Modulatory Effects of Induced Emotions on Decision-Making on the Iowa Gambling Task

Aqeelah Moerat and Lauren Stephenson

ACSENT Laboratory

Department of Psychology

University of Cape Town

Supervisor: Progress Njomboro

Word count:

Abstract: 217

Main body: 7900

Abstract

Emotion plays an important role in adaptive functioning, goal directed behaviour, and human decision-making. In day-to-day life, individuals make important decisions under different affective states and it is useful to know how emotions affect the quality of these decisions. There are inconsistencies regarding the influence of affective states on decision-making in current literature. This study aimed to investigate this topic by testing the effects of emotions on decision-making in a sequential decision-making task, the Iowa Gambling Task (IGT; Bechara et al., 1994). The task is designed to imitate real-life decision-making in a laboratory setting by presenting participants with factors of uncertainty, punishment and reward. We hypothesized that happy individuals (positive affect) would engage in more risky decision-making by selecting more cards from the high-reward and high-punishment decks on the IGT, whilst sad and fearful individuals (negative affect) would make more conservative decisions by selecting more cards from the low-reward and low-punishment decks. Data was collected from thirty-eight female participants from the University of Cape Town. Participants were randomly assigned to one of four emotion conditions (happy, sad, fearful, and neutral) and were exposed to film clips that induced these target emotions. Results showed that induced emotions differed distinctively from one another, although the different emotions did not significantly influence how decision were being made on the IGT.

Keywords: decision-making; Iowa Gambling task (IGT); affect; mood; emotional states

PLAGIARISM

DECLARATION

1. We know that Plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

2. We have used the *American Psychological Association (APA)* convention for citation and referencing. Each significant contribution to, and quotation in, this essay / report / project from the work or works, of other people has been attributed, cited and referenced.

3. This essay / report / project is our own work.

4. We have not allowed, and will not allow, anyone to copy our work with the intention of passing it off as his or her own work.

5. We acknowledge that copying someone else's assignment or essay, or part of it, is wrong, and declare that this is my own work.

SIGNATURE: ***A. Moerat & L. Stephenson***

Acknowledgements

We express our deepest appreciation to our supervisor, Dr Progress Njomboro, for the admirable guidance and supervision he provided throughout this research process.

We give special thanks to Dr Colin Tredoux for his amicable support and significant help towards the end of this project.

We also extend our greatest appreciation to Dr Kevin Thomas for his remarkable guidance throughout our ACSENT lab meetings.

We would also like to thank Dr Michelle Hoogenhout, for all her appreciated work regarding statistical analyses and Robyn Human for assisting us stylistically.

Introduction

In day-to-day life, individuals have to make decisions and these range from trivial to more serious ones. Often, the decisions we make involve financial, ethical and moral matters, in addition to political reasoning and behaviour (Kligyte, Connelly, Thiel, & Devenport, 2013; Naqvi, Shiv, & Bechara, 2006). These decisions are not made under emotionally neutral conditions, but rather are made under a range of positive and negative affective states. Research has highlighted the important role emotion plays in adaptive functioning, goal directed behaviour, and in human decision-making (Miu, Heilman, & Houser, 2008). Furthermore, a significant body of research has focused on the negative consequences of decisions made under different affective states, especially in everyday situations such as risky driving, partner violence and in legal decision making. (Bachoo, Bhagwanjee, & Govender, 2013; Hatcher, Colvin, Ndlovu, & Dworkin, 2014; Heilman, Crişan, Houser, Miclea, & Miu, 2010; Hu, Xie, & Li, 2013; Lev, Hershkovitz, & Yechiam, 2008; Nuñez, Schweitzer, Chai, & Myers, 2015). There is a need to identify how emotions affect the quality of decisions. If decision-makers can recognize the influence that emotions have on their ability to make sound decisions, they can utilize this information to influence emotion regulation strategies that optimize our decision-making whether negative or positive. This study investigates whether different affective states have a significant effect on decision-making and the type of decisions people make in different environmental settings, especially those involving finance and investment where high risk is often present (Porcelli & Delgado, 2009). We compare the effects of positive and negative affect on decision-making. We selected three discrete emotions, namely happiness, sadness and fear, because they appear frequently when making everyday decisions and potentially influence cognitive and behavioural outcomes of our decisions (Scherer, Wranik, Sangsue, Tran, & Scherer, 2004).

Emotion and Decision-making

Emotions can be viewed as results of the representation and regulation of momentary changes in the activity pattern of somatosensory regions, which is then expressed through bodily feedback (Damasio, Everitt, & Bishop, 1996). They are typically perceived as temporary events of motivational, psychological and physiological changes that have a distinct cause and a certain cognitive profile and experiential content (Qiao-Tasserit et al., 2017). In practical terms, emotions impart value to others and objects, aid in prioritising goals and aid in the mobilisation of energy and motivation to achieve these goals through guiding

behaviour (Gifford, 2002). Most importantly, emotions influence decision-making in terms of how we conduct ourselves and how we interact with our immediate environment.

Several studies have debated the exact mechanism through which emotions influence decision-making. Forgas (1995)'s Affect Infusion Model (AIM) proposes that affect influences an individual's capabilities to process information and influences the manner in which decisions are made. Similarly, Loewenstein and Lerner (2003) argue for an affect-as-information approach in which immediate and expected emotions influence decision-making. Immediate emotions are those felt whilst making a decision and these can directly impact decision-making or they can indirectly affect the process when a decision-maker perceives the consequences of their decision differently as a result of their current affective state. On the other hand, expected emotions influence an individual's decision based on a predicted outcome. The expected emotion mechanism assumes that individuals will estimate the emotional outcomes of alternative series of actions and ultimately decide on a course of action that will heighten a positive affective state. Another theory which also incorporates a cognitive appraisal perspective on emotions is called the Appraisal Tendency Framework (ATF) (Lerner & Keltner, 2000). The ATF, as with the previously mentioned theories, posits that discrete emotions result in certain cognitive and motivational processes (Han, Lerner, & Keltner, 2007; Lerner & Keltner, 2000). As a multifaceted theoretical framework, the ATF recognises that the valence of an emotion is not the only influential factor concerning decision-making, but that the emotion's cognitive appraisal dimension is persuasive too (Han et al., 2007). For example, individuals in chronic uncertain states, such as depressed individuals, process information more systematically than individuals in chronic certain states (Weary & Jacobson, 1997). Likewise, individuals experiencing affective states that align with feeling certain, such as happiness and anger, may not be motivated to process information further because they possess an internal cue of feeling correct (Tiedens & Linton, 2001). These theories posit that emotions heavily influence decision-making by affecting cognitive, information and motivational processes.

Positive Affect

Findings concerning the effects of happiness on decision-making have been mixed (Hu et al., 2013; Mittal & Ross, 1998; Nygren, Isen, Taylor, & Dulin, 1996; Yuen & Lee, 2003). Some researchers suggest that happy individuals generate favourable assumptions and outlooks towards their immediate environment and are more likely to engage in risky decision-making (Yuen & Lee, 2003). Such individuals perceive the results of risky decisions as advantageous and are more willing to approach risky choices (Hu et al., 2013; Yuen &

Lee, 2003). Similarly, Schwarz (2000) argues that because happy individuals interpret stimuli positively, they tend to utilise a top-down heuristic processing strategy. When making decisions, happy individuals rely on established knowledge structures and pay little attention to the precise details of their context therefore they are inclined to make risky decisions because they are not fully attending to their environment.

However, other researchers argue against these findings and claim that happiness results in better decision-making behaviour (Bagneux, Font, & Bollon, 2013; De Vries, Holland, & Witteman, 2008; Mittal & Ross, 1998; Nygren et al., 1996). A few studies have shown that individuals with positive affect when asked to play a gambling game cautioned themselves in the selection of risky decisions, and were less likely to gamble when losses were possible (Mittal & Ross, 1998; Nygren et al., 1996). Similarly, De Vries and colleagues (2008) revealed that happy individuals made greater advantageous decisions on a gambling task by relying on intuitive processing than individuals who were induced with sadness. Drawing from these results, researchers have yet to reach consensus regarding the influence of happiness on decision-making.

Negative Affect

Research suggests that in comparison to individuals in positive affective states, individuals with negative affect are more likely to judge situational characteristics more conservatively, tend to avoid making risky decisions and are likely to favour low-risk reward selections in a gambling game (Hu et al., 2013; Raghunathan & Pham, 1999; Schwarz, 2000). Both sadness and fear are associated with a strong sense of uncertainty in terms of the present situation and what will occur in the future (Smith & Ellsworth, 1985; Tiedens & Linton, 2001). Tiedens and Linton (2001) suggest that individuals in uncertain affective states are more likely to adopt a bottom-up systematic processing style which is a deeper processing system than that of a top-down strategy. Consequently, uncertain-emotions such as sadness and fear will result in conservative decision-making behaviour.

However, Raghunathan and Pham (1999) argue that discrete emotions resulting from the same valence, such as negative affect, can influence decision-making in distinct ways. Findings seem consistent in that fearful individuals avoid risky decisions (Bagneux et al., 2013; Raghunathan & Pham, 1999). Raghunathan and Pham (1999) argue that fearful individuals find themselves within an environment in which poor control over the situation is perceived and any further uncertainty needs to be reduced. This uncertainty is reduced through engaging in cautious and conservative decision-making behaviour. Sadness, on the other hand, results in response to the absence or loss of a person or object. Raghunathan and

Pham (1999) predicted that sad individuals would therefore be more motivated to engage in behaviour that would lead to reward substitution or acquisition. Thus, sad individuals engage in risky decision-making behaviour in order to attain a specific reward. Findings from research regarding negative affect are therefore mixed.

Measuring Decision-making

Neuroscientific research highlights the significant role immediate emotions play in decision-making (Bechara, Damasio, Damasio, & Anderson, 1994; Bechara, Damasio, & Damasio, 2000; Damasio et al., 1996). Bechara and colleagues (1994) found that individuals with major emotional impairments have difficulty making socially adaptive goal directed decisions. They used the Iowa Gambling Task (IGT) to investigate factors involved in motivational decision-making. The task is designed to imitate real-life decision-making in a laboratory setting by presenting participants with factors of uncertainty, punishment, and reward (Bechara et al., 1994). In the original task, participants choose a selection of cards from four identical decks. Each deck offers different levels of reward and punishment. The disadvantageous decks (decks A and B) offer high reward, but high punishment, whilst the advantageous decks (decks C and D) offer low reward with low punishment. Participants are rewarded when they receive fictional monetary gains from deck selection, whilst they are punished when they lose the fictional money. Participants rely on their ability to assess which decks are risky and which are beneficial in the long term and they succeed when they prioritize safer decks over the risky decks (Bechara et al., 1994). The IGT has been shown to supply a sensitive index of impulsivity and decision-making accuracy (Hartman, 2008). It has demonstrated sensitivity to neurological deficits, personality characteristics and affective states (Hartman, 2008; Peters & Slovic, 2000).

Relevance of research study

The current literature indicates that decision-making abilities are influenced by emotions. A great deal of research has been done to determine the effects that specific emotions have on decision-making abilities, however these findings have yet to result in a consensus concerning the definite effects of positive and negative affect, as well as the discrete emotions that fall under them. Additionally, this research has been done almost exclusively in the United States of America and Europe. In this study, our aim is to contribute to this body of research through the perspective of a South African context. It is important to assess how South Africans make decisions in these affective states as studies have shown cross-cultural variations of how we experience elicitors of emotions. This study will allow us to identify whether there are variations in the types of decisions, specifically those concerning

avoidance of risk, made under a range of emotions in addition to understanding how different emotions influence decision-making.

Research Aims and Hypotheses

This study investigates the influence of positive and negative affective states on both risky and safe decision-making on the Iowa Gambling Task (IGT). This study aims to compare decision-making across 3 groups of participants who receive different emotion inductions (happiness, sadness, fear) and a fourth emotionally neutral control group. Based on current literature, we hypothesize that happy individuals (positive affect) will engage in more risky decision-making by selecting more cards from the high-reward and high-punishment decks (decks A and B), whilst sad and fearful individuals (negative affect) will make more conservative decisions and avoid risky decision-making behaviour by selecting more cards from the low-reward and low-punishment decks (decks C and D).

Method

Design and Setting

This study utilised a double-blind experimental, quantitative design. All data collection sessions took place in a room located within the Department of Psychology at the University of Cape Town (UCT).

A total of 230 female undergraduate students from the University of Cape Town were screened for the study. One-hundred and ninety-seven female students met the eligibility criteria and were emailed and invited to participate in the study. Although 73 individuals signed up to participate, only 43 ultimately turned up and were randomly assigned to one of the four experimental conditions (happiness vs. sadness vs. fear vs. neutral).

Participants

A power analysis that was run in G*Power 3.1 software indicated that a sample size of 40 would produce a power of 90% for a two-tailed test with an alpha level set at .05 and an effect size of .34 (Heilman et al., 2010). This analysis was run on the F-tests setting, using one-way ANOVA.

Convenience sampling was used to recruit female participants through the Student Research Participation Programme (SRPP) established within the Department of Psychology at UCT (see Appendix A).

Eligibility criteria.

There were three conditions that needed to be fulfilled for eligibility to participate in the study. Firstly, participants needed to be females. Research suggests that females are better able to express their emotions compared to males (Brody & Hall, 2008). Likewise, females report higher levels of emotional arousal to film clips. Our study required participants to readily acknowledge and identify their current emotional state and this is why only females were chosen as participants.

Secondly, potential participants were screened for general depressive symptoms on the *Beck Depression Inventory-II* (BDI-II; see Appendix C) (Beck & Steer, 1984). The BDI-II is a well-used measure and possesses a high reliability score (α = .93) (Beck, Steer, & Brown, 1996; Dozois, Dobson, & Ahnberg, 1998). The measure consists of 21 multiple-choice questions, and participants need to choose one of four statements that is best associated with how they have been feeling over the past 2 weeks. A cut-off score of 29 is proposed because scores higher than this are conventionally accepted as suggesting high levels of depression (Beck, Steer, & Carbin, 1998). Therefore, individuals who scored higher than 29 on the BDI-II were not invited to participate in our research study. Tanaka-Matsumi and Kameoka (1986) argue that within a university setting, a high score such as 29 may be representative of poor functioning and increased academic stress as opposed to moderate to severe symptoms of depression. It is for this reason that a cut-off score of 29 was chosen for this study, therefore, individuals who scored 29 and below were invited to take part in the experimental session.

Thirdly, potential participants were screened for the presence of anxiety using the *Beck Anxiety Inventory* (BAI; see Appendix D) (Beck, Epstein, Brown, & Steer, 1988). The BAI has been shown to successfully discriminate anxiety from depression when tested within non-clinical samples, and it has high levels of internal consistency (α = 0.91) and a moderate test-retest correlation (r = 0.62) (Creamer, Foran, & Bell, 1995). Like the BDI-II, the BAI also consists of 21-multiple choice questions and individuals choose one of four statements that is best associated with how they have been feeling over that past week. Beck and Steer (1984) suggest that a score above 18 indicates moderate to severe anxiety. For this reason, only individuals who obtained a score of 18 or lower were invited to participate in the study.

Participants with significant depressive and anxiety scores were sent personalised emails telling them of their high score and what this score may mean. They were advised to visit UCT's Student Wellness Service or to phone the SADAG UCT Student Careline.

Materials

Emotion induction. Film clips were used to induce emotions in this study (see Appendix F). The utilisation of film clips is a popular induction technique because film clips can robustly elicit emotion (Schaefer, Nils, Sanchez, & Philippot, 2010). Additionally, film clips are considered to have high levels of emotional intensity, complexity and are relatively ecologically valid (Ellard, Farchione, & Barlow, 2012). Researchers have proposed a set of standardised film clips that reliably induce differing emotions (Quigley, Lindquist, & Barrett, 2014; Schaefer et al., 2010; Uhrig et al., 2016). Four film clips that had been pre-tested as robustly inducing happiness, sadness, fear and neutral emotions from previous studies were used in this study. The film clip to induce happiness was taken from the film 'W*hen Harry Met Sally'* and the scene depicts a woman who fakes an orgasm in a restaurant. This excerpt has been successfully validated by several researchers (Gross & Levenson, 1995; Hewig et al., 2005; Rottenberg, Ray, & Gross, 2007; Schaefer et al., 2010). To induce sadness, a scene from *The Champ,* depicting the death scene of a boxer, was used. This scene can robustly induce the target emotion of sadness (Gross & Levenson, 1995; Hewig et al., 2005; Rottenberg et al., 2007; Rottenberg, Salomon, Gross, & Gotlib, 2005). The film clip used to induce fear was obtained from *Silence of the Lambs* and involves a police officer following a suspect to the basement. As with the other film clips, this scene has also been used and validated in numerous studies to successfully induce fear (Chapman, Dixon-Gordon, Layden, & Walters, 2010; Gross & Levenson, 1995; Hewig et al., 2005; Tolegenova, Kustubayeva, & Matthews, 2014). Lastly, a neutral film clip was chosen in order to create a baseline. Research concerning neutral film clips has been divided into two broad categories; plain neutral and pleasant neutral (Rottenberg et al., 2007). Plain neutral clips can be described as an abstract graphic display such as those depicted in a screensaver. This type of neutral film clip induces little emotion however participations often report feeling bored or annoyed. It is for this reason that we obtained a pleasant neutral film clip which provokes low levels of satisfaction. We used a scene depicting coral reefs obtained from *Planet Earth: Shallow Seas* which has been pre-tested and validated by other researchers (Bartolini, 2011; Howard, 2014). To ensure the same induction time, all film clips were edited to be 2 minutes and 51 seconds. Films were edited to this length to ensure that participants were exposed to equal time frames. Likewise, Bagneux and colleagues (2013) conducted a study in which film clips were only 52 seconds in length, and these clips resulted in significant emotional arousal for all emotions. Therefore, by increasing the duration of the film clips, we hoped to achieve a greater intensity of arousal of target emotions.

Measures.

Self-reported emotional arousal. The current study utilised the emotional arousal scale (see Appendix G) that was used in research performed by both Schaefer and colleagues (2010) and Bagneux and colleagues (2013). Post-emotion induction, participants reported the level of their arousal by completing the statement "When I watched the film, I felt…" using a 7-point Likert-like scale ranging from (1) = "*no emotions at all*" to (7) = "*intense emotions*".

Differential Emotions Scale. To measure the presence of discrete emotions in participants, we used the Differential Emotions Scale (DES; see Appendix G) (Izard, Dougherty, Bloxom, & Kotsch, 1974). The DES is a widely used self-report measurement that allows participants to indicate on a 5-point Likert-scale ((1) = "*not at all*" to (5) = "*very strongly*") the level of a discrete emotion they are potentially feeling. Likewise, this scale allows participants to choose from a selection of 10 emotional adjectives that measure the emotional quality of a participant's experiences. These include: (1) *interested*; (2) *happiness/joy*; (3) *surprised*; (4) *sad*; (5) *angry*; (6) *disgusted*; (7) *contempt*; (8) *fearful*; (9) *shy/shame*; (10) *guilty*. The DES is regarded as reliable measure for testing an individual's emotion experience using discrete emotion labels ($\alpha = .81$) (Izard et al., 1974).

Certainty-Uncertainty appraisals. Four items were used to assess certainty-uncertainty appraisals (see Appendix G and H). This was done to see whether each target emotion influenced how participants would perform on the IGT. These four items ($\alpha = .55$) were presented on an 11-point Likert-like scale ranging from (1) = "*not at all*" to (11) = "*definitely*". Three of these items were utilised to examining participants' understanding of the situation; (1) "*Do you feel you know what is happening now?*"; (2) "*Do you feel you understand what is happening now?*"; (3) "*Do you feel uncertain about what is happening now?*" (Smith & Ellsworth, 1985; Weary & Jacobson, 1997). The fourth item was used to assess if participants were able to predict what would happen next in the experiment; (4) "*Do you feel you can predict what is going to happen next?*".

Iowa Gambling Task (IGT). In this task, participants are given a fictitious sum of R2000 as credit. They then choose a selection of cards from four identical decks labelled A, B, C and D. Each deck offers different levels of reward and punishment. Each selection produced a profit. For example, selecting from the disadvantageous decks (A+B) always generated a profit of R100 whilst choosing from the "advantageous" decks (C+D) always resulted in a gain of R50. However, some selections resulted in losses. Participants can lose R150, R250, R350 or even R1250 in decks A and B whilst they only lose R25 or R50 when

selecting from decks C and D. Therefore, decks A and B offer high reward and high punishment, whilst decks C and D offer low reward accompanied by low punishment.

The current study made use of the non-automated card version of the IGT as it was easy to administer and the online version was not readily accessible. Likewise, administering the IGT in this manner allowed for certainty-uncertainty appraisals to be asked after every 20 trials. The simulation was stopped after 100 trials. The participants were not told how many selections they would have to make.

Procedure

Upon arrival at the venue, one researcher would read the information sheet with the research participant and the participant then signed the informed consent document (see Appendix E). The participant was randomly assigned to one of four experimental conditions (happiness vs. sadness vs. fear vs. neutral) and was told that she was going to watch one film clip and afterwards would complete a few questionnaires describing how she felt whilst she was watching the clip. The researcher left the room whilst the participant was watching the film clip in order to prevent expectancy biases. The participant watched the film clip on a 15.6 inch laptop screen.

After emotion induction, the same researcher re-entered the room and asked the participant to complete the arousal scale and the DES. Following the instructions used by Philippot (1993) and then Schaefer and colleagues (2010), participants were instructed to report (a) what they had actually felt and not what they believe people should feel in reaction to the film clip, and (b) how they felt at the specific time that they were watching the clip and not their general mood of the day. The research participant also completed the four certainty-uncertainty appraisals.

At this point the second researcher entered the room, and the initial researcher left the room. As with Bagneux and colleagues (2013) the researcher who administered the IGT did not know which emotional condition the participant had been exposed to. The participant was given a document with the instructionsfor the IGT, and the researcher read these through with the participant (see Appendix J). For every 20 card selections, the participant was asked to complete the four certainty-uncertainty appraisals. After the IGT had been carried out (100 trials) the participant was debriefed and encouraged to take a detailed debriefing form home with them (see Appendix I). If the participant felt distressed at the end of the session, she was encouraged to visit the UCT's Student Wellness Service for support. In total, the session lasted approximately 35-40 minutes.

Data Management and Statistical Analyses

The data obtained from this study was analysed using the IBM SPSS statistical analytics programme, Version 24.0. The certainty-appraisal tendency scores were added together, and Item C was scored inversely. These net scores were loaded into the dataset for every 20 trials. Likewise, the IGT scores were saved as the net card scores for the disadvantageous deck (A+B) and the advantageous deck (C+D) for every 20 trials.

The analysis occurred in three stages. Firstly, to establish whether the films induced their target emotions, several one-way ANOVAs were run. The variables included the film type and the self-reported scores for happiness, sadness, fear and contempt (for the neutral condition) respectively. Secondly, the influence of film clips on certainty-uncertainty appraisals were examined by performing a mixed ANOVA. The certainty-uncertainty appraisals sets (0 to 5) served as the within-factors variable, and the type of film clip served as the between-factors variable. Lastly, the influence of film clips on decision-making as indexed by the IGT was examined by performing another mixed ANOVA. The Time sets (1 to 5) served as the within-factors variable, and the type of film clip served as the between-factors variable.

The data was examined before any statistical analyses took place, and appropriate *post-hoc* analysis was implemented when violations occurred.

Ethical Considerations

This study has been ethically approved by the University of Cape Town Research Ethics Committee (see Appendix M).

Consent, voluntary participation, and confidentiality. Informed consent was obtained from participants before commencing with participant screening (see Appendix B), and beginning the experimental session (see Appendix E). In the experimental session, an information sheet was given to participants. This was read to participants and any foreign concepts were explained. Participants were reminded that participation was voluntary, and that they could withdrawal at any time from the study. However, withdrawal meant that they would not receive the allocated SRPP points. They were also notified that their scores would remain confidential and anonymous in the write-up process.

Potential risks. The study possessed minimal risk. Individuals were screened for general anxiety and depressive symptoms prior to participation in order to avoid putting vulnerable individuals into potentially stressful situations. In the experimental session, participants were informed that if they felt distressed, they could withdraw from the study.

Benefits. Participants received 1 SRPP point for completing the screening measure, and 2 SRPP points for participating in the experimental session.

Debriefing. Following the experimental session**,** participants were debriefed in person and received a debriefing form to take home (see Appendix I). A researcher explained why participants needed to undergo emotion inducing techniques, and participants were encouraged to ask questions regarding the study. If participants felt distressed, they were advised to visit the UCT's Student Wellness Service.

Results

Emotional states

Before commencing with any analyses, the data was cleaned. The scores from a total of 5 participants were removed from the dataset because they failed the manipulation check which assessed through the DES scores to see whether the target emotion had been induced. As a result, the final sample consisted of 38 participants. Subsequently, sample sizes differ slightly across the groups and the group sizes are small (happiness, $n = 9$; sadness, $n = 9$, fear, $n = 11$; neutral, $n = 9$).

Participants experienced moderate levels of arousal to the film clips (see Table 1). Those exposed to the sad film clip ($M = 3.78$, $SD = 0.67$) and the neutral film clip ($M = 3.78$, $SD = 0.83$) reported adequate levels of arousal. Participants who saw the fear film clip ($M = 3.18$, $SD = 1.54$) reported feeling slightly aroused, whilst those who saw the happy film clip ($M = 2.67$, $SD = 0.87$) reported low levels of arousal.

Figure 1 shows which emotions were elicited for each film clip. After exposure to the happy film clip (a), participants reported feeling happy, surprised and slightly shameful. Participants who saw the sad film (b) felt sad and reported fewer other DES items, whereas those who were exposed to the fear film clip (c) reported several affective states including feeling surprised, disgusted and fearful. The neutral film clip (d) elicited low levels of negative affect and moderate levels of positive affect including happiness, surprise and contempt. Therefore, although all films induced their target emotion, other emotions were induced as well. This may explain the standard deviations for each target emotion.

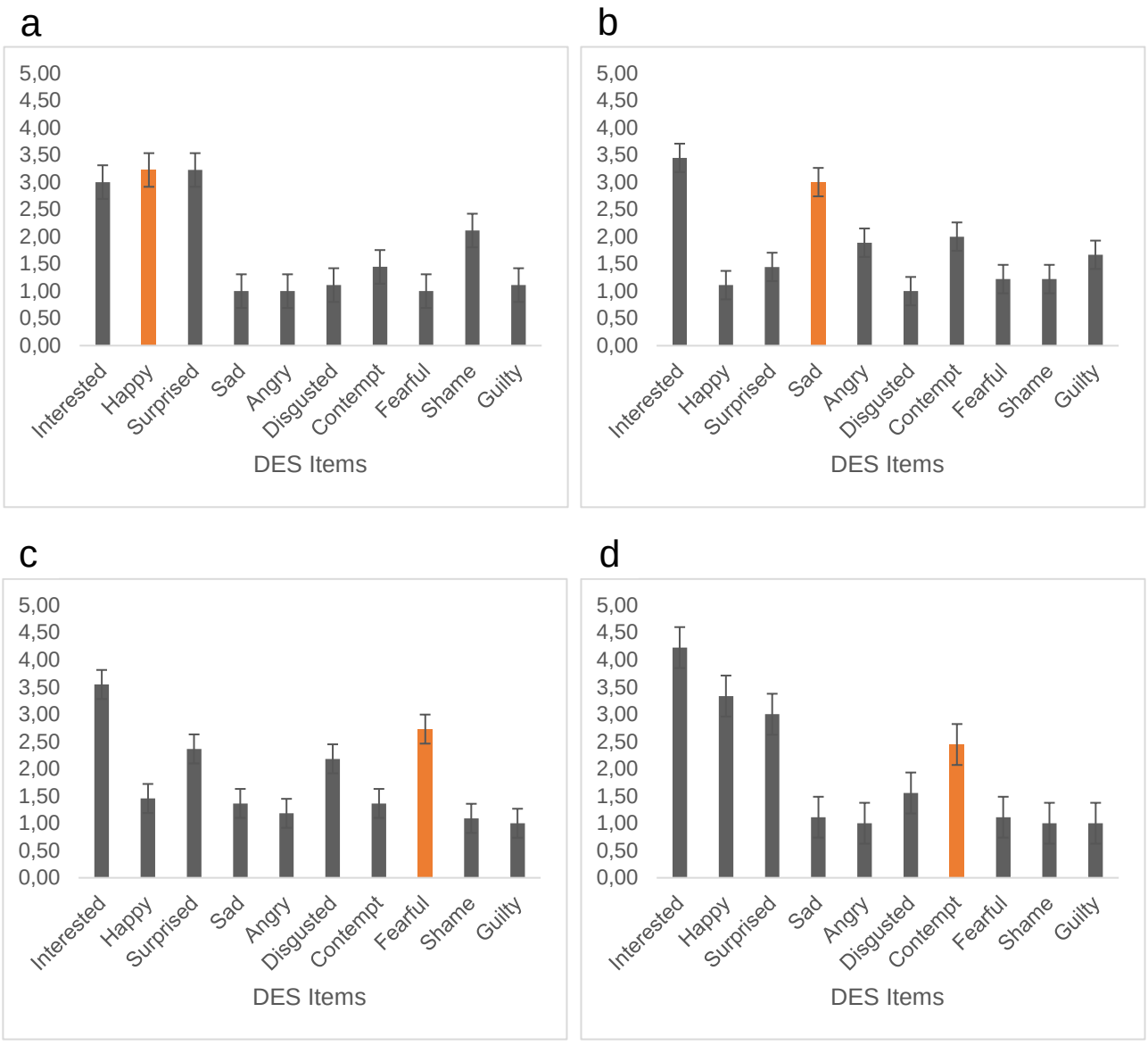

Figure 1. Mean DES item ratings after exposure to film clips. Ratings yielded from exposure to happy (a), sad (b), fear (c), and neutral film clips (d). Error bars represent standard error at 95% confidence intervals.

Each film was moderately successful at inducing the specific target emotion (see Table 1 and Figure 2). Happiness (M = 3.22, SD = 1.09) and sadness (M = 3.00, SD = 1.11) were both sufficiently induced whilst fear (M = 2.72, SD = 1.10) and the neutral condition (M = 2.44, SD = 1.59) were only slightly induced. Participant in the neutral condition also reported a high score for happiness (M = 3.33, SD = 0.71) although this happiness score is appropriate because a positive-neutral film was selected for induction. Figure 2 shows this data graphically and allows for easy comparisons to be made across the film clips.

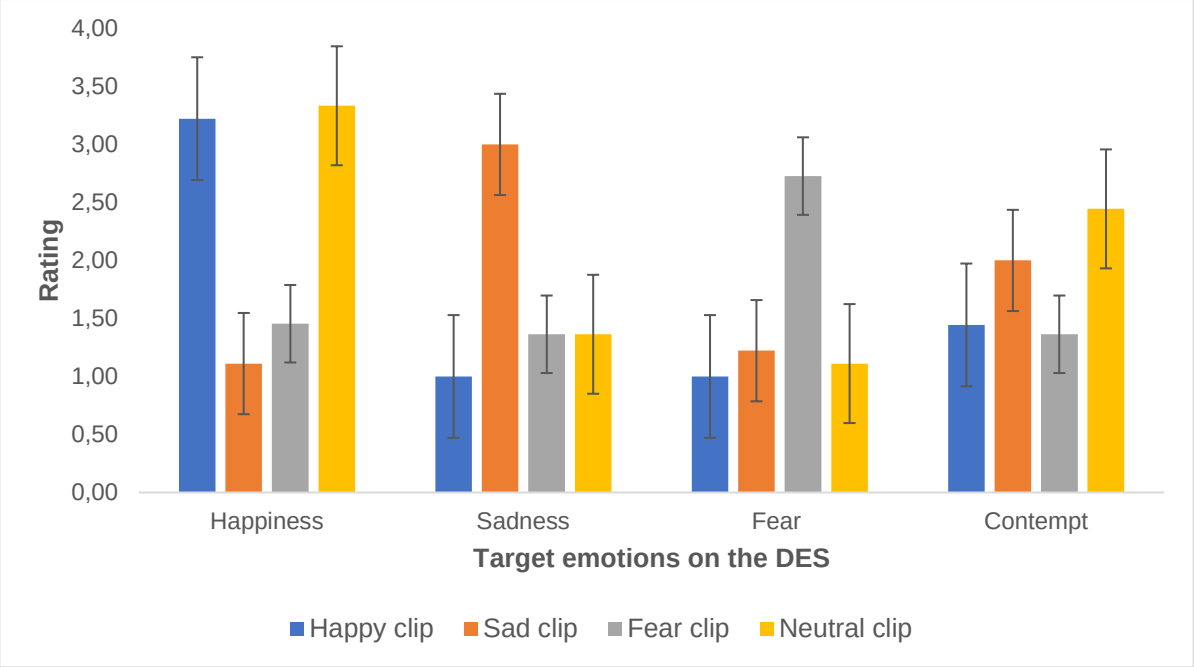

Figure 2. Mean DES item ratings for target emotions after exposure to film clips. Error bars represent standard error at 95% confidence intervals.

Statistical analyses were performed on the scores of happiness, sadness, fear and contempt to establish that the assumptions for conducting a one-way ANOVA were met. The Kolmogorov-Smirnov goodness-of-fit test was used to assess the normality of data distribution. If a statistically significant *p*-value is yielded then this indicates that the distributions significant differ from normal. Results showed that sadness ($p = .044$) and fear ($p = .01$ at $\alpha < .05$) were non-normally distributed, whilst happiness and contempt were normally distributed. Field (2009) states that in the case of small sample sizes, a non-normal distribution of data is common. Likewise, he argues that ANOVA is relatively robust to violations of normality. Therefore, further analyses can continue despite these violations.

Levene's test was run to examine the homogeneity of variance. Sadness and contempt met the assumption of homogenous variances, however, the happiness ($p = .004$) and fear datasets ($p = .037$) violated this assumption. Field (2009) states that when group sizes differ, it is easier to violate this assumption, nonetheless an analysis will continue and appropriate *post-hoc* tests will be used.

A one-way ANOVA was run and a significant effect was found between exposure to the happy film and a participant's corresponding affective state ($F(3, 34) = 22.28$, $p < .001$) with an effect size of 66.3%. Post-hoc comparisons using a Games-Howell correction indicated that participants who saw the happy film felt significantly happier than those who saw the sad

($p < .001$) and fear film ($p = .005$), whilst they did not feel significantly happier than those who saw the neutral film ($p = .994$).

A significant effect between exposure to a sad film and one's subsequent affective state was also found ($F(3, 34) = 17.36$, $p < .001$) with an effect size 61%. A Games-Howell correction revealed that the participants who were exposed to the sad film felt significantly sadder than those who saw the happy ($p = .003$), fear ($p = .010$) and neutral film ($p = .004$).

Likewise, a participant's affective state was significantly influenced when exposed to the fear film clip ($F(3, 34) = 15.99$, $p < .001$) with an effect size of 59%. A Games-Howell correction showed that participants who were exposed to the fear film felt significantly more fearful than those who saw the happy ($p = .002$), sad ($p = .005$) and neutral film ($p = .003$).

However, another one-way ANOVA revealed that there was no significant effect between exposure to the neutral film and a participant's corresponding state ($F(3, 34) = 2.13$, $p = .12$).

Therefore, all films except the neutral clip were able to significantly influence their specific target emotion.

Table 1

Means and standard deviations of arousal scores, emotion scores, appraisal tendency and net scores of C+D for each time as a function of emotion condition

	Emotion condition							
	Happiness		Sadness		Fear		Neutral	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Arousal	2.67	0.87	3.78	0.67	3.18	1.54	3.78	0.83
Emotional scores								
Happiness	3.22	1.09	1.11	0.33	1.45	0.69	3.33	0.71
Sadness	1.00	0.00	3.00	1.11	1.36	0.67	1.11	0.33
Fear	1.00	0.00	1.22	0.44	2.72	1.10	1.11	0.33
Neutral	1.44	0.88	2.00	0.87	1.36	0.81	2.44	1.59
Certainty-uncertainty								
Appraisal tendency								
Time 0	22.11	9.43	19.78	8.23	20.36	8.54	22.33	8.20
Time 1	25.78	8.89	26.11	6.58	24.91	5.97	22.78	6.06
Time 2	25.22	8.87	28.44	8.37	27.27	7.10	26.33	6.40
Time 3	27.88	4.46	29.11	9.56	26.55	11.41	28.89	6.03
Time 4	30.56	6.27	31.22	10.00	28.82	11.80	30.56	8.35
Time 5	31.67	5.05	30.44	9.32	30.45	12.19	32.00	7.48
Net scores (C+D)								
Time 1	9.56	2.79	9.22	2.28	8.45	1.69	9.22	1.56
Time 2	10.33	3.81	11.44	2.65	11.00	1.73	10.44	1.94
Time 3	12.78	4.82	13.44	4.75	11.73	1.79	12.33	4.85
Time 4	13.89	3.59	12.78	4.49	11.64	1.91	13.89	4.08
Time 5	13.00	5.81	12.00	5.12	12.91	3.24	13.33	3.43

Note. SD = standard deviation

Certainty-Uncertainty Appraisals

Table 1 shows the across each condition, certainty-uncertainty appraisal scores increased throughout the administration of the IGT. At Time 0, before the IGT had been administered, all participants felt relatively uncertain about the task. Participants exposed to the sad (M = 19.78, SD = 8.23) and the fear film (M = 20.36, SD = 8.54) reported low levels

of certainty, whilst those who saw the happy (M = 22.11, SD = 9.43) and the neutral clip (M = 22.33, SD = 8.20) reported moderate levels of certainty. After completing the IGT, all certainty-uncertainty appraisals were relatively high with participants in the neutral (M = 32.00, SD = 7.48) and happy condition (M = 31.67, SD = 5.05) reporting high levels of certainty, and those in the fear (M = 30.45, SD = 12.19) and the sadness condition (M = 30.44, SD = 9.32) reporting slightly lower levels of certainty.

Before conducting the mixed ANOVA, the Kolmogorov-Smirnov goodness-of-fit test was run to examine the homogeneity of variance. Results revealed that all variables had p-values greater than .05, therefore indicating that the data was normally distributed. The assumption of sphericity, however, was violated as there were significant differences between variances ($\chi^2(14) = 91.74$, $p < .001$). The analysis was continued and appropriate *post-hoc* analyses were implemented, however, there was no significant effect between type of film and certainty-uncertainty appraisal tendencies ($F(3, 34) = .06$, $p = .98$). Therefore, the certainty-uncertainty appraisal tendencies of participants did not depend on the type of film that they were exposed to.

Decision-making

As seen in Table 1, all participants across the four conditions gradually picked more selections from the safe decks. At Time 1, happy participants (M = 9.56, SD = 2.79) selected most of their cards from the safe decks and fearful (M = 8.45, SD = 1.69), contempt (M = 9.22, SD = 1.56) and sad individuals (M = 9.22, SD = 2.28) selected moderate levels of cards from decks C and D. By Time 5, participants in the neutral (M = 13.33, SD = 3.43), happy (M = 13.00, SD = 5.81), fear (M = 12.91, SD = 3.24), and sad condition (M = 12.00, SD = 5.12) were all selecting more cards from the safe decks.

Figure 3 shows the pattern in which decisions were made. Fearful individuals (c) appear to make more conservative decisions than those feeling happy (a), sad (b) and those with a neutral affect (d). Both individuals with positive affect (a) and neutral affect (c) appear to be less cautious in how they make decisions because they quickly change to safe decks and maintain selections from safe decks. Sad individuals (Figure c), also follow this pattern but in a slightly reserved manner.

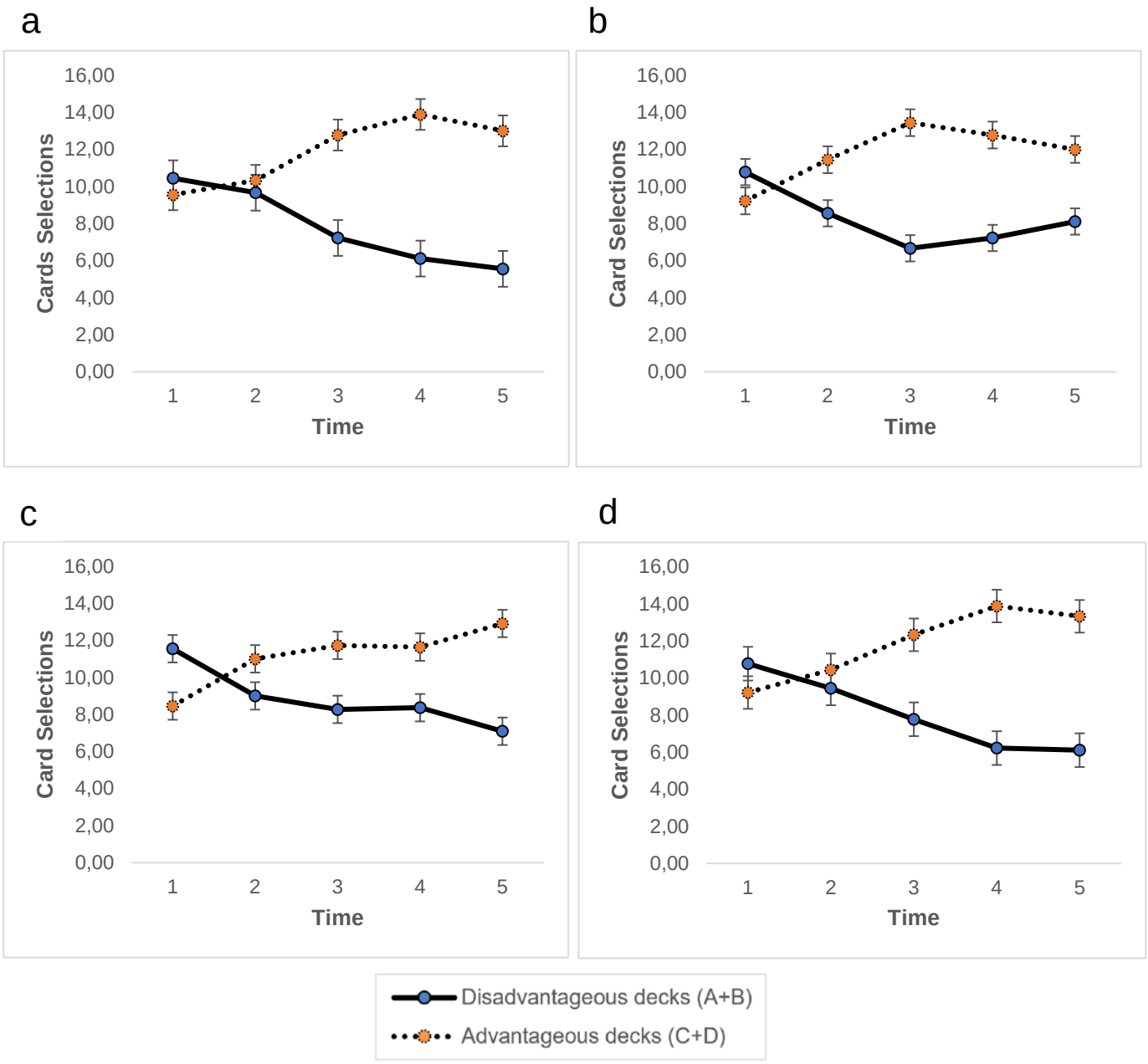

Figure 3. Relationship between induced emotion and deck choices. Selections influenced by happiness (a), sadness (b), fearful (c), and contempt (d). Error bars represent standard error at 95% confidence intervals.

The Kolmogorov-Smirnov goodness-of-fit test was run to assess the normality of data distribution. Results revealed that only the neutral scores for Time 1 (p = .002), the sad (p = .015) and neutral scores for Time 2 (p = .001), and the neutral scores for Time 3 (p = .002) were non-normally distributed. However, further analysis proceeded because ANOVA is robust to such violations, and non-normal distributions frequently occur in datasets with small sample sizes (Field, 2009).

A Mauchly's test of sphericity emerged with a significant effect ($\chi^2(9) = 21.54$, p = .01). This result, although violates an assumption for conducting a mixed ANOVA, makes

theoretical sense because it indicates that individuals are making similar decisions within specific time intervals. However, appropriate *post-hoc* analyses were implemented so to continue the analysis. The mixed ANOVA revealed a significant difference in participants' choices over time ($F(4, 31) = 14.03$, $p < .001$). Findings confirm that participants learned to adopt a conservative strategy whilst playing the IGT. In the beginning of the game, certainty scores were much lower has for all individual but a gradual increase in certainty occurred as they selected more cards from the different decks provided.

The mixed ANOVA revealed that there was no significant interaction effect and that the type of film shown made no significant difference in how participants made decisions ($F(3, 34) = 0.37$, $p = .78$). Therefore, our hypothesis stating that individuals induced with positive affect (happiness) would make more risky decisions compared to those induced with negative affect (sadness and fear) has not been supported. Although individuals changed their decisions over time, this was not significantly influenced by their induced affective state.

Discussion

The present literature highlights the important role that affective states play in individual's everyday decisions (Raghunathan & Pham, 1999). However, research concerning discrete emotions and their consequences on decision-making behaviour have been inconsistent. Some researchers have claimed that happiness results in risky decision-making (Hu et al., 2013; Schwarz, 2000; Yuen & Lee, 2003), whereas others have argued that happiness promotes better decision-making behaviour (Bagneux et al., 2013; De Vries et al., 2008). Likewise, some researchers argue that negative affect results in cautious and safer decisions (Hu et al., 2013; Schwarz, 2000), whilst others claim that this is not the case and that sad individuals are more likely to make risky decisions that offer reward substitution or acquisition (Raghunathan & Pham, 1999).

We addressed these inconsistencies found in the literature in the present study. We had hypothesized that individuals with positive affect make risky decisions and select more cards from the disadvantageous decks that offered high-reward but high-punishment (decks A and B), whilst individuals with negative affect would make more conservative decisions by selecting more cards from the advantageous decks that offered low-reward but low-punishment (decks C and D).

Emotion and Decision-making

Statistical analyses revealed that decision-making, as indexed by the IGT, did not significantly depend on an individual's affective state, therefore both of our hypotheses were

not confirmed. The group means of the decision-making scores of happy individuals were not suggestive of the predictive pattern in which we hypothesised that happy individuals would select more cards from the disadvantageous decks (decks A and B). Instead, group means indicated that happy individuals developed a tendency towards selecting from the advantageous decks and this remained stable until the end of the task. The group means of individuals in induced negative affective states (sadness and fear) were suggestive of the predicted pattern in which individuals with negative affect would engage in conservative decision-making and thus select more cards from the advantageous decks (decks C and D).

There may be several reasons for the null findings. One such reason could be that our chosen measures were not sensitive enough to our manipulation check. Quigley and colleagues (2014) state that the measurement of affective states is embedded with difficulties due to the variation in which emotions are internalised and externalised. One method of measuring these affective states include using self-report questionnaires in which participants are expected to respond to a set of adjectives which are thought to correspond to their current emotional state. The rating system presumes that affective states are static in nature, and remain static even when compared to different affective concepts. However, it is possible for individuals to move through affective states merely by thinking about emotion adjectives. For example, Izard (1972) has discussed several studies in which individuals reported heightened levels of a certain emotion from simply imagining a situation associated with that emotion.

Furthermore, Quigley and colleagues (2014) argue that many studies, as with the current study, utilise Likert-type scales. They advise that using this type of scale should be considered carefully in relation to the chosen scale labels. This is because participants typically assume bi-polarity on unipolar and ambiguously-laden scale anchors. For example, when a participant is asked if they feel sad on a 5-point scale ranging from "(1) *not at all*" to "(2) *intensely*", she may interpret "(1) *not at all*" to mean happiness. Bartoshuk, Fast, and Snyder (2005) also argue for the presence of individual differences in how individuals make meaning of anchor labels. Therefore, anchor labels should be approached with caution.

We utilised Izard and colleagues' (1974) DES to measure the presence of target emotions. The DES consists of 10 emotional adjectives which are rated on a 5-point Likert-type scale ranging from (1) = "*not at all*" to (5) = "*very strongly*". The concerns raised with regards to presenting participants with an array of emotional adjectives associated with ambiguous anchor headings are present in this measure. Due to the large number of emotional adjectives, participants' affective states may have fluctuated whilst completing the measure. Likewise, interpretation of the anchor headings may have also influenced the way in

which this measure was completed. Therefore, there is a concern that DES scores indicated that participants were successfully induced with the target emotion, whilst in fact they were not and they may have only reported a high rating for the target emotion just by thinking about the emotional adjective. This would then introduce a confounding variable into our study, which would have notable effects on the validity and the reliability of any statistical results.

Another possible reason of why null findings were obtained may relate to cultural variations and individual differences in interpreting emotions. Quigley and colleagues (2014) suggest that variation in emotional responses can be the result of context and individual differences. When individuals are given a set of emotional adjectives, as in the current study, they may interpret these words differently. This interpretation may be dependent on their subjective notions surrounding affective states, or as a result of their cultural context. This raises the central question of whether emotions are perceived differently between individuals (Barrett, 2006). Researchers such as Ekman (1992), Izard (2007) and LeDoux (2012) claim that emotions are universal and can be felt and described similarly throughout different cultures because they are innate. However, many researchers, such as Russell (1991) and Lindquist, Siegel, Quigley, and Barrett (2013), argue that emotions are not universal but rather resemble cultural variations. Both Lindquist and others (2013) and Lutz and White (1986) argue that culture plays an important role in how an emotion is interpreted and expressed.

From the data collected in our study, group means showed that the target as well as other unanticipated emotions were elicited. For example, many participants in the fear condition reported feelings of disgust. Likewise, feelings of shame were reported by participants in the happy condition. The film clip had sexual aspects attached to it which in some cases could be quite personal to some individuals or even embarrassing in some instances. Both the fear and happy film clip have been validated and reported to robustly induce their target emotions (Gross & Levenson, 1995), however, this was not the case for our South African sample. The reason for this may be due to cultural variation in the way that emotions are perceived, or this could indicate the presence of individual differences.

Another concern is the quality and maintenance of the affective state whilst the IGT was administered. Participants were exposed to film clips for a duration of 2 minutes and 51 seconds. Target emotions were only moderately induced, however, they were expected to last over the duration of the gambling task which took between 20 to 30 minutes to complete. It is probable that these affective states were not maintained throughout the game therefore

influencing the results. Likewise, after 20 trials participants were repeatedly required to complete certainty-uncertainty appraisals. This disruption may have further reduced their already moderately-induced affective state.

Furthermore, the group means across the conditions revealed that participants were making safer decisions by selecting cards from the advantageous decks, thereby indicating that individuals were more motivated in acquiring low-reward accompanied with low-punishment, as opposed to high-reward accompanied with high-punishment. These choice patterns may be reflective of the society we live in which economic losses and instability are prevalent. Bakos, Denburg, Fonseca, and de Mattos Pimenta Parente (2010) argue that an individual's performance on decision-making is heavily influenced by their cultural context. This reasoning is potentially an explanation of why cards from safer decks were selected by participants.

Additionally, previous studies that have concentrated on affective states and their effects on decision-making have used greater sample sizes than this current study. For example, De Vries and colleagues (2008) obtained a sample of 52 participants, randomly assigned them across two conditions, and found that affective state significantly influenced decision-making in Time 2 of the IGT. Likewise, Bagneux and colleagues (2013) randomly assigned 73 participants across three conditions and found that affective states significantly influenced decision-making. Although these studies obtained low effect sizes, they indicate that a greater sample size is needed to yield significant results. However, even greater sample sizes should be obtained to yield significant results with a larger power.

In the present study, only the scores of 38 participants were analysed. Likewise, our study consisted of 4 conditions, therefore meaning that group sample sizes were extremely small. It was, therefore, unlikely that such a small sample size would result in significant effects. Thus, our sample size contributes in explain null findings.

Limitations and Directions for Future Research

Emotion induction was a pivotal feature of this study. Several researchers have proposed a number of film clips that are argued to robustly induce specific target emotions (Bartolini, 2011; Chapman et al., 2010; Gross & Levenson, 1995; Hewig et al., 2005; Howard, 2014; Rottenberg et al., 2007; Rottenberg et al., 2005; Schaefer et al., 2010; Tolegenova et al., 2014). However, chosen film clips only moderately induced target emotions and we suspect that the length of these emotional states were limited and brief. Likewise, emotions other than the target emotion were elicited. Therefore, future research should work towards creating a new database of film clips for emotion induction. Film clips

should robustly induce target emotions, whilst eliciting low or no levels for other emotions. Likewise, robust inductions would allow for greater longevity of the affective state. Additionally, further research can be conducted using virtual reality agents to successfully and robustly induce target emotions.

A second limitation is the size of our sample. Given the time constraints and the fact that a double-blind experimental procedure was used, only a small sample was achieved. This influenced the number of statistical analyses that can be run on the data, and has notable limitations for achieving a significant effect with a moderate effect size. Future research should therefore be done with a greater sample to see whether significant results can be achieved.

Additional future research could explore a broader range of discrete emotional affects and their role in decision-making. Further research on decision-making qualities can enhance our understanding on the way in which emotions affect decisions and further developments of therapy techniques can be constructed to account for the range of decisions made in a variety of discrete emotions.

Summary and Significance of Study

Literature surrounding decision-making confirms that it is influenced by affective states. This study was undertaken due to the mixed results of discrete emotions on decision-making behaviour present in current literature. Although findings were not significant and so generalizations cannot be made, these results are still important as they reflect the ambiguity surrounding affective states. The significance of this study and research-alike is that better understandings of discrete emotions and their influence will lead to greater understanding of how we make decisions. This is important because decisions are made every day. The quality of these decisions may be undermined as a result of an immediate emotion, which is why understanding the effects of affective states on decision-making behaviour is useful and practical for daily life.

References

Bachoo, S., Bhagwanjee, A., & Govender, K. (2013). The influence of anger, impulsivity, sensation seeking and driver attitudes on risky driving behaviour among post-graduate university students in Durban, South Africa. *Accident Analysis & Prevention, 55*, 67-76. doi:10.1016/j.aap.2013.02.021

Bagneux, V., Font, H., & Bollon, T. (2013). Incidental emotions associated with uncertainty appraisals impair decisions in the Iowa Gambling Task. *Motivation and Emotion, 37*(4), 818-827. doi:10.1007/s11031-013-9346-5

Bakos, D. S., Denburg, N., Fonseca, R. P., & de Mattos Pimenta Parente, M. A. (2010). A cultural study on decision making: Performance differences on the Iowa Gambling Task between selected groups of Brazilians and Americans. *Psychology & Neuroscience, 3*(1), 101-107. doi:10.3922/j.psns.2010.1.013

Barrett, L. F. (2006). Are emotions natural kinds? *Perspectives on Psychological Science, 1*(1), 28-58. doi:10.1111/j.1745-6916.2006.00003.x

Bartolini, E. E. (2011). *Eliciting emotion with film: Development of a stimulus set*. Department of Psycholoygy. Wesleyan Univeristy

Bartoshuk, L. M., Fast, K., & Snyder, D. J. (2005). Differences in our sensory worlds: Invalid comparisons with labeled scales. *Current Directions in Psychological Science, 14*(3), 122-125. doi:10.1111/j.0963-7214.2005.00346.x

Bechara, A., Damasio, A. R., Damasio, H., & Anderson, S. W. (1994). Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition, 50*(1), 7-15. doi:10.1016/0010-0277(94)90018-3

Bechara, A., Damasio, H., & Damasio, A. R. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral Cortex, 10*(3), 295-307. doi:10.1093/cercor/10.3.295

Beck, A., & Steer, R. A. (1984). Internal consistencies of the original and revised Beck Depression Inventory. *Journal of Clinical Psychology, 40*(6), 1365-1367. doi:10.1002/1097-4679(198411)40:6<1365::aid-jclp2270400615>3.0.co;2-d

Beck, A. T., Epstein, N., Brown, G., & Steer, R. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893-897. doi:10.1037//0022-006x.56.6.893

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck Depression Inventory-II. *PsychTESTS Dataset*. doi:10.1037/t00742-000

Brody, L. R., & Hall, J. A. (2008). Gender and Emotion in Context. In M. Lewish, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of Emotions* (Third Edition ed., pp. 395-408). New York: NY: The Guilford Press.

Chapman, A. L., Dixon-Gordon, K. L., Layden, B. K., & Walters, K. N. (2010). Borderline personality features moderate the effect of a fear induction on impulsivity. *Personality Disorders: Theory, Research, and Treatment, 1*(3), 139-152. doi:10.1037/a0019226

Creamer, M., Foran, J., & Bell, R. (1995). The Beck Anxiety Inventory in a non-clinical sample. *Behaviour Research and Therapy, 33*(4), 477-485. doi:10.1016/0005-7967(94)00082-u

Damasio, A. R., Everitt, B. J., & Bishop, D. (1996). The somatic marker hypothesis and the possible functions of the prefrontal cortex. *Philosophical Transactions of the Royal Society B: Biological Sciences, 351*(1346), 1413-1420. doi:10.1098/rstb.1996.0125

De Vries, M., Holland, R. W., & Witteman, C. L. (2008). In the winning mood: Affect in the Iowa gambling task. *Judgment and Decision Making, 3*(1), 42-50. doi:10.1037/e633962013-462

Dozois, D. J., Dobson, K. S., & Ahnberg, J. L. (1998). A psychometric evaluation of the Beck Depression Inventory–II. *Psychological Assessment, 10*(2), 83-89. doi:10.1037//1040-3590.10.2.83

Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6*(3-4), 169-200. doi:10.1080/02699939208411068

Ellard, K. K., Farchione, T. J., & Barlow, D. H. (2012). Relative effectiveness of emotion induction procedures and the role of personal relevance in a clinical sample: a comparison of film, images, and music. *Journal of Psychopathology and Behavioral Assessment, 34*(2), 232-243. doi:10.1007/s10862-011-9271-4

Field, A. (2009). *Discoviering statistics using SPSS* (3rd ed.). London, England: Sage.

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin, 117*(1), 39-66. doi:10.1037/0033-2909.117.1.39

Gifford, A. (2002). Emotion and self-control. *Journal of Economic Behavior & Organization, 49*(1), 113-130. doi:10.1016/s0167-2681(02)00061-6

Gross, J. J., & Levenson, R. W. (1995). Emotion elicitation using films. *Cognition & Emotion, 9*(1), 87-108. doi:10.1080/02699939508408966

Han, S., Lerner, J. S., & Keltner, D. (2007). Feelings and consumer decision making: The appraisal-tendency framework. *Journal of Consumer Psychology, 17*(3), 158-168. doi:10.1016/s1057-7408(07)70023-2

Hartman, D. E. (2008). The Iowa Gambling Task: not just another 12-step program. *Applied Neuropsychology, 15*(2), 158-159. doi:10.1080/09084280802083897

Hatcher, A. M., Colvin, C. J., Ndlovu, N., & Dworkin, S. L. (2014). Intimate partner violence among rural South African men: Alcohol use, sexual decision-making, and partner communication. *Culture, Health & Sexuality, 16*(9), 1023-1039. doi:10.1080/13691058.2014.924558

Heilman, R. M., Crişan, L. G., Houser, D., Miclea, M., & Miu, A. C. (2010). Emotion regulation and decision making under risk and uncertainty. *Emotion, 10*(2), 257-265. doi:10.1037/a0018489

Hewig, J., Hagemann, D., Seifert, J., Gollwitzer, M., Naumann, E., & Bartussek, D. (2005). Brief report. *Cognition & Emotion, 19*(7), 1095-1109. doi:10.1080/02699930541000084

Howard, A. (2014). *Elicitation of empathic emotions using film: Development of a stimulus set*. Department of Psychology. University of Illinois. Urbana, Illinois.

Hu, T.-Y., Xie, X., & Li, J. (2013). Negative or positive? The effect of emotion and mood on risky driving. *Transportation Research Part F: Traffic Psychology and Behaviour, 16*, 29-40. doi:10.1016/j.trf.2012.08.009

Izard, C. E. (1972). *Patterns of emotions: A new analysis of anxiety and depression*. NY, New York: Academic Press.

Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. *Perspectives on Psychological Science, 2*(3), 260-280. doi:10.1111/j.1745-6916.2007.00044.x

Izard, C. E., Dougherty, F. E., Bloxom, B. M., & Kotsch, N. E. (1974). *The Differential Emotions Scale: A method of measuring the meaning of subjective experience of discrete emotions*. Nashville, TN: Vanderbilt University Press.

Kligyte, V., Connelly, S., Thiel, C., & Devenport, L. (2013). The influence of anger, fear, and emotion regulation on ethical decision making. *Human Performance, 26*(4), 297-326. doi:10.1080/08959285.2013.814655

LeDoux, J. (2012). A neuroscientist's perspective on debates about the nature of emotion. *Emotion Review, 4*(4), 375-379. doi:10.1177/1754073912445822

Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition & Emotion, 14*(4), 473-493. doi:10.1080/026999300402763

Lev, D., Hershkovitz, E., & Yechiam, E. (2008). Decision making and personality in traffic offenders: A study of Israeli drivers. *Accident Analysis & Prevention, 40*(1), 223-230. doi:10.1016/j.aap.2007.05.009

Lindquist, K. A., Siegel, E. H., Quigley, K. S., & Barrett, L. F. (2013). The hundred-year emotion war: Are emotions natural kinds or psychological constructions? Comment on Lench, Flores, and Bench (2011). *Psychological Bulletin, 139*(1), 255-263. doi:10.1037/a0029038

Loewenstein, G., & Lerner, J. S. (2003). The role of affect in decision making. In R. J. Davidson, R. S. Klaus, & H. Hill Goldsmith (Eds.), *Handbook of affective science* (Vol. 619, pp. 619-642). New York, NY: Oxford University Press.

Lutz, C., & White, G. M. (1986). The anthropology of emotions. *Annual Review of Anthropology, 15*(1), 405-436. doi:10.1146/annurev.anthro.15.1.405

Mittal, V., & Ross, W. T. (1998). The impact of positive and negative affect and issue framing on issue interpretation and risk taking. *Organizational Behavior and Human Decision Processes, 76*(3), 298-324. doi:10.1006/obhd.1998.2808

Miu, A. C., Heilman, R. M., & Houser, D. (2008). Anxiety impairs decision-making: Psychophysiological evidence from an Iowa Gambling Task. *Biological Psychology, 77*(3), 353-358. doi:10.1016/j.biopsycho.2007.11.010

Naqvi, N., Shiv, B., & Bechara, A. (2006). The role of emotion in decision making: A cognitive neuroscience perspective. *Current Directions in Psychological Science, 15*(5), 260-264. doi:10.1111/j.1467-8721.2006.00448.x

Nuñez, N., Schweitzer, K., Chai, C. A., & Myers, B. (2015). Negative emotions felt during trial: The effect of fear, anger, and sadness on juror decision making. *Applied Cognitive Psychology, 29*(2), 200-209. doi:10.1002/acp.3094

Nygren, T. E., Isen, A. M., Taylor, P. J., & Dulin, J. (1996). The influence of positive affect on the decision rule in risk situations: Focus on outcome (and especially avoidance of loss) rather than probability. *Organizational Behavior and Human Decision Processes, 66*(1), 59-72. doi:10.1006/obhd.1996.0038

Peters, E., & Slovic, P. (2000). The springs of action: Affective and analytical information processing in choice. *Personality and Social Psychology Bulletin, 26*(12), 1465-1475. doi:10.1177/01461672002612002

Philippot, P. (1993). Inducing and assessing differentiated emotional feeling states in the laboratory. *Cognition and Emotion, 7*, 171-193. doi:10.1080/02699939308409183

Porcelli, A. J., & Delgado, M. R. (2009). Acute stress modulates risk taking in financial decision making. *Psychological Science, 20*(3), 278-283. doi:10.1111/j.1467-9280.2009.02288.x

Qiao-Tasserit, E., Quesada, M. G., Antico, L., Bavelier, D., Vuilleumier, P., & Pichon, S. (2017). Transient emotional events and individual affective traits affect emotion recognition in a perceptual decision-making task. *PloS One, 12*(2), 1-16. doi:10.1371/journal.pone.0171375

Quigley, K., Lindquist, K. A., & Barrett, L. F. (2014). Inducing and measuring emotion and affect: Tips, tricks, and secrets. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 220-252). New York, NY: Cambridge University Press.

Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision making. *Organizational Behavior and Human Decision Processes, 79*(1), 56-77. doi:10.1006/obhd.1999.2838

Rottenberg, J., Ray, R. D., & Gross, J. J. (2007). Emotion elicitation using films. In J. A. Coan & J. J. B. Allen (Eds.), *The handbook of emotion elicitation and assessment* (pp. 9-20). London: Oxford University Press.

Rottenberg, J., Salomon, K., Gross, J. J., & Gotlib, I. H. (2005). Vagal withdrawal to a sad film predicts subsequent recovery from depression. *Psychophysiology, 42*(3), 277-281. doi:10.1111/j.1469-8986.2005.00289.x

Russell, J. A. (1991). Culture and the categorization of emotions. *Psychological Bulletin, 110*(3), 426-450. doi:10.1037//0033-2909.110.3.426

Schaefer, A., Nils, F., Sanchez, X., & Philippot, P. (2010). Assessing the effectiveness of a large database of emotion-eliciting films: A new tool for emotion researchers. *Cognition and Emotion, 24*(7), 1153-1172. doi:10.1080/02699930903274322

Scherer, K. R., Wranik, T., Sangsue, J., Tran, V., & Scherer, U. (2004). Emotions in everyday life: probability of occurrence, risk factors, appraisal and reaction patterns. *Social Science Information, 43*(4), 499-570. 10.1177/0539018404047701

Schwarz, N. (2000). Emotion, cognition, and decision making. *Cognition and Emotion, 14*(4), 433-440. doi:10.1080/026999300402745

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48*(4), 813-838. doi:10.1037/0022-3514.48.4.813

Tanaka-Matsumi, J., & Kameoka, V. A. (1986). Reliabilities and concurrent validities of popular self-report measures of depression, anxiety, and social desirability. *Journal of Consulting and Clinical Psychology, 54*(3), 328-333. doi:10.1037//0022-006x.54.3.328

Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: the effects of specific emotions on information processing. *Journal of Personality and Social Psychology, 81*(6), 973-988. doi:10.1037//0022-3514.81.6.973

Tolegenova, A. A., Kustubayeva, A. M., & Matthews, G. (2014). Trait Meta-Mood, gender and EEG response during emotion-regulation. *Personality and Individual Differences, 65*, 75-80. doi:10.1016/j.paid.2014.01.028

Uhrig, M. K., Trautmann, N., Baumgärtner, U., Treede, R.-D., Henrich, F., Hiller, W., & Marschall, S. (2016). Emotion elicitation: A comparison of pictures and films. *Frontiers in Psychology, 7*, 1-12. doi:10.3389/fpsyg.2016.00180

Weary, G., & Jacobson, J. A. (1997). Causal uncertainty beliefs and diagnostic information seeking. *Journal of Personality and Social Psychology, 73*(4), 839-848. doi:10.1037/0022-3514.73.4.839

Yuen, K. S., & Lee, T. M. (2003). Could mood state affect risk-taking decisions? *Journal of Affective Disorders, 75*(1), 11-18. doi:10.1016/S0165-0327(02)00022-8

Appendix A

SRPP advert

You are invited to participate in our study that aims to test whether viewing different film clips affect how one plays games.

Who can participate?

We are looking for **female students** to participate in our study.

What does the participation involve?

You will need to complete a screening survey to determine whether you are eligible to participate. You will be awarded **1 SRPP point** for having completed the online screening measure, regardless of whether you are eligible to complete the rest of the study or not. During the experimental session, you will watch a film clip, complete some questionnaires and then play a card game. The duration of the experimental session will last between **45 minutes to an hour** and you will receive **2 SRPP points** for participating. Therefore, you can receive a total of **3 SRPP** points for participating in the full study (including the survey).

Where will this study take place?

This study will take place in Room 3D in the Department of Psychology at the University of Cape Town.

How to sign up:

If you are interested in participating in this study, please follow this link https://www.surveymonkey.com/r/X8LPLRQ and complete the survey. You will be contacted by the researchers if you are eligible to participate and you will be notified of when the experiment will take place. You will also have the option of indicating a slot you are able to come into the lab for an experimental session.

If you have any further questions about this study, please email filmeffects2017@gmail.com.

Disclaimer

It is generally accepted that the decision to include or exclude individuals from participating in a study depends on the focus, objective, nature of research and context in which the research is conducted. Some research may be focused on a certain individual (such as in a person's life history), or a group of individuals who share a specific characteristic (e.g., an identifiable group of asthma sufferers who happen to be all of one sex; a religious order that is restricted to one sex). Other

examples include research that is focused on specific cultural traditions or languages, or on one age group (e.g., a study of posture corrections in adolescents). These are regarded as appropriate forms of inclusion and exclusion of individuals or groups in research studies - so long as the selection criteria for those to be included in the research are relevant to answering the research question.

Appendix B

Informed Consent for screening

Screening for film study: BDI-II and BAI

Welcome to Our Survey

1. Invitation

We are inviting female students to participate in our research. To determine your eligibility for a research study, we need to collect information about you. By signing this consent form, you are permitting us to collect this information. Signing this consent form does not commit you to participate in a study. Neither does it guarantee that you will participate. Before you participate in a study, we will give you a consent form with information about that study.

2. Purpose

We are honours students from the Psychology department at the University of Cape Town. The information that will be attained from this study will be used for research purposes.

3. Procedures

- If you agree to participate, it is completely voluntary.
- This study poses a low risk of harm to you.
- You are required to complete 2 questionnaires.
- The duration of this experiment is approximately 15 minutes.

4. Confidentiality

- Any information obtained from this study is strictly confidential.
- The data obtained from these questionnaires will be kept protected by only the researchers as they will be used for educational purposes.
- You are required to provide your name, student number and email address in order for us to contact you if you are eligible for this study.
- The information collected will not include any markers that can identify you in the final research paper therefore you will be anonymous in this study.

5. Risks or Discomforts

This screening process poses minimal harm however if you feel distressed during or after the session, we advise you to visit the to UCT's Student Wellness Service.

6. Benefits

There are no benefits for completing these questionnaires however if you are eligible you will be invited to participate in the study of which you can then receive SRPP points.

7. Withdraw

You are free to withdraw at any point during the procedure if you no longer wish to participate in this experiment and there will no consequences.

8. Questions

If you have any questions, concerns or complaints related to this research, please contact us:

Aqeelah Moerat and Lauren Stephenson at filmeffects2017@gmail.com

Or

Dr Progress Njomboro at the Department of Psychology, University of Cape Town (UCT) 021 650 3429 or via email: Progress.Njomboro@uct.ac.za

For any details relating to being a research participant or to reach the Ethical Approvals Committee contact the Postgraduate Administrator: Rosalind Adams at the Department of Psychology on 021 650 3417 or via email: Rosalind.Adams@uct.ac.za

9. Consent

By signing this consent form, I agree to participate in the screening. I give permission to use the resulting information to determine my eligibility for this research study.

OK

* 1. Do you agree to participate? (If you do not consent, please exit the survey)

* 2. Are you a female student? (If you are male student, please exit the survey)

* 3. Participant details (these are required so that we can contact you if you meet our eligibility criteria)

Name and Surname	
Student number	
Psychology module that you require SRPP points for	
Email Address	

Appendix C

Beck's Depression Inventory-II

Carefully read each group of statements, and then choose one statement in each group that best describes the way in which you have been feeling during the past 2 weeks. If there are multiples of statements that describe the way you have been feeling, choose the statement with the highest number beside it. A total of 21 questions must be answered.

OK

* 4. Sadness

- 0. I do not feel sad.
- 1. I feel sad much of the time.
- 2. I feel sad all the time.
- 3. I am so sad or unhappy that I can't stand it.

* 5. Pessimism

- 0. I am not discouraged about my future.
- 1. I feel more discouraged about my future than I used to be.
- 2. I do not expect things to work out for me.
- 3. I feel my future is hopeless and it will only get worse.

* 6. Past Failure

- 0. I do not feel like a failure.
- 1. I have failed more than I should have.
- 2. As I look back; I see a lot of failures.
- 3. I feel I am a total failure as a person.

* 7. Loss of Pleasure

- 0. I get as much pleasure as I ever did from the things I enjoy.
- 1. I don't enjoy things as much as I used to.
- 2. I get very little pleasure from the things I used to enjoy.
- 3. I can't get any pleasure from the things I used to enjoy.

* 8. Guilty Feelings

- 0. I don't feel particularly guilty.
- 1. I feel guilty over many things I have done or should have done
- 2. I feel quite guilty most of the time.
- 3. I feel guilty all of the time.

* 9. Punishment and Feelings

- 0. I don't feel I am being punished.
- 1. I feel I may be punished.
- 2. I expect to be punished.
- 3. I feel I am being punished.

* 10. Self-Dislike

- 0. I feel the same about myself as ever.
- 1. I have lost confidence in myself.
- 2. I am disappointed in myself.
- 3. I dislike myself.

* 11. Self-Criticalness

- 0. I don't criticise or blame myself more than usual.
- 1. I am more critical of myself than I used to be.
- 2. I criticize myself for all my faults.
- 3. I blame myself for everything bad that happens.

* 12. Suicidal Thoughts or Wishes

- 0. I don't have any thoughts of killing myself.
- 1. I have thought of killing myself, but I would not carry them out.
- 2. I would like to kill myself.
- 3. I would kill myself if I had the chance.

* 13. Crying

- 0. I don't cry any more than I used to.
- 1. I cry more than I used to.
- 2. I cry over every little thing.
- 3. I feel like crying, but I can't.

* 14. Agitation

- 0. I am no more restless or wound up than usual.
- 1. I feel more restless or wound up than usual.
- 2. I am so restless or agitated that it's hard to stay still.
- 3. I am so restless or agitated that I have to keep moving or doing something

* 15. Loss of Interest

- 0. I have not lost interest in other people or activities.
- 1. I am less interested in other people or things than before.
- 2. I have lost most of my interest in other people or things.
- 3. It's hard to get interested in anything.

* 16. Indecisiveness

- 0. I make decisions about as well as ever.
- 1. I find it more difficult to make decisions than usual.
- 2. I have much greater difficulty in making decisions than I used to.
- 3. I have trouble making any decision.

* 17. Worthlessness

- 0. I do not feel I am worthless.
- 1. I don't consider myself as worthwhile and useful as I used to.
- 2. I feel more worthless as compared to other people.
- 3. I feel utterly worthless.

* 18. Loss of Energy

- 0. I have as much energy as ever.
- 1. I have less energy than I used to have.
- 2. I don't have enough energy to do very much.
- 3. I don't have enough energy to do anything.

* 19. Changes in Sleeping Pattern

- 0. I have not experienced any change in my sleeping pattern.
- 1. I sleep somewhat more than usual or I sleep somewhat less than usual.
- 2. I sleep a lot more than usual or I sleep a lot less than usual.
- 3. I sleep most of the day or I wake up 1-2 hours early and can't get back to sleep.

* 20. Irritability

- 0. I am no more irritable than usual.
- 1. I am more irritable than usual.
- 2. I am much more irritable than usual.
- 3. I am irritable all the time.

* 21. Changes in Appetite

- 0. I have not experiences any change in my appetite
- 1. My appetite is somewhat less than usual or my appetite is somewhat greater than usual.
- 2. My appetite is much less than before or my appetite is much greater than before.
- 3. I have no appetite at all or I crave food all the time.

* 22. Concentration Difficulty

- 0. I can concentrate as well as ever.
- 1. I can't concentrate as well as usual.
- 2. It's hard to hard to keep my mind on anything for very long.
- 3. I find I can't concentrate on anything.

* 23. Tiredness or Fatigue

- 0. I am no more tired and fatigued than usual.
- 1. I get more tired or fatigued more easily than usual.
- 2. I am too tired or fatigued to do a lot of things I used to do.
- 3. I am too tired or fatigued to do most of the things I used to do.

* 24. Loss of Interest in Sex

- 0. I have not noticed any recent changes in my interest in sex.
- 1. I am less interest in sex than I used to be.
- 2. I am much less interested in sex now.
- 3. I have lost interest in sex completely.

PREV NEXT

Appendix D

Beck's Anxiety Inventory

Carefully read each group of statements, and then choose one statement in each group that best describes the way in which you have been feeling over the past week (including today). If there are multiples of statements that describe the way you have been feeling, choose the statement with the highest number beside it. A total of 21 questions must be answered.

OK

* 25. Please select the appropriate response

	0. Not at all	1. Sometimes	2. Often	3. Severely
Numbness and tingling	○	○	○	○
Feeling hot	○	○	○	○
Wobbliness in legs	○	○	○	○
Fear of the worst happening	○	○	○	○
Dizzy or lightheaded	○	○	○	○
Heart pounding or racing	○	○	○	○
Unsteady	○	○	○	○
Terrified	○	○	○	○
Nervous	○	○	○	○
Feelings of choking	○	○	○	○
Hands trembling	○	○	○	○
Shaky	○	○	○	○
Fear of losing control	○	○	○	○
Difficulty breathing	○	○	○	○
Fear of dying	○	○	○	○
Scared	○	○	○	○
Abdominal discomfort	○	○	○	○
Faint	○	○	○	○
Face flushed	○	○	○	○
Sweating (not due to heat)	○	○	○	○

Appendix E

Consent form

UNIVERSITY OF CAPE TOWN

DEPARTMENT OF PSYCHOLOGY

CONSENT FORM

Title of study: Could viewing different films affect how people play games?

Investigators: Aqeelah Moerat & Lauren Stephenson

1. Invitation

You are being invited to take part in this study regarding how viewing film clips influences how people play games. You were chosen as a participant because you are a female undergraduate student at UCT. We ask that you read this form carefully and ask any questions before agreeing to volunteer in the study.

2. Purpose

We are Honours students from the Psychology department at the University of Cape Town. The purpose of the study is to determine whether film clips affect the way in which people play games. Ultimately, the information obtained from this study will be used for research purposes.

3. Procedures

- If you agree to participate, it is completely voluntary.
- This study poses a low risk of harm to you.
- You will watch a film clip, and then play a card game.
- The duration of this experiment will take between 45 minutes to an hour.

4. Confidentiality

- Any information attained from this study is strictly confidential.
- Data obtained from the self-reported measures and the results from the game will be kept protected by only the researchers as they will be used for educational purposes.
- You are required to provide you name and student number for SRPP purposes only, this is in no way related to this study. The information collected will not include any markers that can identify you in the final research paper therefore you will be anonymous in this study.

5. Risks or Discomforts

This study poses minimal harm however; you will watch a film clip that could conceivably result in emotional distress. If you feel distressed after the session you will be advised to visit the to UCT's Student Wellness Service. Contact details will be provided below.

6. Benefits

If you agree to participate in this study, you will be awarded with **2** SRPP points required for your Psychology course.

7. Withdraw

You are free to withdraw at any time if you no longer wish to participate in this experiment however you will not receive any SRPP points.

8. Questions

If you have any questions, concerns or complaints related to this research, please contact us:

Aqeelah Moerat and Lauren Stephenson at filmeffects2017@gmail.com OR

Dr Progress Njomboro at the Department of Psychology, University of Cape Town (UCT) 021 650 3418 or via email: Progress.Njomboro@uct.ac.za

For any details relating to being a research participant or to reach the Ethical Approval Committee contact the Postgraduate Administrator: Rosalind Adams at the Department of Psychology on 021 650 3417 or via email: Rosalind.Adams@uct.ac.za

9. Consent

Your signature below implies that you have been informed about this study. You have read and understood its purpose from the information provided above. Your signature also indicates that you have agreed to being a volunteer in this research. You are aware that participation is entirely voluntary and you will not be disadvantaged if you choose to withdraw at any time from the experiment.

Participant's Signature: ……. **Date:** …….

Appendix F

Film clips used in study

Title	***Year***	***Emotion Category***	***Total time***	***Description***
When Harry met Sally	1989	Happiness	*2:51sec*	Sally pretends to have an orgasm in a public restaurant.
The Champ	1979	Sadness	*2:51sec*	A little boy gets the chance to speak to a boxer for the last time. The boy is crying and begging the boxer not to die.
Silence of the Lambs	1991	Fearful	*2:51sec*	A forensic detective examines a dead body in an abandoned basement.
Planet Earth: Shallow seas	2007	Positive Neutral	*2:51sec*	Scene of coral reefs, with narrator speaking broadly about marine life.

Appendix G

Arousal scale, DES and Certainty-uncertainty Appraisals post-emotion induction

Please circle the response that is most appropriate

1. Arousal Scale

When I watched the film, I felt…

No emotions at all	Slight emotions	Some emotions	Moderate emotions	Strong emotions	Very strong emotions	Intense emotions
1	2	3	4	5	6	7

2. DES

I feel…

		Not at all	Slightly	Moderately	Considerably	Very Strongly
1	Interested	1	2	3	4	5
2	Happy/ Joyful	1	2	3	4	5
3	Surprised	1	2	3	4	5
4	Sad	1	2	3	4	5
5	Angry	1	2	3	4	5
6	Disgusted	1	2	3	4	5
7	Contempt	1	2	3	4	5
8	Fearful	1	2	3	4	5
9	Shy/ shame	1	2	3	4	5
10	Guilty	1	2	3	4	5

3. Appraisals

a. Do you feel you know what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

b. Do you feel you understand what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

c. Do you feel uncertain about what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

d. Do you feel you can predict what is going to happen now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

Appendix H

Appraisals used during Iowa Gambling task

At Time 1

a. Do you feel you know what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

b. Do you feel you understand what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

c. Do you feel uncertain about what is happening now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

d. Do you feel you can predict what is going to happen now?

Not at all	A little bit	Slightly	To a small extent	Somewhat	Moderately	Considerably	To a large extent	Strongly	Very strongly	Definitely
1	2	3	4	5	6	7	8	9	10	11

At Time 2 – *refer to time 1 for scale labels*

a. Do you feel you know what is happening now?

1	2	3	4	5	6	7	8	9	10	11

b. Do you feel you understand what is happening now?

1	2	3	4	5	6	7	8	9	10	11

c. Do you feel uncertain about what is happening now?

1	2	3	4	5	6	7	8	9	10	11

d. Do you feel you can predict what is going to happen now?

1	2	3	4	5	6	7	8	9	10	11

At Time 3 – ***refer to time 1 for scale labels***

a. Do you feel you know what is happening now?

1 2 3 4 5 6 7 8 9 10 11

b. Do you feel you understand what is happening now?

1 2 3 4 5 6 7 8 9 10 11

c. Do you feel uncertain about what is happening now?

1 2 3 4 5 6 7 8 9 10 11

d. Do you feel you can predict what is going to happen now?

1 2 3 4 5 6 7 8 9 10 11

At Time 4 – ***refer to time 1 for scale labels***

a. Do you feel you know what is happening now?

1 2 3 4 5 6 7 8 9 10 11

b. Do you feel you understand what is happening now?

1 2 3 4 5 6 7 8 9 10 11

c. Do you feel uncertain about what is happening now?

1 2 3 4 5 6 7 8 9 10 11

d. Do you feel you can predict what is going to happen now?

1 2 3 4 5 6 7 8 9 10 11

At Time 5 – ***refer to time 1 for scale labels***

a. Do you feel you know what is happening now?

1 2 3 4 5 6 7 8 9 10 11

b. Do you feel you understand what is happening now?

1 2 3 4 5 6 7 8 9 10 11

c. Do you feel uncertain about what is happening now?

1 2 3 4 5 6 7 8 9 10 11

d. Do you feel you can predict what is going to happen now?

1 2 3 4 5 6 7 8 9 10 11

Appendix I

Debriefing Form

UNIVERSITY OF CAPE TOWN
DEPARTMENT OF PSYCHOLOGY
DEBRIEFING FORM

1. Study title

Modulatory effects of induced emotions on decision-making on the Iowa Gambling Task

2. Background and Aim of the Study

In day-to-day life, individuals are constantly forced to make decisions. These decisions range from trivial ones to more serious issues concerning financial, moral and political reasoning and behaviour. Often, these types of decisions are not made under neutral conditions, but rather they are made under the influence of a range of affective states. Recent research has highlighted the important role emotion plays in adaptive functioning, goal directed behaviour and human decision making. This study investigates the effects of happiness, anxiety and sadness on decision-making as indexed by the Iowa Gambling Task.

3. Inclusion Criteria and its Relation to the Study.

Research suggests that females, compared to males, are better able to recognise and express emotions. Females were, therefore, recruited because the study required participants to quickly feel emotions but also be able to identify them.

4. Wellness of the Participant and Additional Support

The emotions experienced from induction techniques should pose minimal risk to your health. However, if you feel distressed as a result of your participation, please inform us immediately so that we can provide you with the necessary information to contact the Student Wellness Service for additional support. For additional information regarding this study we encourage you to ask any questions that you may have or email the researchers:

Contact details:

Aqeelah Moerat and Lauren Stephenson at filmeffects2017@gmail.com

Student Wellness Service at 021 650 1017 **or contact the SADAG UCT Student Careline, which is a free 24 hour telephone counselling service. The Careline can be called on 0800 24 25 26 free from a Telkom line or send an SMS to 31393 for a call-me-back.**

Appendix J

Iowa Gambling Task Instructions

Rules:

1. In front of you are four decks of cards A, B, C, and D.
2. I want you to select one card at a time, from any deck you choose.
3. Each time you select a card it will tell you that you have won some amount of money. I won't tell you how much you will win. You will find out along the way. Every time you win, I will give you copies of the amount you would have won.
4. Every so often, however, when you pick a card, the card will say you have won some money, but then it also says you have lost some money. I won't tell you when you will lose or how much you will lose. You will find out along the way. Every time you lose you have to give back some money.
5. You are absolutely free to switch from one deck to another any time you wish.
6. The goal of the game is to win as much money as possible.
7. I won't tell you for how long the game will continue. You must keep on playing until I tell you to stop.
8. You will get this ZAR2000 credit (copies of bank notes) to start the game. This written agreement is a reminder of how much money you borrowed to play the game.
9. The game does not make you lose money at random. All l can say is that you may find yourself losing money on all of the decks, but some decks will make you lose more than others. You can win if you stay away from the worst decks.

Appendix K

Iowa Gambling Task Scoring Sheet

PARTICIPANT NUMBER:
DATE:
GAMBLING TEST RESPONSE SHEET

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
A +100			150		300		200		250	350		350		250	200		300	150				300		350		200	250						350	200	250				150	300		
B +100									1250					1250							1250												1250								
C +50			50		50		50		50	50		25	75				25	75		50				50	25	50			75	50				25	25		75		50	75
D +50										250										250									250						250						

Appendix L

Raw data

	Film	Arousal_scale	DES_Interested	DES_Happy	DES_Surprised	DES_Sad	DES_Angry	DES_Disgusted	DES_Contempt	DES_Fearful	DES_Shame	DES_Guilty
2	Happy	2,00	3,00	2,00	4,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00
3	Happy	4,00	3,00	3,00	2,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00
4	Happy	2,00	3,00	2,00	4,00	1,00	1,00	1,00	1,00	1,00	4,00	1,00
5	Happy	2,00	1,00	2,00	3,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00
6	Happy	4,00	2,00	3,00	3,00	1,00	1,00	1,00	1,00	1,00	3,00	2,00
7	Happy	2,00	4,00	5,00	4,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
8	Happy	3,00	3,00	4,00	2,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00
9	Happy	3,00	4,00	4,00	3,00	1,00	1,00	2,00	3,00	1,00	2,00	1,00
10	Happy	2,00	4,00	4,00	4,00	1,00	1,00	1,00	3,00	1,00	1,00	1,00
11	Sad	4,00	2,00	1,00	1,00	2,00	4,00	1,00	2,00	1,00	1,00	2,00
12	Sad	4,00	3,00	1,00	1,00	4,00	2,00	1,00	3,00	2,00	1,00	1,00
13	Sad	3,00	2,00	1,00	1,00	3,00	1,00	1,00	1,00	1,00	1,00	1,00
14	Sad	3,00	4,00	2,00	1,00	1,00	1,00	1,00	3,00	1,00	1,00	1,00
15	Sad	4,00	5,00	1,00	2,00	3,00	1,00	1,00	2,00	2,00	1,00	1,00
16	Sad	4,00	4,00	1,00	1,00	3,00	1,00	1,00	1,00	1,00	1,00	1,00
17	Sad	3,00	3,00	1,00	2,00	3,00	3,00	1,00	3,00	1,00	2,00	2,00
18	Sad	4,00	4,00	1,00	1,00	3,00	1,00	1,00	1,00	1,00	1,00	1,00
19	Sad	5,00	4,00	1,00	3,00	5,00	3,00	1,00	2,00	1,00	2,00	5,00
20	Fear	5,00	4,00	1,00	2,00	2,00	1,00	3,00	3,00	4,00	1,00	1,00
21	Fear	3,00	4,00	1,00	2,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00
22	Fear	2,00	4,00	1,00	2,00	3,00	3,00	5,00	1,00	4,00	1,00	1,00
23	Fear	5,00	4,00	1,00	4,00	1,00	1,00	4,00	1,00	4,00	1,00	1,00
24	Fear	1,00	3,00	2,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00
25	Fear	5,00	4,00	1,00	4,00	2,00	1,00	1,00	1,00	3,00	2,00	1,00
26	Fear	3,00	3,00	3,00	2,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00
27	Fear	2,00	4,00	1,00	2,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00
28	Fear	2,00	3,00	2,00	1,00	1,00	1,00	1,00	3,00	2,00	1,00	1,00
29	Fear	2,00	2,00	1,00	2,00	1,00	1,00	2,00	1,00	2,00	1,00	1,00
30	Fear	5,00	4,00	2,00	4,00	1,00	1,00	3,00	1,00	4,00	1,00	1,00
31	Neutral	4,00	4,00	3,00	4,00	1,00	1,00	2,00	5,00	1,00	1,00	1,00
32	Neutral	4,00	4,00	3,00	4,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00
33	Neutral	4,00	5,00	3,00	4,00	2,00	1,00	3,00	1,00	1,00	1,00	1,00
34	Neutral	5,00	4,00	5,00	4,00	1,00	1,00	1,00	4,00	1,00	1,00	1,00
35	Neutral	4,00	4,00	3,00	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
36	Neutral	4,00	4,00	4,00	1,00	1,00	1,00	1,00	3,00	2,00	1,00	1,00
37	Neutral	4,00	4,00	3,00	2,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00
38	Neutral	2,00	5,00	3,00	4,00	1,00	1,00	2,00	4,00	1,00	1,00	1,00
39	Neutral	3,00	4,00	3,00	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00

	Film	Block1_AB	Block2_AB	Block3_AB	Block4_AB	Block5_AB	Block1_CD	Block2_CD	Block3_CD	Block4_CD	Block5_CD	Certainty_B0	Certainty_B1	Certainty_B2	Certainty_B3	Certainty_B4	Certainty_B5
2	Happy	9,00	5,00	0,00	6,00	5,00	11,00	15,00	20,00	14,00	15,00	22,00	25,00	24,00	28,00	27,00	31,00
3	Happy	7,00	8,00	0,00	6,00	0,00	13,00	12,00	20,00	14,00	20,00	24,00	23,00	26,00	34,00	38,00	41,00
4	Happy	10,00	10,00	6,00	8,00	4,00	10,00	10,00	14,00	12,00	16,00	21,00	17,00	16,00	23,00	25,00	27,00
5	Happy	14,00	8,00	7,00	4,00	6,00	6,00	12,00	13,00	16,00	14,00	8,00	26,00	25,00	32,00	33,00	31,00
6	Happy	15,00	18,00	9,00	9,00	4,00	5,00	2,00	11,00	11,00	16,00	14,00	18,00	20,00	23,00	22,00	27,00
7	Happy	7,00	7,00	15,00	2,00	2,00	13,00	13,00	5,00	18,00	18,00	16,00	42,00	37,00	34,00	33,00	36,00
8	Happy	12,00	9,00	8,00	11,00	13,00	8,00	11,00	12,00	9,00	7,00	33,00	20,00	14,00	24,00	30,00	30,00
9	Happy	10,00	13,00	10,00	0,00	18,00	10,00	7,00	10,00	20,00	2,00	39,00	22,00	24,00	26,00	26,00	26,00
10	Happy	10,00	9,00	10,00	9,00	-2,00	10,00	11,00	10,00	11,00	9,00	22,00	39,00	41,00	27,00	41,00	36,00
11	Sad	12,00	2,00	0,00	7,00	12,00	8,00	18,00	20,00	13,00	9,00	20,00	38,00	39,00	34,00	30,00	26,00
12	Sad	6,00	10,00	8,00	5,00	8,00	14,00	10,00	12,00	15,00	12,00	19,00	23,00	25,00	29,00	33,00	35,00
13	Sad	12,00	9,00	9,00	13,00	1,00	8,00	11,00	11,00	7,00	19,00	11,00	20,00	24,00	30,00	38,00	40,00
14	Sad	9,00	10,00	4,00	2,00	5,00	11,00	10,00	16,00	18,00	15,00	18,00	26,00	33,00	37,00	43,00	34,00
15	Sad	11,00	11,00	15,00	13,00	13,00	9,00	9,00	5,00	7,00	7,00	23,00	24,00	41,00	39,00	39,00	37,00
16	Sad	10,00	9,00	8,00	9,00	5,00	10,00	11,00	12,00	11,00	15,00	17,00	16,00	21,00	20,00	24,00	23,00
17	Sad	11,00	8,00	6,00	2,00	16,00	9,00	12,00	14,00	18,00	4,00	7,00	27,00	15,00	11,00	9,00	10,00
18	Sad	14,00	8,00	0,00	11,00	11,00	6,00	12,00	20,00	9,00	9,00	30,00	33,00	30,00	39,00	32,00	34,00
19	Sad	12,00	10,00	10,00	3,00	2,00	8,00	10,00	11,00	17,00	18,00	33,00	28,00	28,00	23,00	33,00	35,00
20	Fear	9,00	6,00	6,00	6,00	2,00	11,00	14,00	14,00	14,00	18,00	35,00	26,00	25,00	19,00	30,00	25,00
21	Fear	10,00	8,00	10,00	10,00	6,00	10,00	12,00	10,00	10,00	14,00	7,00	22,00	30,00	31,00	38,00	43,00
22	Fear	11,00	10,00	8,00	6,00	3,00	9,00	10,00	12,00	14,00	17,00	28,00	35,00	38,00	44,00	44,00	44,00
23	Fear	12,00	10,00	6,00	9,00	5,00	8,00	10,00	14,00	11,00	15,00	8,00	27,00	34,00	34,00	36,00	36,00
24	Fear	10,00	11,00	9,00	8,00	7,00	10,00	9,00	11,00	12,00	13,00	25,00	31,00	32,00	31,00	27,00	37,00
25	Fear	10,00	9,00	10,00	12,00	13,00	10,00	11,00	10,00	8,00	7,00	22,00	17,00	18,00	13,00	14,00	14,00
26	Fear	14,00	9,00	7,00	8,00	9,00	6,00	11,00	13,00	12,00	11,00	25,00	25,00	19,00	25,00	28,00	30,00
27	Fear	13,00	8,00	9,00	8,00	7,00	7,00	12,00	11,00	12,00	13,00	18,00	20,00	19,00	22,00	20,00	24,00
28	Fear	12,00	9,00	6,00	6,00	6,00	8,00	11,00	14,00	14,00	14,00	25,00	31,00	33,00	33,00	36,00	35,00
29	Fear	12,00	12,00	11,00	9,00	10,00	8,00	8,00	9,00	11,00	10,00	17,00	24,00	31,00	36,00	39,00	41,00
30	Fear	14,00	7,00	9,00	10,00	10,00	6,00	13,00	11,00	10,00	10,00	14,00	16,00	21,00	4,00	5,00	6,00
31	Neutral	10,00	8,00	12,00	7,00	5,00	10,00	12,00	9,00	13,00	16,00	31,00	20,00	27,00	33,00	38,00	42,00
32	Neutral	9,00	7,00	10,00	5,00	7,00	11,00	10,00	10,00	15,00	9,00	23,00	30,00	19,00	24,00	14,00	17,00
33	Neutral	12,00	10,00	12,00	4,00	5,00	8,00	9,00	8,00	16,00	15,00	32,00	32,00	40,00	40,00	42,00	32,00
34	Neutral	12,00	13,00	2,00	0,00	10,00	8,00	10,00	18,00	20,00	10,00	31,00	20,00	20,00	20,00	27,00	26,00
35	Neutral	10,00	10,00	10,00	10,00	10,00	10,00	10,00	10,00	10,00	9,00	14,00	19,00	28,00	28,00	31,00	32,00
36	Neutral	10,00	11,00	12,00	13,00	7,00	10,00	9,00	8,00	7,00	13,00	8,00	12,00	25,00	27,00	32,00	34,00
37	Neutral	10,00	11,00	2,00	3,00	7,00	10,00	9,00	18,00	18,00	13,00	22,00	26,00	21,00	24,00	23,00	29,00
38	Neutral	14,00	10,00	0,00	9,00	2,00	6,00	10,00	20,00	11,00	17,00	22,00	23,00	30,00	32,00	33,00	39,00
39	Neutral	10,00	5,00	10,00	5,00	2,00	10,00	15,00	10,00	15,00	18,00	18,00	23,00	27,00	32,00	35,00	37,00

Appendix M

Ethical Approval

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

25 August 2017

Aqeelah Moerat and Lauren Stephenson
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Aqeelah and Lauren

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *Modulatory effects of induced emotions on decision-making on the Iowa Gambling Task.* The reference number is PSY2017-036.

I wish you all the best for your study.

Yours sincerely

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee