for advertising research but has shown great utility in the use of public service announcements and health campaigns (Kim et al., 2008). Results from AdSAM show that emotional response can be a strong predictor of behavior and a valuable tool for strategic planning and message design (Morris et al., 2002). However, since the focus of this dissertation is on two specific biometric measures (valence and arousal), emotional response is conceptualized as a two-dimensional construct and therefore only focuses on the pleasure and arousal dimensions of the PAD scale.

1.3. STUDY OVERVIEW

This dissertation contributes to the emotional literature in several ways. Although studies on emotional flow do exist (e.g., Nabi et al., 2018), there is a shortage of empirical, experimental research as the concept itself is new and researchers are still trying to understand how discrete emotions can act together in specific sequences, or flows, to affect physiological measures, attitudes and behaviors.

Because emotional flow looks at the evolution of the emotional experience during exposure to a message (Nabi, 2015), this dissertation takes an experimental approach to understanding the effects of emotional flows using varying flows of discrete emotions.

Specifically, the experiment examines how humor-sadness-hope, humor-sadness, and humor-sadness-neutral emotional flows differ in terms of emotional response (valence and arousal), attitudes, and behaviors. These specific emotions are used because of their different valences as well as different action tendencies, or adaptive responses (Lerner et al., 2015). For example, humor is positively valenced and promotes attention to the message, sadness is negatively valenced and promotes deeper thinking and elaboration on problems, while hope is positively valenced and promotes positive health behaviors.

From a theoretical perspective this dissertation seeks to show that discrete emotions can be sequenced into specific flows in which the emotions build upon each other to increase emotional responses of arousal and positive valence. Subsequently, since each discrete emotion carries specific action tendencies, this study will try to demonstrate that increased arousal and valence responses may affect certain behaviors (e.g., information seeking behavior) via these action tendencies.

Practically, advertisers and marketers may be able to create messaging with specific emotional flows that use emotions to increase both arousal and valence responses in consumers, advocates, and the general public. Organizations can also include emotions within these flows that, based on their action tendencies, can possibly affect specific attitudes and behaviors in different contexts including attitudes toward the message, information seeking behavior about a product or issue, or pursuing an advocated behavior.

CHAPTER 2

LITERATURE REVIEW

2.1 PERSUASION

Persuasion is an omnipresent function that is becoming even more so as society becomes more interconnected via technology like social media and targeted advertising. Politicians attempt to persuade voters, charities hope to persuade people to donate, advertisers try and persuade consumers to alter their behaviors whether it's purchasing their product, liking their brand, or sharing their ad, and public health officials work to persuade people to change their behaviors. O'Keefe (2016) characterizes persuasion as a mechanism that influences an audience's mental state. Even if a persuader's ultimate goal is a behavioral effect such as buying a product or changing a health behavior, the effect involves influencing what the audience thinks (O'Keefe, 2016).

Advertising messages that focus on different persuasion goals require different kinds of theory as well as different research methodologies in order to understand them (Sasser & Koslow, 2019). O'Keefe (2016) identifies three areas of theory that social-scientific work on persuasion informs: theories of attitude and psychological processes, theories of voluntary action, and theories of persuasion and social influence proper. Each is distinct yet all share the common thread of adapting persuasive messages toward audiences. This dissertation focuses on theories of persuasion and social influence. Specifically, the focus is on health advertising which promotes behaviors that can reduce illness or deaths (Thorson & Rodgers, 2019). For example, a public service

announcement (PSA) may focus on melanoma where the goal of the persuasion is to encourage viewers to reduce their exposure to sunlight and lower their chances of getting skin cancer.

Many persuasion theories in the past have concentrated on some aspect of information processing, while others have focused on cognitive response. This suggests that thoughts generated during message processing can determine attitude change (Eagly & Chaiken, 1993). Emotions can influence information processing and are, in part, made up of cognitive appraisals, suggesting that the experience of emotion is associated with individuals' appraisal of their environment (Smith & Ellsworth, 1985). For example, fear is associated with cognitive appraisals of uncertainty, unpleasantness, and low levels of individual control. This leads an individual to perceive negative events as unpredictable and under situational control rather than their own, ultimately resulting in high perceptions of risk (Lerner et al., 2015).

Emotion has been intertwined with persuasion since the days of Aristotle. Classical orators argued that manipulations of emotions like anger, despair, and compassion could effectively sway opinions (Destano et al., 2004). "A person who gained mastery both in the evocation of emotion and in the emotional framing of argumentation was believed to be among the most successful practitioners of persuasion (Cicero, *De Oratore*, trans. 2001; Kennedy, 1994). However, the timeline for empirical research is shorter. Many studies have focused on the roles that affective states have played in persuasion (e.g., Eagly & Chaiken, 1993; McGuire, 1969, 1985; Petty et al., 2001; Petty &Wegener, 1998).

2.2 EMOTION

Before discussing how emotions can affect persuasion, it is necessary to develop a proper definition. The term affect is often used as an umbrella for several mental processes including emotions, moods, and feelings. In order to understand the construct of emotions, it's important to contrast them with moods. Moods are low intensity, protracted affective states (Cohen, Pham, & Andrade, 2008). These valenced constructs allow people to feel good or bad yet unable to identify the target of their mood (Cohen, Pham, & Andrade, 2008). Positive moods consist of physiological activation and feelings of pleasantness while negative moods are made up of a physiological activation and feelings of unpleasantness (Watson & Tellegen, 1985).

Emotions are a distinct construct from moods. They are internal mental states that are valenced evaluations of a situation or object. They are typically viewed as short-lived, intense, and directed at external stimuli (Nabi, 2015). They are made up of five components: a cognitive appraisal or evaluation of a situation or event, a physiological component (arousal), a motor expression, a motivational component (behavioral intention or sense of readiness), and a subjective feeling state (Scherer, 1984).

Although this presents a general definition of emotions, they can be further classified into schools of thought. Most extant research focuses on one of two models of emotion: dimensional or discrete. It can be argued that dimensional emotions are a more simplified view while discrete emotions are more nuanced, however they are both important lenses through which emotions can be studied. What follows is a discussion of each category of emotion.

2.3 DIMENSIONAL EMOTIONS

The dimensional model is a more generalized way of looking at emotions that categorizes them into two dimensions of emotional response: valence (positive and negative) and arousal (high and low; Nabi, 2010). Valence and arousal can be defined as subjective experiences (Russell, 1989). Valence is the extent to which an individual involves pleasantness or unpleasantness into their conscious affective experience and arousal is the extent an individual incorporates subjective experiences of arousal into their conscious affective experience (Barrett, 1998).

Research using this model looks at the degree to which different valences, different levels of arousal, or a combination of the two affect reactions to stimuli (Nabi, 2010). For example, valence and arousal response studies have been used to study the anxiety-depression relationship. Feldman (1995) showed that the valence and arousal focus are related to the correlation between ratings of anxious and depressed moods. In this case, subjects reported anxious moods (arousal) whenever they experienced depressed moods (valence), and vice versa (Feldman, 1995). Morris et al., (2002) found that using dimensional emotions was a more successful mechanism for predicting conative attitudes such as brand interest and purchase intention compared to cognitive measures. Research in the context of social marketing and advertising communication used a dimensional emotional approach to show that college students had positive emotional responses toward social marketing and advertising communications that their peers shared compared to those that were promoted directly by marketers (Morris, Choi, & Ju, 2016).

Although providing valuable insights, taking such a broad view of emotion by viewing it through only positive and negative dimensions can cause researchers to miss potential influences of specific emotions (Destano et al., 2004). It represents what some might consider a gross oversimplification of emotional experiences and distinctions between negative emotions such as sadness and anger, and positive emotions like joy and hope can be lost (Destano et al, 2004).

2.4 DISCRETE EMOTIONS

Destano et al. (2004) felt that using only a dimensional approach diminished the ability to distinguish between negative emotions, such as anger and sadness, and positive emotions, like hope and joy. One can take the view that a primary purpose of emotions is to generate adaptive responses to specific situational evaluations through different mental processing, motivations and physiologies (Damasio, 1994; Frijda, 1986; Herrald & Tomaka, 2002, Keltner & Gross, 1999; LeDoux & Phelps, 2000; Schwarz & Clore, 1996). With this view, it makes sense that specific emotions might exert a distinct influence on these events that is not acquired when examined via a less complex positive-negative dichotomy. In other words, different emotions should exert different influences on cognitive and motivational processes (cf. Frijda, 1986; Keltner & Gross, 1999).

These specific emotions are referred to as discrete emotions. Discrete emotions are a more complex model of emotions. They are essentially categorical states of emotions (Nabi, 2010). They are based on cognitive appraisals of situations (Winterich et al., 2010). A cognitive appraisal is a method of cognitive meaning making that elicits an emotion across a series of six dimensions: control, attentional activity, pleasantness,

anticipated effort, certainty, and self/other responsibility (agency, Smith & Ellsworth, 1985).

As Desteno et al. (2004) discussed, there are a variety of reasons that researchers might choose to focus on discrete emotions as opposed to just a dimensional approach. Complex phenomena require complex theorizing. Human action and thought are complicated constructs, and the dimensional model might not be sophisticated enough to completely explain the communication process. Discrete emotions are more robust. In fact, as a part of their process, they already measure valence and arousal responses (Nabi, 2010). However, they also add more nuance that allows us to understand human behavior more fully (Nabi, 2010). Researchers are able to observe different behaviors across those dimensions mentioned above which helps them to understand and predict the onsets and outcomes of different emotional experiences, a characteristic not necessarily shared by a dimensional only approach (Nabi 2010).

Advertising research has often focused on discrete emotions and their influence on ad related outcomes. For instance, fear and guilt are discrete emotions that are often studied within advertising contexts. In fear research, an advertisement triggers a fear response and then often depicts a way to assuage that fear (i.e. a gain frame). For example, Rossiter and Thornton (2004) found that anti-speeding TV commercials that contained a fear appeal coupled with relief (e.g. a driver forced to stop suddenly before hitting a child who had chased a ball into the road) was more effective in reducing speeding compared to an ad that only contains fear without relief (e.g. a female driver at the scene of a car accident that she caused which resulted in the death of her best friend).

One such way that researchers have predicted outcomes of emotional experiences is by drawing on appraisal theories of emotion (Winterich et al., 2010). One appraisal theory of emotion that is particularly pertinent to this dissertation is the appraisal-tendency framework (ATF; Lerner & Keltner 2001; Lerner & Tiedens, 2006), which posits that emotions elicit implicit cognitive predispositions that cause individuals to appraise future events that are in line with the cognitive appraisals that characterize specific emotions. The ATF relies on two theoretical assumptions. First, it assumes that emotions are characterized by cognitive appraisals (Winterich et al., 2010). This is in line with other appraisal theories of emotion which say that emotions and the cognitive appraisal of a situation are correlated such that each particular emotion is defined by a specific pattern of cognitive appraisal (Ellsworth & Scherer, 2003; Lazarus, 1991; Roseman, 1984; Smith & Ellsworth, 1985; Weinter Graham, & Chandler, 1982). For example, if an individual appraises a negative event, such as a tree falling on someone's house, to be caused by other individuals (e.g., careless tree company employee) the individual will experience anger. However, if that individual appraises that negative event to be controlled by the situation (a severe storm), the individual will experience sadness. Lerner and Keltner (2000) draw mostly on the dimensions outlined by Smith and Ellsworth (1985) to make predictions about the influences of certain emotions on judgement. In the case of anger, the emotion arises from appraisals of other-responsibility for negative events, individual control, and a sense of certainty about what transpired (Averill, 1983; Betancourt & Blair, 1992; Smith & Ellworth, 1985; Weinter et al., 1982).

The second theoretical assumption is that cognitive appraisals not only elicit specific emotions, but also shape assessments of later, unrelated situations which

subsequently guide behaviors (Neumann, 2000: Roseman & Evdokas, 2004). According to the ATF, emotions can elicit implicit cognitive predispositions to appraise future events that correspond to the central appraisals characterizing that particular experienced emotion (Winterich, et al., 2010). These are referred to as "appraisal tendencies," which influence judgement of subsequent events even when they are unrelated to the emotion evoking event (Keltner et al., 1993; Lerner & Keltner, 2001; Lerner et al., 2004; Tiedens & Linton, 2001). Lerner and Keltner (2000) developed the concept of appraisal tendencies based on the idea that specific emotions are defined by a set of central dimensions and that specific emotion directs cognition to address specific problems. In the case of anger, the cognitive appraisals of certainty and human control lead to an appraisal tendency to perceive negative events as predictable, under human control, and brought about by others. The resulting effect is that an angry person perceives lower levels of risk and therefore might make riskier judgments after an anger inducing event (Lerner & Keltner, 2000; Winterich, et al., 2010). Winterich et al. (2010) highlight the distinction between cognitive appraisals which occur first and refer to thoughts stimulated by specific events that result in specific emotions and appraisal tendencies which occur only after an emotion occurs.

Other discrete emotions have not been studied as much as anger. As mentioned, Destano et al. (2004) believes a discrete emotion approach can help show the subtle differences between positive emotions such as joy and hope. These two emotions, along with a commonly experienced negative emotion such as sadness, have action tendencies that work well together. Joy can be considered synonymous with humor.

This dissertation will focus on three discrete emotions: humor, sadness, and hope. Humor is the positive emotion of amusement, the appraisal that something is funny, and the tendency to laugh (Gervais & Wilson, 2005: Martin, 2007; McGraw & Warren, 2010). Sadness is the feeling of loss, physical or psychological pain, and failure (Izard, 1977; Lazarus, 1991; Plutchik, 1980; Tomkins, 1963). Hope is the desire for relief from a negative situation or a desire for a positive outcome (Lazarus, 1991).

2.5 MIXED EMOTIONS

Now that there has been a discussion about discrete emotions and the way their cognitive appraisals and accompanying appraisal tendencies influence behavior, it is important to discuss the concept of mixed emotions as a way to determine if emotional flow is an effective way to influence behaviors. Larsen and McGraw (2014) broadly define mixed emotions as the co-occurrence of positive and negative affect.

Oceja and Carrera (2009) outline four patterns of mixed emotions using their Analogical Emotional Scale. The sequential pattern occurs when one emotion appears first and is then replaced by a second emotion. The prevalence pattern involves two emotions occurring at the same time, but one emotion is of a higher intensity compared to the other. The inverse pattern happens when two emotions evolve in a way that as one emotion increases, a second decreases. High simultaneous patterns come about when both emotions are moderate or high in intensity and run a simultaneous course (Oceja & Carrera, 2009). Other research has looked at mixed emotions in the context of these patterns. This dissertation focuses on the sequential pattern as each discrete emotion is subsequently replaced by another discrete emotion.

Cacioppo and Berntson (1994) developed the evaluative space model which says that positive emotions elicit appetitive or approach motivational behaviors and negative emotions elicit aversive or avoidance motivational behaviors. Not only this, but they are separable and can exist independently (Cacioppo & Berntson, 1994). The core of this argument relies on two independent motivation systems (Cacioppo & Gardner, 1999): the appetitive (approach) system and the aversive (avoidance) system (Lang et al., 1997). The appetitive system responds automatically to positive stimuli and is a driving force behind approach behavior in the environment (Keene & Lang, 2016). The aversive system responds automatically to potential threats in the environment through quick, automatic defensive behaviors, as well as motivating complex behaviors such as fight and flight (Keene & Lang, 2016). Additionally, the aversive system can motivate unpleasant emotional reactions like moral or physical disgust (Clayton et al., 2017; Lang & Yegiyan, 2011). Importantly, messages that elicit activation in both motivational systems (coactivation) lead to higher attention, better memory, and low arousal response (Lang et al., 2013; Keene & Lang, 2016). Eckler and Bolls (2011) showed that coactivation can result in better attitudes toward specific advertisements and increased likelihood to share as opposed to strictly unpleasant messages.

To test the evaluative space model, Larsen et al. (2001) surveyed people coming out of a movie, *Life is Beautiful.* The movie is about a father distracting his son with games and fun so the son would not understand the horrors of the concentration camp they lived in during the holocaust. After the movie, people reported feeling both happy and sad. Although different situations, Larsen et al. (2001) found similar feelings when surveying students who were moving out of their dorm rooms at the end of a school year

as well as students graduating from college. They felt both happy and sad compared to students in more typical situations.

Williams and Aaker (2002) examined the experience of conflicting emotions to understand the impact mixed emotions can have on persuasive outcomes and why these specific outcomes might arise. Individuals that showed a lower propensity to accept duality had more negative attitudes toward mixed emotional appeals as opposed to those that were more comfortable with the mixed appeals (Williams and Aaker, 2002). Negative attitudes did not result from individuals focusing on negative emotions elicited from the stimuli. Rather, Williams and Aaker (2002) found that discomfort influenced attitudes and mixed emotional messages. Their results showed that mixed emotional appeals led to higher levels of discomfort for those with that lower propensity to accept duality compared to those with a higher propensity (Williams & Aaker, 2002).

2.6 EMOTIONAL FLOW

More and more we are seeing messages with different emotional cues within them. By adopting Oceja and Carrera's (2009) sequential pattern of mixed emotions, emotional flow is conceptualized to explicate how emotions evolve in response to changing content within a message. In her study examining persuasive health messages, Nabi (2015) defines emotional flow as "the evolution of the emotional experience during exposure to a health message, marked by one or more emotional shifts" (p. 117). Those shifts can include negative to positive, positive to negative, or of a negative or positive emotional state to one of the same valence (e.g. fear to anger; Nabi 2015). Nabi's (2015) emotional flow is more concerned about the flow of one emotion to another within one single message illustrating the sequential pattern of mixed emotions proposed by Oceja

and Carrera (2009) as opposed to much of the other mixed emotions research which looked at emotions within the context of separate messages.

The idea itself is not novel. In their study on "inhibitory" versus "anticipatory" fear, Leventhal and Trembly (1968) found that fear appeals elicited disgust in addition to fear. Dillard et al. (1996) asked about several discrete emotions (anger, fear, sadness, happiness, surprise, and puzzlement) in a study examining public service announcements (PSAs) about AIDS. Findings showed that 28 out of the 31 PSAs induced at least two emotions and 16 evoked three emotions (Dillard et al., 1996). O'Keefe (2002) found that anger might be a consequence of guilt and humor is often involved with a variety of other emotions including surprise, disgust, and guilt (Caterina & Incasa, 2010; Weems, 2014; Hemenover & Schimmack, 2007). The above-mentioned studies looked at emotions as offshoots of the persuasion process, or at the very least incidental. The emotional flow concept is novel in the sense that emotions can ideally be intentionally generated in a specific sequence as a way to evoke specific attitudes and behaviors (Nabi, 2015). The sequencing is especially important to our understanding of how discrete emotions work together to reach persuasive goals which ultimately helps in message design (Nabi, 2015).

There is a dearth of literature regarding the persuasive effects of emotional shifts contained within single messages. However, some research has found that shifts from a negative to positive state and from a positive to negative state outperformed single valenced messages specifically in the context of avoiding excessive drinking (Carrera et al., 2008; Carrera et al., 2010). The studies argue that the emotional shift's message had

greater influence due to a reduction in defensive processing and increase perceptions of self-efficacy specifically in negative-positive shifts.

Emotional flow is an important concept because it helps flesh out a univalenced view of emotional research. Witte (1992) showed that in fear appeals research, a threat is shown followed by some sort of efficacy information. The univalenced approach considers the weighting of the threat and efficacy information together in order to judge the success of the fear appeal (Rogers, 1983; Witte, 1992). However, an emotional flow approach would look at those as two different constructs. A threat could cause fear but then efficacy could lead to hope or relief which would then have its own action tendency (Nabi, 2015). In a similar vein, Fitzgerald et al. (2019) examined the efficacy of restorative narratives, stories that share experiences of hope and resilience at the end of a threat appeal and found that these restorative narratives may promote greater prosocial behavior compared to narratives that only focus on negative outcomes (i.e., threat messages).

In a theoretical paper proposing emotional flow, Nabi (2015) suggests that a flow of humor-sadness-hope can be an effective persuasive device since humor promotes attention to the message, sadness with its negative valence promotes deeper message processing, and hope motivates individuals to act. The purpose of this dissertation is to empirically test this specific sequential emotional pattern within the confines of a single message. Most importantly, in order to better understand the unique effects of this specific emotional flow, this dissertation compares its effects on key dependent variables with two control groups of differing emotional flows: humor-sadness and humor-sadness-

neutral conditions. What follows is a more detailed discussion of each specific discrete emotion contained in this particular emotional flow.

Humor is an emotion that has received a great deal of attention in advertising research and is used extensively to promote positive responses to advertising messages (Markiewicz, 1974; Strick et al., 2009). Humor has shown a propensity for increasing message attention and producing positive affect and was also found to increase ad liking, brand liking, and purchase intention (Eisand, 2009, 2011; Gulas & Weinberger, 2006). Humor is attention-getting and pleasant and there is evidence that it provokes deeper message processing (Nabi et al., 2007; Young, 2008).

Izard (1977) says sadness, or distress, is arguably the most commonly experienced negative emotion. The emotion results from feelings of irrevocable loss, physical or psychological pain, and failure to achieve a goal (Izard, 1977; Lazarus, 1991; Plutchik, 1980; Tomkins, 1963). The action tendency of sadness can cause someone to enter a state of inaction or withdrawal to find comfort or think about loss (Frijda, 1986; Lazarus, 1991; Roseman et al., 1994). Izard (1993) says that sadness can slow down both cognitive and motor systems. This can help individuals deal with stress by relying on others and maintain social bonds (Izard, 1977). Sadness also motivates problem solving by causing people to focus on details that might lead to possible solutions to problems (Izard, 1977, 1993). Nabi (2015) concurs by saying that sadness is associated with deeper thinking and greater elaboration on problems or situations. This is supported by Affect-As-Information Theory which posits that people rely on current feelings as a heuristic to make complex judgements as long as those feelings are relevant to the object of judgement. Negative affect lets individuals know something may be wrong which

encourages detailed attention and processing so that they may rectify the situation (Clore, 1992; Schwarz, 1990; Schwarz & Clore, 1983). Additionally, negative affective valence sometimes signals that a person's knowledge, expectations, and inclinations are inadequate and thus lead to detailed, or systematic, processing (Clore & Storbeck, 2006; Schwarz & Clore, 1996).

Hope is the feeling of "wishing and yearning for relief from a negative situation, or for the realization of a positive outcome when the odds do not greatly favor it" (Lazarus, 1991, p. 282). Lazarus (1991) views hope as an antidote to despair and in the context of this dissertation, sadness. Other researchers characterize hope as an expectation that a desired goal will be attained (Averill et al., 1990; Bruininks & Malle, 2005; Farran et al., 1995; McGeer, 2004; Pettit, 2004; Stotland, 1969). Appeals in which threatening or negative information is followed by efficacy information could feasibly generate hope (Nabi, 2015). Likewise, Fitzgerald et al. (2019) argue that stories that highlight hope may be more influential compared to those that only focus on negative trajectories, due in part to their themes of resilience and strength.

Snyder (1994) posits that hope has an appraisal tendency of executing the means to attain desired goals (agency thinking). Snyder (2000) further articulated that self-efficacy indicates that one can perform a behavior while hope indicates that a person wants to do a behavior. Nabi (2015) points out that self-efficacy information can generate positive health behavior due to generating feelings of hope. Prestin (2013) shows that self-efficacy is not the only way to do so and that offering inspirational stories may also serve as a way to generate hope.

2.7 AROUSAL

Nabi (2015) described the concept of emotional flow as suggesting that unique sets of information are revealed within a persuasive message. As these elements are revealed, emotional responses shift which can help explain the success of the message. These shifts can enhance persuasion for two reasons. First, individual emotions have specific unique effects on message processing depth and action tendencies (Nabi et al, 2018). Second, physiological arousal plays a very strong role in emotional experiences and emotions in one part of a message can influence emotional intensity in subsequent parts of the message (Nabi et al, 2018; Nabi & Myrick, 2018).

According to Excitation Transfer Theory, physiological arousal associated with emotional experiences takes longer to dissipate than associated cognitions (Zillman, 1983). If one stimulus produces an arousal response and a second stimulus is presented close to the first and is also arousing, the two sources may combine to produce more intense arousal responses (Zillman, 1983). “If one is aroused physiologically, one’s emotional response to subsequent events is likely to be more intense” (Nabi, 2018, 446). In this dissertation, the emotional response of arousal is measured by both physiological arousal and self-report arousal. Specifically, physiological arousal is measured through galvanic skin response (GSR). Second, self-report arousal is measured with AdSAM scale (Morris et al., 2005).

As stated above, a flow containing two emotions could generate more arousal response than a message that contains just a single emotion. For example, a message containing humor-sadness flow should be more arousing than a message that is only sad. Building upon that, because physiological arousal and emotions are correlated, adding a

third discrete emotion to the flow should influence the intensity of emotions further (Nabi, 2018; Nabi & Myrick, 2018; Zillman, 1983). Once a stimulus that produces an arousal response is combined with another, they can potentially act together for a more intense arousal response (Zillman, 1983). Adding the third emotion to the flow, in this case hope, should cause even more intensity in physiological arousal compared to other emotional flows.

To possibly clarify the effect that adding a third discrete emotion to the emotional flow has on arousal, it makes sense to include an emotional flow condition with a neutral portion in place of hope. By including a neutral segment instead of a third emotion in the flow, excitation transfer can essentially be tested to see if it is the emotion that is transferring arousal or the length of the entire flow. Again, using both psychophysiological and the self-report arousal, the following hypotheses are proposed:

H1: The humor-sadness-hope emotional flow will have a higher number of GSR peaks than the humor-sadness and humor-sadness-neutral flows.

H2: The humor-sadness-hope emotional flow will have higher levels of self-reported arousal response than the humor-sadness and humor-sadness-neutral emotional flows.

Arousal can enhance both positive and negative emotions in a way that someone who is experiencing a positive emotion will find even more feelings of pleasantness when arousal response is high and less when arousal response is low (Horney, 2013). Emotional flow suggests that people can experience unique emotions in sequence. As the message continues to play, the flow of separate emotions builds and later emotional responses can be stronger than they otherwise might have been if experienced separately

(Nabi, 2018). Emotional responses, such as arousal, have been shown in advertising literature to mediate the relationship between advertising content and attitudes and behaviors (e.g. Edell & Burke, 1987; Holbrook & Batra, 1987). It is likely that physiological arousal plays a mediating role in the attitudes and behavior measures. The following hypotheses are proposed:

H3: Physiological arousal response (as measured by average number of peaks) will mediate the relationship between the different emotional flows and a) message engagement, b) attitudes toward the video, c) risk perceptions, and d) information seeking.

H4: Arousal response, as measured by the PAD scale, will mediate the relationship between the different emotional flows and a) message engagement, b) attitudes toward the video, c) risk perceptions, and d) information seeking.

2.8 EXPRESSED VALENCE

Humor is a discrete emotion with positive valence. Research shows that it can produce both positive affect as well as increase ad attitude (Eisand, 2009; Gulas & Weinberger, 2006). Sadness can result from feelings of loss and pain, as well as failure to achieve a goal (Izard, 1977; Lazarus, 1991; Plutchik, 1980; Tomkins, 1963). The action tendency of sadness can cause someone to enter a state of inaction or withdrawal (Frijda, 1986; Lazarus, 1991; Roeseman et al., 1994). Like humor, hope is a positively valenced emotion, an antidote to sadness (Lazarus, 1991).

Mood Management Theory (MMT) argues that emotions are driven by hedonic motivations to keep positive feelings and alter negative emotions into more favorable ones (Zillman, 1988). Though the focus of this dissertation is not about mood but rather

emotion, valence response is an important part of both. It is logical that when viewing a stimulus that elicits a positive emotion, an individual would want to keep the positive valence response when confronted with a negative emotion. Mood Management Theory and Excitation Transfer Theory (Zillman, 1983, 1988) would predict that the humor-sadness-hope sequence would create a positive valence response. From an MMT standpoint, since individuals prefer more positive-valenced states, ending the sequence on a positive emotion should create that positive state. Additionally, the literature on restorative narratives, which highlight hope and resilience, have shown to be successful in persuasive efforts, particularly in health and prosocial endeavors (Fitzgerald, et al., 2019). By ending on a positive emotion and with that positive emotion being one of hope, the thought is that participants may have more positive emotional responses.

In addition to measuring physiological arousal in real-time, this dissertation also adopts facial expression analysis to track the level of positive emotions expressed throughout the process of message exposure. Second-by-second emotional valence response activity is recorded using a web camera combined with software that measures a combination of facial actions (McDuff et al., 2016). The coding is built on the AFFECTIVA emotional facial action coding system using a sale of 0 (absent) to 100 (present). Scores that are higher than 50% are the threshold for deciding the predominant emotion present (Bellman et al., 2017; McDuff et al. 2016). Self-report valence response is measured using the AdSAM scale. For the dimension of valence, or pleasure, participants choose one of a series of graphic characters that range from very positive to very negative feelings (Morris, 2019).

H5: The humor-sadness-hope emotional flow will have higher positive emotional expression than the humor-sadness and humor-sadness-neutral emotional flows.

H6: The humor-sadness-hope emotional flow will have higher self-reported pleasure scores than the humor-sadness and humor-sadness-neutral emotional flows.

2.9 DEPENDENT VARIABLES

As two important dimensions of emotional response, arousal and valence can manifest themselves to influence perceptual and attitudinal responses (Nabi, 2002). For example, humor can have positive effects on ad attitude (Eisand, 2009; Gulas & Weinberger, 2006). Fazio et al. (1986) proposed the Affect Priming Theory which posits attitudes can be activated based on exposure to attitude objects. In other words, if an individual feels positive, they are primed to feel more positive thoughts and conversely, if they are in a negative emotional state, their thoughts will be more negative. Based on Fazio et al.'s (1986) Affect Priming Theory and Excitation Transfer Theory (Zillman, 1988), the fact that the humor-sadness-hope flow begins and ends with positive emotions, and the intensity of those emotions can build through the flow, that positive frame should carry over to attitudes about the video as well. The point of emotional flow is to strategically structure the appeals that evoke the emotions in a sequence that facilitates that persuasive process (Nabi, 2015). In the case of this dissertation, that includes capturing attention, promoting deeper message processing, and promoting behaviors. As such, in addition to attitude, the following dependent variables are tested.

Perceived risk is the belief that one is vulnerable to a particular disease and can also be seen as a predictor of self-protective behavior (Rimal & Real, 2003). According

to Wilson (2000), information seeking is the purposeful act of seeking information in order to satisfy a need or meet a specific goal. Online engagement such as viral behaviors like likes, clicks, views, and shares, have been used as metrics to measure the success of online advertising campaigns (Association of National Advertisers, 2014). Cognitively or affectively engaging with a brand (e.g., commenting on a post) is one level of engagement while advocating for a brand (e.g., liking or sharing a YouTube video) represents an even deeper investment with a brand (Gavilanes, Flatten, & Brettel, 2018). With greater attention, message processing, and positive health behaviors that humor, sadness, and hope are associated with, coupled with the increasing intensity of emotions through the emotional flow progression, the following hypothesis proposed:

> **H7:** People who watch the humor-sadness-hope emotional flow will have a) more positive attitudes toward the video, b) higher risk perceptions, and c) higher information seeking, and d) higher message engagement than those that watch the humor-sadness and humor-sadness-neutral flows.

CHAPTER 3

METHODOLOGY

3.1 STUDY DESIGN

This study employed a three-condition between-subject experimental design (3: humor-sadness-hope vs. humor-sadness vs. humor-sadness-neutral). The University Human Subjects Review Board approved all of the study procedures and protocols.

3.2 STUDY PARTICIPANTS

The study utilized the biometrics laboratory on the campus of the University of South Carolina, so participants were students from the school. Participants were recruited from across campus by contacting instructors of various courses in order to enlist students. Students were able to sign up for the study and participate for credit in their respective classes or a $10 Amazon gift card. Covid protocols required participants to wear a mask inside the lab until the researcher left the room and the experiment began.

Based on a power analysis using G* Power software, a single factor experiment with three conditions yielding a large effect size ($f = 0.4$) and power of .8 suggested a total sample size of 52. As such, the study was able to secure 52 participants. The sample size in this dissertation was limited by the COVID restrictions and protocols that were in place while this research was conducted.

3.3 STIMULI DEVELOPMENT

The study used the video *Dear 16-Year-Old Me,* a public service announcement featuring individuals speaking to the camera about experiences with melanoma. The first segment of the video includes bits of humorous advice to their 16-year-old selves such as "There will be a new set of Star Wars movies coming out. Do not watch them, they ruin everything." The video then proceeds to focus on the symptoms of melanoma and the sadness that accompanies losing someone from melanoma. The video concludes with ways of preventing melanoma and treatments that provide hope to those who view it.

3.4 PRETEST

To test for elicitation of the three specific emotions, the *Dear 16-Year-Old Me* PSA was divided into four separate segments: humor, sadness, hope, and neutral. A pretest (N = 75) was conducted among a group of *MTurk* participants who did not take part in the main experiment in order to assess the manipulation of the individual video segments. Each participant watched the respective segments in a random order and then answered several questions to indicate how the videos made them feel. A series of within-subject ANOVAs were conducted to test that each individual segment elicited the appropriate emotion. The humor video received the highest score on the humor scale (M = 4.96, SD = 1.33, F (3, 300) = 7.41, $p < .001$, $\eta_p^2 = .07$) compared to sadness (M = 3.9, SD = 1.66) and hope (M = 4.31, SD = 1.33). The sadness video received the highest score on the sadness scale (M = 4.75, SD = 1.55, F (3, 300) = 7.83, $p < .001$, $\eta_p^2 = .07$) compared to humor (M = 3.56, SD = 1.75) and hope (M = 3.76, SD = 1.60). The hope video received the highest score on the hope scale (M = 5.42, SD = 1.14, F (3, 300) = 3.73, $p < .001$, $\eta_p^2 = .04$) compared to sadness (M = 4.85, SD = 1.50). There was not a

significant difference at the $p < .05$ level between hope and humor in the hope video. This was not a concern though because they are both positively valanced emotions. There was not a significant difference at the $p < .05$ level between humor, hope, or sadness in the neutral video, which was the desired outcome as the neutral video was not meant to elicit any strong emotional response. Thus, all segments were successful.

To create the humor-sadness emotional flow, the video played the humor and sad clips combined and ran for 1:48. The humor-sadness-hope flow was a combination of the three clips and ran for 3:20. The humor-sadness-neutral flow consisted of the humor and sadness clips combined with a portion of the neutral informational video listing causes of melanoma. There was a transition between the sadness and neutral portion of the video that was a black screen containing the words "here are some causes of melanoma." This video ran for 3:28. The difference in time from the humor-sadness-hope and humor-sadness-neutral was due to the location of a natural cut-off point. For the neutral portion of the video, an informative clip about melanoma was chosen as opposed to a random neutral clip so it would relate to the subject matter of the entire video.

3.5 EXPERIMENTAL PROCEDURE

The experiment was conducted in the biometric lab located on the campus of the University of South Carolina in Columbia, South Carolina. Participants were welcomed to the lab by a researcher. After giving their permission, they were introduced to the biometric laboratory. Physiological arousal response was recorded using a GSR device from Shimmer Sensing and the iMotions biometric research platform. Skin conductance was measured using two Ag/AgCl surface electrodes. The electrodes were placed on the palmar surface of the middle finger and the index finger of each participant's

nondominant hand with Velcro straps. The unconscious valence response was assessed using iMotions software which operated via a digital camera, placed on top of the computer monitor.

Participants were randomly assigned to one of the three emotional flow videos. During the experiment, biometric data was recorded in real time while participants watched the video associated with their experimental treatment condition. After viewing the video, all participants completed a questionnaire containing the self-reported dependent measures of emotions, attitudes and behavioral intentions.

3.6 DEPENDENT MEASURES

Skin conductance. To measure arousal response, a base level was first taken by measuring the amplitude of peaks in arousal between the participants putting on the sensors and the beginning of the experiment (viewing of the video). Physiological arousal response was then measured as the number of peaks that exceed the amplitude of the base arousal level (Langner, Schmidt, & Fischer, 2015). The spikes in arousal that exceed the baseline were tallied for each participant via the software. Measuring peak amplitudes that exceed baseline amplitude has been shown to provide valid, reliable, and objective measures of physiological arousal response (Boucsein, 2012; Fox et al., 2018).

Observed facial valence. Valence as a facial response was measured via the digital camera in front of the participant that obtained biometric data through automatic sensors that measure facial muscle movement and the resulting expressions (Smith & Rose, 2019). The iMotions software then matches facial expressions to their respective emotional profiles (Ekman & Friesen, 1978). Using the iMotions Facial Expression Analysis Module, a webcam synchronizes facial emotions expressed with stimuli in real-

time (Gonzalez-Rodriguez et al., 2020). 20 facial-expression measures (action units), such as cheek rise (indicating smile) and eyebrow furrow (indicating frustration), are analyzed, as well as the expression of seven core emotions: joy, anger, fear, disgust, contempt, sadness, and surprise. Values on the expected emotion are then provided by the software (Gonzales-Rodriguez et al., 2020). Second-by-second facial activity is measured on a scale from 0 to 100% indicating the likelihood of the expression of such activity.

PAD. Self-reported measures for emotional response were collected using the Advertising Self-Assessment Manikin (AdSAM, Morris et al., 1994). AdSAM visually assesses the pleasure, arousal, and dominance dimensions via a graphic character placed along a continuous nine-point scale (Morris, 2019). The first row includes the pleasure scale, and the figures range from a smiling happy face to a frowning unhappy face. The second row is the arousal scale and includes figures which range from extremely calm with eyes closed to excited figures with open eyes and raised eyebrows. The dominance scale represents changes in control via changes in size of the manikins from a large figure to small figure indicating levels of control (Morris, 2019). Again, the emotional response measures are conceptualized as two-dimensional and only focuses on the pleasure and arousal dimensions of the PAD scale.

Attitude. Attitude toward the public service announcement was measured with four items on a seven-point scale based on previous research examining issue involvement (Maheswaran & Meyers-Levy, 1990). The items measured included useful/extremely useful, favorable/extremely unfavorable, extremely bad idea/good idea, and not at all important/very important. The items were averaged to form a single reliable index (M = 5.61, SD = 0.98, Cronbach's α = .88).

Perceived Risk. Perceived risk was assessed based on scales adapted from health communication research (Pepper et al., 2015; Wong & Capella, 2009). Perceived risk of melanoma was based on four items on a seven-point scale. Items included what participants thought the likelihood that sun exposure would cause them to develop melanoma, whether they worried about health risks of sun exposure, whether they think about the health risks of sun exposure, and whether they feel afraid about developing melanoma. The items were averaged to form a single reliable index (M = 5.41, SD = 1.48, Cronbach's α = .79).

Information Seeking. Information seeking was measured using two statements adapted from Griffin et al. (2008) on a seven-point scale. Those statements read "When it comes to the topic of melanoma, I am likely to go out of my way to get more information" and "When the topic of melanoma comes up, I will try to learn more about it." The items were averaged to form a single reliable index (M = 4.32, SD = 1.76, Spearman-Brown α = .80).

Message Engagement. Message engagement was measured using three statements on a seven-point scale. Those statements, based on research from Alhabash et al. (2015) were "If I see this ad on YouTube, I would 'like' it on YouTube," "If I see this ad on YouTube, I would share it with my friends," and "If I see this ad on YouTube, I would comment on it on YouTube." The items were averaged to form a single reliable index (M = 3.54, SD = 1.67, Cronbach's α = .74).

3.7 COVARIATES

Concern for Developing Melanoma. Although most people are exposed to sun in some way, that does not necessarily mean that they are at risk for developing

melanoma. However, it is important to control for possible concerns for developing melanoma due to sun exposure. Adapted from research by Sherman et al. (2000), participants were asked, "how concerned are you that you have not taken enough precautions to protect yourself from melanoma." The question was asked on a seven-point scale.

Issue Relevance. Issue relevance was measured using three statements on a seven-point scale adapted from previous research (Morris, Choi, & Chu, 2016). These statements were "Melanoma related to my personal interests," "Melanoma is related to me," and "Melanoma is of concern to me." The items were averaged to form a single reliable index (M = 5.03, SD = 1.68, Cronbach's α = .90).

Credibility. Credibility was measured using two statements on a seven-point scale adapted from previous research (Nan, 2013). The statements were "In my view, the video contains credible information about melanoma," and "In my view, the video about melanoma is trustworthy." The items were averaged to form a single reliable index (M = 6.14, SD = 1.11, Spearman-Brown α = .91).

Perceived Realism. Perceived realism was measured with three statements on a seven-point scale adapted from previous research (Zhang, 2015). These statements were "The video portrayed the dangers of melanoma accurately," "The video portrayed the dangers of melanoma realistically," and "The video portrayed the dangers of melanoma in a believable way." The items were averaged to form a single reliable index (M = 6.27, SD = .70, Cronbach's α = .86.

CHAPTER 4

RESULTS

4.1 MANIPULATION CHECK

Each individual emotion for each clip was examined during the pretest before combining them into their specific emotional flows. Hope is the main emotion that may differentiate responses in all three groups. Therefore, hope was used as the manipulation check to see how people perceived the entire emotional flow in each of the three conditions.

A one-way between-groups analysis of variance was conducted to determine if the humor-sadness-hope flow would have a significantly higher hope measure than the humor-sadness and humor-sadness-neutral flows. Participants were divided into three groups according to which emotional flow they viewed (Group 1: Humor-Sadness, Group 2: Humor-Sadness-Hope, Group 3: Humor-Sadness-Neutral). There was a statistically significant difference in the amount of hope felt in the humor-sadness-hope flow compared to the humor-sadness flow and humor-sadness-neutral flow (F (2, 49) = 6.71, p = .03, η_p^2 = .22). Post-hoc comparisons using the Tukey HSD test indicate that people had higher levels of hope when viewing the humor-sadness-hope emotional flow (M= 5.13, SE = .37) than those who viewed the humor-sadness-neutral (M = 3.75, SE = .27) emotional flow at the $p < .05$ level as well as the humor-sadness emotional flow (M = 4.25, SE = .26) but at a marginally significant level, p = .06. This can likely be attributed

to the small sample size. The humor-sadness-hope emotional flow successfully produced more hope in participants and the manipulations were successful.

4.2 HYPOTHESIS TESTING

Arousal. H1 stated that the humor-sadness-hope emotional flow would have a higher number of GSR peaks than the humor-sadness and humor-sadness-neutral emotional flows. To test for differences in number of GSR peaks, first a base arousal response was taken, measured as the amplitude of peaks from when participants first entered the lab until they began the experiment (Esmark Jones et al., 2019). Arousal response was then measured as the number of peaks that exceeded the amplitude of the initial base level (Langner et al., 2015). A one-way between-groups analysis of variance was conducted to determine if the humor-sadness-hope flow would have a higher number of GSR peaks than the humor-sadness and humor-sadness-neutral flows. Participants were divided into three groups according to which emotional flow they viewed (Group 1: Humor-Sadness, Group 2: Humor-Sadness-Hope, Group 3: Humor-Sadness-Neutral). There was no statistically significant difference at the $p < .05$ level in peak amplitude for the three different emotional flow sequences: $F\ (2, 49) = 0.51$, $p = .61$, $\eta_p^2 = .03$. Humor-Sadness ($M = 3.39$, SD = 2.85), Humor-Sadness-Hope ($M = 3.41$, SD = 3.30), Humor-Sadness-Neutral ($M = 3.53$, SD = 2.77). Therefore, H1 is not supported.

H2 proposed that the humor-sadness-hope emotional flow would have higher levels of self-reported arousal response than the humor-sadness and humor-sadness-neutral emotional flows. A one-way between-groups analysis of variance was conducted to determine if the humor-sadness-hope flow would have higher self-reported arousal response than the humor-sadness and humor-sadness-neutral flows. There was a

statistically significant difference at the $p < .05$ level in arousal level for the three different emotional flow sequences. F (2, 49) = 4.87, p = .01, η_p^2 = .17. Post-hoc comparisons using the Tukey HSD test indicate that people had higher levels of arousal when viewing the humor-sadness-hope emotional flow (M= 5.41, SE = .48) than those who viewed the humor-sadness (M = 4.06, SE =.31) or humor-sadness-neutral (M = 3.88, SE = .33) emotional flows. H2 is supported.

Mediation Analysis. To test for the mediation effects of physiological arousal, a multi-categorical mediation analysis with 5,000 bootstrapped samples specified in order to generate percentile-based 95% confidence intervals was conducted using Model 4 of the PROCESS macro for SPSS (Hayes, 2018). Emotional Flow Group was the independent variable. There were three different emotional flows so two dummy variables were created using the humor-sadness flow as the reference level (X_1 indicated the difference between humor-sadness and humor-sadness-hope and X_2 indicated the difference between humor-sadness and humor-sadness-neutral flows). Message engagement, attitude, risk perceptions, and information seeking were the dependent variables and average number of peaks was the mediator.

H3 predicted that physiological arousal response would mediate the relationship between the different emotional flows and a) message engagement, b) attitudes toward the video, c) risk perceptions, and d) information seeking. When considering the difference between the humor-sadness and humor-sadness-hope flow, the number of peaks did not mediate the relationship between emotional flow and message engagement, (point estimate = .06, SE_{boot} =.47, 95% CI = -.89 to 1.01). When considering the difference between the humor-sadness and humor-sadness-neutral flow, the number of

peaks did not mediate the relationship between emotional flow and message engagement (point estimate = .03 SE_{boot} =.47, 95% CI = -.92 to .98). H3a is not supported.

Results indicate that when considering the difference between the humor-sadness and humor-sadness-hope flow, the number of peaks did not mediate the relationship between emotional flow and attitude, (point estimate = .25, SE_{boot} = .25, 95% CI = -.26 to .76). When considering the difference between the humor-sadness and humor-sadness-neutral flow, the number of peaks did not mediate the relationship between emotional flow and attitude (point estimate = .29, SE_{boot} =.25, 95% CI = -.22 to .80). H3b is not supported

When considering the difference between the humor-sadness and humor-sadness-hope flow, the number of peaks did not mediate the relationship between emotional flow and risk perceptions, (point estimate = .04, SE_{boot} =.41, 95% CI = -.77 to .86). When considering the difference between the humor-sadness and humor-sadness-neutral flow, the number of peaks did not mediate the relationship between emotional flow and risk perceptions (point estimate = .36, SE_{boot} =.41, 95% CI = -.07 to .17). H3c is not supported.

When considering the difference between the humor-sadness and humor-sadness-hope flow, the number of peaks did not mediate the relationship between emotional flow and information seeking behavior, (point estimate = .56, SE_{boot} =.58, 95% CI = -.60 to 1.72). When considering the difference between the humor-sadness and humor-sadness-neutral flow, the number of peaks did not mediate the relationship between emotional flow and information seeking behavior (point estimate = .43, SE_{boot} =.58, 95% CI = -.73 to 1.60). H3d is not supported.

H4 stated that self-reported arousal response would mediate the relationship between the different emotional flows and a) message engagement, b) attitudes toward the video, c) risk perceptions, and d) information seeking behavior. To test for mediation effects of self-reported arousal, a multi-categorical mediation analysis with 5,000 bootstrapped samples was conducted using Model 4 of the PROCESS macro for SPSS (Hayes, 2018). Emotional Flow Group was again the independent variable using the same dummy codes. Message engagement, attitude, risk perceptions, and information seeking behavior were the dependent variables and the arousal score from the PAD scale was the mediator.

The mediation analysis indicates that when considering the difference between the humor-sadness and humor-sadness-hope flow, arousal response significantly mediates the relationship between emotional flow and message engagement (point estimate = -.34, SE_{boot} =.25, 95% CI = -.94 to -.003). In the humor-sadness-hope emotional flow, higher levels of arousal response led to lower message engagement. This relationship was entirely indirect as the direct path leading from X_1 and arousal response was not statistically significant (β = .28, SE = .49, 95% CI = -.70 to 1.26). Analysis indicates that when considering the difference between the humor-sadness and humor-sadness-neutral flow, arousal response did not mediate the relationship between emotional flow and message engagement (point estimate = -.15, SE_{boot} =.46, 95% CI = -1.07 to .78). H4a is supported.

Results of the mediation analysis indicate that when considering the difference between the humor-sadness and humor-sadness-hope flow, arousal response does not significantly mediate the relationship between emotional flow and attitude (point estimate

= .36, SE_{boot} = .26, 95% CI = -.17 to .88). When considering the relationship between the humor-sadness-hope emotional flow and the humor-sadness-neutral emotional flow, arousal response does not significantly mediate the relationship between emotional flow and attitude (point estimate = .21, SE_{boot} = .25, 95% CI = -.28 to .70). H4b is not supported.

Analysis shows that when considering the differences between the humor-sadness and humor-sadness-hope flow, arousal response significantly mediates the relationship between emotional flow and perceived risk (point estimate = -.29, SE_{boot} =.19, 95% CI = -.72 to -.01). In the humor-sadness-hope emotional flow, higher levels of arousal lead to lower risk perceptions. Once again, this relationship was entirely indirect as the direct path leading from X_1 and arousal response was not statistically significant (β = .25, SE = .41, 95% CI = -.58 to 1.08). When considering the difference between the humor-sadness and humor-sadness-neutral flow, arousal response did not mediate the relationship between emotional flow and perceived risk (point estimate = .25, SE_{boot} =.39, 95% CI = -.54 to 1.03). H4c is supported.

Results also indicate that when considering the difference between the humor-sadness and humor-sadness-hope flow, arousal response does not significantly mediate the relationship between emotional flow and information seeking (point estimate = .74, SE_{boot} = .60, 95% CI = -.47 to 1.95). When considering the relationship between the humor-sadness-hope emotional flow and the humor-sadness-neutral emotional flow, arousal response does not significantly mediate the relationship between emotional flow and information seeking (point estimate = .26, SE_{boot} = .57, 95% CI = -.88 to 1.40). H4d is not supported.

Valence. H5 stated that the humor-sadness-hope emotional flow would have higher positive emotional expression than the humor-sadness and humor-sadness-neutral emotional flows. A one-way between groups analysis of variance was conducted to determine if the humor-sadness-hope flow would have more positive valence response than the humor-sadness and humor-sadness-neutral sequences. There was no statistically significant difference at the $p < .05$ level in degree of positive valence response for the three different emotional flow sequences. F (2, 49) = 0.74, p = .49, η_p^2 = .03. Humor-Sadness (M = 53.94, SD = 75.83), Humor-Sadness-Hope (M = 57.35, SD = 131.83), Humor-Sadness-Neutral (M = 20.53, SD = 77.32). Therefore, H5 is not supported.

H6 proposed that the humor-sadness-hope would have higher self-reported pleasure scores than the humor-sadness and humor-sadness-neutral emotional flows. A one-way between groups analysis of variance was conducted to determine if the humor-sadness-hope flow would have more positive valence response than the humor-sadness and humor-sadness-neutral sequences. There was a statistically significant difference at the $p < .05$ level in pleasure level for the three different emotional flows. F (2, 49) = 3.88, p = .03, η_p^2 = .14. Post-hoc comparisons using the Tukey HSD test indicate that people had higher levels of pleasure when viewing the humor-sad-hope emotional flow (M= 4.53, SE = .37) than those who viewed the humor-sadness (M = 3.28, SE =.18) emotional flow. The humor-sadness-neutral emotional flow (M = 3.94, SE = .39) did not differ significantly from the humor-sadness or humor-sadness-hope emotional flows. H6 is supported.

Other Dependent Variables. H7 proposed that people who watch the humor-sadness-hope emotional flow will have a) more positive attitudes toward the video, b)

higher risk perceptions, and c) higher information seeking behavior, and d) higher message engagement than those that watch the humor-sadness and humor-sadness-neutral emotional flows. A one-way between-groups analysis of covariance was conducted to compare the differences that the three different emotional flow videos would have on message engagement, attitudes toward the video, risk perceptions, and information seeking. The independent variable was the specific emotional flow (Group 1: Humor-Sadness, Group 2: Humor-Sadness-Hope, Group 3: Humor-Sadness-Neutral). Issue reliability, concern, credibility, and realism were included as covariates.

Results from the ANCOVA showed no significant difference between the three different emotional flows on attitudes toward the video F (1, 45) = .28, p = .76, η_p^2 =.01 ($M_{\text{humor-sadness}}$ = 5.47, SD = 0.83; $M_{\text{humor-sadness-hope}}$ = 5.66, SD = 0.69; $M_{\text{humor-sadness-neutral}}$ = 5.70, SD = 0.70). H7a is not supported.

Results from the ANCOVA showed no significant difference between the three different emotional flows on risk perceptions of melanoma. F (1, 45) = .71, p = .50, η_p^2 =.03 ($M_{\text{humor-sadness}}$ = 5.33, SD = 1.22; $M_{\text{humor-sadness-hope}}$ = 5.29, SD = 1.22; $M_{\text{humor-sadness-neutral}}$ = 5.61, SD = 1.07). H7b is not supported.

Results from the ANCOVA showed no significant difference between the three different emotional flows on information seeking behavior. F (1, 45) = .77, p = .47, η_p^2 =.03 ($M_{\text{humor-sadness}}$ = 4.08, SD = 1.83; $M_{\text{humor-sadness-hope}}$ = 4.50, SD = 1.40; $M_{\text{humor-sadness-neutral}}$ = 4.38, SD = 1.82). H7c is not supported.

Results from the ANCOVA showed no significant difference between the three different emotional flows on message engagement. F (1, 45) = .24, p = .78, η_p^2 =.01

($M_{\text{humor-sadness}}$ = 3.59, SD = 1.37; $M_{\text{humor-sadness-hope}}$ = 3.53, SD = 1.55; $M_{\text{humor-sadness-neutral}}$ = 3.50, SD = 1.26). H7d is not supported.

4.3 SUMMARY OF FINDINGS

There were no significant results using biometric measurements while self-reported measurements of emotional response provided significant results. As such, there was no significant relationship between biometric and self-reported measures of arousal response and valence response. **See Tables 4.1 and 4.2.** Thus, the hypothesized associations among mediating and dependent variables were not viable.

While the biometric data and attitude and behavioral measurements did not yield significant results, this dissertation is not without significant findings and contributions. The dissertation was successful in finding support for the use of emotional flow as a way to increase the emotional responses of arousal and valence. Specifically, those who watched the video with the humor-sadness-hope emotional flow had higher levels of self-reported arousal compared to those who viewed humor-sadness or humor-sadness-neutral emotional flows. Similarly, those that viewed the humor-sadness-hope emotional flow experienced higher levels of self-reported pleasure compared to those who viewed humor-sadness emotional flow but not the humor-sadness-neutral emotional flow.

Self-reported arousal response was identified as a mediator between emotional flow and both message engagement and risk perceptions. Specifically, during the humor-sadness-hope emotional flow, those who felt higher levels of arousal lead to lower message engagement. Arousal response also mediated the relationship between emotional flow and perceived risk. In the humor-sadness-hope emotional flow, participants feeling higher levels of arousal had lower risk perceptions when it came to melanoma.

Table 4.1 Means (SDs) and Pearson Correlations between Physiological and Self-Reported Arousal Responses to Emotional Flow Videos

	M	SD	1	2
1. Average Peaks Per Minute	3.44	2.92	--	
2. Self-Reported Arousal	4.44	1.69	.02	--

Note: N = 52

Table 4.2 Means (SDs) and Pearson Correlations between Physiological and Self-Reported Valence Responses to Emotional Flow Videos

	M	SD	1	2
1. Positive Valence	44.14	97.70	--	
2. Self-Reported Pleasure	3.90	1.40	.25	--

Note: N = 52

CHAPTER 5

DISCUSSION

Originally, this dissertation sought to test how different discrete emotions can be sequenced into different flows so that those flows can affect arousal response, valence response, attitudes, and behaviors. Though studies on mixed emotions exist, very few actually examine ways in which emotions can be strategically sequenced into different flows to achieve specific outcomes. A unique aspect of the study was using biometric measurements of the emotional responses physiological arousal and valence. Though results from the biometric measurements were not significant, other findings from this study add valuable information to mixed emotion literature as well as practical implications for those responsible for creating messaging in advertising, marketing, and non-profit industries.

The results contained in this dissertation provide several theoretical implications: (1) the excitation transfer process is supported by arousal responses, such that those that viewed the humor-sadness-hope emotional flow had higher levels of arousal compared to the other emotional flows; (2) mood management may play a role in emotional flow as participants had more positive valence responses when viewing the longer emotional flow that ended on a positive emotion (hope) compared to others; (3) arousal response mediates the effects of emotional flow on perceived risk and message engagement; and (4) sadness was identified as a moderator for both attitude and message engagement.

Overall, results showed support for emotional flow as a viable way to structure messages, particular in terms of the emotional responses of arousal and valence, lending strong support to Affect Priming Theory, Mood Management Theory, and Excitation Transfer Theory.

5.1 THEORETICAL IMPLICATIONS

Arousal. First of all, arousal response results seem to confirm the excitation transfer process. Specifically, participants who viewed the humor-sadness-hope emotional flow had higher levels of arousal compared to those who viewed the humor-sadness and humor-sadness-neutral flows. As Zillman (1983) argues, if one stimulus produces an arousal response and a second stimulus closely follows, the sources can combine to produce a stronger and more intense arousal response. Nabi (2018) concurs that subsequent emotional responses can be more intense. Through the flow of three discrete emotions, the intensity of arousal response was allowed to continue to build. Due to the flow of three emotions, sadness built arousal response on top of humor and was subsequently built upon by the emotion of hope. This may be attributed to Zillman's (1983) claim that physiological arousal associated with emotions can take time to dissipate. By combining three emotions into a flow, the arousal response triggered by each did not have time to dissipate before the next emotion was presented.

This is further supported by the fact that the humor-sadness emotional flow had lower arousal response scores. There was not a subsequent third emotion that would allow the intensity of the arousal response to continue to build. Similarly, because the neutral portion of the humor-sadness-neutral emotional flow was not associated with any discrete emotion and was therefore truly neutral, the arousal response level may have

dissipated during that portion of the flow. This may add to Zillman's (1983) excitation transfer argument that arousal responses associated with emotional stimuli takes time to dissipate by showing that a neutral portion of an emotional may serve as a buffer for arousal response and give the intensity time to dissipate rather than letting the arousal level continue to build. However, it is worth noting that the humor-sad and humor-sad-neutral emotional flows had similar mean arousal scores (M = 4.06 and M = 3.88 respectively) so a two emotional flow and a three-step flow that ends with a neutral segment seem to have similar effects on self-reported arousal which can also add to excitation transfer literature.

Valence. Results also show that participants who viewed the humor-sadness-hope emotional flow had significantly higher self-reported pleasure levels, or positive valence response, than those who viewed the humor-sadness emotional flow. Zillman (1988) argues that emotions are ultimately driven by hedonic desires and that people want to keep positive feelings and convert negative emotions into positive ones. Using humor as an initial, positive emotion may have acted to put participants in a positive frame of mind via affective priming (Fazio et al., 1986). Through the flow of the message from humor to sadness, participants may have fought to keep their mood positive. As the message continued to flow from sadness to hope, another positive emotion, participants were able to end the message on a positive note and retain their positive valence. This is supported by and may extend Mood Management Theory by using a third emotion to continue valence regulation.

Like arousal, a humor-sadness-hope emotional flow eliciting a more positive valence response is also supported by Zillman's (1983) Excitation Transfer Theory.

Participants were primed to feel positive with the humor portion of the video. The intensity of sadness elicited by the sad portion of the emotional flow may have increased due to the idea that two emotions can combine to produce more intense emotions which is evident by the lower mean scores (M = 3.28) for positive valence response. However, because the humor-sadness-hope emotional flow used three emotions and ended on a positively valenced emotion, the intensity of that positive emotion was higher and thus provided a higher self-reported positive valence response mean score (M = 4.53).

Though not significant, the humor-sadness-neutral emotional flow had a lower mean pleasure score (M = 3.94) than the humor-sadness-hope emotional flow. This could indicate that the neutral message may regulate the intensity of emotions since there were no discrete emotions associated with the neutral portion of the emotional flow.

An important element of this dissertation was the use of biometric measurement. However, all biometric measures proved to be insignificant. From a galvanic skin response perspective, there are elements that can influence GSR measurement. Participants who are experiencing this sort of measurement for the first time are not familiar with the devices which may result in erratic readings. Diurnal fluctuations in eccrine sweat-glands are different for individuals so the time of measurement can also influence results (Najafpour et al., 2017). Though efforts were made to keep a consistent lab environment, temperature and humidity levels can also influence skin conductance (Montagu & Coles, 1966). The placement of electrodes can be problematic because they are placed on participants' fingers which can restrict movement during the experiment. This can compromise ecological validity as the real world is no longer approximated and their reactions may differ from normal real-world reactions (Korpal & Jankowiak, 2018).

Skin conductance is also subject to inter-person variability such as age, gender, ethnicity, and hormonal cycle (Boucsein, 2012). So, although GSR measurement is a robust way to measure electrodermal activity, there are a variety of different circumstances that could influence that measurement.

Ekman (1972) argued that facial expressions are universal and as such, this dissertation used an experimental design based on that assertion. However, that contention has been challenged by others who say that facial expressions vary widely through both contexts and cultures. For example, research has shown that although Westerners and East Asians have similar concepts of how faces display pain, they have different ways of expressing pleasure (Chen et al., 2018). Additionally, other researchers have concluded that little to no evidence exists that people can reliably infer someone's emotions for facial movements. Feldman et al. (2019) agreed that how people communicate emotions varies across cultures and contexts, they also found that facial movements are capable of expressing more than one emotion.

It is important to point out that biometric data was collected simultaneously as each participant watched their respective videos. The self-reported data using AdSAM was collected after the videos were finished. Though each measurement technique has been shown as effective measurements for emotional response (e.g. Morris et al., 2002; Bellman et al., 2017) the difference in time of measurement may have influenced results. As discussed above, there are possible factors such as age and culture that can influence biometric measurement. AdSAM has shown to be effective in children and adults, as well as cross-culturally (Morris, 1995).

Mediating Role of Arousal. Data analysis identified the PAD dimension of arousal as an underlying process to explain the effects of different emotional flows on outcome variables such as perceived risk and message engagement. An interesting note is that in the cases of both perceived risk and message engagement, the indirect effect of emotional flow on the outcome variables was significant while the direct effect was not. This is considered indirect-only mediation (Zhao et al., 2010). According to Baron and Kenny (1986) this can be considered the strongest type of mediation and refer to it as full mediation. Zhao et al. (2010) agree and believe that the strength of mediation should be measured by the size of the indirect effect rather than the lack of a direct effect.

Although arousal response did not mediate the relationship between the different emotional flows and attitudes or information seeking behavior, it did act as an underlying mechanism for the effects of the emotional flow on perceived risk and message engagement. Specifically, higher levels of arousal led to lower risk perceptions with a humor-sadness-hope emotional flow. Higher levels of arousal also lead to lower message engagement when participants viewed the video with the humor-sadness-hope emotional flow.

Higher arousal response may lead to lower risk perceptions and message engagement due to Lang's (2000) Limited Capacity Model. The model operates on two main assumptions: people are information processors and their ability to process that information is limited (Lang, 2000). Cognitive psychologists believe that attention is the distribution of cognitive resources available for the encoding of an object or task (Kahneman, 1973; Lang & Basil, 1998). In this case, viewing of the emotional flow. Other evidence supports the contention that messages rated high on emotional arousal

allow for fewer resources available for encoding (e.g., Lang et al., 1999). Because arousal levels were higher in the humor-sadness-hope emotional flow, that arousal response potentially distracted participants from fully attending to the message. Not giving full attention to the message would leave them less engaged with the intended persuasive intent of the message as well as distracted from the information about the risks of the disease, thus resulting in lower message engagement and risk perceptions.

This is not unprecedented in research on emotion, however the results are significant since this dissertation focuses on multiple emotions contained within a single message. Studies using singular emotions have shown that emotions can compete with cognitive processes to reduce attention. Vuilleumier (2005) discusses the way that neural pathways are activated by emotional attention, especially when related to threat, and thus compete with other sources of attention. Eysenck and Calvo (1992) found that anxiety impairs working memory capacity, storing and updating contents of memory, because anxiety can draw resources away from other processing. Other studies using a valenced approach (e.g. Garrison & Schmeichel, 2019) found that working memory capacity is reduced when confronted with emotional information. By showing that a flow of several emotions may also potentially mitigate attention to a message, this dissertation can build on existing studies and extend the Limited Capacity Model further to mixed emotions.

Moderating Role of Sadness. Sadness is a core emotion in this study as well as a significant portion of the emotional flow in all three videos. Additionally, it has been used in research to trigger attention and problem solving activity by searching for solutions or seeking out help (Izard, 1977, 1993). It also promotes deeper message processing (Nabi, 2015). Adding a third emotion (i.e., hope) or additional, neutral,

information to a sad video may change the degree or action tendency of sadness. Thus, sadness was checked to see if levels of sadness in different emotional flows potentially impacted different outcome variables.

In testing a model predicting attitude, there was a statistically significant interaction between emotional flow and sadness on attitudes $F(2, 46) = 4.6$, $p = .02$, $\Delta R^2 = .16$. When considering the difference between the humor-sadness and humor-sadness-hope flow, sadness did not moderate the relationship between emotional flow and attitude ($\beta = .57$, SE = .29, 95% CI = -.01 to 1.15). However, when considering the difference between the humor-sadness and humor-sadness-neutral flow, inspection of the effect of the humor-sadness-neutral flow at different levels of the moderator indicate that the humor-sadness-neutral flow produces more positive attitudes when sadness is higher ($\beta = .78$, SE = .26, 95% CI = .26 to 1.30). **See Table 5.1**.

The result is interesting in the sense that the neutral portion of the emotional flow seems to again have acted as a sort of regulating factor as far as attitudes are concerned. A neutral portion of an emotional flow possibly plays a consistent regulating role in emotions since results suggest similar effects in regulating arousal response as well as valence response. It is interesting that hope did not act in any sort of regulating or buffering capacity, particularly since it's viewed as an antidote to despair and can generate positive health behaviors (Lazarus, 1991; Nabi, 2015). However, one thing stands out they may help justify a neutral condition acting in a regulatory manner, at least in the context of this study. Participants found the issue of melanoma to have relatively high relevance to themselves (humor-sadness, $M = 4.94$; humor-sadness-hope, $M = 5.13$; humor-sadness-neutral $M = 5.0$). The neutral portion of the humor-sadness-neutral

emotional flow was strictly information about melanoma. Because participants had higher levels of issue relevance, the fact that they were provided with further information about melanoma may allow any residual negativity felt from the sadness portion of the video to subside.

After further moderation analysis using sadness as a moderator, there was a statistically significant interaction between emotional flow and sadness on message engagement $F(2, 46) = 4.3$, $p = .02$, $\Delta R^2 = .16$. When considering the difference between the humor-sadness and humor-sadness-hope flow, sadness did not moderate the relationship between emotional flow and message engagement ($\beta = 1.13$, SE = .55, 95% CI = .01 to 2.21). But when considering the difference between the humor-sadness and humor-sadness-neutral flow, probing the effect of the humor-sad-neutral flow at different levels of the moderator indicate that the humor-sadness-neutral flow produces lower message engagement scores when sadness is lower ($\beta = 1.40$, SE = .49, 95% CI = .43 to 2.38). **See Table 5.2.**

It makes sense that lower sadness levels would produce lower message engagement scores since sadness has been shown to motivate problem solving (Izard, 1977, 1993). The emotion is also associated with deeper processing depth and greater elaboration about problems and situations (Nabi, 2015). It can be argued that these different action tendencies are associated with message engagement since engagement involves investing deeper with messages and decision making about clicks, views, and shares (Association of National Advertisers, 2014; Gavilanes, Flatten, & Brettel, 2018).

Though degree of sadness is beyond the scope of the study, it is interesting nonetheless to find that higher and lower levels of sadness can have effects on different outcomes such as attitudes and message engagement.

5.2 PRACTICAL IMPLICATIONS

From a practical standpoint, this dissertation provides valuable insights into creating effective messages regardless of industry. Emotion and persuasion share a strong link and is important to understand how using multiple emotions within a single message can lead to stronger persuasion. This study found support for using an emotional flow with three discrete emotions as a way to increase arousal response. Physiological arousal is central to emotions. However, as Lang (2000) discusses, higher levels of arousal can reduce the capacity to process information. Therefore, it is necessary to be strategic when designing messages. Due to reduced processing capacity, messages with strong peripheral cues may be more effective and have a stronger impact. This is especially important as higher arousal response led to lower message engagement and risk perceptions. Based on the results from this study, if organizations design a message involves deeper message processing, they may consider a univalenced message or if mixed emotions are prudent, use a message with fewer emotional flow points.

High-arousal response is not necessarily a negative trait though. Belanche, Flavian, and Perez-Rueda (2017) found that high-arousal stimuli increased the effectiveness of skippable ads in online advertising. Advertisers, marketers, and non-profits can introduce high-arousal inducing emotional flows into their skippable video advertising so that users are less likely to click away or skip the video altogether. High-arousal videos were also found to perform better when viewers found the content relevant

to themselves or their needs, in other words, congruent (Belanche, Flavian, & Perez-Rueda, 2017). With the increase in digital advertising and in particular targeted advertising, it would be advantageous for organizations to create videos with emotional flows that result in high arousal response and target consumers that find the content relatable and congruent to their beliefs and needs.

Although Lang et al. (1999) found that messages rating high on emotional arousal allow for fewer resources dedicated to encoding, other research has found that messages that elicit higher arousal are more memorable. Bakalash and Riemer (2013) studied ad-elicited emotional arousal and found increased amygdala activation in memorable ads vs. non-memorable ads. In other words, higher emotionally arousing ads were more memorable. For marketers and advertisers who desire a memorable ad, they might consider designing messages with multiple emotions that flow together to create a more intense experience.

Much of the substantive data derived from this study involved the intensity of arousal and valence response. It can be argued that the power of persuasion is partly in the intensity of the emotions felt. This dissertation shows that as emotions flow from one distinct, discrete emotion to another, and then to a third, what results is an intensely valenced emotion. In this case, flowing from a positive emotion like humor, to a negative sadness emotion, and ending with a positive emotion like hope resulted in an intense positive valence response compared to a flow that contained only two emotions or two emotions flowing into a neutral segment. This is important information for marketers and advertisers that desire consumers of the message to feel a positive or negative valenced response.

Ultimately, this story is about emotions and their ability to persuade. As Izard (1977) said, human behavior may be completely motivated by emotions. Nabi (2002) concurs and shows that emotions play a strong role in persuasion. To repeat Cicero, "A person who gained mastery both in the evocation of emotion and in the emotional framing of argumentation was believed to be among the most successful practitioners of persuasion (*De Oratore,* trans. 2001; Kennedy, 1994).

5.3 LIMITATIONS

Though this dissertation contained strong theoretical and practical information, it is not without its limitations. The sample size was quite small. However, given the conditions put in place due to the COVID-19 pandemic, finding participants for a lab experiment proved quite difficult.

One of the unique aspects of this dissertation was the incorporation of biometric measures of the emotional responses physiological arousal and valence. Results from the tests were insignificant though. This could be partly explained by the lab setting. By its nature, the lab is an unnatural environment. Subjects may not be comfortable mentally or physically during the process. Research has found that research subjects may not pay close attention to stimuli in these settings while participating in experiments (Peterson & Umesh, 2018). Indeed, subjects often seemed hesitant when entering the lab and throughout the experiment. COVID protocols required mask wearing until the experiment started and the subjects were alone in the lab with the researcher a safe distance away. However, concerns about COVID may have influenced participants' state of mind.

Although the videos elicited appropriate emotional responses in self-reports during pre-tests and manipulation checks, COVID protocols prevented pre-testing using

the biometric sensors. The stimuli were effective from a self-reporting point-of-view, particularly with measures of valence and arousal responses. However, the power of emotional flow is in emotions that not only increase in intensity through the flow but do so simultaneously with their action tendencies. The fact that the hypotheses for attitudes and behaviors were not supported could be explained partly by the stimuli not activating the action tendencies of the emotions. This shows the importance of pretesting stimuli with biometrics as well as self-reports.

5.4 CONCLUSION

This dissertation began as a way to address and test Nabi's (2015) new concept of emotional flow, strategically sequencing specific discrete emotions in such a way as to affect arousal, valence, attitudes and behaviors. The study carries significance because there is little research that specifically compares varied sequences of emotions. The study also carried measurements of these emotions beyond the use of self-reporting by incorporating biometric measurements of the emotional responses valence and arousal. Though the results from the biometric results were not significant, they provide a platform from which to launch future research on emotional flow using biometrics as a measurement tool. Using different stimuli with the same emotional flows or testing emotional flows with different discrete emotions provide a wealth of opportunities to further research emotional flow.

Using those self-reports, this dissertation provides strong support for emotional flow as a way to increase both arousal and valence responses. Based on Affect Priming Theory, Mood Management Theory and Excitation Transfer Theory, there is validation that discrete emotions can act together, in sequence, to increase both arousal and valence

responses. Again, this provides opportunities to further explore different discrete emotions and how they interact with each other in future research. Ultimately, emotional flow seems to be a valid construct that is ripe for future study. Nabi's (2015) conceptual paper provided the basis for this dissertation, but hopefully this study provides the basis for different avenues of research regarding the strategic use of discrete emotions sequenced within single messages.

Table 5.1 Linear Model of Emotional Flow Predictors of Attitude Toward the Video

	B	*SE B*	*t*	*p*
Constant	7.96	.97	8.18	$p < .001$
Emotional Flow Group 1	-2.45	1.30	-1.88	$p = .06$
Emotional Flow Group 2	-3.44	1.24	-2.78	$p < .01$
Sadness	-.54	.29	1.98	$p = .05$
Emotional Flow Group 1 x Sadness	.57	.29	1.98	$p = .06$
Emotional Flow Group 2 x Sadness	.78	.26	3.03	$p < .01$

Note: $R^2 = .18$

Table 5.2 Linear Model of Emotional Flow Predictors of Message Engagement.

	B	*SE B*	*t*	*p*
Constant	7.38	1.83	4.03	$p < .001$
Emotional Flow Group 1	-5.10	2.46	-2.08	$p = .04$
Emotional Flow Group 2	-6.73	2.33	-2.89	$p < .01$
Sadness	-.81	.39	-2.10	$p < .05$
Emotional Flow Group 1 x Sadness	1.11	.55	2.04	$p = .05$
Emotional Flow Group 2 x Sadness	1.40	.49	2.89	$p < .01$

Note: $R^2 = .17$

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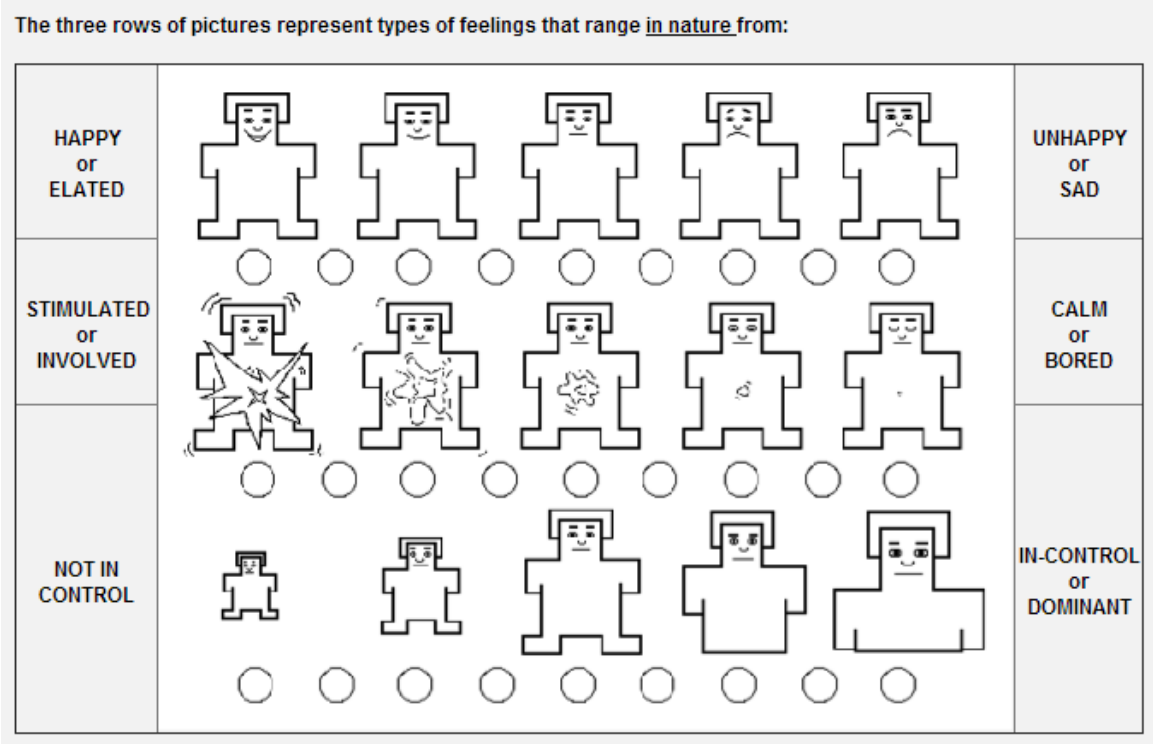
APPENDIX A

STUDY QUESTIONNAIRE

Please pay close attention to the following instructions. The question will be based on these instructions.
AdSAM Scales
AdSAM is a simple but highly effective way for you to indicate how you feel in response to several questions throughout the survey. Below, you'll notice three different rows of graphic characters (Manikins), which represent you and your feelings.



For each question where AdSAM is used, please:
Indicate your immediate emotional reaction.
Don't spend a lot of time thinking about it. Indicate how you feel by clicking ne circle on each row.

Either select a circle directly below a Manikin, or in between two Manikins. There will be no words, only Manikins

1. Using the following range of responses, please select the numbers to indicate how you feel about the video
    a. Unappealing/appealing
    b. Uninformative/informative
    c. Unexciting/exciting
    d. Boring/interesting
    e. Unpleasant/pleasant
    f. Dull/dynamic
    g. Confusing/clear
    h. Unattractive/attractive
    i. Unfavorable/favorable
    j. Unlikeable/likeable
    k. Ordinary/sophisticated
    l. Unpersuasive/persuasive
    m. Low quality/high quality
    n. Bad/good

    Please reflect your experiences while watching the video just now, and indicate your answers to teach of the following questions
2. How much attention did you pay while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always
3. How engaged were you while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always
4. How involved were you while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always

Please reflect on your experiences while watching the video just now, and indicate your answers to each of the following questions

5. How uch attention did you pay while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always
6. How engaged were you while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always
7. How involved were you while watching the video?
    a. Never
    b. Rarely
    c. Sometimes
    d. About half the time
    e. Often
    f. Very often
    g. Always

Please reflect on your experiences while watching the video just now, and indicate your answers to each of the following questions.

8. I completely concentrated on the entire video while I was watching it.
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
9. When I was watching the entire video, time seemed to pass very quickly
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

10. While I was watching the entire video, nothing else seemed to matter
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
11. While I was watching the entire video, I felt completely captivated
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please reflect on your experiences while watching the video just now and evaluate the overall experience based on the following statements.

12. The video seemed moving
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
13. The video seemed emotional
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
14. The video seemed intense
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
15. The video seemed memorable
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree

d. Neither agree nor disagree
e. Somewhat agree
f. Agree
g. Strongly agree

16. Use the following range of responses, please select the numbers to indicate how you feel about the video.
    a. Not at all convincing/very convincing
    b. Nat at all effective/very effective
    c. Not informative/very informative
    d. Not interesting/very interesting
    e. Not at all impactful/very impactful
    f. Not useful to me/very useful to me

Please indicate the extent to which you agree with the following statements:

17. After watching the video, I am worried about the risks of sun exposure
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
18. After watching the video, I will think about the health risks of sun exposure
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
19. After watching the video I feel afraid about developing melanoma
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
20. Using the following range of responses, please select the umbers to indicate how likely you think it is that sun exposure will cause you to develop melanoma
    a. Unlikely/likely

After watching the video, please indicate the extent to which you agree with the following statements

21. When it comes to the topic of melanoma, I am likely to go out of my way to get more information
    a. Strongly disagree
    b. Disagree

c. Somewhat disagree
d. Neither agree nor disagree
e. Somewhat agree
f. Agree
g. Strongly agree

22. Whenn the topic of melanoma comes up, I will try to learn more about it
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please indicate the extent to which you agree with the following statements

23. I plan to use sunscreen daily in the coming weeks
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
24. I plan to check my skin once a month
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
25. I plan to see a dermatologist in the near future
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
26. I plan to use clothes for sun protection regularly in the weeks ahead
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please indicate the extent to which you agree with the following statements

27. If I see this video on YouTube, I would 'like' it on YouTube
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
28. If I see this video on YouTube, I would share it with my friends
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
29. If I see this video on YouTube, I would comment on it on YouTube
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please indicate the extent to which you agree with the following statements

30. I would be interested in signing a petition to raise awareness of melanoma in schools
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
31. I would like to receive an email with information on how to take further action in spreading melanoma awareness
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please indicate the extent to which you agree with the following statements

32. I am concerned that I have not taken enough precautions to protect myself from melanoma
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
33. Melanoma related to my personal interests
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
34. Melanoma is related to me
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
35. Melanoma is of concern to me
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
36. In my view, the video contains credible information about melanoma
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
37. In my view, the video about melanoma is trustworthy
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree

e. Somewhat agree
f. Agree
g. Strongly agree

38. The information contained in this video will help inform my decisions
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
39. I trust the information contained in this video to be correct
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
40. The information in the video was trying to educate me
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
41. I learned something from the information contained in the video
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
42. The information in the video was factually correct
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
43. The video portrayed the dangers of melanoma accurately
    a. Strongly disagree
    b. Disagree

c. Somewhat disagree
d. Neither agree nor disagree
e. Somewhat agree
f. Agree
g. Strongly agree

44. The video portrayed the dangers of melanoma realistically
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
45. The video portrayed the dangers of melanoma in a believable way
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
46. I am knowledgeable about the health risks of melanoma
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
47. I am knowledgeable about ways to prevent melanoma
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
48. I enjoyed this video
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
49. I appreciated this video

a. Strongly disagree
b. Disagree
c. Somewhat disagree
d. Neither agree nor disagree
e. Somewhat agree
f. Agree
g. Strongly agree

50. This video was very good
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
51. This video was very bad
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
52. I liked this video
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
53. I did not like this video
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

Please indicate the extent to which you agree with the following statements

54. If I think something is unpleasant is going to happen I usually get pretty worked up
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree

e. Somewhat agree
f. Agree
g. Strongly agree

55. I worry about making mistakes
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
56. Criticism or scolding hurts me quite a bit
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
57. I feel pretty worried or upset when I think or know somebody is angry at me
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
58. Even if something bad is about to happen to me I rarely experience fear or nervousness
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
59. I feel worried when I think I have done poorly at something
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
60. I have very few fears compared to my friends
    a. Strongly disagree

b. Disagree
c. Somewhat disagree
d. Neither agree nor disagree
e. Somewhat agree
f. Agree
g. Strongly agree

61. When I get something I want, I feel excited and energized
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
62. When I'm doing well at something I love to keep at it
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
63. When good things happen to me it affects me strongly
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
64. It would excite me to win a contest
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
65. When I see an opportunity for something I like, I get excited right away
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree

66. When I want something, I usually go all-out to get it
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
67. I go out of my way to get things I want
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
68. If I see a chance to get something I want, I move on it right away
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
69. When I go after something I use a “no holds barred” approach
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
70. I will often do things for no other reason than that they might be fun
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
71. I crave excitement and new sensations
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree

f. Agree
g. Strongly agree

72. I'm always willing to try something new if I think it will be fun
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
73. I often act on the spur of the moment
    a. Strongly disagree
    b. Disagree
    c. Somewhat disagree
    d. Neither agree nor disagree
    e. Somewhat agree
    f. Agree
    g. Strongly agree
74. What is your age in years?
75. Please indicate your gender
    a. Male
    b. Female
    c. Other
76. Are you of Hispanic origin?
    a. Yes
    b. No
77. What is your race?
    a. White
    b. Black or African American
    c. American Indian or Alaska Native
    d. Asian
    e. Native Hawaiian or Pacific Islander
    f. Two or more races
    g. Other.