Eliciting Seven Discrete Positive Emotions Using Film Stimuli

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Dedications

This thesis is dedicated to the Psychology Department at Vanderbilt University. You had me hooked since the very first day of my freshman year, and you have inspired me in innumerable ways. Walking into Wilson Hall is something I will sorely miss, and I hope to keep up relationships with all the wonderful professors who have given me bits of their truly invaluable knowledge and perspective.

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Abstract

Successful, efficacious, and reliable mood induction procedures are an important part of emotion research. Film clips have already been shown to reliably induce discrete negative emotional states, as well as general positive affect, in laboratory settings. However, there is an absence of research in eliciting discrete positive emotional states in these settings. This study attempted to elicit seven discrete positive emotional states using preselected film stimuli: joy, gratitude, awe, determination, interest, serenity, and hope. Elicitations for joy, awe, serenity, and interest were successful.

There are few things as engrossing as watching a film at the movie theater. We flock to the movie theater to laugh, to cry, to jump for joy, and to scare ourselves silly. As we are transported to another world, we lose ourselves in the story line and we feel deeply for the characters that we love. Movies are an escape from our own realities; for an hour or two, we can step into the shoes of a hero, a seductress, or a villain, and see what the world looks like through their eyes.

… A young man walks quickly into the living room, flinging his jacket on the couch beside him. The lottery drawing from yesterday evening plays on the television in front of him. Sweat glistens on his brow – it's hot, and he's uncomfortable. He fidgets in his seat as his eyes glance down to the lottery ticket in his hand. The smiling reporter notes, "4" – he checks his ticket – yes!... "32", "45", - could it be? – the camera pans closer to the man as an expression of disbelief, hope, and incredulousness spreads across his face…. "and the all-important *mondo-ball* number… 21". He looks up. His mouth hangs open. Upbeat, cheerful music starts to play in the background, and he springs to his feet. Jumping up and down, he shouts, "Grandma!" (a tambourine plays in the background, and the music gets louder, more excited) "We won the lottery!"

How does this description make you feel? If you were watching it on a screen, do you think you would feel more intensely? The film clip described was used in this study, and according to the results, this "Lottery" clip would most likely cause you to feel joy, or enthusiasm. It is the combination of music, camera angles, fantastic story lines, and complex character development that make the world inside every good movie a beautiful and stimulating place. The emotional and cognitive reactions that take place while watching a film are of great use to researchers in the field of emotion science.

Emotion Research: Background

Emotion is essential to the human experience. Coloring our lives with transient feelings such as gratitude, anger, happiness, and sadness, emotions provide us with essential feedback about how we live in the world. Emotions can communicate vitally important information to us, or simply tell us that all is well, and we have the opportunity to relax for a while. Happiness, for example, tells us that we are doing well – that our needs and desires are satisfied, and that our environment is safe and conducive to exploration and enjoyment (Frederickson, 1998). In contrast, the emotion of fear denotes that we are in a dangerous environment, motivating us to find an exit as quickly as possible (Fridja, 1987).

Discrete emotions affect our lives on a moment-by-moment basis, while the aggregate of an individual's emotional experience accounts for a large part of their subjective well being, overall mental health, and to some extent, their physical health as well. The presence of too many negative emotions heightens our arousal, weakens the immune system, and prolongates the healing process (Evans, Bullinger, & Hygge, 1998). In contrast, positive emotions over time, brought on by traits such as optimism, help promote significantly faster healing after a serious medical trauma, such as a heart attack. (Carver & Scheier, 1998). Additionally, a maladaptive imbalance of emotions can be a sign of mood disorders such as major depression or bipolar disorder.

Emotion research seeks to fully understand both the objective (across populations) and subjective (within the individual) aspects of emotional experience. Research examines questions ranging from the origins and purposes of emotion, to how they affect the individual on an immediate basis. Research suggests that emotions function as a

method of universal communication, and that the basic emotions – fear, anger, disgust, sadness, happiness, and surprise – are understood throughout the world by their characteristic facial expressions, (Ekman, 1992). It is also thought that each emotion has corresponding behavioral tendencies (Lazarus, 1991), which help to distinguish emotions from one another. The transient nature of emotions and the variability in individual emotional responsiveness make emotions inherently difficult to study.

Appraisal theories of emotion elicitation (e.g. Smith & Lazarus, 1990) posit that any emotional response is the product of the interaction between the individual and their environment. This premise entails that the same environmental stimuli will elicit different emotions in separate individuals according to each person's appraisal of the situation. Appraisals are unconscious automatic judgments about the nature of the situation with respect to the individual. They note the relevancy of a particular situation to the individual, as well as the congruency (or discrepancy) of the individual's current needs and goals with the circumstances of their immediate environment. Due to the subjective nature of emotions, emotion elicitation procedures must find and exploit the commonalities among emotional stimuli in order to find those that work across populations.

Emotion Elicitation

The ability to successfully, reliably, and powerfully elicit various emotions is necessary for emotion research and affective science. As affective science has matured, so have the elicitation techniques: disgust can now be elicited by revolting pictures, instead of, say, a bucket of frogs (really!) (Rottenberg, Ray, & Gross, 2007). Methods of elicitation include emotionally valenced pictures, emotional behavior and vignettes (such

as remembering an emotional experience), didactic interaction tasks (such as conflict discussion among married couples), music, and social elicitation using scripted, controlled situations (Rottenberg, Ray, & Gross, 2007). Various parameters restrict the success of elicitation procedures: the difficulty of creating a lab setting that authentically conveys 'real life', time and ease of replication constraints, and of course, the ever-present ethical concerns. (Rottenberg, Ray, & Gross, 2007)

The use of film stimuli for emotion elicitation has gained recognition for its ease of replication, standardization, and ecological validity. The dynamic and complex nature of films allow for authentic recreation of "reality" as it exists outside of laboratory enclosure. Soaring imagery or intensely violent scenes would be impossible to bring into a laboratory without video, and films allow for the harmless portrayal of extraordinarily intense or graphic scenes while avoiding ethical constraints. Overall, films have been shown to be one of the most powerful methods to elicit emotions within a laboratory setting. A meta-analysis of elicitation techniques by Westermann, Stahl, Spies, and Hesse (1996) found that films are the most effective stimuli at eliciting both positive and negative affect among participants.

Emotion researchers Rottenberg, Ray, and Gross (2007) detail seven dimensions for the comparison emotion-eliciting stimuli and various emotion-eliciting techniques: intensity of emotional response, complexity of the stimuli, demand characteristics (cues within the stimuli that bias participants in one way or another; usually considered a confounding variable), standardization, temporal resolution (the precision of a measurement with respect to the amount of time needed to measure the phenomenon), ecological validity (the ability of a stimuli to accurately recreate reality), and attentional

capture. With regards to other methods of eliciting emotion, films allow for high levels of emotional response, with high levels of complexity and low demand characteristics. Films are easily standardized and possess high ecological validity, in addition to having very high levels of attentional capture. In short, films are realistic, standardizable, and intense snapshots of pseudo-realities that allow emotional reactions to more realistic situations and scenarios that would be impossible to create and measure otherwise.

Overall, films are one of the easiest and most effective methods of emotion elicitation within a laboratory. A few studies have elicited a range of emotions with film, and while films are a relatively new method of discrete emotional elicitation, their success is undeniable. Phillpot (1993) used 12 film clips designed to elicit six distinct affective states, and he successfully elicited discrete emotions of amusement, sadness, and a neutral state among the majority of his participants. Gross and Levenson (1995) successfully elicited the discrete emotions of amusement, anger, contentment, disgust, sadness, surprise, a neutral state, and fear using 16 film clips and a much larger subject pool. Building upon prior research, Schaefer, Nils, Sanchez, & Philippot (2010) attempted to validate seventy film excerpts, with ten separate scenes for each of the desired emotional states: anger, disgust, sadness, fear, amusement, tenderness, and a neutral state, using scores of discrete emotionality, positive and negative affect, and "mixed feelings". The researchers ranked the effectiveness of each film excerpt in eliciting the desired emotional state, either a discrete emotional state such as anger, or a "blended" state of two separate emotions.

Two significant gaps exist within the literature for emotion eliciting film stimuli. The first is the lack of a cohesive, international database of emotionally-valenced and

validated clips. As previously enumerated, several notable efforts have been made to both build a database of films and enumerate proper film selection criteria. The scope, and breadth of the Schaefer et al. (2010) findings, as well as the organization and publishing of their database, is an impressive step in the direction of a cohesive and international film database. However, more efforts must be made to make a database of films that is cohesive, complete, and easily accessible, mostly by testing, validating, and adding more films clips. A model for this database is that of the International Affective Picture System (IAPS), an internationally available database of pictures used in emotion and affective science research (Lang, Bradley & Cuthbert, 2008). Ideally, a database would encompass films that successfully elicit the full range of discrete emotions.

The second gap in emotional elicitation research, and the focus of the present study, is the lack of concentration on discrete *positive* emotions. Current research concerning the success of film stimuli has been primarily focused on "basic" emotions such as anger, disgust, fear, sadness, and surprise. Gratitude, hope, joy, serenity, awe, interest, and determination are discrete positive emotions that have yet to be examined by film elicitation techniques.

Emotion induction procedures allow for experimental research into how various discrete emotions affect processes ranging from our basic cognition and memory to the development of several psychopathologic mental disorders. It is crucial to include the study of discrete positive emotions within the scope of future emotion elicitation research.

Positive Psychology

The study of positive emotions and positive emotionality lies at the intersection of emotion research and positive psychology. Positive psychology studies the mechanisms underlying all aspects of human flourishing. As a much-needed complement to traditional medical-model psychology, positive psychology expands the scope of traditional psychology to include research about successful, flourishing individuals, instead of confining the field to the understanding of mental maladaptation. Positive psychology applies the scientific method to questions concerning concepts such as happiness, fulfillment, strengths and virtues, resiliency, optimism, and self-compassion. Together, positive psychology and traditional psychology provide a more complete picture of human functioning.

A necessary aspect of all positive experiences, positive emotions also have a significant impact on our daily lives and routines (Catalino and Frederickson, 2011), our ability to flourish (Keyes, 2007), and our health-related outcomes (Frederickson, 2001). Positive emotions also serve to enhance learning by broadening our attentive scope (Frederickson, 1998; Greene, & Noice, 1988), encouraging us to be creative, to play, and to explore new dimensions of our environments. Positive emotions do this all while reducing the high physiological arousal related to negative emotions such as stress, which is called the "undoing effect" (Fredrickson, Mancuso, Branigan, & Tugade, 2000). Across the life span, positive emotions and an optimistic outlook serve to improve memory and health outcomes in the elderly population (Ong, 2010).

Currently, positive emotion inductions have focused on inducing broad positive affect, such as 'happiness', using techniques such as positive feedback during problem-

solving tasks, (Um, Song, & Plass, 2007), and virtual reality mood induction procedures (Baños, Liaño, Botella, Raya, Guerrero & Rey, 2007).

Research Questions

My research examined whether the selected film stimuli successfully elicited the discrete positive emotions of gratitude, hope, joy, serenity, awe, interest, and determination. Ultimately, my goal was to produce film clips that reliably elicit each of these discrete emotions across a wide range of individuals.

Specifically, I examined the success of eliciting differentiated positive emotions using 14 selected films. I also examined the possibility of an interaction between subjective emotional arousal and the targeted emotion, as I was interested in understanding if the type of emotion being elicited would affect emotional arousal. Due to the complex appraisals of some emotions, I also examined whether viewing an actor express a discrete emotion in a film clip would allow the participant to subjectively mirror that emotion. For example, gratitude is particularly difficult to replicate due to the necessity of directly receiving a benefit from another individual. I hypothesized that participants could experience gratitude if they were able to view a character in a film clip express gratitude. This hypothesized sympathetic transmission of emotion was the rationale behind the selection of clips for the self-referencing emotions of joy, hope, gratitude, and determination, as each clip shows characters expressing those very emotions.

Discrete Positive Emotions

The discrete positive emotions I examined in this study are gratitude, hope, joy, serenity, awe, interest, and determination. I selected each of these emotions based upon the diversity of their appraisal processes, as I wanted to include a variety of discrete positive emotions. Each of the selected emotions have been enumerated as distinct positive emotions by previous psychological research (Frederickson, 1998; Fridja, 1986), though none have been the subject of emotion elicitation procedural research, a gap in the literature that this study attempts to fill. Below, I will provide a brief profile of each emotion, including its antecedents and consequences.

Gratitude is experienced when one receives, or is preparing to receive, help in some form. Gratitude serves to enhance mindfulness and overall subjective well being. Wholly separate from the feeling of indebtedness, gratitude comes from appraising the benefit in question as subjectively valuable, and perceiving benevolent intentions on the part of the helper. Gratitude motivates the individual to perform reciprocal, pro-social behavior, and it is perhaps the most widely studied discrete positive emotion (McCullough, Tsang, & Emmons, 2002).

Joy is evoked from an improvement in environment or resources, perhaps towards an individual's goals or desires (Frederickson, 1998). Joy motivates the individual to acquire further resources through 'free activation', or "readiness to engage with one's environment in any enjoyable manner possible" (Fridja, 1986).

Hope is a belief in a positive outcome in the future, and it appears when we feel as though our circumstances are not where we want them to be. In this manner, hope is distinct from other positive emotions because it may occur in a negative environment. As a future-oriented emotion, hope denotes confidence in one's abilities and environments to

produce a positive, desired outcome – in other words, to turn our circumstances around (Frederickson, 1998).

Serenity, or calmness, is a mental state free from anxiety, tension, negativity, and disturbance. Often linked with the feeling of "doing nothing" and the emotion of contentment (Ellsworth & Smith, 1988b; Lazarus, 1991), serenity encourages the individual to slow down and savor their current experiences.

Interest is experienced in safe, novel, and stimulating environments (Izard, 1977). An individual is more likely to be curious about a novel environment that they appraise as important and requiring effort (Ellsworth & Smith, 1988b). With interest comes the urge to engage and attend to the events at hand.

Determination is experienced when an individual encounters an obstacle to a desired goal within their immediate environment. Determination results from a positive appraisal of the obstacle, noting one's ability to overcome whatever stands in their way. Determination subsequently motivates the individual to achieve the final goal (Smith & Lazarus, 1990). In this manner, determination is also distinct (like hope) from other positive emotions, due to its presence in possibly negative situations.

The explanations, appraisals, and antecedents of these emotions provide the basic rationale and framework behind the films that were evaluated in this study.

Utility of Positive Emotion Elicitation Research

Eliciting emotions within the laboratory allows researchers to examine the direct effects of emotions on our physiology, our cognition, and our behavior. Recent research suggests that discrete emotions, even emotions of the same valence, have differential effects on cognitive processing (DeSteno, Petty, Wegener, & Rucker, 2000). Emotion

also influences decision-making processes, as the incorporation of emotion into models of decision-making increases the explanatory power of these models (Lopes & Oden, 1998). For example, the general experience of positive emotions has been shown to increase an individual's reliance on heuristics and stereotypical thinking, (Forgas, 1998) as positive emotions lessen the need for systematic processing (Schwarz, 1990). This has far reaching practical effects, such as the nature of persuasion in advertising, as well as theoretical implications concerning ideas, such as the evolutionary function behind heuristics and why they are more active when we are in a positive mood or emotion-state.

Emotion elicitation procedures also provide a window into the emotional processes within the brain. Neurobiologists have already linked basic positive affect to sub-neocortical brain regions, as well as neurotransmitters such as dopamine and GABA (Burgdorf & Panksepp, 2006). Using film clips to elicit discrete emotions of similar valences with radically different antecedents and appraisals, such as pride and awe, may help further categorize emotional reactivity in the brain.

Discrete positive emotion induction procedures also find utility in dissecting the deficits in positive emotionality, processing, and affect found in many psychopathologic disorders. (*DSM–IV–TR* (2000) 4th ed., text rev.) Disorders such as schizophrenia, depression, and anxiety disorders all have potential symptoms of a deficit in positive affect. Examining the diminishing nature of various discrete positive emotions may help further the understanding of the course of these disorders. For example, the prodromal phase of schizophrenia is marked by gradual decline of an individual's functioning in both intra- and interpersonal environments. Emotion elicitation procedures could shed light onto the specific nature of positive affective decline during the prodromal phases of

schizophrenia, or the lack of positive affect in Major Depressive Disorder (MDD). If an individual presenting with MDD responded well to an elicitation of 'awe', but failed to laugh at an amusing clip, or smile at a joyous one, 'awe' could be seen as a gateway into the individual's positive affective repertoire. This knowledge may guide further research concerning possible patterns in positive affect degradation across psychopathology, as well as inform the development of cutting-edge positive clinical interventions, geared towards improving the lives and general functioning of various patients.

As interdisciplinary connections continue to grow, emotion research is needed in new ways in order to understand how a human (non-rational) subject makes decisions, becomes a success or a failure, flourishes or flounders – and how emotional processes influence each aspect. For example, emotion plays a large role in the burgeoning field of *neuroeconomics,* as researchers synthesize the emotional and cognitive processes behind decision-making and risk-analysis. Psychopathologists seek to understand disorders in which emotion regulation, experience, and reactivity have gone awry. With special regards to this study, the still-developing field of positive psychology directed a wave of research attention towards understanding the role, function, and characteristics of various positive emotions. As an emotion-elicitation procedure, the use of films within various research contexts has the possibility of application within a large number of inquiries, methodologies, and scientific pursuits.

Method

Preliminary survey and selection of films (Pilot Study)

Over the course of several months, I asked a large group of individuals (including fellow students, colleagues, professors, film buffs, and members of the Smith/Kirby laboratory team) for their nominations of films that they believed to feature one of the seven discrete positive emotions. These suggestions produced a film list of approximately 60 clips, which was subsequently shortened by our preliminary survey within our laboratory research group.

The 12 film clips in the pilot study were listed on a webpage: www.julianab.posterous.com. I created specifically for this study. Smith/Kirby lab members provided pilot data using this website. (N=10) The purpose of piloting for this study was to further refine and validate the selection of film clips. Each lab member was instructed to watch the film clips in a randomly selected order. Instructions and links to the ordered film clips were distributed via email. Pilot participants completed a simple discrete emotions measure used within our lab, called the Emotion-Rating Form.

Originally, pride was included in place of 'hope' in the discrete emotions examined in the preliminary selection of film clips, before the collection of pilot data. However, according to the opinion of the researcher and the large group of individuals used for guidance and selection of the film clips, no film clips were found that satisfactorily elicited pride. *Pride* is evoked when one accomplishes something personally important, or reflects upon such an accomplishment. It is characterized by a feeling of 'self-agency' and the desire to convey your success to others in your social group (Fridja, Kuipers, & ter Schure, 1989). Pride was finally replaced with 'hope',

possibly due to the difficulty of transmitting a valid emotional response to another's personal accomplishment within a film clip.

Of the 12 film clips used in the pilot study, 8 were used in the final study. The pilot data means were analyzed for the strength of the targeted emotion relative to all other emotion means, and the 'successful' videos – those that had high target emotion means – were used as 'models' for successful emotion-eliciting content. Additional videos for gratitude, joy, serenity, and hope were added to the final film set based upon the knowledge gained during the success or failure of pilot film clips. For example, the emotional display by the character in a clip used for 'joy' in the pilot study ("500 Days of Summer") provided the rationale behind the inclusion of the second clip ("Lottery") in the final set.

I selected the final set of film clips based on a modified version of the selection criteria used by Gross and Levenson (1995). The final film clips were selected for evaluation and testing based on: a) length – the films in question range from 0:45s to 5 minutes; b) intelligibility – the content of the film clip needed to be understandable without additional clarification on the part of the researcher; and c) discreteness – the final films were deemed most likely to elicit the specific emotion in question (either gratitude, hope, joy, serenity, awe, interest, or determination) based upon preliminary mean analysis.

Study Participants

The majority of participants in this study were Vanderbilt University undergraduates, though personal friends, family members, and family friends completed additional surveys. To increase the sample size, emails with the website and specific

viewing instructions were sent out to members of the researcher's extended family, friends, and previous professional contacts. The final sample size included 651 individual responses, and 35% were male (N=230). The exact amount of participants is unknown. It is important to note that some individuals watched more than one video, however due to the nature of the anonymity of the data, videos were evaluated entirely using between-subjects analyses.

Materials:

Our film database is comprised of 14 emotional film clips, using two clips to each discrete positive emotion. Each clip is both auditory and visual in nature, and every clip is in full color. The titles, descriptions, clip lengths, and clip sources can be found in (Appendix C).

Procedure

The majority of data was collected in the Rand and Commons dining halls on Vanderbilt Campus in the evening, while students were studying. Potential participants were politely asked if they had five minutes to watch a video and respond to a survey. Those who agreed were led to a quiet place within the dining hall, where they were informed of the purpose of the study and given the instructions to "breathe deeply and try to clear your mind". A random video was selected using the random number generator at www.random.org, using the numerals (1-14). All clips were shown full screen on a 17" MacBook Pro. Bose 'Quiet Comfort' headphones were provided, and adjusted to the same volume each time. After watching the clip, participants responded to the corresponding survey. Participants sometimes agreed to watch the film in groups, in which case paper surveys were distributed to each participant. In a group setting, the clips

were viewed on the same 17' MacBook Pro, however the computer speakers replaced

headphones to ensure that each member of the group could hear the auditory aspect of the

film.

Indirectly collected responses came from the distribution of emails to family,

friends, and professional contacts with detailed viewing instructions, as well as a brief

description of the study's subject of positive emotion elicitation using film clips.

Instructions in the email were to, "The website www.julianab.posterous.com has access

to the 14 film clips in my study. Please watch each video, and click on each video's

corresponding link to answer a short survey about your emotional experience. Before you

watch each video, breathe deeply and try to clear your mind. Data is completely

anonymous, and videos do not need to be watched all at once, (though please make every

effort to watch all 14 videos!)"

Measures

Subjective Emotional Arousal: Subjects were asked about the amount of their

subjective emotional arousal during the film, using a 1-7 Likert Scale: For example: "1= I

felt no emotion at all while watching the film" and, "7 = I felt very intense emotions

while watching the film."

Discrete Emotions Measure: In order to assess the accuracy of our films in

eliciting the targeted discrete positive emotions, participants completed an updated

version of a discrete emotions measure, The Emotion-Rating Form (Smith, Haynes,

Lazarus, & Pope, 1993). This self-report measure differentiates among 27 discrete

emotional states described by groups of adjectives. While all of our targeted discrete

positive emotions exist on the scale, the Emotion-Rating Form asks for self-reported

experience of both positive and negative emotional states. Sample groupings of adjectives include: *a) hopeful, optimistic; b) frustrated, thwarted, exasperated; c) tranquil, calm, relaxed.* Subjects note the degree to which a grouping of adjectives accurately describes their current emotional state, using a 1-9 scale: *1 – Does not characterize my feelings at all; 5 – generally characterizes my feelings somewhat; 7 – generally characterizes my feelings extremely well.* The full questionnaire, including the Emotion-Rating Form, used in this study can be found in (Appendix D).

Results

Video analysis was completed in several steps. Profile correlations for each targeted positive emotion (hope, awe, determination, interest, joy, gratitude, serenity) were used to assess the degree of similarity between ideal emotional responses and average emotional responses. Additionally, ANOVA analyses were used to assess possible effects of targeted emotion, video, and gender on the results of the reported emotions. Analysis of emotion synonyms determined each video's "hit rate", or the percentage of correct identifications of the targeted emotion (or its synonyms), providing clues into the non-standardized emotional reactions of all participants.

In order for a film to be deemed as a 'successful elicitation', the correlation between the actual average profile and the ideal average profile had to be significant at the $p<.05$ level, and possess a target emotion average score of at least 4.9 (on a 1-7 scale). (4.9) represents the top 30% of the scale of (1-7), and was deemed to be an appropriate cutoff by the researcher. Discreteness scores were calculated for each video profile, which refers to the target emotion mean in each profile, minus the second-highest

emotion average. Discreteness was assessed to note any immediate differences on the Emotion Rating Form, as a way of relating the two highest means to one another. A small discreteness score (any score less than .75, approximately 10% of the 1-7 rating scale) would suggest that the video elicited a blend of emotions, while a larger score, (any score above 1.45, approximately 20% of the 1-7 scale) would suggest that the video elicited a more discrete emotion. These cutoff points were made at the discretion of the researcher.

Emotion Description Analysis

Each survey asked the participant to describe, "In [their] own words, what emotion(s) did [they] feel most strongly while viewing the clip?" The results of this free-response question were analyzed for their 'hit rates' for all 14 video clips. A correct response ("hit") was identified to be an enumeration of one or more synonyms of the target emotion in question, or the target emotion itself. The synonyms for each emotion were selected using an online Thesaurus, and can be found in the appendix of this paper**.** For example, a correct response for the 'Remember the Titans' film clip (target emotion: determination) was, "Motivation and excitement", as 'motivation' is a synonym for 'determination'. The hit rates are shown below, in (Figure 1).

Figure 1: "Hit Rate"

Target Emotion	Movie Clip	"Hits"	Total	Hit Rate
Gratitude	Blind Side	5	50	10%
Gratitude	Schindler's List	9	44	20%
Joy	500 Days	35	42	83%
Joy	Lottery	41	45	91%
Hope	Coach Carter	16	41	39%
Hope	Field of Dreams	13	50	26%
Awe	Mountains	26	50	52%

Awe	Planet Earth	32	42	76%
Interest	Beautiful Mind	28	51	55%
Interest	Octopus	38	50	76%
Determination	Titans	25	44	57%
Determination	Marshall	30	58	52%
Serenity	Beach	30	41	73%
Serenity	Dolphins	35	43	81%

Video Analysis

Though the Emotion-Rating Form included positive and negative emotion ratings, positive emotions were focused on in the analyses in order to reduce extraneous error. Aggregate mean analyses across positive and negative emotions found no significant relationship between emotional category means, $r(649) = .242$, validating our analyses' focus on the positive emotions within the Emotion-Rating Form.

Video analyses were conducted using ideal profiles for each target emotion. These target profiles consisted of ideal average responses to the Emotion-Rating Form: for example, the ideal average response for videos that attempted to elicit the target emotion of "Interest" would have an average of '1' (the lowest possible response average) for all emotions *except* for 'interest', which would have an average of '7' (the highest possible response average). These profiles were made using Microsoft Excel, and transposed into SPSS data analysis software.

Average responses for each positive emotion category on the Emotion-Rating Form were calculated by video and by target emotion, leaving 21 profiles (14 separate average profiles, and 7 target emotion profiles) for analysis. Each profile was analyzed using a Pearson's Correlation in relation to its target emotion's ideal profile: for example, the two averaged profiles for 'interest' were compared to the ideal profile of 'interest'.

Significant correlations were found across profiles for awe, interest, joy, and serenity, while no significant correlations were found among the profiles for determination, hope, or gratitude.

**Figure 2:** Significant Profile Correlations

Target Emotion	Movie Clip	Correlation	Significance Level
Interest	Beautiful Mind	r=.679	p<.01
Awe	Mountains	r=.627	p<.05
Awe	Planet Earth	r=.581	p<.05
Joy	Lottery	r=.558	p<.05
Joy	500 Days	r=.595	p<.05
Serenity	Beach	r=.836	p<.001
Serenity	Dolphins	r=.718	p<.01

The pages that follow contain the mean profiles of each video, presented in column graphs. Correlations with the ideal profiles are reported, as well as standard deviations (SD) and 'discreteness' (D) scores.

Gratitude:

Of the two videos examined neither met the criteria for a successful elicitation. "Schindler's List" had a low correlation of [r(43)=.441, p=.144] (SD=1.21; D=.83) 'Compassionate' had the highest emotion mean (5.16) as opposed to gratitude (4.33).

Figure 3: Schindler's List
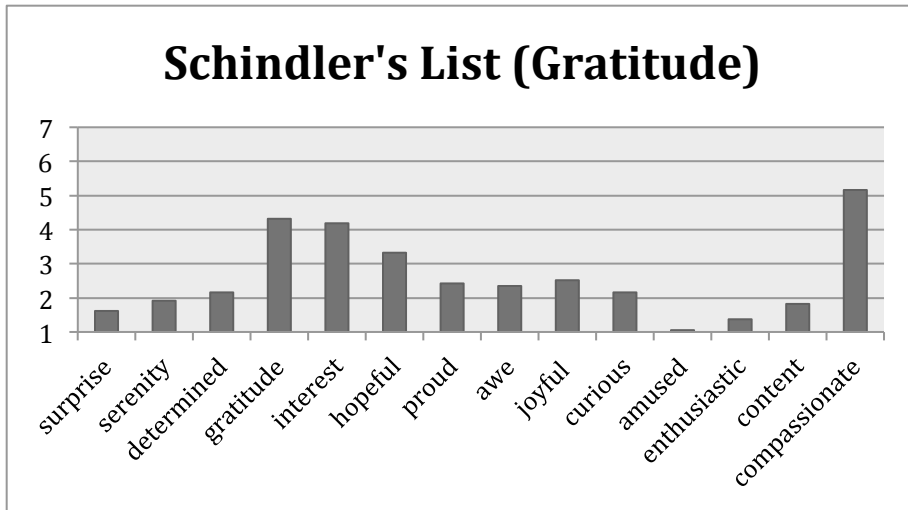
"The Blind Side" was also an unsuccessful elicitation. [r(49) =.291, p=.313] (SD=1.225, D=.92) The target emotion average was 4.34, with compassionate, again, being the highest average emotion (5.46). In this video, (D) represents the difference between 'compassionate' and 'interest'.
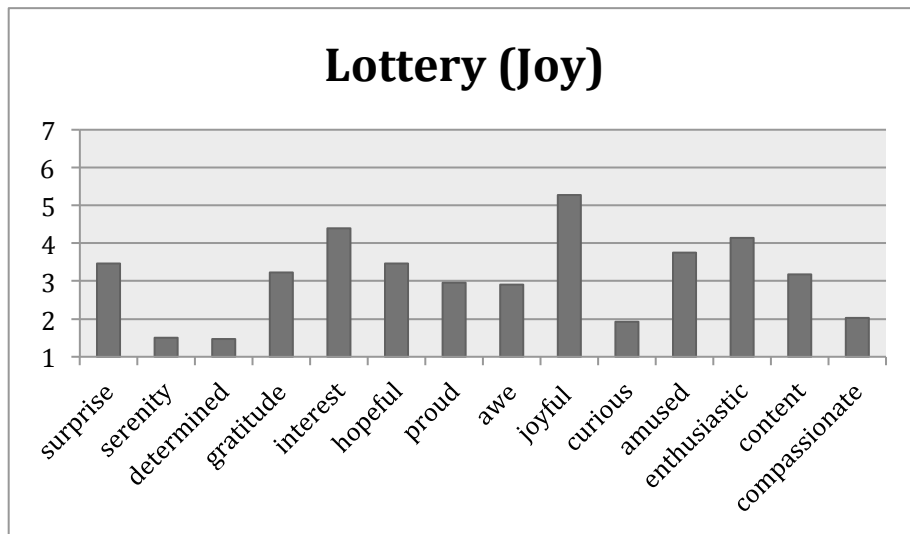
Figure 4: The Blind Side
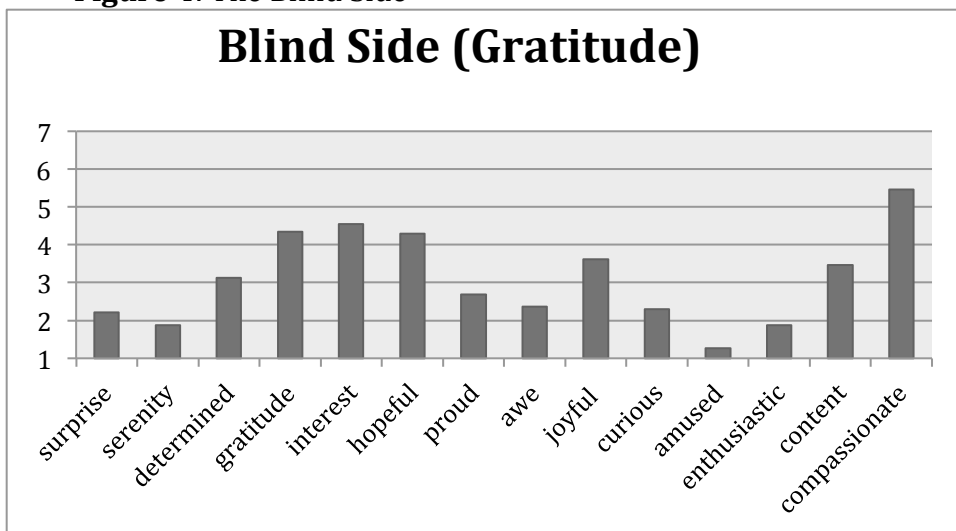
Joy

Of the two videos analyzed for Joy, both were successful at eliciting the emotion. "Lottery" was deemed a successful elicitation [r(44)=.558, p<.05], with an average target emotion score of (5.27). (SD=1.1; D= .87)

Figure 5: Lottery Ticket

500 Days of Summer: 500 Days of Summer was deemed a successful elicitation: r(41)=.595, p<.05, with an average target emotion score of 5.59. (SD=1.19; D=1.19)

Figure 6: 500 Days of Summer
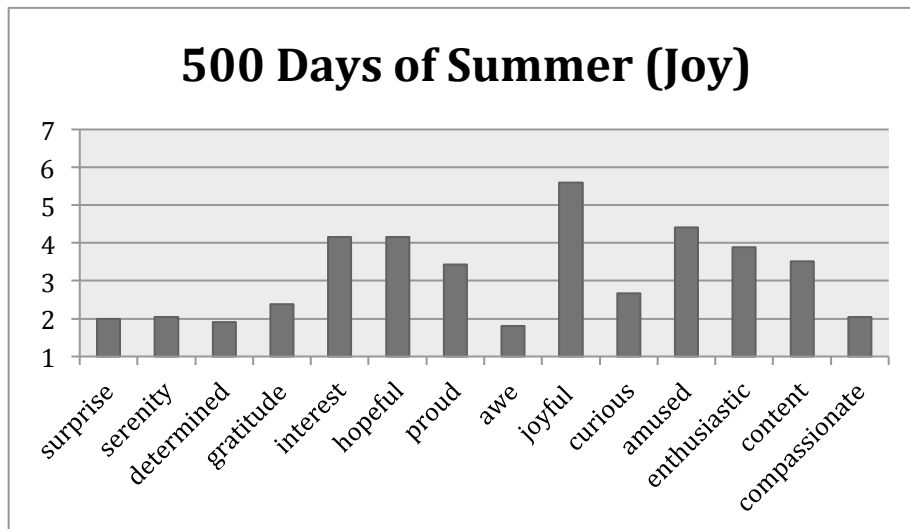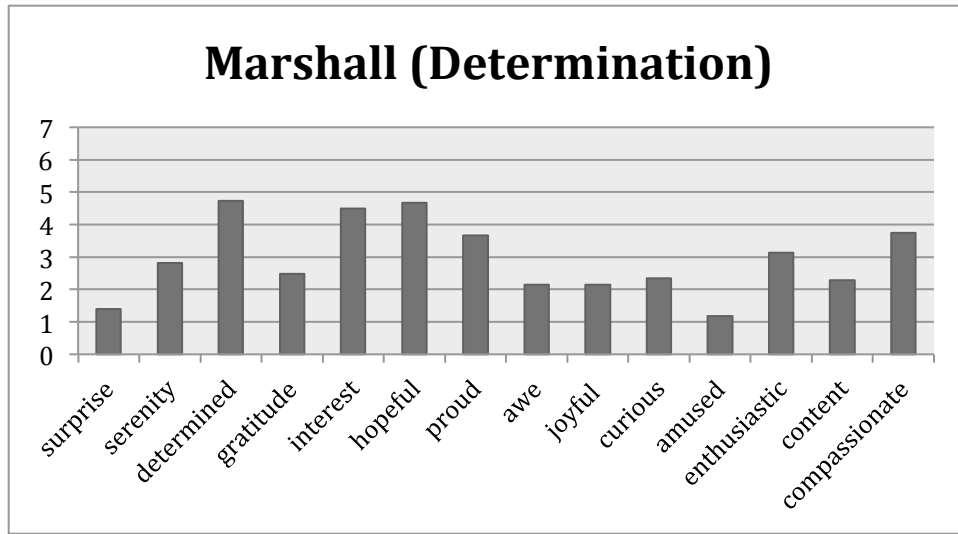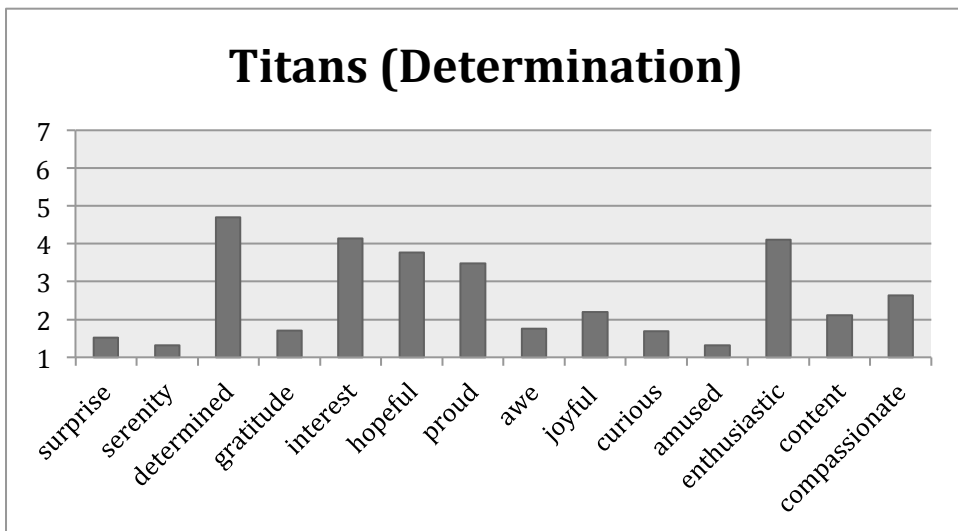
Determination:

Both videos that attempted to elicit 'determination' were unsuccessful. "Marshall" [r(57)=.440, p=.115], with a target emotion mean of 4.72. (SD=1.164; D=0.22)

Figure 7: We Are Marshall

'Remember the Titans' was also an unsuccessful elicitation. [r(43)=.508, p=.064], with a target emotion mean of 4.70. (SD=1.191, D=0.57)

Figure 8: Remember the Titans

Hope

Both films used to elicit hope were also unsuccessful. "Field of Dreams" had a low correlation (r(49)=.482, p=.081), with a target emotion mean of 4.08. Of note is the fact that 'interest' had the highest reported mean score (4.24). (SD=.91; Discreteness=.16).

Figure 9: Field of Dreams

Field of Dreams (Hope)
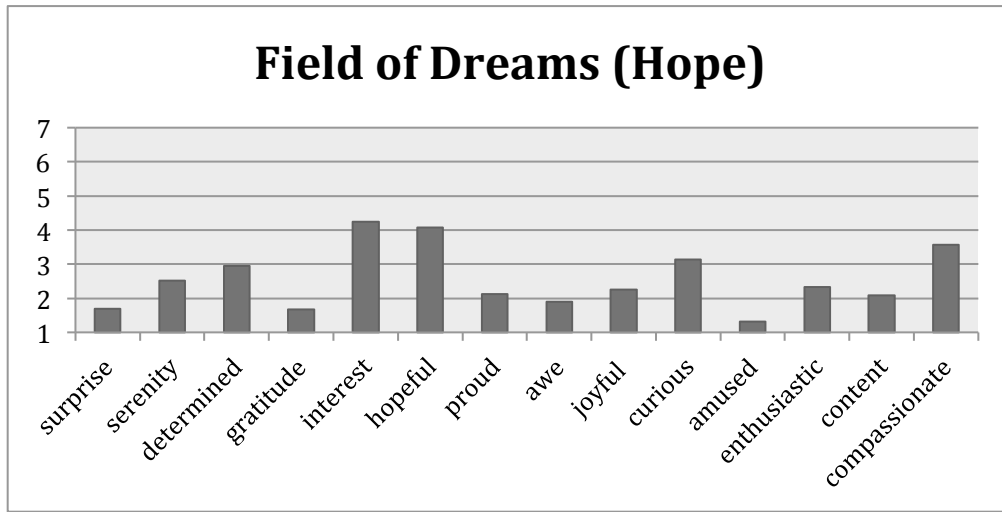
"Coach Carter" was also an unsuccessful elicitation. [r(40)=.357, p=.21] (SD=1.12; D=.12) 'D' represents the difference between determination and interest.

Figure 10: Coach Carter

Coach Carter (Hope)
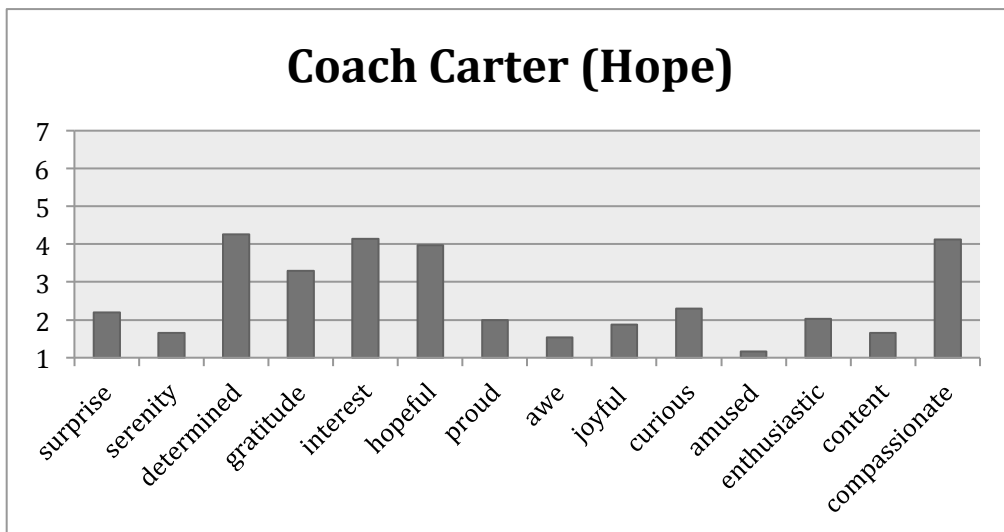
Awe

Both films used to elicit 'awe' were successful. "Planet Earth" successfully elicited 'awe' r(41)=.581, p<.05], with a target emotion mean of 5.6. (SD=1.117; D=.74)

Figure 11: Planet Earth
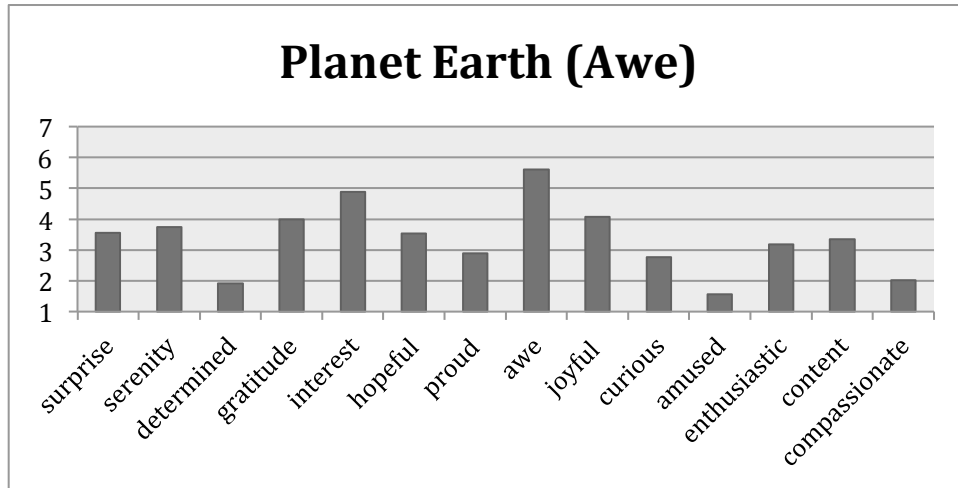
The video "Mountains" was also a successful elicitation [r(49)=.627, p<.05], with a target emotion mean = 5.4. (SD=1.07; D=1.01)

Figure 12: Mountains
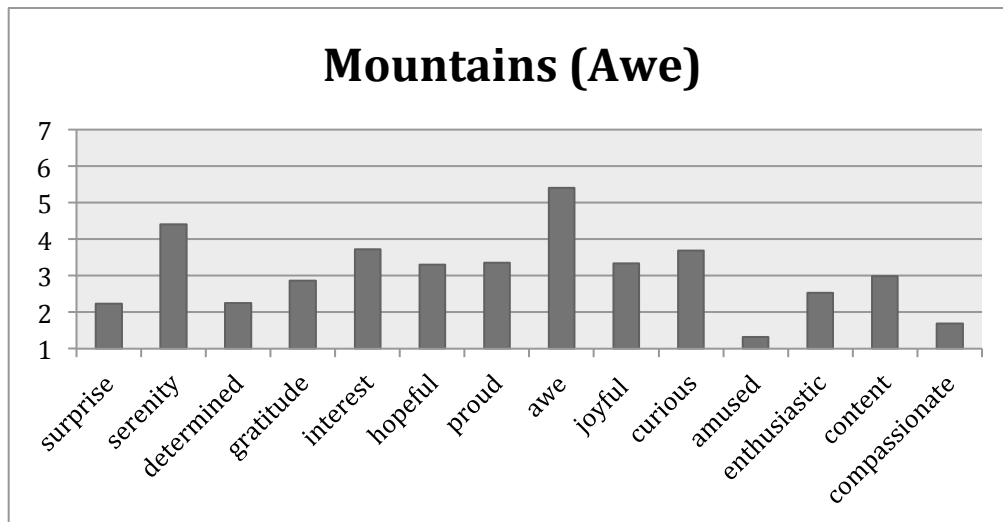
Serenity

The two film clips used to elicit 'serenity' were the most successful film clips of the entire study. "Dolphins" successfully elicited awe [r(42)=.718, p<.01], with a target emotion mean of 5.83. (SD=1.252; D=2.09)

Figure 13: Dolphins
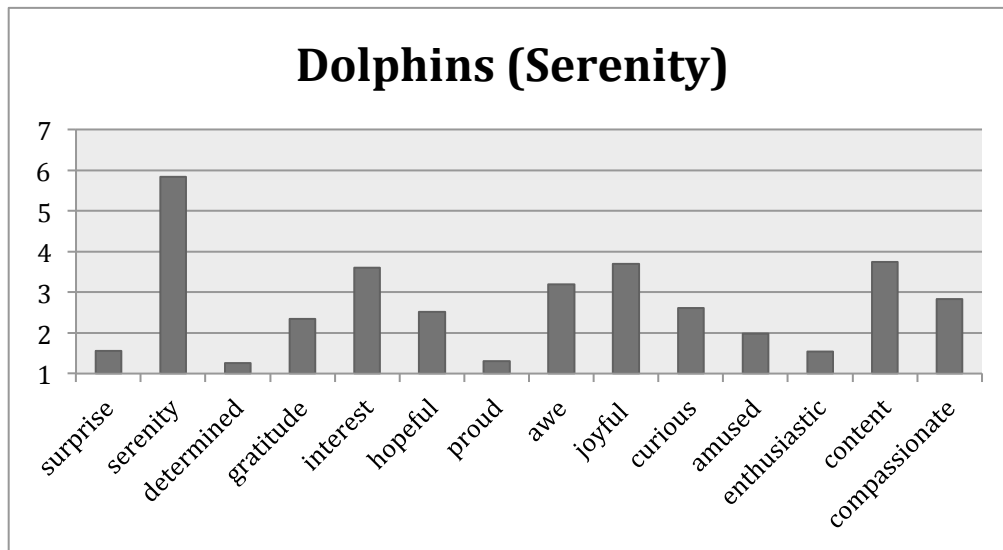
"Beach" was the most successful elicitation, [r(40)=.836, p<.001], with a . target emotion mean of 5.85, and the highest discreteness score (SD=1.21; D=2.58).

Figure 14: Beach
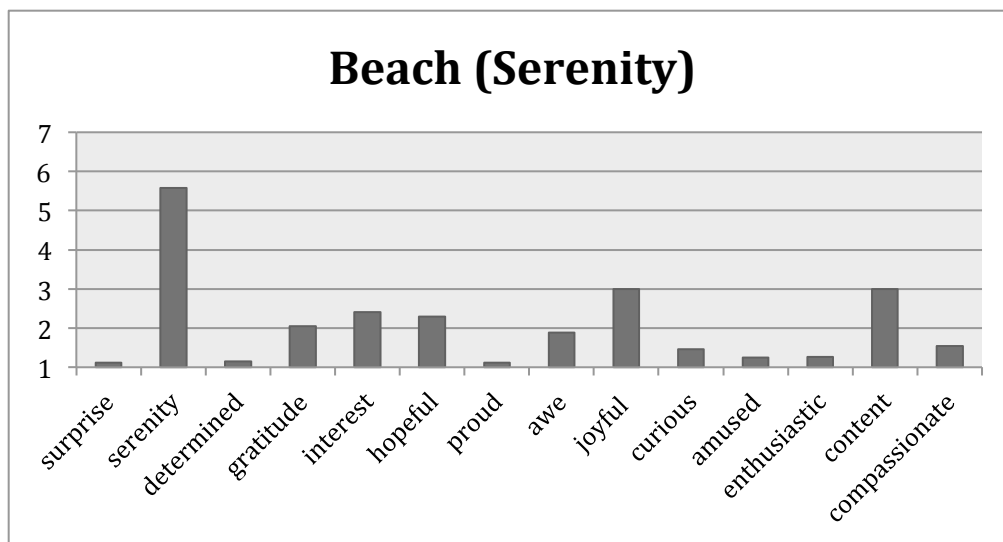
Interest

Only one film clip, "A Beautiful Mind", successfully elicited 'interest'

[r(50)=.679, p<.01], with a target emotion mean of 5.19. (SD=.988, D =1.08).

Figure 15: A Beautiful Mind
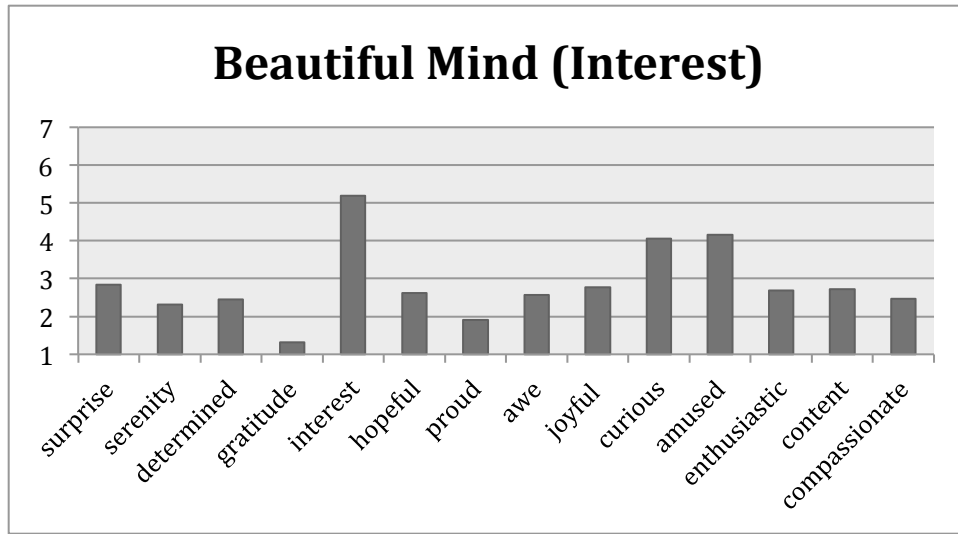
"Octopus" was not successful at eliciting interest, (r(39)=.479, p=.073), though it

had a high target emotion mean of 5.76 (SD=1.568, Discreteness=.4).

Figure 16: Octopus
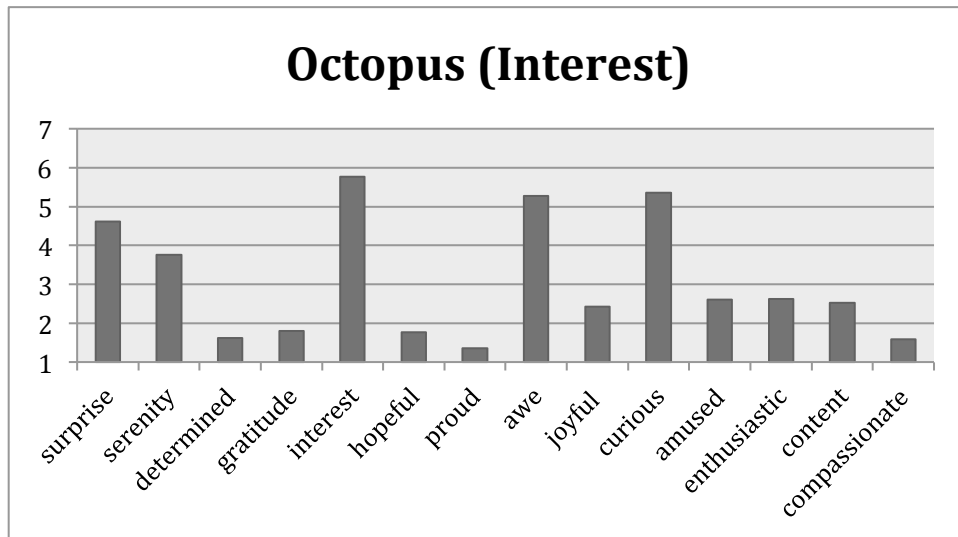
Participants were also asked to rate their perceived overall intensity of emotional arousal while watching each of the film clips. A one-way ANOVA was run to assess for possible effects of targeted emotion (that is, the seven emotions that the 14 videos attempted to elicit) on scores of emotional intensity. Figure 17 is a plot of the mean emotion intensity scores across each targeted emotion.

Figure 17: Emotion Intensity Mean x Target Emotion
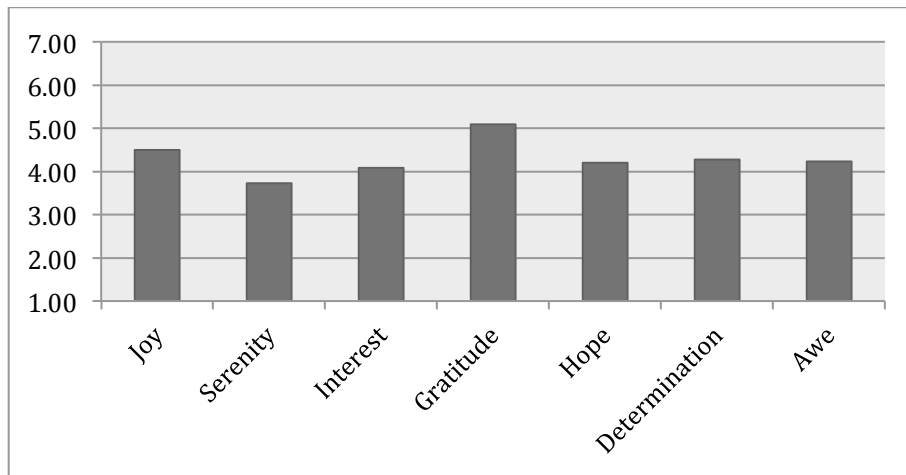
There was a significant effect of targeted emotion on emotional intensity at the p<.001 level. [$F(2, 646) = 7.155$, p=.000], with gratitude displaying the highest average emotional intensity score (5.09), and serenity displaying the lowest (3.73). A table corresponding to the results can be found in (Appendix B, Figure 18) of this paper.

One-way ANOVAS were run to assess possible effects of video on the reported values for each of the seven discrete positive emotions. This was completed in order to examine whether different videos elicited significantly distinct profiles from one another. No significant effect for video would suggest that the videos did not succeed in eliciting significantly different emotional profiles in relation to one another. Effects were found for *video* at the p<.001 level for all targeted discrete positive emotions: serenity, determination, hope, gratitude, awe, joy, and interest. These tables can be found in

(Appendix B: Figure 19) of this paper. This signifies that emotional levels varied

significantly from one another according to both the targeted emotion for each video, and

each validates the distinct emotional nature of the videos in relation to the seven target

discrete positive emotions.

Finally, a Pearson's two-tailed correlation was run to assess the relationship

between the profiles' Discreteness (D) scores and their correlations to the ideal profile.

Discreteness and correlations were found to be related at the p<.01 level: [r(13) = .793,

p=.001].

Discussion

Emotion Elicitation

The overarching purpose of this study was to examine the possibility of eliciting

discrete positive emotional responses using film clips. All of the analyses completed for

this study fall under this goal.

The emotion descriptions and each video's "hit rates" corresponded closely with

the strength of the correlations between the videos, and each emotion's ideal profile.

Those with the strongest similarities to ideal emotional profiles (serenity, awe, interest,

and joy) were also the emotions with the highest "hit rates". This suggests that the

participants were able to correctly identify their own subjective emotional experience

with the Emotion-Response Scale items.

The ANOVA results that observed a main effect of video on the seven target

positive emotions verified the significantly distinct emotional content of each video. Had

an effect not been found, it would mean that the videos elicited similar positive emotional

profiles across the target emotions. The main effect demonstrates that regardless of the type of emotion each video elicited, the videos were distinct from one another in terms of the overall emotional response from participants.

The main effect of target emotion on emotional intensity suggests that each emotion had distinctly different patterns of subjective emotional arousal. This result provides sufficient reason to further examine emotional arousal while eliciting discrete positive emotions, perhaps using physiological as well as psychological measures, an idea which is discussed further within this section.

The bulk of the analysis focused on assessing the similarity between a video's actual emotional profile and the ideal profile. The high correlation between the discreteness (D) measures and the correlation coefficients for each video validate the profile correlations attempt to assess the video's ability to elicit a discrete target emotion. Significant correlations between the actual and ideal profiles were found for the emotions of interest, awe, joy, and serenity. The videos for the emotions of gratitude, hope, and determination did not yield any significant results, as these emotional categories elicited a variety of emotions instead of discretely targeting one emotion. Below, I will enumerate the various successes and failures of emotion elicitation across all seven targeted emotions in this study.

Joy

As the emotion with the highest "hit rate", joy was not the emotion with the strongest correlation to the ideal profile, as may have been expected.

 To the layperson, 'joy' may represent a broad category of positive emotional states, as opposed to a discrete emotional experience. This belief may explain the

presence of many more positive emotional states than simply 'joyful' on its own for each video clip. Participants may have simply felt elevated positive affect, and as such validated many more positive emotions than simply 'joy', which lowered the strength of the profile correlations using the standardized Emotion-Rating Form measure. Evidence for this phenomenon comes from the high average ratings of 'amusement', 'interest', 'hope', and 'enthusiasm' on each video for joy. Relatively small discreteness scores for "Lottery" detail a blend between joy and interest are perhaps due to the gradual, tense nature of the revelation that the character had indeed won the lottery. This anticipation may have captured the viewers' attention, which would account for the high levels of 'interest'. Further clips could examine the type of content in the video for information such as this to reduce the overlap between elicited emotions.

Gratitude

Gratitude was the least successful of all emotion elicitations in this study, both in terms of the two videos' strength of correlations between ideal and actual emotion profiles, as well as their low "hit" rates.

Gratitude is one of the most heavily studied discrete positive emotions (Emmons, 2005), and many benefits have been shown to stem from one's expression and feeling of gratitude. Elicitation using film procedures may be a difficult task to achieve due to the need for an individual to directly experience a benefit or gift from an external benefactor (person or non-person) in order to experience the emotion of gratitude. The necessity of receiving a benefit onto one's person, and immediately perceiving that benefit, make gratitude inherently difficult to elicit using emotion. I hypothesized that viewing an actor express gratitude could potentially transmit the emotion to a viewer, however this does

not seem to be the case – at least with these film clips. According to the synonym analysis, viewers felt compassionate, or sympathetic to the characters. "Compassion" means to understand and feel for the experience of another individual. Though the characters in the film clips from "Blind Side" and "Schindler's List" may have been experiencing gratitude within the clips themselves, the indirect emotional experience of the viewer might account for the failure of these clips – and perhaps any other film clip – to discretely elicit gratitude. The small degree of discreteness for both gratitude profiles was due to the high average of 'compassionate' evoked by each video, which further supports the notion of sympathy for the characters in the clips.

The film clips used in the targeted 'gratitude' condition were more somber than many of the other film clips used in this study. Responses for 'sad' were clearly elevated in the 'means' graphs (Figures 3, 4) for 'Schindler's List' and 'The Blind Side', when compared to other mean responses of 'sad' in other film clips. The somber nature of these clips may also explain gratitude's highest average emotional intensity scores across targeted emotional categories (5.33), as we are predisposed to both remember, and to attend to, negative emotional stimuli (Frederickson, 1998).

Though the synonym analysis did not reveal a high "hit rate", four promising responses followed the theme of, "A strong sense of wanting to help out", which is the action tendency component of gratitude's overall emotional profile – returning the favor in some manner. The urge to "help" signified that these four participants felt grateful – and some felt grateful enough that they identified the urge to help. Therefore, while gratitude as a whole was not successful, aspects of the videos and responses give important clues about directions of future research, namely, the continued possibility of

finding a different set of film clips that allows viewers to feel gratitude more discretely, and more intensely.

Determination

"Remember the Titans" and "We Are Marshall" elicited strong responses for pride, hope, interest, enthusiasm, and determination. Again, emotional categories have significant areas of overlap, especially when they are considered in light of the whole emotional response. 'Determination', the target emotion, describes an emotional state that signals a mode of readiness, or preparation, and of a belief in one's own ability to overcome an obstacle in the present or very near future. Overlap between emotions occurs when this readiness could also be described as hope: the belief that your immediate circumstances will improve. Or perhaps an individual describes this state as pride, an emotion that prompts social communication about one's readiness and confidence in their ability to overcome the obstacle. The high reports of 'interest' and 'enthusiasm' in the 'determination' category could be interpreted as activity, arousal, and engagement with the present moment; again, this signals one's overall ability to turn circumstances for the better. Each separate emotion signifies an aspect of an overall picture, and the emotions are prevented from blending into one another (losing their discreteness) because each emotion has very different action tendency. Perhaps the temporal discrimination across situations that elicit determination, hope, and/or pride is very small – that is, each emotion may come in rapid succession from one another, due to the high arousal situation. 'Quick-thinking' could cause an individual to make several rapid-succession appraisals at once, and therefore, all emotions would be experienced in

the time span of one or two minutes. The high ratings of enthusiasm, hope, and pride as well as the small discreteness scores in each of the profiles supports this conclusion.

Hope

"Field of Dreams" and "Coach Carter" failed to elicit the discrete emotion of 'hope'. As previously noted, an individual is hopeful when he or she believes that their current situation will improve at some point in the future. Both clips contain a dialogue that focuses on a negative situation at hand: in 'Field of Dreams', a man is getting ready to foreclose his house, and in 'Coach Carter', a basketball team at a failing urban school is told that the odds are against them even graduating high school. Each clip then builds the dialogue to a point where the possibility of improvement is imminent and attainable. However, these clips elicited various emotions, such as hope, gratitude, and compassion. Again, emotional overlap occurs here, as participants may have felt grateful for their immediate situation when it was contrasted with the poor situations of the individuals in the clips. They may have also felt compassion for those shown to be experiencing hardship.

A second trend in the analysis of 'hope' elicitation was the apparent overlap in emotional descriptions between the videos for 'Hope' and 'Determination'. Six individuals used the term "inspired" in the videos for 'Hope', and 15 individuals used "inspired" in the videos for 'Determination'. Hope, as previously noted, includes the belief that poor circumstances will improve over time, while determination includes the action tendency to actively take steps to improve upon one's circumstances. When analyzed in this light, 'inspired' is the common ground between these similar emotional

categories. It is easy to imagine a circumstance where one feels both hopeful at the

possibility of a positive outcome, as well as determined to make that outcome happen.

Both of the hope profiles had the smallest discreteness scores: "Field of Dreams"

between 'interest' and 'hope', and "Coach Carter", between 'determination' and

'interest'. The high degree of interest in both of the profiles may be due to the heavy

presence of complex dialogue in each of these scenes, a fact that must be taken into

further consideration when selecting videos for 'interest', as well as for 'hope', in the

future.

Serenity

The two film clips used to elicit *serenity,* 'Dolphin' and 'Ocean', were the most

successful elicitations in the study regarding the combination "hit rate" and high

correlations to the ideal profile of serenity. One possible explanation for their success is

their use of images commonly associated with 'relaxation' and 'tranquility', which may

have primed participants to validate 'serenity' on the discrete emotions questionnaire.

The synonym analysis pointed to valid elicitation of serenity, with numerous responses

such as, "The [dolphin] clip made me feel relaxed, secure, and peaceful."

From an appraisal perspective, serenity occurs during an low-arousal environment

that is in line with an individuals current needs, goals, and wants. The relaxation response

to a calming environment reduces blood pressure, heart rate, and muscle tension (Benson,

1975). Further studies using film stimuli as emotional antecedents in laboratory settings

could benefit from the use of physiological data to assess changes in participants'

baseline physiological measures. Physiological data could be used to assess the efficacy

of serenity videos verifiably moving the viewers into a state of relaxation.

Both of the serenity profiles had discreteness scores of above two, and the highest of all discreteness scores, further validating the success of eliciting serenity with the two film clips.

Awe

The videos for awe – a montage of scenes from BBC's 'Planet Earth', and a clip of 'Mountains' – were successful in eliciting awe according to both "hit rate" and profile correlations. Videos were selected with the knowledge that awe is most likely to be evoked when an individual witnesses something (an event, a picture, a natural phenomenon) that is perceived to be far greater and more powerful than themselves. Synonym analysis yielded results such as, "A sense of wonder and a feeling of my own insignificance in the grand scheme of things" and, "Humbled, and in awe because [the mountains] were so beautiful".

Shiota and Keltner (2007) note that the most defining characteristic of an awe-inspiring stimulus is the dramatic expansion of an individual's cognitive frame of reference. The experience of awe has been found to have self-diminishing qualities on self-schema, causing an individual to become aware of their "insignificance" in relation to the larger world. Awe also directs attention away from subjective experience and onto the external environment. Further research could benefit from understanding the types or varieties of cognitive accommodation/assimilation due to the experience of "awe" across various populations.

Interest

The film clip from "A Beautiful Mind" successfully elicited 'interest' when correlated with its ideal profile, while "Octopus" was not successful. However, these

clips were chosen based upon their informational content, with each clip revealing and explaining a piece of information.

The success of "A Beautiful Mind" and the failure of "Octopus" bring up both the distinction and overlap between 'interest' and 'curiosity' on the discrete emotions measure. As each term functions as slightly different instantiations of the overall emotion, I decided to leave the terms separate. Upon analysis, the second video for interest, "Octopus" barely missed the level of significance. However, the video was found to be significant in its elicitation if the scores from 'interest' and 'curiosity' were averaged prior to analysis. (The very small discreteness score for "Octopus" reports the difference between 'interest' and 'curiosity'.) When the two emotions were averaged, the correlations for both videos are: "Octopus", $r(49)=.554$, $p<.05$., and "A Beautiful Mind" $r(50)=.579$, $p<.05$. "A Beautiful Mind" is significantly lower than its first analysis without 'interest and curiosity' averaged together.

The reason for this difference between curiosity and interest in the two clips may be found in the synonym analysis. The "hit rate" for "Octopus" was far greater than that of "A Beautiful Mind'". Participants were much more likely to endorse 'amusement' or 'humor' in the clip of "A Beautiful Mind", along with 'interest', due to the content of the clip itself. In contrast, "Octopus" viewers were more likely to denote their "surprise" or "fascination". I hypothesize that this difference is due to the uniqueness of the octopus in the video. Therefore, 'curiosity' may be related to new, novel, and slightly peculiar information – a discovery – while 'interest' may be evoked with similarly new, but less peculiar (and more straightforward) acquisition of knowledge, such as John Nash's theory of Governing Dynamics in "A Beautiful Mind".

Interest is an essential mechanism for learning and development because it focuses an individual's attention on the subject at hand. Continued research can perhaps understand what stimuli are interesting to various populations. Of particular note to me is the possibility that 'interest' must be elicited using informational, and perhaps educational, content.

Further Explanations

Several explanations for the results of this study fall under the overarching hypothesis that discrete positive emotions have many overlapping features, making them less distinct overall. These overlapping features include facial expressions. Negative emotions are easily and cross-culturally discernible, whereas positive emotions are not, as they are only recognized in the category of general positivity by the *Duchene smile* (Frederickson, 1998). Autonomic system responsivity also fails to strongly differentiate among discrete positive emotions, whereas emotional states like anger and fear elicit different autonomic profiles (Frederickson, 1998). It is possible that the lack of differentiation among positive emotional experience dulls the significance of emotion research findings due to the participant's validation of varying types of positive affect, especially when using self-report measures.

Less-Differentiated Positive Affect

This overlap between discrete positive emotions is an issue that all positive emotion researchers will face. Frederickson (1998) notes that positive emotions are both fewer in number, as well as far less differentiated, than their negative counterparts. In fact, a fair degree of overlap between emotions occurs during descriptions of positive emotional experiences, the degree to which is not witnessed in descriptions of negative

experiences (Ellsworth & Smith, 1988b). Less powerful films, such as the films used in unsuccessful elicitations within this study, elicit a mid-level range of positive affect, resulting in a less-differentiated emotional profile. A film that elicits general positive arousal (such as "Remember the Titans") has a profile that validates a range of related emotions, and no significantly distinct emotions. However, this study's success in eliciting awe, serenity, interest, and joy point to the ability for film stimuli to significantly elicit some discrete positive emotions, and thus leaves room for further exploration into discrete positive emotional elicitation using film clips.

Direct Engagement v. Indirect Engagement

One possible explanation for the success of the emotions of interest*, serenity,* and awe is what I will term "direct engagement" with the film clip. "Direct" engagement of the video means that the viewer was the primary audience for the content within the film clip, whereas "indirect" engagement details that the content of the clip was filtered through an additional human character. The clips of *interest* were videos explaining various phenomena, while the beautiful scenes in both serenity and *awe* immediately transported the viewer to another place. In contrast, the videos for *hope, gratitude,* and *determination* all depicted scenes where characters were shown to feel grateful, or hopeful, or determined. In these videos, the participants did not mirror the exact emotions felt by the characters. Instead, they felt emotions in response to the characters, which I term "indirect" or "sympathetic engagement" with the film clip. Evidence for this distinction is shown when participants sympathized with a character situation, as evidenced by the high ratings of compassion in both the *hope* and *gratitude* clips.

The distinction between clips that elicit "direct engagement" versus "sympathetic engagement" is the key to understanding why many of the emotion elicitation films were unsuccessful. Directly influencing the participant is obviously the most attractive option when conducting an emotion elicitation. However, some emotions – such as gratitude – need the participant to be *acted* upon by another force or individual in order to directly feel the emotion. Others, such as pride, need the participant themselves to reflect positively upon a personal achievement of some sort. "Sympathetic" films may be the only option of elicitation for these types of emotions. The successes of both 'joy' clips, even as a sympathetically aroused emotion, provide a ray of hope for the possibility that 'sympathetic' emotional arousal can closely mirror the emotion or situation shown in films. The characters in "500 Days of Summer" and "Lottery Ticket" displayed remarkable patterns of overall positive emotion, affectivity, and high arousal levels. Due to the significant correlations and high "hit rates", the participants in this study were able to robustly mirror the actors' emotions. While it may be the case that when using film, gratitude, hope, determination, and other positive emotions must use "sympathetic" film clips, it is also possible that there are other, more intense films that depict these emotions strongly enough to elicit similar responses in their viewers.

Time Investment

The unsuccessful attempts to elicit the emotions of gratitude, hope, and determination may also be explained by the insubstantial amount of time invested by each participant in the characters shown exhibiting those very emotions within the film clips. Each of these emotions is a 'sympathetically-engaged' emotion. While immediately relatable emotions such as 'joy' may be transmitted to the viewer with only a minute's

worth of a character's noticeable glee (i.e. '500 Days of Summer'), more subtle and

nuanced emotions such as hope and gratitude necessarily depend on the pre-context of

those emotions. In order for a participant to feel 'gratitude', they must understand the

great benefit that the character has received; that is, they must identify the context of the

gratitude itself, identify with the character, and finally, sympathize with their emotional

experience. It may be the case that participants would experience hope or gratitude if they

had the opportunity to watch the entire film – Schindler's List, for example – and imagine

themselves as one of the men and women who were saved by Oscar Schindler. After an

hour and a half of absorption within the life of those in World War II, gratitude may be

more easily understood and evoked, even through sympathetic engagement with the

characters. Further research concerning sympathetically-engaged film clips and their

corresponding emotions could shed more light onto whether or not emotions such as

hope, gratitude, and determination have the ability to be elicited using film clips.

Limiting Factors

The results of this study are limited in their generalizability by factors primarily

pertaining to the sample size and population characteristics. As stated before, the majority

of data was collected from the Vanderbilt Undergraduate population, limiting the nature

of conclusions we are able to draw from our data in terms of age, immediate culture, and

demographics. Furthermore, while the sample size (approximately 40 views per video) is

adequate, more responses would increase the power of our findings.

Unfortunately, additional situational and subject variables pose threats to both the

reliability and validity of these findings. The first confounding variable is the non-

standardized nature of data collection for the entire study. Two distinct types of data

collection occurred: *direct*, which refers to the experimenter being present at the time of collection, and *indirect,* which refers to a condition where the experimenter was absent. Direct collection took place, as noted, within the Vanderbilt Campus. The background noise and level of activity within the dining halls was a major source of distraction for participants while watching the videos. Also of note is the varying time of day in which data collection took place: of the direct data collected, the earliest occurred at approximately 8:30AM, while the latest was collected at approximately 1:00AM. Lastly, and perhaps most grievously, the number of individual responses amassed in direct data collection is uncertain. This is due to experimenter error, as the notebook containing the gender and number of participants, as well as the time and location of data collection, is at this time unable to be found. No situational information was gathered from indirect data collection (time of day, environment, distractions present, etc.) due to the anonymous nature of the film questionnaire. Overall, the lack of standardization present in both forms of data collection serves as a potential confounding variable to consider in light of the results of this study. Also, the strength of the analyses is not constant, as each film had a different number of viewers.

Confounding subject variables were also present during data collection, including the precipitating mood of each participant prior to viewing the film. For many participants in the direct collection, viewing the film came as an interruption to their present activity, be it studying, eating, or having a conversation. This poses a threat to the desired 'neutral' state achieved in other emotion elicitation procedures (Gross & Levenson, 1995), and leaving our results without a controlled baseline. Individuals are variable in their stable trait differences of emotional reactivity, sensitivity, and general

personality. For example, women have been shown to be more emotionally reactive than

men (Gross & Levenson, 1995, Hagemann et al., 1999). Also, stable personality traits

such as extraversion and neuroticism influence participants' experienced emotions during

both positively and negatively valenced films, respectively (Gross et al., 1998). Further

studies could make use of trait and personality analyses to assess for other relationships

between emotional reaction and individual characteristics.

Accuracy of Emotion-Terms

Another possible difficulty with self-report measures of emotion arises from the

problem of translating an emotional experience into an accurate word description, and

then validating the description on self-report measures. The Emotion-Rating Form, with

its 27 emotion terms, is quite a thorough measure, reflecting many different types of

emotions. All 27 items were included in the measures within this study for the purpose of

complete emotional sampling (both negative and positively valenced terms). However,

overlapping areas of emotionality such as 'curiosity' and 'interest' may confuse the

participants, as well as confound the data analyses. These two emotions reflect varying

subsets of the overall 'cognitive engagement' with the film stimuli, and they both may be

part of the overall category of 'interest'. "Curiosity", according to the Random House

Dictionary (2012), means, "eager to know", while "interest" denotes a more general

"concern with a subject". The distinction between these is shown in the difference in

content of the two 'interest' films: "A Beautiful Mind", which aroused more interest than

curiosity, contained a mathematical formula explained within a metaphor of 'picking up'

a girl at a bar. "Octopus", on the other hand, aroused nearly equal amounts of curiosity

and interest, perhaps due to the unique nature of the octopus itself – individuals may have

been less 'concerned with the subject matter' and more 'eager to know' further information about the shape-shifting creature.

Of further interest is the issue of 'discreteness' in emotional measures. The obviously strong correlation between the discreteness scores and the correlations between actual and ideal profiles points to the necessity of separated emotional experience in significant emotion elicitation procedures. Discreteness scores are of use because they allow for immediate knowledge concerning the two strongest emotions, and the amount of separation between their average scores.

Future Research

The first type of further research involves replicating this study using a broader subject base, as well as a standardized, controlled experimental procedure in a true laboratory. Confounding variables such as the noise level in dining halls, quasi-random population sampling, and limited population characteristics could be controlled for with a more cohesive experimental procedure. Additionally, new measures could provide more discrete data, and new film clips could be tested. Guided by the distinction difference between direct engagement and sympathetic engagement, more intense, relatable film clips targeting sympathetically engaged emotions such as gratitude or hope would provide further insight into whether or not it is possible to elicit these emotions using film clips.

The replications of this study (using controlled experimental methods, of course) could also incorporate variations on the current research methodology. As previously noted, the *time investment* of the participant could be manipulated by increasing the amount of time spent viewing a film clip. This increase could range from an additional

five minutes to an entire hour of film viewing. If the time investment of the viewer was significantly increased, the *subjective (indirect) engagement* with the film clip could be increased to a degree that the sympathetic arousal (due to a character's emotion and circumstance) would be of a great enough degree to elicit a distinct emotion. "Schindler's List" may very well elicit the discrete emotion of gratitude if participants were given the opportunity to identify with those individuals whom Schindler saved. Of course, time constraints would need to be taken into account, but a longer experiment is worth the elicitation of an elusive positive emotion – especially one as powerful as gratitude (Emmons, 2005).

Changing the instructions given to participants could potentially help to increase their levels of emotional connection with the characters in the film clips. Instructions for the individual to take the perspective of the character within the film clip may increase their connection, attention, and emotional response to the emotional experience of the actors themselves.

Additional measurements of emotionality could also be incorporated into future replications of this study. Emotion research has made use of physiological data such as heart rate, skin conductance level, and blood pressure (Mauss & Robinson, 2009), however such data has so far been inconclusive regarding the specificity of autonomic system activation in relation to discrete emotional response. Basic physiological measures such as heart rate could be incorporated into this study as a source of validation for emotions such as *serenity*, which according to the relaxation response significantly lowers baseline heart rate (Benson, 1975). The emotional profiles found for *determination* found high levels of emotions such as 'enthusiasm', and three

corresponding synonym responses along the lines of "fired up!" suggesting that participants experienced an increase in physiological arousal while viewing the "Remember the Titans" and "Marshall" clips. This potential increase could be assessed using basic physiological data as well.

As positive emotions are less differentiated than negative emotions, measurements other than prompted survey responses could be used to assess potentially nuanced similarities among populations in the aftermath of the emotion induction procedure. Voice tone analysis has been successfully used to assess the level of emotional arousal in an individual (Bachorowski & Owen, 1995), though vocal tone has not been successful in assessing emotional valence (Bachorowski, 1999). Participants could be instructed to give unstructured, prompted vocal feedback regarding their emotional experience when watching a clip. These vocal tones could give further insight into the type of emotional experience evoked by the film, and improvements in current digital processing software may allow for more in-depth vocal analysis.

Finally, synonym analysis procedures such as the one in this study could be further refined using content analysis measures. Participants could be asked to either speak or write about their emotional experiences, thoughts, or ideas concerning the film clips. Basic measures such as the Linguistic Inquiry and Word Count (LIWC) (Pennebaker & Francis, 1999) have been used to assess the number of words, affective words, and punctuations in the analysis of text for both positive and negative emotions (Hancock, Landrigan, & Silver, 2007). Recently, a database called WordNetAffect has been tested and validated regarding the lexical affective analysis of text, including distinctions between "emotion-eliciting states", "cognitive states", "personality traits",

and "behavior" categories of affective words. (Valitutti, Strapparava, & Stock, 2004). The unprompted responses of the participants may yield a more precise picture of their emotional experience due to the film clip, because the response would be in their own words. This type of measure avoids the confusion of validating prompted emotional states, as may have been seen on the Emotion Response Scale within this study.

Frederickson (2001) noted that positive emotions tend to expand one's thought-action repetoires, encouraging exploration and play in one's immediate environment. Over time, the individual's experience of positive emotions and the aggregate of their broadened behavioral and cognitive interactions with their environment 'build' positive resources, such as increased knowledge, or improved health outcomes and social support. Part of the less-differentiated nature of positive emotions (Frederickson, 1998) may be due to the differences between individuals concerning the ways that their enduring personality characteristics influence their behavior (Dall, Houston, & McNamara, 2004), such as their choice of modes of play, exploration, and connection with their environment. Unprompted measures such as voice tone analysis and affective textual analysis may pick up on the more subjective and varied nature of positive emotional reaction and behavioral tendencies. A (potentially) more precise analysis regarding the individual's experience of a positive emotion could allow for a more accurate assessment of commonalities in individuals' positive emotional experiences. This type of research using discrete positive emotions and vocal/textual analysis has yet to be completed, and is certainly a subject worthy of further examination.

The second area of future exploration for emotion elicitation using film clips concerns the assimilation of all normed, emotion-eliciting video clips into an

international database, similar to the International Affective Picture System (IAPS). As the research concerning emotion elicitation using films grows ever larger, so does the need for an organized, accessible collection of these films for further use, research, and distribution into other settings. This database would facilitate the use of films for emotion elicitation – proven to be one of the most reliable and robust methods – for further affective science research.

Conclusion

This study was conducted to assess the ability of 14 film clips to elicit seven discrete positive emotions: joy, gratitude, awe, determination, interest, serenity, and hope. Seven film clips successfully elicited four emotions: interest was elicited by one clip, and joy, awe, and serenity were each elicited by two video clips. Currently, this is the first study to examine the use of film clips to elicit discrete positive emotions. As the fields of positive psychology and affective science grow, so do the possibilities for interdisciplinary research across all fields using the data gathered about the antecedents, consequences, profiles, and utility of discrete positive emotions.

The results of this study present a distinction between *direct engagement* and *subjective engagement* with a film clip. Films that present stimuli to be directly processed by the viewer (*direct*), instead of stimuli processed through a character (*sympathetic*), were successful in eliciting their target emotions. However, this study found success in eliciting one emotion in a sympathetic manner – joy. The success of 'joy' suggest the possibility of using more robust content for the elicitation of other nuanced emotions

such as gratitude, hope, determination – emotions that require a significant empathetic connection between the character and the viewer in order to be successfully elicited.

Further research could examine the difference between direct and indirect presentation of film stimuli by attempting to elicit those emotions that were unsuccessful in this study. While it may be the case that nuanced emotions require direct engagement with the participant through didactic interaction tasks in the laboratory, the ability to elicit these emotions using film stimuli should not be ruled out just yet. After all, film stimuli are some of the most easily accessible, replicable, and effective methods of emotion elicitation in a laboratory.

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Appendix A:

Synonyms used in Synonym Analysis:

Gratitude Synonyms:
Appreciation, thankfulness, acknowledgement
Joy Synonyms:
Happiness, excitement, elation, upbeat, cheerful, lighthearted
Hope Synonyms:
Aspiration, belief, confidence, optimism, trust,
Awe Synonyms:
Amazement, wonder, marvel, astonishment, elevation
Interest Synonyms:
Curiosity, intrigue, engage, engross, fascination, captivate,
Determination Synonyms:
Challenge, inspire, conviction, motivated, committed, 'pumped-up', driven, aggressive, energetic
Serenity Synonyms:
Calm, peaceful, relaxed, tranquil, content, at ease

www.thesaurus.com

Appendix B:

ANOVA

Figure 18: Emotion Intensity x Target Emotion

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	94.522	6	15.754	7.155	.000
Within Groups	1413.460	642	2.202		
Total	1507.982	648			

Figure 19: ANOVA (Positive Emotion x Video)

		Sum of Squares	df	Mean Square	F	Sig.
serenity	Between Groups	616.213	6	102.702	44.408	.000
	Within Groups	728.498	315	2.313		
	Total	1344.711	321			
determined	Between Groups	321.730	6	53.622	17.755	.000
	Within Groups	948.295	314	3.020		
	Total	1270.025	320			
gratitude	Between Groups	278.931	6	46.489	18.697	.000
	Within Groups	778.269	313	2.486		
	Total	1057.200	319			
interest	Between Groups	185.628	6	30.938	9.264	.000
	Within Groups	1048.671	314	3.340		
	Total	1234.299	320			
hopeful	Between Groups	135.019	6	22.503	5.990	.000
	Within Groups	1179.604	314	3.757		
	Total	1314.623	320			
awe	Between Groups	492.961	6	82.160	33.252	.000
	Within Groups	775.849	314	2.471		
	Total	1268.810	320			
joyful	Between Groups	355.359	6	59.226	19.308	.000
	Within Groups	966.272	315	3.068		
	Total	1321.630	321			

Appendix C:

Joy:
- *500 Days of Summer* – "You Make My Dreams Come True" – (0:46) – The main character in *500 Days of Summer* walks to work in the morning in a happy, blissful reality where music is playing and everyone smiles, waves, and congratulates him. (www.movieclips.com)
- *Lottery Ticket* – "Winning the Lottery" – (1:06) – The clip details a young man watching the television as a woman reports the winning lottery numbers. When he finds out that he has all six of the correct numbers, celebration ensues! (www.movieclips.com)

Interest/Curiosity:
- *A Beautiful Mind* – "Ignore the Blonde" – (2:46) – The mathematician John Nash describes his theory of Governing Dynamics using the metaphor of he and his friends trying to pick up women at a bar: if they work together, doing what is best for themselves as well as the group of them, the outcome will be better than if they worked alone! (www.movieclips.com)
- "Mimic Octopus" – (2:59) – A voiceover details the incredible shape-shifting abilities of the mimic octopus. (www.YouTube.com)

Gratitude:
- *The Blind Side* – "Do You Have Any Place to Stay?" – (1:07) – A woman sees a young man walking alongside of the road at night, and offers him a place to stay for the evening. (www.movieclips.com)
- *Schindler's List* – "He Who Saves One Life Saves the World Entire" (2:45) This clip can be found at the closing scenes of *Schindler's List.* The hundreds of people that Schlinder saved during World War II follow him out of the factory and to his car, thanking him along the way. His close friend gives him a ring engraved with a Hebrew saying, "He Who Saves One Life Saves the World Entire". (www.movieclips.com)

Serenity:
- "Relaxing Beach Scenes" – (5:22) – A montage of beach scenes is set to "A Good Heart" by Marc Enfroy. (www.YouTube.com)
- "Dolphins" – (5:41) – Images of dolphins swimming underwater are played over the sounds of Medwyn Goodall's "Dolphin Companion". (www.YouTube.com)

Hope:
- *Coach Carter* – "A Better Life" (2:09) – Coach Carter addresses his team in the library, telling them that the odds are stacked against them in all aspects of life – however, if they want better, then he'll do everything he can to get them all into college. (www.movieclips.com)
- *Field of Dreams* – "People Will Come" – (2:59) – The main character is in a tight spot with money, and may have to foreclose his home. An old man convinces him to keep his house and build the baseball field, telling him that people will come from far and wide to see it. (www.movieclips.com)

Awe:
- *Planet Earth* – Montage – (3:10) – Scenes from BBC's Planet Earth are shown while Sigur Ros' "Hoppipolla" plays in the background. (www.YouTube.com)

- *Planet Earth* – Mountains – (2:26) This clip shows footage taken from the BBC series Planet Earth, set to "In a Moment of Greatness" by Larry Groupe. It was originally edited by Andy Netley for Planet Earth, and re-edited by James McGhee (amateur editor/filmmaker) for viewing on YouTube. (www.YouTube.com)

Challenge/Determination:

- *Remember the Titans* – "Not Another Yard" – (0:46) –The Titan's coach calls them in for a huddle in the middle of an important game to re-energize the players, and make them remember that they are the Titans! (www.YouTube.com)
- *We Are Marshall* – "We Cannot Lose" – (1:59) – A coach takes his players to the gravesite of deceased Marshall athletes, telling them about their past. A big game is coming up, and he says that because they are "Marshall", they cannot lose if they lay their whole heart on the line. (www.movieclips.com)

Figure 20: Emotion Rating Form

Appendix D:

DEAL 1

After watching the video, please complete the survey below.

Thank you!

1) Gender
   - ☐ Male
   - ☐ Female

2) Have you ever seen this clip before?
   - ☐ Yes
   - ☐ No

3) Please describe, in one or two sentences, the clip you just viewed.
   _____

4) In your own words, what emotion(s) did you feel most strongly while viewing this clip?
   _____

At the end of the viewing period, please indicate whether or not you felt the following emotions while watching the clip. Use the following numerical values and criteria for your ratings. 1 = I did not feel the emotion at all. 3 = I felt this emotion somewhat; 5 = I moderately felt this emotion; 7 = I experienced this emotion very strongly. Numbers without explanations serve as 'in-between' ratings for the intensity of the emotions in question.

5) Surprised, Astonished
   - ☐ 1 - I did not feel this emotion at all
   - ☐ 2
   - ☐ 3 - I felt this emotion somewhat
   - ☐ 4
   - ☐ 5 - I felt this emotion moderately
   - ☐ 6
   - ☐ 7 - I felt this emotion very strongly

6) Tranquil, calm, serene, relaxed
   - ☐ 1 - I did not feel this emotion at all
   - ☐ 2
   - ☐ 3 - I felt this emotion somewhat
   - ☐ 4
   - ☐ 5 - I felt this emotion moderately
   - ☐ 6
   - ☐ 7 - I felt this emotion very strongly

7) Determined, motivated, persistent
   - ☐ 1 - I did not feel this emotion at all
   - ☐ 2
   - ☐ 3 - I felt this emotion somewhat
   - ☐ 4
   - ☐ 5 - I felt this emotion moderately
   - ☐ 6
   - ☐ 7 - I felt this emotion very strongly

8) Relieved, unburdened
   - ☐ 1 - I did not feel this emotion at all
   - ☐ 2
   - ☐ 3 - I felt this emotion somewhat
   - ☐ 4
   - ☐ 5 - I felt this emotion moderately
   - ☐ 6
   - ☐ 7 - I felt this emotion very strongly

9)   Regretful, remorseful

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

10) Shy, timid, bashful

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

11) Grateful, appreciative, thankful

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

12) Interested, engaged

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

13) Mad, angry, irate

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

14) Hopeful, optimistic

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

15) Bored, detached, uninterested

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

16) Nervous, anxious, apprehensive

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

17) Overwhelmed, overloaded, ruffled.

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

18) Proud, triumphant

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

19) Afraid, scared, frightened

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

20) Sad, down, disheartened

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

21) Awed, wondrous, amazed

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

22) Ashamed, disgraced

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

23) Disgusted, repulsed, revolted

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

24) Joyful, happy, glad

- ☐ 1 - I did not feel this emotion at all
- ☐ 2
- ☐ 3 - I felt this emotion somewhat
- ☐ 4
- ☐ 5 - I felt this emotion moderately
- ☐ 6
- ☐ 7 - I felt this emotion very strongly

25) Curious, inquisitive

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

26) Irritated, annoyed

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

27) Indebted, obligated

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

28) Amused, humored

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

29) Eager, enthusiastic, excited

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

30) Embarrassed, humiliated

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

31) Disappointed, let down

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

32) Satisfied, content

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

33) Compassionate, empathetic

☐ 1 - I did not feel this emotion at all
☐ 2
☐ 3 - I felt this emotion somewhat
☐ 4
☐ 5 - I felt this emotion moderately
☐ 6
☐ 7 - I felt this emotion very strongly

34) Please describe the intensity of your overall emotional experience during the clip, on a scale of 1-7. 1 being "the emotion was barely noticeable", 4 being "a relatively normal amount of emotional experience", and 7 being "a very intense emotional experience"

☐ 1 - barely noticeable
☐ 2
☐ 3
☐ 4 - relatively normal
☐ 5
☐ 6
☐ 7 - very intense